Installing Fedora 14 on x86, AMD64, and Intel 64 architectures

Author
Fedora Documentation Project

Copyright © 2010 Red Hat, Inc. and others.

The text of and illustrations in this document are licensed by Red Hat under a Creative Commons Attribution–Share Alike 3.0 Unported license ("CC-BY-SA"). An explanation of CC-BY-SA is available at http://creativecommons.org/licenses/by-sa/3.0/. The original authors of this document, and Red Hat, designate the Fedora Project as the "Attribution Party" for purposes of CC-BY-SA. In accordance with CC-BY-SA, if you distribute this document or an adaptation of it, you must provide the URL for the original version.

Red Hat, as the licensor of this document, waives the right to enforce, and agrees not to assert, Section 4d of CC-BY-SA to the fullest extent permitted by applicable law.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo, JBoss, MetaMatrix, Fedora, the Infinity Logo, and RHCE are trademarks of Red Hat, Inc., registered in the United States and other countries.

For guidelines on the permitted uses of the Fedora trademarks, refer to https://fedoraproject.org/wiki/Legal:Trademark_guidelines.

Linux® is the registered trademark of Linus Torvalds in the United States and other countries.

Java® is a registered trademark of Oracle and/or its affiliates.

XFS® is a trademark of Silicon Graphics International Corp. or its subsidiaries in the United States and/or other countries.

MySQL® is a registered trademark of MySQL AB in the United States, the European Union and other countries.

All other trademarks are the property of their respective owners.

ইনস্টলেশন প্রক্রিয়া সম্বন্ধে নথিপত্র উপলব্ধ করা হয়।
Preface

1. Document-related norms
   1.1. Printing-related norms
   1.2. Special注意事项
   1.3. Noticeable Points and Warnings

2. Your comments will reach us!

3. Gratitude

Introduction

1. Background
   1.1. Fedora recognition
   1.2. Additional methods for assistance

2. This document recognition
   2.1. Main purpose
   2.2. Intended Readers

1. For experienced users. Quick start method
   1.1. Brief description
   1.2. Download files
   1.3. Installation preparation
   1.4. Fedora installation
   1.5. Complete the installation

I. Installation preparation
   2. Fedora download method
      2.1.1. How to download the installation file?
      2.1.2. How to find the architecture on your computer?
      2.1.3. Which files should be downloaded?
   2.2. CD or DVD for Fedora
   3. Media creation method
      3.1. Making an installation CD set or DVD
      3.2. Installation root media

II. Installation method
   4. x86 Architecture installation method
      4.1. Upgrade or Install?
      4.2. Is Your Hardware Compatible?
      4.3. RAID and other disk devices
Installation Guide

4.3.1. Hardware RAID ................................................................. 24
4.3.2. Software RAID ............................................................... 24
4.3.3. FireWire and USB Disks ................................................ 24
4.4. আপনার ডিস্কে কি পর্যাপ্ত স্থান উপস্থিত আছে? ........................................... 24
4.5. Selecting an Installation Method ........................................ 25
4.6. Choose a boot method ....................................................... 26
5. Preparing for a Network Installation ..................................... 27
5.1. Preparing for FTP and HTTP installation .............................. 28
5.1.2. Preparing for NFS ......................................................... 28
5.2. Preparing for a Hard Drive Installation ............................... 30
6. System Specifications List .................................................... 33
7. ইনস্টলেশনের প্রস্তুতি ........................................................... 27
7.1. Starting the Installation Program ....................................... 36
7.1.1. x86, AMD64, Intel Additional Boot Options ...................... 38
7.2. The Boot Menu ................................................................. 40
7.3. Installing from a Different Source ...................................... 41
7.4. Booting from the Network using PXE ............................... 42
8. Installing using anaconda ...................................................... 43
8.1. Using the Keyboard to Navigate ......................................... 45
8.2. Screenshots during installation ......................................... 46
8.2.2. A Note about Virtual Consoles ....................................... 47
8.3. Installation Method ........................................................... 47
8.3.1. DVD-র সাহায্যে ইনস্টল করার প্রক্রিয়া .......................... 48
8.3.2. Installing from a Hard Drive .......................................... 48
8.3.3. Performing a Network Installation ................................. 49
8.3.4. Installing via NFS .......................................................... 50
8.3.5. Installing via FTP or HTTP ............................................. 51
8.4. Verifying Media .............................................................. 52
8.5. Fedora-তে স্বাগতম .......................................................... 52
8.6. Language Selection .......................................................... 53
8.7. Keyboard Configuration .................................................... 54
8.8. Time Zone Configuration .................................................. 73
8.9. Set the Root Password .................................................... 75

# #
9. অন্য সিস্টেমে ইনস্টলেশনের সমস্যা সমাধানের প্রণালী ................................. 117

9.1. AMD

9.1.1. Fedora

9.1.1.1. Are You Unable to Boot With Your RAID Card?...................... 117

9.1.1.2. Is Your System Displaying Signal Errors?............................ 118

9.1.2. Trouble Beginning the Installation........................................... 118

9.2. Problems with Booting into the Graphical Installation......................... 118

9.3. ইনস্টলেশন চলাকালীন সমস্যা......................................................... 119

9.3.1. Fedora

9.3.1.1. ইনস্টল করার জন্য কেনে ডিভাইস পাওয়া যায় না বা ব্যাক্টেরিয়া বার্তা......................................................... 119

9.3.2. ইনস্টলের ফলস্বরূপ সংগ্রহস্থলের অপরিবর্তন পদ্ধতি....................... 119

9.3.3. Trouble with Partition Tables...................................................... 122

9.3.4. Using Remaining Space............................................................... 122

9.3.5. Other Partitioning Problems........................................................ 122

9.3.6. Are You Seeing Python Errors?..................................................... 122

9.4. Problems After Installation................................................................. 123

9.4.1. Trouble With the Graphical GRUB Screen on an x86-based System?.... 123

9.4.2. Booting into a Graphical Environment.......................................... 124

9.4.3. Problems with the X Window System (GUI)................................. 125

9.4.4. Problems with the X Server Crashing and Non-Root Users................ 125
Installation Guide

15.11.1. Chroot Environment ................................................................. 207
15.11.2. Use an Interpreter .................................................................. 207
15.12. Saving the File ............................................................................. 208

IV. After installation ........................................................................... 209

16. Firstboot ......................................................................................... 211
16.1. License Agreement ........................................................................ 211
16.2. ব্যবহারকারী অ্যাকাউন্টের নির্দেশ ........................................... 212
16.2.1. অনুমোদন কন্ফিগারেশনের পূর্বকারিতা ......................... 214
16.3. Date and Time .............................................................................. 215
16.4. হোস্টওয়্যার পরিষেবা ................................................................ 216

17. Your Next Steps ............................................................................ 219
17.1. Updating Your System ................................................................. 219
17.2. Finishing an Upgrade ................................................................. 220
17.3. প্রথম বারের লগ-ইনের প্রক্রিয়া .................................................... 221
17.3.1. কমান্ড-লাইনের মাধ্যমে সফ্টওয়্যার সংগ্রহস্থলের ব্যবহারকারীর পূর্বকারিতা ............................................................................... 222
17.4. Subscribing to Fedora Announcements and News ......................... 225
17.5. সফ্টওয়্যার ও প্রযুক্তি সম্পর্কের পুরাণ .................................... 225
17.6. Fedora .......................................................................................... 226

18. Basic System Recovery ................................................................ 227
18.1. Rescue Mode ................................................................................ 227
18.1.1. Common Problems .................................................................. 227
18.1.2. Booting into Rescue Mode ....................................................... 227
18.1.3. Booting into Single-User Mode .................................................. 230
18.1.4. Booting into Emergency Mode .................................................. 231

19. Upgrading Your Current System .................................................. 233
19.1. Determining Whether to Upgrade or Re-Install ............................. 233
19.2. Upgrading Your System ............................................................... 234

20. Fedora ............................................................................................ 235
20.1. কম্পিউটারের মধ্যে শুধুমাত্র Fedora-র স্থাপন রূপে হলে ...... 235
20.2. আপনার কম্পিউটারে একটি অপারেটিং সিস্টেমের সূচনা করা হলে .......................................................................................... 236
20.2.1. অপারেটিং সিস্টেমের সূচনা করা হলে ......................... 236
20.2.2. ব্যানার রূপে অপারেটিং সিস্টেমের সূচনা করা হলে .......................................................................................... 237
20.2.3. ব্যানার রূপে অপারেটিং সিস্টেমের সূচনা করা হলে .......................................................................................... 241
20.3. র পরিবর্তনের প্রচ্ছদ্য বিবর্তিত একটি অপারেটিং সিস্টেমের সূচনা করা হলে .......................................................................................... 241

V. Technical appendixes ................................................................... 247
A. An Introduction to Disk Partitions

A.1. Hard Disk Basic Concepts

A.1.1. It is Not What You Write, it is How You Write It

A.1.2. Partitions: Turning One Drive Into Many

A.1.3. Partitions within Partitions — An Overview of Extended Partitions

A.1.4. Fedora—

A.1.5. Partitions Name MANAGEMENT and the pARTition table.

A.1.6. Disk Partitions and Other Operating Systems

A.1.7. Disk Partitions and Mount Points

A.1.8. How Many Partitions?

B. iSCSI disks

B.1. iSCSI disks in anaconda

B.2. iSCSI disks during start up

C. Block ENCryption

C.1. What is block device encryption?

C.2. Encrypting block devices using dm-crypt/LUKS

C.2.1. Overview of LUKS

C.2.2. How will I access the encrypted devices after installation? (System Startup)

C.2.3. Choosing a Good Passphrase

C.3. Creating Encrypted Block Devices in Anaconda

C.3.1. What Kinds of Block Devices Can Be Encrypted?

C.3.2. Block-Device Support for Encryption and Formatting drives

C.3.3. Creating Encrypted Block Devices in the Installed System After Installation

C.3.4. Format the device as a dm-crypt/LUKS encrypted device

C.3.5. Encrypting block devices on the system after installation

C.3.6. Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device

C.3.7. Add the mapping information to /etc/crypttab

C.3.8. Add an entry to /etc/fstab

C.4. What is block device encryption?

C.4.1. Create the block devices

C.4.2. Optional: Fill the device with random data

C.4.3. Choose a Good Passphrase

C.4.4. Choose a Good Passphrase

C.4.5. Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device

C.4.6. Add the mapping information to /etc/crypttab

C.4.7. Add an entry to /etc/fstab

C.4.8. Common Post-Installation Tasks

C.4.9. Set a randomly generated key as an additional way to access an encrypted block device

C.4.10. Add a new passphrase to an existing device

C.4.11. Remove a passphrase or key from a device

C.4.12. Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device

C.4.13. Add the mapping information to /etc/crypttab

C.4.14. Add an entry to /etc/fstab

C.4.15. Common Post-Installation Tasks

C.4.16. Set a randomly generated key as an additional way to access an encrypted block device

C.4.17. Add a new passphrase to an existing device

C.4.18. Remove a passphrase or key from a device

C.4.19. Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device

C.4.20. Add the mapping information to /etc/crypttab

C.4.21. Add an entry to /etc/fstab

C.4.22. Common Post-Installation Tasks

C.4.23. Set a randomly generated key as an additional way to access an encrypted block device

C.4.24. Add a new passphrase to an existing device

C.4.25. Remove a passphrase or key from a device

D. Understanding LVM

E. The GRUB Boot Loader

E.1. GRUB
Preface

1. Document Formatting

1.1. Formatting Guidelines

In this document, the formatting conventions have been employed to draw the reader's attention to specific information. Different parts of the text are marked according to their importance.

In the PDF and printed versions of Liberation Font Collection, Liberation should be used. If Liberation font is installed on your computer, it should also be used in the HTML version of this document. Otherwise, a suitable alternative font will be used. Note: Liberation Fonts are included by default in Red Hat Enterprise Linux 5 and later versions.

1.1.1. Monospaced Bold

For systems where input such as shell commands, file names, and paths are written, monospaced bold is used to highlight them. For example:

```
my_next_bestselling_novel
```

This line highlights a file name, shell command, and a file name. The text is separated accordingly.

In the context of a file name, a monospaced bold font is used to make the file name stand out. For example:

```
Ctrl + Alt + F1
```

For the purpose of switching terminals, the above command is used.

For the purpose of switching之间的windows, the above command is used.

In discussions of source code, the names of classes, methods, functions, variables, and results are monospaced bold-italicized. For example:

```
filesystem
```

This class is related to the file system, and
```
file
```

This file is related to the file name, and
```
dir
```

This directory is related to the directory name. Each class has a defined permission.

1 https://fedorahosted.org/liberation-fonts/
Preface

The mouse-related preferences can be started from the main menu bar by selecting System > Preferences > Mouse. In the toolbox, select the button titled Preferences and click on the checkbox next to System Preferences. This button will then turn into a primary button (which will make the mouse easier to use with the right hand).

gedit

If preferences for a font are included in a file, choose the main menu bar by selecting Applications > Peripherals > Font Mapping. Then, in the main menu Mapping, select Search... and enter the necessary font in the Search area. The selected font will be illuminated. To copy it, mark the area of interest and click on the button

gedit

The text in previous sections includes application names; system menu and menu item names; and application menu names, as well as buttons and text in the GUI interface. All text is displayed in a relative bold style and is easily distinguishable. Exceptions include:

- monospace or relative bold, indicated by italic text—such as username, domain.name, file-system, package, version, and release—will be displayed instead where appropriate.

- Commands are shown in a monospace font—such as ssh, username@domain.name, mount -o remount /home, file-system /home, package, rpm q package-version-release.

- Publican

1.2. # বিশেষ দৃষ্টিকোণ সংক্রান্ত নয়নমাত্র

The manual page for Publican is generated in the DocBook XML source file. The manual page can be obtained in the same source file as well as in a PDF or HTML file. The source file is a DocBook XML file.

books Desktop documentation drafts mss photos stuff svn
1.3. উল্লেখ্যবস্তু ও সতর্কবাণী
অবশেষে, সহজে উপেক্ষিত কিছু তথ্যের প্রতি পাঠকের দৃষ্টি আকর্ষণের উদ্দেশ্যে তিনটি ভিন্ন ধরনের বিন্যাস প্রয়োগ করা হয়।

উল্লেখ্য
উল্লেখ্য শীর্ষক লেখাগুলি মূলত সূত্র, কোনো কাজের সহজ উপায় অথবা বিকল্প পদ্ধতি পর্যবেক্ষণের মূল্যায়ন করার জন্য ব্যবহার করা হয়। অপরদিকে বিশেষ উল্লেখ্যতা না হলেও, পাঠকের কাজে সহায়তা করতে পারে তাদের জানা যাবে।

গুরুত্বপূর্ণ
গুরুত্বপূর্ণ শীর্ষক উপক্ষেত্রগুলির মধ্যে লেখা হয়: বর্তমান সেশানের জন্য প্রযোজ্য পরিবর্তিত কনফিগারেশন অথবা আপডেট প্রয়োজন, যা উল্লেখ্যতা বিবর্তিত করার পূর্বে পুনরায় আরম্ভের প্রয়োজন। গুরুত্বপূর্ণ উল্লেখ্যতা হলে তথ্য হারানোর সম্ভাবনা না থাকলেও অথবা বাধা বিঘ্ন হতে পারে।

সতর্কবাণী
সতর্কবাণী উপক্ষেত্র করা উচিত নয় এবং এটি উপক্ষেত্র করা হলে তথ্য হারানোর সম্ভাবনা রয়েছে।

2. #আপনার মতামত আমাদের নিশ্চয় জানাবেন!
ফদাদি আপনাকে জন্ম আপনি কমিউনিটি অথবা এই উল্লেখ্যবস্তু পর্যবেক্ষণের মূল্যায়ন করার জন্য অনুগ্রহ করে আপনাকে নিশ্চয় জানাতে ইচ্ছুক হয়েছেন। জন্ম আপনাকে নিশ্চয় জানান।

Fedora Documentation.

# # #
Preface

A note to the reader: if you wish to improve this guide further, please provide clear details. If you notice any errors, kindly provide the relevant section number and any other relevant information so that we can locate the error.

3. #Acknowledgments

This document contains some sections from the Fedora Project's http://docs.fedoraproject.org/install-guide/-et.al, copyright © 2009 Red Hat, Inc. and others, previously published.

###

###

###
Introduction

This document details the full range of installation options, including those that apply only in limited or unusual circumstances. The provides a much-abbreviated set of instructions for downloading Fedora, creating an installation disc, and installing Fedora on a typical desktop or laptop computer. The is available from http://docs.fedoraproject.org/installation-quick-start-guide/.

1. #পটভূমি

1.1. #পরিচিতি

To find out more about Fedora, refer to http://fedoraproject.org/. To read other documentation on Fedora related topics, refer to http://docs.fedoraproject.org/.

1.2. #অতিরিক্ত সহায়তা প্রাপ্ত করার প্রণালী

For information on additional help resources for Fedora, visit http://fedoraproject.org/wiki/Communicate.

2. #এই নথির পরিচিতি

2.1. #মূল উদ্দেশ্য

এই সহায়িকা থেকে পাঠকরা:
1. অন-লাইন ডিস্ট্রিবিউটিওনের অবস্থান সনাক্ত করতে পারবেন
2. কম্পিউটারের বুট করার জন্য কনফিগারেশনের তথ্য প্রস্তুত করতে পারবেন
3. ইনস্টলেশন প্রোগ্রাম বুঝতে ও ইন্টারেক্ট করতে পারবেন
4. সিস্টেমে ইনস্টল করার পরে মেল লিখি কনফিগারেশন করতে পারবেন

This guide does not cover use of Fedora. To learn how to use an installed Fedora system, refer to http://docs.fedoraproject.org/ for other documentation.
2.2. #উদ্দিষ্ট পাঠক

This guide is intended for Fedora users of all levels of experience. However, it treats the installation process and its many options in far greater detail than most novice users are likely to require. You do not need to read and understand this entire document to install Fedora on a computer. This document is most likely to help experienced users perform advanced and unusual installations.
অভিজ্ঞ ব্যবহারকারীদের জন্য দ্রুত আরম্ভের প্রণালী

অভিজ্ঞ ব্যবহারকারীদের জন্য, কোনো ধরনের বিলম্ব না করে ইনস্টলেশনের বিভিন্ন কাজের একটি সংক্ষিপ্ত সারাংশ এই বিভাগে উপলব্ধ করা হয়েছে। উল্লেখ্য, এই সহায়িকার পরবর্তী অধ্যায়ের মধ্যে বিশিষ্ট তথ্য ও বিভিন্ন সহযোগিতার উপস্থাপনা রয়েছে। ইনস্টলেশনের সময় কেন্দ্রিত বিষয়গুলিতে অধ্যায়টি পড়তে সহায়তা পূর্ণতা পূর্ণতা পূর্ণতা পূর্ণতা পূর্ণতা পূর্ণতা।

## 1.1. #ছানার রুপায়ন

ইনস্টলেশন প্রণালী অত্যন্ত সরল ও এর মধ্যে কয়েকটি ধাপ উপস্থিত রয়েছে:

1. মিডিয়া অথবা বুট করার জন্য একটি কনফিগারেশন প্রস্তুত করন।
2. ইনস্টলেশনের জন্য সিস্টেম প্রস্তুত করন।
3. কম্পিউটার বুট করন ও ইনস্টলেশন প্রক্রিয়া আরম্ভ করন।
4. পুনরায় বুট করে ইনস্টলেশনের পরে করণীয় কনফিগারেশন সমাপ্ত করন।

### 1.2. #ফাইল ডাউনলোড করন

ফাইল ডাউনলোড করন সম্পর্কিত অধ্যায় পড়তে সহায়তা প্রাপ্ত করুন।

### 2. Download the ISO images for the full distribution on CD or DVD.

Create CD or DVD media from the ISO files using your preferred application, or put the images on a Windows FAT32 or Linux ext2, ext3, or ext4 partition.

3. Download the vmlinuz kernel file and the initrd.img ramdisk image from the distribution's isolinux/ directory. Configure your operating system to boot the kernel and load the ramdisk
image. For further information on installation without media, refer to "Installing Without Media.

For information on setting up a network boot server from which you can install Fedora, refer to "Setting Up an Installation Server.

To learn how to turn ISO images into CD or DVD media, refer to "Making Fedora Discs available from http://docs.fedoraproject.org/readme-burning-isos/.

1.3. ইনস্টলেশনের প্রস্তুতি
ব্যবহারকারীদের জন্য দ্রুত আরম্ভের প্রণালী

The installation program provides functions for resizing ext2, ext3, ext4, and NTFS formatted partitions. Refer to "for more information.

1.4. ইনস্টল করুন

Boot from the desired media, with any options appropriate for your hardware and installation mode. Refer to "for more information about boot options. If you boot from the Live CD, select the "Install to Hard Disk" option from the desktop to run the installation program. If you boot from minimal media or a downloaded kernel, select a network or hard disk resource from which to install.

ইনস্টলেশনের প্রস্তুতির পর, সিস্টেমের মধ্যে নিবন্ধিত ব্যবহারকারী কাজ সমাপ্ত করুন।

রেফার টু "Firstboot or the Firstboot page on the Fedora wiki: http://fedoraproject.org/wiki/FirstBoot for more detail.
ইনস্টল করার পূর্বে নির্দিষ্টরূপে নির্ণয় ও রিসোর্স সম্পর্কে আলোচনা করা হচ্ছে। যেমন:

• Fedora ইনস্টলেশন আপগ্রেড করা হবে না কিন্তু নতুন করে ইনস্টল করা হবে।
• হার্ডওয়্যার সম্পর্কিত নির্ণয়, ও ইনস্টলেশনের সময় ব্যবহারযোগ্য হার্ডওয়্যারের বিবরণ।
This chapter explains how to get the files you need to install and run Fedora on your computer. Concepts in this chapter may be new, especially if this is your first free and open source operating system. If you have any trouble with this chapter, find help by visiting the Fedora Forums at http://www.fedoraforum.org/.

The Fedora Project distributes Fedora in many ways, mostly free of cost and downloaded over the Internet. The most common distribution method is CD and DVD media. There are several types of CD and DVD media available, including:

- **DVD**
  - Live images you can use to try Fedora, and then install to your system if you so choose
  - Reduced-size bootable CD and USB flash disk images you can use to install over an Internet connection

Most users want the Fedora Live image or the full set of installable software on DVD or CDs. The reduced bootable images are suitable for use with a fast Internet connection and install Fedora on one computer. Source code discs are not used for installing Fedora, but are resources for experienced users and software developers.

Users with a broadband Internet connection can download *ISO images* of CD and DVD media or images of USB flash disks. An ISO image is a copy of an entire disc in a format suitable for writing directly to a CD or DVD. A USB flash disk image is a copy of an entire disk in a format suitable for writing directly to a USB flash disk.

For more information on burning CDs and DVDs, refer to #.#.3, #.#.#.####.####.####.

If downloading the Fedora ISO images and burning them to CD or DVD is impossible or impractical for you, refer to #.###.2, "CD ### DVD-# ### Fedora ####### #### 2.2" to learn about other ways that you can obtain Fedora.

### 2.1. **Fedora**

#### 2.1.1. #ইনস্টলেশন ফাইল কী ভাবে ডাউনলোড করা যাবে?

To follow a Web-based guide to downloading, visit http://get.fedoraproject.org/. For guidance on which architecture to download, refer to #.###.###?.
Fedora software is available for download at no cost in a variety of ways.

2.1.1.1. #mirror থেকে

The Fedora installation files are freely available from web servers located in many parts of the world. These servers mirror the files available from the Fedora Project. If you visit http://download.fedoraproject.org/, you are redirected to a mirror, based on a calculation of which mirror is likely to offer you the best download speed. Alternatively, you can choose a mirror from the list maintained at http://mirrors.fedoraproject.org/publiclist. This page lists mirrors according to geographic location. The mirrors geographically closest to you are likely to provide you with the fastest downloads. If the company or organization that provides your internet access maintains a mirror, this mirror is likely to provide you with the fastest downloads of all.

Mirrors publish Fedora software under a well-organized hierarchy of folders. For example, the Fedora distribution normally appears in the directory fedora/linux/releases/14/ This directory contains a folder for each architecture supported by that release of Fedora. CD and DVD media files appear inside that folder, in a folder called iso/ For example, you can find the file for the DVD distribution of Fedora for x86_64 at fedora/linux/releases/14/Fedora/x86_64/iso/Fedora-14-x86_64-DVD.iso

2.1.1.2. #BitTorrent

BitTorrent is a way to download information in cooperation with other computers. Each computer cooperating in the group downloads pieces of the information in a particular torrent from other peers in the group. Computers that have finished downloading all the data in a torrent remain in the swarm to seed, or provide data to other peers. If you download using BitTorrent, as a courtesy you should seed the torrent at least until you have uploaded the same amount of data you downloaded.

If your computer does not have software installed for BitTorrent, visit the BitTorrent home page at http://www.bittorrent.com/download/ to download it. BitTorrent client software is available for Windows, Mac OS, Linux, and many other operating systems.

You do not need to find a special mirror for BitTorrent files. The BitTorrent protocol ensures that your computer participates in a nearby group. To download and use the Fedora BitTorrent files, visit http://torrent.fedoraproject.org/.

Minimal boot CD and USB flash disk images are not available through BitTorrent.

Releases are separated by architecture, or type of computer processor. Use the following table to determine the architecture of your computer according to the type of processor. Consult your manufacturer's documentation for details on your processor, if necessary.
2.1. Which files should be downloaded?

You have several options to download Fedora. Read the options below to decide the best one for you.

Each file available for download in a Fedora distribution includes the architecture type in the file name. For example, the file for the DVD distribution of Fedora 14 for x86_64 is named Fedora-14-x86_64-DVD.iso. Refer to "##### # # # # # # # # # " if you are unsure of your computer’s architecture.

1. **DVD**

   If you have plenty of time, a fast Internet connection, and wish a broader choice of software on the install media, download the full DVD version. Once burned to DVD, the media is bootable and includes an installation program. The DVD version contains a mode to perform rescue operations on your Fedora system in an emergency. You can download the DVD version directly from a mirror, or via BitTorrent.

2. **Full Distribution on a set of CDs**

   If the DVD image is too large for you to download conveniently, or you want to have a broad choice of software to install on a system with a CD drive but no DVD drive, you can download the full distribution as a set of CDs. The total size of the images that make up the CD set is approximately the same as the size of the DVD image. You can download the images that make up the CD set directly from a mirror, or via BitTorrent.
If you want to try Fedora before you install it on your computer, download the Live image version. If your computer supports booting from CD or USB, you can boot the operating system without making any changes to your hard disk. The Live image also provides an Install to Hard Disk desktop shortcut. If you decide you like what you see, and want to install it, simply activate the selection to copy Fedora to your hard disk. You can download the Live image directly from a mirror, or using BitTorrent.

If you have a fast Internet connection but do not want to download the entire distribution, you can download a small boot image. Fedora offers images for a minimal boot environment on CD. Once you boot your system with the minimal media, you can install Fedora directly over the Internet. Although this method still involves downloading a significant amount of data over the Internet, it is almost always much less than the size of the full distribution media. Once you have finished installation, you can add or remove software to your system as desired.

Installing the default software for Fedora over the Internet requires more time than the Live image, but less time than the entire DVD distribution. Actual results depend on the software you select and network traffic conditions.

The following table explains where to find the desired files on a mirror site. Replace arch with the architecture of the computer being installed.

<table>
<thead>
<tr>
<th>মিডিয়ার ধরন</th>
<th>ফাইলের অবস্থান</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVD</td>
<td><code>fedora/linux/releases/14/Fedora/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>DVD.iso</code>&lt;br&gt;<code>Fedora-14-</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc1.iso</code>&lt;br&gt;<code>Fedora-14-</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc2.iso</code>&lt;br&gt;<code>Fedora-14-</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc3.iso</code>, and similar.</td>
</tr>
<tr>
<td>Full distribution on a set of CDs</td>
<td><code>fedora/linux/releases/14/Fedora/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc1.iso</code>&lt;br&gt;<code>fedora/linux/releases/14/Fedora/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc2.iso</code>&lt;br&gt;<code>fedora/linux/releases/14/Fedora/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>iso/Fedora-14-</code>&lt;br&gt;<code>disc3.iso</code>, and similar.</td>
</tr>
<tr>
<td>Live image</td>
<td><code>fedora/linux/releases/14/Live/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>Live.iso</code>&lt;br&gt;<code>Fedora-14-</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>Live.iso</code>&lt;br&gt;<code>Fedora-14-KDE-</code>&lt;br&gt;<code>Live.iso</code>&lt;br&gt;<code>Fedora-14-</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>os/images/</code>&lt;br&gt;<code>boot.iso</code>&lt;br&gt;<code>fedora/linux/releases/14/Fedora/</code>&lt;br&gt;<code>arch/</code>&lt;br&gt;<code>os/images/</code>&lt;br&gt;<code>boot.iso</code></td>
</tr>
</tbody>
</table>
If you do not have a fast Internet connection, or if you have a problem creating boot media, downloading may not be an option. Fedora DVD and CD distribution media is available from a number of online sources around the world at a minimal cost. Use your favorite Web search engine to locate a vendor, or refer to http://fedoraproject.org/wiki/Distribution.
মডিয়া নির্মাণের প্রণালী

এই বিভাগ উল্লিখিত যে কোনো একটি পদ্ধতি ব্যবহার করে নম্বরলম্বিত ইনস্টলেশন ও বুট মডিয়া প্রস্তুত করা যাবে:

• ইনস্টলেশন DVD
• an set of installation CDs
• an USB flash drive

ইনস্টলেশন বা বুট করার জন্য ব্যবহারযোগ্য USB অথবা CD/DVD ব্যবহার করা যেতে পারে।

বিভিন্ন এর চেষ্টা করে যেকোনো বুট ও ইনস্টলেশন মিডিয়ায় তথ্য ও মিডিয়া নির্মাণের জন্য আবশ্যক ইমেজ ফাইল নিম্নলিখিত টেবিলে উল্লিখিত হয়েছে।

ছক#3.1. বুট ও ইনস্টলেশন মিডিয়া

<table>
<thead>
<tr>
<th>Architecture</th>
<th>Installation DVD or set of CDs</th>
<th>Installation USB flash drive</th>
<th>বুট CD</th>
<th>অথবা বুট DVD</th>
<th>USB ফ্র্যাশ ড্রাইভ</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS- x86</td>
<td>X86 DVD ISO (32-bit)</td>
<td>X86 DVD ISO boot.iso</td>
<td>boot.iso</td>
<td>boot.iso</td>
<td></td>
</tr>
<tr>
<td>UEFI- x86</td>
<td>X86 64-DVD ISO (64-bit)</td>
<td>X86 64-DVD ISO boot.iso</td>
<td>boot.iso</td>
<td>boot.iso</td>
<td></td>
</tr>
<tr>
<td>BIOS- AMD64</td>
<td>x86 64-DVD ISO (32-bit)</td>
<td>X86 64-DVD ISO boot.iso</td>
<td>boot.iso</td>
<td>boot.iso</td>
<td></td>
</tr>
<tr>
<td>UEFI- AMD64</td>
<td>x86 64-DVD ISO (64-bit)</td>
<td>UWPBDY NOY</td>
<td>UWPBDY NOY</td>
<td>efiboot.img</td>
<td>(x86 64-DVD ISO)</td>
</tr>
</tbody>
</table>

3.1. # Making an installation CD set or DVD

You can make an installation CD set or DVD using the disc burning software on your computer.

The exact series of steps that produces a CD or DVD from an ISO image file varies greatly from computer to computer, depending on the operating system and disc burning software installed. Use this procedure as a general guide. You might be able to omit certain steps on your computer, or might have to perform some of the steps in a different order from the order described here.

ডিস্ক বার্ন করার জন্য ব্যবহৃত সফ্টওয়্যারে, ইমেজে ফাইল থেকে ডিস্ক বার্ন করার ক্ষমতা উপস্থিত থাকা আবশ্যক। যদিও অধিকাংশ সফ্টওয়্যার এই বৈশিষ্ট্য উপস্থিত রয়েছে, তথাপো এই বৈশিষ্ট্যগুলো কয়েকটি সফ্টওয়্যারের অনেক কম্পিউটারের ব্যবহৃত হয়।
স্থানীয় #3. মডিয়ার নির্মাণের প্রণালী

এই পুস্তকে, বিশেষ উল্লেখ দুইটি উল্লেখযোগ্য উল্লেখ করা হয়েছে। প্রথম যে উল্লেখ করা সম্ভব নয় ও দ্বিতীয় যে সংস্করণের মধ্যে ভেকিন্স বার্ন করার জন্য কম্পিউটার গুলি বার্ন করার জন্য সঞ্চযণ সম্পর্কের মধ্যে ভেকর্ন বার্ন করার জন্য। কম্পিউটার হার্ড রুপক বিশেষ-ভাবে উল্লেখ ব্যবহার করা হয়। উল্লেখযোগ্য অপারেটিং সিস্টেমের মধ্যে এই মাধ্যমে সম্ভব হয়। Windows XP, Windows Vista, Windows 7, Windows, Linux, Unix, ISO, Linux, ISO, LINUX, GNOME, Nautilus

**Burning ROM**  Roxio Creator

The **Disk Utility** software installed by default with Mac OS #

1. Download an ISO image file of a Fedora disc as described in #

2. Insert a blank, writeable disc into your computer’s disc burner. On some computers, a window opens and displays various options when you insert the disc. If you see a window like this, look for an option to launch your chosen disc burning program. If you do not see an option like this, close the window and launch the program manually.

3. Launch your disc burning program. On some computers, you can do this by right-clicking (or control-clicking) on the image file and selecting a menu option with a label like **Copy image to CD** or **Copy CD or DVD image**. Other computers might provide you with a menu option to launch your chosen disc burning program, either directly or with an option like **Open With**. If none of these options are available on your computer, launch the program from an icon on your desktop, in a menu of applications such as the **Start** menu on Windows operating systems, or in the Mac **Applications** folder.

4. In your disc burning program, select the option to burn a CD from an image file. For example, in **Nero Burning ROM** this option is called **Burn Image** and is located on the **File** menu.

5. **Burn** a blank disc to a **ISO** file. The **Burn** file to **ISO** option is also included in the **Media** menu.

6. **Burn** the **ISO** file to **USB** media.

ক্ষতি কম্পিউটারের, ফাইল ব্যবহারের #

ক্ষতি ব্যবহারর উল্লেখ ব্যবহার করা সম্ভব নয় ও বার্ন করার উপলব্ধ সম্ভব না এবং এটি ব্যবহার করা সম্ভব নয়।

3.2. #ইনস্টলশনের উৎসস্থল রূপে USB

**Unusual USB Media**

আস্তিনাম্নি ভাবে, ফাইলগুলি অথবা পার্টিশন বিশিষ্ট USB মডিয়ার করতে হবে, কিন্তু পরিস্থিতি হিসেবে লাভ সম্ভব না হতে পারে।
You can install Fedora on 32-bit x86 systems and BIOS-based AMD64 and Intel #64 systems using a USB flash drive, provided that your hardware supports booting from this type of device. Note that you cannot install Fedora on UEFI-based AMD64 and Intel #64 systems from a USB flash drive, although you can use a USB flash drive to boot the Fedora installer on UEFI-based AMD64 and Intel #64 systems — refer to "Making Fedora USB Media on a Windows Operating System".

# 3.2.1. Making Fedora USB Media on a Windows Operating System

## Note — This Method Is Not Destructive

This method is not destructive, so existing data on the media is not harmed. Nevertheless, it is always a good idea to back up important data before performing sensitive disk operations.

The most straightforward way to place a Fedora image on USB media using a Windows operating system is to transfer the Fedora live image to the USB device with the LiveUSB Creator tool.

Note that the dd tool discussed in "Making Fedora USB Media in UNIX, Linux, and Similar Operating Systems" is also available for Windows. Follow the instructions in that section to use an implementation of dd for Windows operating systems. The instructions in this section assume that you will use LiveUSB Creator.

1. **Download the LiveUSB Creator program for Windows from** [http://fedorahosted.org/liveusb-creator](http://fedorahosted.org/liveusb-creator).

2. LiveUSB Creator can create live USB media either from an image file that you downloaded previously, as described in "Making Fedora USB Media with dd", or it can download an image file from the Internet. Either:
   - **Use existing LiveCD** or **Download Fedora Live ISO** from the LiveUSB Creator.

3. **Create Live USB**

# 3.2.2. Making Fedora USB Media in UNIX, Linux, and Similar Operating Systems

A graphical tool is available to create Fedora USB media on systems that run Fedora, Red Hat Enterprise Linux, or operating systems derived from either of these. To create Fedora USB media on other UNIX or Linux operating systems (including Mac OS X), use the command-line method described in "Making Fedora USB Media with dd".
3.2.2.1.1. Creating Fedora USB Media in Fedora, Red Hat Enterprise Linux, and similar Linux distributions

Graphical and command-line tools are available to create Fedora USB media on computers that run Fedora, Red Hat Enterprise Linux, and Linux distributions derived from Red Hat Enterprise Linux. The graphical tool and the works only with the Fedora live image. To create Fedora USB media from the distribution image or minimal boot media image, use the command-line method described in 3.2.1.3, “Making Fedora USB Media with dd”.

3.2.2.1.1. Making Fedora USB Media with a graphical tool

---

**Important** — Enable Extra Packages for Enterprise Linux

To perform this procedure on Red Hat Enterprise Linux and Linux distributions derived from it, enable the Extra Packages for Enterprise Linux (EPEL) repository. Refer to http://fedoraproject.org/wiki/EPEL/FAQ#howtouse for instructions.

**Note** — This Method Is Not Destructive

This method is not destructive, so existing data on the media is not harmed. Nevertheless, it is always a good idea to back up important data before performing sensitive disk operations.

1. গ্রাফিক্যাল প্যাকেজ পরিচালনা ব্যবস্থা অথবা নিম্নলিখিত কমান্ড সহযোগে সিস্টেমের মধ্যে liveusb-creator ইনস্টল করুন:

```
su -c 'yum -y install liveusb-creator'
```

2. Plug in your USB media.

3. মনোযোগ করুন যে, প্রথমে লাইভীয় লাইভের প্যাকেজ পরিচালনা ব্যবস্থায় আরম্ভ করার জন্য LiveUSB Creator লাভ করা উচিত।

4. **LiveUSB Creator** can create live USB media either from an image file that you downloaded previously, as described in 2.1.3, “Fedora Live ISO?” or it can download an image file from the Internet. Either:
   - **Use existing Live CD**
   - **Browse Fedora Live ISO**
   - **Download Fedora Live ISO**
   - **LiveUSB Creator**

   লাইভের নীচে উপস্থাপিত তাপন টপলে ডাউনলোড করা কাজ শুরু করা এবং এর সব চেয়ে সহজ হয়।

5. **Create Live USB**

---
3.2.2.1.2. Making Fedora USB Media with livecd-tools

Important — Enable Extra Packages for Enterprise Linux

To perform this procedure on Red Hat Enterprise Linux and Linux distributions derived from it, enable the Extra Packages for Enterprise Linux (EPEL) repository. Refer to http://fedoraproject.org/wiki/EPEL/FAQ#howtouse for instructions.

Note — This Method Is Not Destructive

This method is not destructive, so existing data on the media is not harmed. Nevertheless, it is always a good idea to back up important data before performing sensitive disk operations.

1. Install the `livecd-tools` package on your system with your graphical package manager, or the following command:

   ```bash
   su -c 'yum-y install livecd-tools'
   ```

2. Plug in your USB media.

3. Find the device name for your USB media. If the media has a volume name, look up the name in `/dev/disk/by-label` or use the `findfs`:

   ```bash
   su -c 'findfs LABEL="MyLabel"'
   ```

   If the media does not have a volume name, or you do not know it, consult the `/var/log/messages` log for details:

   ```bash
   su -c 'less /var/log/messages'
   ```

4. In the media ISO image, use the `livecd-iso-to-disk` command:

   ```bash
   su -c 'livecd-iso-to-disk the_image.iso /dev/sdX1'
   ```

   `sdX1` refers to the USB device. If the media has a partition, use `livecd-iso-to-disk` to mount the ISO image to the specific partition. For most flash drives, a single partition is sufficient. For hard drives, multiple partitions are common. It is recommended to always back up important data before proceeding with sensitive disk operations.
3.2.2.1.3. **Making Fedora USB Media with dd**

**Warning:**

If a disk image is used and the disk image is damaged, the media can become unusable. If a file system is damaged, the media may become unusable. If a file system is damaged, the media may become unusable. If a file system is damaged, the media may become unusable. If a file system is damaged, the media may become unusable.

1. Connect a USB flash drive.

2. To find the USB flash drive label or device, run `findfs` and `dmesg` commands:
   ```bash
   su -c 'findfs LABEL="MyLabel"'
   su -c 'dmesg'
   ```

3. Use the `dd` command to write the ISO image to the USB flash drive:
   ```bash
   dd if=path/image_name.iso of=/dev/sdc
   ```

**Example:**

- For a DVD installation:
  ```bash
  dd if=~/Downloads/F14-Server-i386-DVD.iso of=/dev/sdc
  ```

### 3.2.2.2. **Making Fedora USB Media in other Linux Distributions**

To create Fedora USB media on a computer that uses a Linux distribution other than Fedora, Red Hat Enterprise Linux, and those derived from Red Hat Enterprise Linux, use one of the command-line procedures detailed in this section.

### 3.2.2.2.1. **Making Fedora USB Media with livecd-tools**

**Note:** This Method Is Not Destructive

This method is not destructive, so existing data on the media is not harmed. Nevertheless, it is always a good idea to back up important data before performing sensitive disk operations.

This method works only with the Fedora live image, and only on Linux operating systems.
1. Download a live ISO file for Fedora as shown in 2.1.3, "Fedora USB Media in UNIX, Linux, and Similar Operating Systems"

2. Plug in your USB media.

3. Find the device name for your USB media. If the media has a volume name, look up the name in `/dev/disk/by-label` or use the `findfs` command:

   ```
   su -c 'findfs LABEL="MyLabel"'
   ```

   If the media does not have a volume name, or you do not know it, consult the `/var/log/messages` log for details:

   ```
   su -c 'less /var/log/messages'
   ```

4. Many Linux distributions automatically mount USB media devices when you connect the device to your computer. If this is the case, unmount the device. The specific method to do this varies widely between Linux distributions and desktops. Some common methods include:

   • select File > Unmount if the operating system presents you with a window that displays the contents of the device.
   • Click the device icon and Unmount it.
   • Select the eject icon — usually a triangle pointing upward.

5. Use the command line:

   ```
   su
   root
   ```

6. To unmount a live ISO:

   ```
   mount -o loop /path/to/image/file/imagefile.iso /path/to/mount/point
   ```

7. Change directory to the mounted ISO:

   ```
   cd /path/to/mount/point
   ```

8. Use the command line:

   ```
   livecd-iso-to-disk
   ```

9. Mount the ISO file using the device name:

   ```
   livecd-iso-to-disk -v /path/to/image/file/imagefile.iso device
   ```
## 3.1.3. Mounting Fedora Live Image File

### Example 3.1

Mounting a Fedora Live Image File is useful for creating a live USB media for the purpose of running a live CD/DVD in a virtual machine or on systems with a UNIX operating system (including Mac OS X).

1. **Mount the Live CD Image**
   - Become root:
     ```bash
     su -
     ```
   - Create a mount point:
     ```bash
     mkdir /mnt/livecd
     ```
   - Mount the file:
     ```bash
     mount -o loop /home/Username/Downloads/Fedora-14-i686-Live.iso /mnt/livecd
     ```
   - Change to the LiveOS directory:
     ```bash
     cd /mnt/livecd/LiveOS
     ```
   - Use `livecd-iso-to-disk` to copy the live ISO image to the USB flash drive:
     ```bash
     ./livecd-iso-to-disk /home/Username/Downloads/Fedora-14-i686-Live.iso /dev/sdc1
     ```

### 3.2.2.2.2. Making Fedora USB Media with dd

#### Warning

When using the `dd` command to copy a live CD/DVD image to a USB flash drive, be careful to select the correct USB device, as accidental deletion of data can occur. Ensure that there is no mounted media or files in the USB flash drive and only proceed with the command if you are certain that the USB flash drive is empty or contains data that can be safely overwritten.

Use this method for the distribution image, the minimal boot media image, or on systems with a UNIX operating system (including Mac OS X).

1. **Mount the USB Flash Drive**
   ```bash
   mount -o loop /dev/disk/by-label/MyLabel /mnt/
   ```

2. **Use `findfs` to locate the USB flash device**
   ```bash
   findfs LABEL="MyLabel"
   ```

3. **Copy the Image to the USB Flash Drive**
   ```bash
   su -c 'findfs LABEL="MyLabel"' -m
   ```

4. **Copy the Image to the USB Flash Drive**
   ```bash
   dd if=/home/Username/Downloads/Fedora-14-i686-Live.iso of=/dev/sdc1 bs=4M status=progress
   ```

5. **Verify the USB Image**
   ```bash
   dmesg
   ```

6. **Finalize the USB Image**
   ```bash
   sync
   ```
3.3. #সংক্ষিপ্তিত বুট মিডিয়া নির্মাণের প্রণালী

A piece of minimal boot media is a CD, DVD, or USB flash drive that contains the software to boot the system and launch the installation program, but which does not contain the software that must be transferred to the system to create a Fedora installation.

## সংক্ষিপ্ত বুট মিডিয়ার ব্যবহার:

- to boot the system to install Fedora over a network
- to boot the system to install Fedora from a hard drive
- ইনস্টলেশনের সময় kickstart ফাইল ব্যবহারের জন্য (#14.8.1, "Creating Kickstart Boot Media"
- ইনস্টলেশনের জন্য anaconda ব্যবহার
- #31-bit, #64 সিস্টেমের #3.3.1, "UEFI-ভিত্তিক সিস্টেমে সংক্ষিপ্তিত বুট মিডিয়া নির্মাণের প্রণালী"

1. Download the ISO image file named boot.iso that is available at the same location as the images of the Fedora installation DVD (#2, Fedora #3.1, "Making an installation CD set or DVD"

2. #3.1, "Making an installation CD set or DVD"-এর উল্লেখিত ইনস্টলেশন ডিস্ক বার্ন করার পদ্ধতি অনুসরণ করে একটি ফাইলের মাধ্যমে অথবা CD, DVD-র মাধ্যমে boot.iso ফাইল বার্ন।

3.3.1. #UEFI-

The Fedora Project does not provide an image to produce minimal boot CDs or DVDs for UEFI-based systems. Use a USB flash drive (as described in this section) to boot the Fedora installer, or use
the installation DVD with the **linux askmethod** option to boot the installer from DVD and continue installation from a different installation source — refer to "Selecting an Installation Method".

Use the **efidisk.img** file in the **images/** directory on the Fedora installation DVD to produce a bootable USB flash drive for UEFI-based systems.

1. Download an ISO image file of the Fedora installation DVD as described in.

2. Become root:
   
   ```
   su -
   ```

3. ISO template file জন্য একটি মাউন্ট পয়েন্ট তৈরি করুন:
   
   ```
   mkdir /mnt/dvdiso
   ```

4. ISO ইমেজ ফাইল মাউন্ট করুন:
   
   ```
   mount DVD.iso /mnt/dvdiso o loop
   ```

   এই ক্ষেত্রে **DVD.iso**-র পরিবর্তে **ISO** ফাইলের নাম উল্লেখ করুন, উদাহরণস্বরূপ **F14-Server-x86_64-DVD.iso**

5. ISO ফাইল থেকে **efidisk.img** USB-এ ফ্ল্যাশ ফ্ল্যাশ ড্রাইভে স্থানান্তর করুন:
   
   ```
   dd if=/mnt/dvdiso/images/efidisk.img of=/dev/
   ```

   device_name

   উদাহরণস্বরূপ:

   ```
   dd if=/mnt/dvdiso/images/efidisk.img of=/dev/sdc
   ```

6. ISO ফাইল আন-মাউন্ট করুন:
   
   ```
   umount /mnt/dvdiso
   ```
খন্ড# #ইনস্টলশন প্রণালী

Fedora Installation Guide-র এই অংশে ইনস্টলশন প্রণালী সম্পর্কে আলোচনা করা হয়েছে। এর মধ্যে রয়েছে ইনস্টলার আরম্ভ করার বিভিন্ন পদ্ধতি থেকে ইনস্টলেশন সমাপ্তির জন্য কম্পিউটার পুনরারম্ভের পর্যায়ের তথ্য। ইনস্টলেশনের সময় উৎপন্ন সমস্যার সমাধানের তথ্য বিশিষ্ট একটি অধ্যায় এই বিভাগের মধ্যে অন্তর্ভুক্ত করা হয়েছে।
অধ্যায় 4.

x86

4.1. Upgrade or Install?

আপনি আর্কিটেকচারে ইনস্টলেশনের পরিকল্পনা নির্বাচনের জন্য Upgrading Your Current System অধ্যায়ে লেখা তথ্যের সাহায্যে নিন।

4.2. Is Your Hardware Compatible?

যদি কোনো পুরোনো অথবা স্বনির্মিত সিস্টেম ব্যবহার করেন, তাহলে হার্ডওয়্যারের সামঞ্জস্য বিশেষভাবে গুরুত্বপূর্ণ। গত দুই বৎসরের মধ্যে কারখানায় নয়নিমিত অধ্যক্ষ সস্তানের সাথে Fedora 14-র সামঞ্জস্য হওয়া উচিত। কিন্তু হার্ডওয়্যারের রূপরেখায় নয়নিমিত কলন্ত হওয়ার দরুন আপনার হার্ডওয়্যারের সাথে সামঞ্জস্যের ১০০% গ্যারেন্টি দেওয়া কখনোই সম্ভব নয়।

The most recent list of supported hardware can be found in the Release Notes for Fedora 14, available at http://docs.fedoraproject.org/release-notes.

At the end of a successful Fedora installation process, the installation program offers you the option to provide details of your hardware configuration anonymously to the Fedora Project (refer to 16.4, “Fedora”). You can view the statistics gathered by this method at http://smolt.fedoraproject.org/static/stats/devices.html. Viewing the list of hardware that makes up systems on which other people have successfully installed Fedora might help you determine how suitable your hardware is.

4.3. RAID  ও অন্যান্য ডিস্ক ডিভাইস

Fedora uses mdraid instead of dmraid for installation onto Intel BIOS RAID sets. These sets are detected automatically, and devices with Intel ISW metadata are recognized as mdraid instead of dmraid. Note that the device node names of any such devices under mdraid are different from their device node names under dmraid Therefore, special precautions are necessary when you migrate systems with Intel BIOS RAID sets.

Local modifications to /etc/fstab /etc/crypttab or other configuration files which refer to devices by their device node names will not work in Fedora. Before migrating these files, you must therefore edit them to replace device node paths with device UUIDs instead. You can find the UUIDs of devices with the blkid command.
4.3.1. # Hardware RAID

RAID, or Redundant Array of Independent Disks, allows a group, or array, of drives to act as a single device. Configure any RAID functions provided by the mainboard of your computer, or attached controller cards, before you begin the installation process. Each active RAID array appears as one drive within Fedora.

On systems with more than one hard drive you may configure Fedora to operate several of the drives as a Linux RAID array without requiring any additional hardware.

4.3.2. # Software RAID

You can use the Fedora installation program to create Linux software RAID arrays, where RAID functions are controlled by the operating system rather than dedicated hardware. These functions are explained in detail in 8.17, “রাইড ফাংশনস একাডেমিক কর্মীর সাথে ভিত্তিক করা যাবে। এই ধরনের অধিকাংশ উপকরণ কারণে দৃশ্য বিস্তৃত করা সম্ভব হয় ও কনফিগারিকনের পরে ব্যবহারের জন্য পরস্পর ধারক।

4.3.3. # FireWire and USB Disks

Some FireWire and USB hard disks may not be recognized by the Fedora installation system. If configuration of these disks at installation time is not vital, disconnect them to avoid any confusion.

4.4. # আপনার ডিস্কে কি পর্যাপ্ত স্থান উপস্থিত আছে?

Nearly every modern-day operating system (OS) uses disk partitions, and Fedora is no exception. When you install Fedora, you may have to work with disk partitions. If you have not worked with disk partitions before (or need a quick review of the basic concepts), refer to A, An Introduction to Disk Partitions before proceeding.

The disk space used by Fedora must be separate from the disk space used by other OSes you may have installed on your system, such as Windows, OS/2, or even a different version of Linux. For x86, AMD64, and Intel systems, at least two partitions (/ and swap) must be dedicated to Fedora.

Before you start the installation process, you must

- have enough unpartitioned disk space for the installation of Fedora, or
- এক অথবা একাধিক পার্টিশন থাকা আবশ্যক যথেষ্ট থাকা আবশ্যক যথেষ্ট
- ইনস্টল করার মত স্থান ডিস্কে ফাঁকা করা সম্ভব।

1 Unpartitioned disk space means that available disk space on the hard drives you are installing to has not been divided into sections for data. When you partition a disk, each partition behaves like a separate disk drive.
Selecting an Installation Method

4.5. Selecting an Installation Method

What type of installation method do you wish to use? The following installation methods are available:

**DVD**

If you have a DVD drive and the Fedora DVD you can use this method. Refer to \[8.3.1\], for DVD installation instructions.

**CD set**

If you have a CD drive and the set of Fedora CDs you can use this method. Refer to \[8.3.1\], “DVD-# ####### #### ### #######” for CD installation instructions.

**Live CD**

If you have a CD drive and the Fedora live CD you can use this method. The live CD desktop includes an icon labeled `Install to Hard Drive`. Refer to \[8.3.1\], “DVD-# ####### #### ### #######” for CD installation instructions.

**Hard Drive**

If you have copied the Fedora ISO images to a local hard drive, you can use this method. You need a boot CD-ROM (use the `linux askmethod` or `linux repo=hd: device:/path` boot option), or by selecting `Hard drive` on the `Installation Method` menu (refer to \[8.3.2\], “Installing from a Hard Drive” for hard drive installation instructions.

**NFS**

If you are installing from an NFS server using ISO images or a mirror image of Fedora, you can use this method. You need a boot CD-ROM (use the `linux askmethod` or `linux server:options:/path` boot option, or the `NFS directory` option on the
Installation Method

Refer to 8.3.4, "Installing via NFS" for network installation instructions. Note that NFS installations may also be performed in GUI mode.

URL

Refer to 8.3.4, "Installing via NFS" for network installation instructions. Note that NFS installations may also be performed in GUI mode.

DVD/CD-ROM

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.

Choose a boot method

You can use several methods to boot Fedora.

Other than booting from an installation CD or DVD, you can also boot the Fedora installation program from minimal boot media in the form of a bootable CD or USB flash drive. After you boot the system with a piece of minimal boot media, you complete the installation from a different installation source, such as a local hard drive or a location on a network. Refer to 3.3, "--------- 7.1.1, "x86, AMD64, # Intel 64 ---------" for instructions on making boot CDs and USB flash drives.

If you boot from a Fedora installation DVD, the installation program loads its next stage from that disc. This happens regardless of which installation method you choose, unless you eject the disc before you proceed. The installation program still downloads package data from the source you choose.
5.1.

Preparing for a Network Installation

Note

Make sure no installation DVD (or any other type of DVD or CD) is in your system's CD or DVD drive if you are performing a network-based installation. Having a DVD or CD in the drive might cause unexpected errors.

The Fedora installation medium must be available for either a network installation (via NFS, FTP, or HTTP) or installation via local storage. Use the following steps if you are performing an NFS, FTP, or HTTP installation.

The NFS, FTP, or HTTP server to be used for installation over the network must be a separate, network-accessible server. It must provide the complete contents of the installation DVD-ROM or the installation CD-ROMs.

Note

The Fedora installation program has the ability to test the integrity of the installation media. It works with the CD, DVD, hard drive ISO, and NFS ISO installation methods. We recommend that you test all installation media before starting the installation process, and before reporting any installation-related bugs (many of the bugs reported are actually due to improperly-burned discs).

To use this test, type the following command at the boot: prompt:

```bash
linux mediacheck
```

Note

The public directory used to access the installation files over FTP, NFS, or HTTP is mapped to local storage on the network server. For example, the local directory `/var/www/inst/f14` on the network server can be accessed as `http://network.server.com/inst/f14`.

In the following examples, the directory on the installation staging server that will contain the installation files will be specified as `/location/of/disk/space`. The directory that will be made publicly available via FTP, NFS, or HTTP will be specified as `publicly/available/directory`. For example, `/location/of/disk/space` may be a directory you create called `/var/isos` and `/publicly/available/directory` might be `/var/www/html/f14` for an HTTP install.
### 5.1.1. Preparing for FTP and HTTP installation

Extract the files from the ISO image of the installation DVD or set of installation CD-ROMs and place them in a directory that is shared over FTP or HTTP.

1. **FTP/HTTP**
   - Share the directory `/location/of/disk/space/F14.iso` over FTP or HTTP.
   ```
   mv /location/of/disk/space/F14.iso /publicly/available/directory/
   ```

2. **SHA256 checksum**
   - Verify the integrity of the copied ISO image.
   ```
   sha256sum name_of_image.iso
   ```
   where `name_of_image` is the name of the ISO image file. The SHA256 checksum program displays a string of 64 characters called a hash. Compare this hash to the hash displayed for this particular image on the **Download Software** page on the Red Hat Network (refer to `Fedora` `###` `###` `###` `###`). The two hashes should be identical.

3. **Linux**
   - Place the directory `/publicly/available/directory/F14.iso` in the `images` directory.
   ```
   mv /publicly/available/directory/ /location/of/disk/space/images/
   ```
4. Verify that the images/ directory contains at least the install.img file, without which installation cannot proceed. Optionally, the images/ directory should contain the product.img file, without which only the packages for a Minimal installation will be available during the package group selection stage (refer to 8.20, “Package Group Selection”).

5. /etc/exports file contains information related to directories related to the NFS server. To export directories on a specific system:

   /publicly/available/directory client.ip.address (ro)

   To export directories on all systems:

   /publicly/available/directory * (ro)

6. On the network server, start the NFS daemon (on a Fedora system, use /sbin/service nfs start). If NFS is already running, reload the configuration file (on a Fedora system use /sbin/service nfs reload).

7. Be sure to test the NFS share following the directions in the Fedora Deployment Guide. Refer to your NFS documentation for details on starting and stopping the NFS server.

Note

The Fedora installation program has the ability to test the integrity of the installation media. It works with the CD, DVD, hard drive ISO, and NFS ISO installation methods. We recommend that you test all installation media before starting the installation process, and before reporting any installation-related bugs (many of the bugs reported are actually due to improperly-burned discs). To use this test, type the following command at the boot: prompt:

```
linux mediacheck
```
5.2. Preparing for a Hard Drive Installation

Hard drive installations only work from ext2, ext3, ext4, or FAT file systems. You cannot use a hard drives formatted for any other file system as an installation source for Fedora.

<table>
<thead>
<tr>
<th>উল্লেখ্য</th>
<th>সকল ফাইল-সিস্টেম সমর্থিত নয়</th>
</tr>
</thead>
</table>

You cannot use ISO files on partitions controlled by LVM (Logical Volume Management). Use this option to install Fedora on systems without a DVD drive or network connection.

### Cannot Install from LVM Partitions

You cannot use ISO files on partitions controlled by LVM (Logical Volume Management). Use this option to install Fedora on systems without a DVD drive or network connection.

- **ISO**
  - DVD: `install.img`
  - USB: `product.img`

Use the following command on a Linux system:

```
dd if=dvd of=./location/of/disk/space/F14.iso
```

Where `dvd` refers to your DVD drive device.

**Alternate Solution:**

Alternatively, if you have the DVD on physical media, you can create an image of it with the following command on a Linux system:

```
dd if=/dev/dvd of=./location/of/disk/space/F14.iso
```

Where `dvd` refers to your DVD drive device.

1. Obtain an ISO image of the Fedora installation DVD (refer to ^2, Fedora ^8^3, Installation Method). Alternatively, if you have the DVD on physical media, you can create an image of it with the following command on a Linux system:

2. **ISO**

The ISO image must be located on a hard drive that is either internal to the computer on which you will install Fedora, or on a hard drive that is attached to that computer by USB.
Preparing for a Hard Drive Installation

3. **SHA256 checksum (ISO)**

   * Linux:
     
     ```
     $ name_of_image.sha256sum
     ```

     where `name_of_image` is the name of the ISO image file. The SHA256 checksum program displays a string of 64 characters called a hash. Compare this hash to the hash displayed for this particular image on the Download Software page on the Red Hat Network (refer to `Fedora`.

   * Unix:
     
     ```
     sha256sum
     ```

   The two hashes should be identical.

4. **ISO File Management**

   * Install image:
     
     ```
     mount -t iso9660 /path/to/F14.iso /mnt/point -o loop,ro
     cp -r /mnt/point/images /path/images/
     umount /mnt/point
     ```

5. Verify that the `images/` directory contains at least the `install.img` file, without which installation cannot proceed. Optionally, the `images/` directory should contain the `product.img` file, without which only the packages for a **Minimal** installation will be available during the package group selection stage (refer to `Fedora`.

   * Note

     The Fedora installation program has the ability to test the integrity of the installation media. It works with the CD, DVD, hard drive ISO, and NFS ISO installation methods. We recommend that you test all installation media before starting the installation process, and before reporting any installation-related bugs (many of the bugs reported are actually due to improperly-burned discs). To use this test, type the following command at the boot:` prompt:

     ```
     linux mediacheck
     ```
System Specifications List

The installation program automatically detects and installs your computer's hardware. Although you should make sure that your hardware meets the minimum requirements to install Fedora (refer to "Is Your Hardware Compatible"), you do not usually need to supply the installation program with any specific details about your system.

However, when performing certain types of installation, some specific details might be useful or even essential.

- If you plan to use a customized partition layout, record:
  - System’s serial number, make, model, and type. For example, Seagate ST3320613AS 320 GB on SATA0, Western Digital WD7500AAKS 750 GB on SATA1.
- If you plan to install from an image on a local hard drive:
  - Drive and directory.
- If you plan to install from a network location, or install on an iSCSI target:
  - System’s model number, make, model, and type. For example, Netgear GA311.
- IP, DHCP, and BOOTP addresses
- Netmask
- Gateway IP address
- One or more name server IP addresses (DNS)

If any of these networking requirements or terms are unfamiliar to you, contact your network administrator for assistance.

- If you plan to install from a network location:
  - FTP, HTTP, NFS

- If you plan to install on an iSCSI target:
• iSCSI target location. Network's need depending CHAP user name and password and depending CHAP user name and password may be necessary – 8.8.1.1, "Advanced Storage Options" read.

• If your computer is part of a domain:
  • Domain name server is available or not determined. Otherwise, the user will need to write the domain name during installation.
  • If the domain name is not available, the user must write the domain name during installation.
ইনস্টলার বুট করার পদ্ধতি

পুরুষবৃদ্ধিকে ৩২-বিট সিস্টেমের জন্য

### x86

#### UEFI

*Fedora does not support UEFI for 32-bit x86 systems.*

#### BIOS

*Fedora supports version 2.2 of the UEFI specification. Hardware that supports version 2.3 of the UEFI specification or later should boot and operate with Fedora, but the additional functionality defined by these later specifications will not be available. The UEFI specifications are available from [http://www.uefi.org/specs/agreement/](http://www.uefi.org/specs/agreement/)*

---

#14 পুরুষবৃদ্ধিকে ৩২-বিট সিস্টেমের জন্য

*Fedora does not support UEFI for 32-bit x86 systems.*

#### AMD64

*AMD64 ও Intel 64-র সাথে ব্যবহারযোগ্য UEFI*

#### x86, AMD64, Intel

*64-র সাথে ব্যবহারযোগ্য UEFI*

---

To start the installation program from a Fedora DVD or from minimal boot media, follow this procedure:

1. ইনস্টলেশনের সময় অপ্রয়োজনীয় FireWire অথবা USB বিচ্ছিন্ন করুন। অধিক বিবরণের জন্য [4.3.3, “FireWire and USB Disks”] পড়ুন।

2. কম্পিউটার সিস্টেম আরম্ভ করুন

3. কম্পিউটারের মধ্যে মিডিয়া ঢুকিয়ে দিন।

4. বুট মিডিয়া ভেতরে থাকা অবস্থায় কম্পিউটারের বিদ্যুৎ সরবরাহ বন্ধ করুন।

5. কম্পিউটার সিস্টেমের আরম্ভ করুন

মিডিয়া সহযোগে বুট করার জন্য একটি মিডিয়া থেকে বুট করা আছে একজন কিন্তু র-র সংকলন টেপা প্রয়োজন হতে পারে।

*Press F10 to select boot device* এর অনুরূপ একটি বার্তা প্রদর্শন করা হয় কিন্তু বার্তার উদ্দেশ্যে চিহ্নিত কি পৃথক হবে।

**DVD**

Apple C

```
Cmd + Opt + Shift + Del
```

**Apple DVD**

Press F10 to select boot device

### Apple

*Apple কম্পিউটারের ক্ষেত্রে C ইন্ডিউস থেকে সিস্টেম বুট হয়। পুরোনো Apple হার্ডওয়্যারের ক্ষেত্রে, ইন্ডিউস থেকে বুট করার জন্য টেপা যোগ করুন।

কম্পিউটার আরম্ভের সময় কোনো বুট ডিভাইস নির্বাচন করা সম্ভব না হলে, মিডিয়া থেকে বুট করার উদ্দেশ্যে সম্ভবত কম্পিউটারের Basic Input/Output System (BIOS)করনোই প্রয়োজন হতে পারে।

### x86, AMD64, Intel

*64 সিস্টেমের মধ্যে বুট করার জন্য প্রয়োজনীয় নিম্নলিখিত পদ্ধতি।

### BIOS

*64-র বর্তমানের পরিবর্তন করার জন্য, BIOS পরিবর্তন করার জন্য ব্যবহারযোগ্য UEFI করা-র তথ্য সহ একটি প্রক্রিয়ায় পরিবর্তিত হবে।

### DVD-

*DVD-

দূর্বল প্রদর্শন পর্যবেক্ষণ করে, র-র অনুকরণ করে বিভিন্ন পরিবর্তন করা সম্ভব, তা সনাক্ত করুন।

*দূর্বল প্রদর্শন পর্যবেক্ষণ পর্যালোচনা করে, এটি বিভিন্ন কাজের জন্য পরিবর্তন করা সম্ভব, তা সনাক্ত করুন।

*দূর্বল প্রদর্শন পর্যবেক্ষণ পর্যালোচনা করে, (এটি নির্দিষ্ট করে) এগুলো পরিবর্তন করা যেতে পারে। এগুলো বিভিন্ন কাজে বিভিন্ন বিশিষ্ট উল্লিখিত হয়। এই অনুকরণ পরিবর্তন করে,*
Save your changes before exiting the BIOS. For more information, refer to the documentation that came with your system.

7.1. Starting the Installation Program

To start, first make sure that you have all necessary resources for the installation. If you have already read through #4, x86 #64, and followed the instructions, you should be ready to start the installation process. When you have verified that you are ready to begin, boot the installation program using the Fedora DVD or CD-ROM#1 or any boot media that you have created.

You can boot the installation program using any one of the following media (depending upon what your system can support):

- **Fedora DVD** — Your machine supports a bootable DVD drive and you have the Fedora installation DVD.
• Set of Fedora CDs — Your machine supports a bootable CD drive and you have a set of Fedora installation CDs.

• Fedora live CD — Your machine supports a bootable CD drive and you have a Fedora live CD.

• Boot CD-ROM — Your machine supports a bootable CD-ROM drive and you want to perform network or hard drive installation.

• USB — Your machine supports a bootable USB drive and you have a set of Fedora installation CDs.

• Fedora live USB — Your machine supports a bootable USB drive and you have a Fedora live USB.

• Boot CD-ROM — Your machine supports a bootable CD-ROM drive and you want to perform network or hard drive installation.

Insert the boot media and reboot the system.

Press F10 to select boot device

The installation program allows you to choose the boot device when you boot the installation program. Press F10 to select the boot device.

Save your changes before exiting the BIOS. For more information, refer to the documentation that came with your system.
• Once the boot: prompt appears, the installation program automatically begins if you take no action within the first minute. To disable this feature, press one of the help screen function keys.

• If you press a help screen function key, there is a slight delay while the help screen is read from the boot media.

7.1.2. Additional Boot Options

While it is easiest to boot using a DVD and perform a graphical installation, sometimes there are installation scenarios where booting in a different manner may be needed. This section discusses additional boot options available for Fedora.

For x86, AMD64, or Intel 64 systems, examples of boot loader options are given below. To read about the options not discussed in this section, see "10, Boot Options".

- For text mode installation, write: `linux text` at the boot prompt. To set the installation source, use one of the following options:

  - `linux repo=cdrom device`

  - `username:password@URL`

  - `URL`

  - `device`

  - `linux repo=nfs options=server:/path`
### Additional Boot Options

```plaintext
linux repo=nfs iso
```

The installation program prompts you to insert a disc or select an ISO image to test, and click **OK** to perform the checksum operation. This checksum operation can be performed on any Fedora disc and does not have to be performed in a specific order (for example, CD #1 does not have to be the first CD you verify). It is strongly recommended to perform this operation on any Fedora CD or DVD that was created from downloaded ISO images. This command works with the CD, DVD, hard drive ISO, and NFS ISO installation methods.

- ISO checksum: Run this command to perform the checksum operation:

  ```plaintext
  linux mediacheck
  ```

  This command works with the CD, DVD, hard drive ISO, and NFS ISO installation methods.

- ISO: To mount an ISO image, run this command:

  ```plaintext
  cdrom
  ```

  Use `cdrom` to mount a CD or DVD drive, `ftp` or `http` to mount an FTP or HTTP server or path, and `nfs` or `nfs iso` to mount an NFS or NFS ISO ISO image.

- `hd` and `NFS-ISO`: For mounting an ISO image:

  ```plaintext
  options: server:/path
  ```

- `options=server:/path`:

  ```plaintext
  ```

- `console=/<device>`:

  ```plaintext
  linux console=/dev/ttyS0
  ```

  For text mode installations, use:

  ```plaintext
  linux text console=/dev/ttyS0
  ```

  In the above command, `<device>` should be the device you are using (such as ttyS0 or ttyS1). For example, `linux text console=ttyS0`.

- `utf8`:

  ```plaintext
  linux console=ttys0 utf8
  ```

### 7.1.2.1. Kernel Options

#### Kernel Options

- USB device: Use the `anaconda` command to install from a USB device.

- `anaconda` command:

  ```plaintext
  anaconda
  ```

- `boot=hd`:

  ```plaintext
  ```
For text mode installations, use:

```
linux text updates
```

After entering any options, press **Enter** to boot using those options.

If boot options need to be specified for the installation process, a device specifying an anaconda-rhupdates/ directory must be provided. If this is not done, an installation attempt over the network will fail (see also **8.19, "x86, AMD64, # Intel 64 ###-###-###-###"**).

After entering any options, press **Enter** to boot using those options.

To change the boot options, press **Enter** to select the desired option or press **Tab** to edit options.

7.2. The Boot Menu

The boot menu displays a graphical boot menu that includes various options. If no key is pressed within 60 seconds, the default boot option is selected. To select a different boot option, press **Enter** to select the desired option or press **Tab** to edit options.
Installing from a Different Source

7.3. Installing from a Different Source

You can install Fedora from the ISO images stored on hard disk, or from a network using NFS, FTP, or HTTP methods. Experienced users frequently use one of these methods because it is often faster to read data from a hard disk or network server than from a DVD.

The following table summarizes the different boot methods and recommended installation methods to use with each:

<table>
<thead>
<tr>
<th>Boot method</th>
<th>Installation DVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation DVD</td>
<td>DVD, CD set, network, or hard disk</td>
</tr>
<tr>
<td>Set of installation CDs</td>
<td>DVD, CD set, network, or hard disk</td>
</tr>
<tr>
<td>Live CD</td>
<td>Live CD</td>
</tr>
<tr>
<td>Installation USB flash drive</td>
<td>USB flash drive, installation DVD, set of installation CDs, network, or hard disk</td>
</tr>
<tr>
<td>Minimal boot CD or USB, rescue CD</td>
<td>Network or hard disk</td>
</tr>
</tbody>
</table>

Refer to ###### 4.5, “Selecting an Installation Method” for information about installing from locations other than the media with which you booted the system.
7.4. Booting from the Network using PXE

Configure the computer to boot from the network interface. This option is in the BIOS, and may be labeled Network Boot or Boot Services. Once you properly configure PXE booting, the computer can boot the Fedora installation system without any other media.

To boot a computer from a PXE server:
1. Ensure that the network cable is attached. The link indicator light on the network socket should be lit, even if the computer is not switched on.
2. Switch on the computer.
3. A menu screen appears. Press the number key that corresponds to the desired option.

If your PC does not boot from the netboot server, ensure that the BIOS is configured to boot first from the correct network interface. Some BIOS systems specify the network interface as a possible boot device, but do not support the PXE standard. Refer to your hardware documentation for more information.

**Note:**

In environments with multiple NICs, the PXE installation process may identify the first network device it finds, even if it is not linked to a network switch.

**Example Configuration:**

```bash
IPAPPEND 2
APPEND ksdevice=bootif
```

For environments with at least one Ethernet NIC and one PXE interface, the configuration file `pxelinux.cfg/*` can be used to specify:

```bash
ksdevice=link
```

This option causes the installer to use the first network device it finds that is linked to a network switch.
Installing using anaconda

8.1. Text Mode Installation

We recommend that you install Fedora using the graphical interface. If you are installing Fedora on a system that lacks a graphical display, consider performing the installation over a VNC connection — see "13, Installing Through VNC". If anaconda detects that you are installing in text mode on a system where installation over a VNC connection might be possible, anaconda asks you to verify your decision to install in text mode even though your options during installation are limited.

Note

Not every language supported in graphical installation mode is also supported in text mode. Specifically, languages written with a character set other than the Latin or Cyrillic alphabets are not available in text mode. If you choose a language written with a character set that is not supported in text mode, the installation program will present you with the English versions of the screens.

Apart from the graphical installer, anaconda also includes a text-based installer that includes most of the on-screen widgets commonly found on graphical user interfaces. "8.1, "Installation Program Widgets as seen in URL Setup" and 8.2, "Installation Program Widgets as seen in Choose a Language" illustrate widgets that appear on screens during the installation process.
Installing using anaconda

1. **Boot Loader Configuration**

A boot loader password prevents users from passing arbitrary options to the kernel. For highest security, you should set a password, but a password is not necessary for more casual users.

2. [*1 Use a GRUB Password*

   **Boot Loader Password:**
   
   Confirm:
   
   ![Password Input]

3. **OK**

![Boot Loader Configuration](image)

---

**Installation Program Widgets as seen in URL Setup**

![URL Setup](image)

**Installation Program Widgets as seen in Choose a Language**

![Language Selection](image)

---

1. The installation system fails to identify the display hardware on your computer

2. You choose the text mode installation from the boot menu

   1. **LVM**, **RAID**, **FCoE**, **zFCP**, and **iSCSI**
   2. **Partitioning**
   3. **Mount Point**

<table>
<thead>
<tr>
<th>Device</th>
<th>Start</th>
<th>End</th>
<th>Size</th>
<th>Type</th>
<th>Mount Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG VolGroup00</td>
<td></td>
<td></td>
<td>7936M</td>
<td>VolGroup</td>
<td></td>
</tr>
<tr>
<td>LV LogVol01</td>
<td></td>
<td></td>
<td>5888M</td>
<td>ext3</td>
<td>/</td>
</tr>
<tr>
<td>LV LogVol02</td>
<td></td>
<td></td>
<td>2048M</td>
<td>swap</td>
<td></td>
</tr>
<tr>
<td>/dev/sda</td>
<td>1</td>
<td>25</td>
<td>196M</td>
<td>ext3</td>
<td>/boot</td>
</tr>
<tr>
<td>sda2</td>
<td>26</td>
<td>1044</td>
<td>7933M</td>
<td>physical</td>
<td>v</td>
</tr>
</tbody>
</table>

   ![Partitioning](image)

3. **OK**

---

资源共享的高级系统

- **RAID**: Redundant Array of Independent Disks
- **LVM**: Logical Volume Manager
- **FCoE**: Fibre Channel over Ethernet
- **zFCP**: Zoning for Fibre Channel Protocol
- **iSCSI**: Internet Small Computer System Interface

- **RAID**
- **LVM**
- **FCoE**
- **iSCSI**

- **Mounted Point**

---

*Note: The text is in Bangla.*
Using the Keyboard to Navigate

8.1.1. Using the Keyboard to Navigate

Navigation through the installation dialogs is performed through a simple set of keystrokes. To move the cursor, use the `Left` `Right` `Up` and `Down` arrow keys. Use `Tab` and `Shift Tab` to cycle forward or backward through each widget on the screen. Along the bottom, most screens display a summary of available cursor positioning keys.

```
<table>
<thead>
<tr>
<th>Key Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enter</td>
<td>Submit</td>
</tr>
<tr>
<td>Tab</td>
<td>Down</td>
</tr>
<tr>
<td>Shift Tab</td>
<td>Up</td>
</tr>
</tbody>
</table>
```

**Keyboard Shortcuts**

- **Firstboot**

If you choose to install Fedora in text mode, you can still configure your system to use a graphical interface after installation. Refer to the instructions.

**Installation Program Widgets as seen in Firstboot**

- **Window** — Windows (usually referred to as `dialogs` in this manual) appear on your screen throughout the installation process. At times, one window may overlay another; in these cases, you can only interact with the window on top. When you are finished in that window, it disappears, allowing you to continue working in the window underneath.

- **Checkbox** — Checkboxes allow you to select or deselect a feature. The box displays either an asterisk (selected) or a space (unselected). When the cursor is within a checkbox, press `Space` to select or deselect a feature.

- **Text Input** — Text input lines are regions where you can enter information required by the installation program. When the cursor rests on a text input line, you may enter and/or edit information on that line.

- **Text Widget** — Text widgets are regions of the screen for the display of text. At times, text widgets may also contain other widgets, such as checkboxes. If a text widget contains more information than can be displayed in the space reserved for it, a scroll bar appears; if you position the cursor within the text widget, you can then use the `Up` and `Down` arrow keys to scroll through all the information available. Your current position is shown on the scroll bar by a `>` character, which moves up and down the scroll bar as you scroll.

- **Button Widget** — Button widgets are the primary method of interacting with the installation program. You progress through the windows of the installation program by navigating these buttons, using the `Tab` and `Enter` keys. Buttons can be selected when they are highlighted.

- **Keyboard** — Use the `Left` `Right` `Up` and `Down` arrow keys to move the cursor within the widget. When you press `Tab`, the cursor moves to the next available widget. When you press `Shift Tab`, the cursor moves to the previous available widget.
Pressing **F12** accepts the current values and proceeds to the next dialog; it is equivalent to pressing the **OK** button.

### Warning

Unless a dialog box is waiting for your input, do not press any keys during the installation process (doing so may result in unpredictable behavior).

If you have used a graphical user interface (GUI) before, you are already familiar with this process; use your mouse to navigate the screens, click buttons, or enter text fields.

You can also navigate through the installation using the keyboard. The **Tab** key allows you to move around the screen, the Up and Down arrow keys to scroll through lists, and keys expand and collapse lists, while **Space** and **Enter** selects or removes from selection a highlighted item. You can also use the **Alt** key command combination as a way of clicking on buttons or making other screen selections, where **X** is replaced with any underlined letter appearing within that screen.

### Note

If you do not wish to use the GUI installation program, the text mode installation program is also available. To start the text mode installation program, use the following command at the **boot:** prompt:

```
linux text
```

Refer to "The Boot Menu" for a description of the Fedora boot menu and to **8.8, Installing using anaconda** for a brief overview of text mode installation instructions.

Users who must use the text mode installation program can follow the GUI installation instructions and obtain all needed information.

### Screenshots during installation

Anaconda allows you to take screenshots during the installation process. At any time during installation, press **Shift Print Screen** and anaconda will save a screenshot to `/root/anaconda-screenshots`
A Note about Virtual Consoles

Kickstart autoscreenshot

# 14.3, “Creating the Kickstart File”

### 8.2.2. A Note about Virtual Consoles

Fedora

Installation program, installation process dialog box except for additional services such as problem analysis messages and the convenience of writing commands from the shell prompt.

Installation program displays these messages on the installation or system consoles, which can help pinpoint a problem. Refer to "Console, Keystrokes, and Contents" for a listing of the virtual consoles, keystrokes used to switch to them, and their contents.

Generally, there is no reason to leave the default console (virtual console #6) for graphical installations unless you are attempting to diagnose installation problems.

<table>
<thead>
<tr>
<th>कन्सॉल</th>
<th>की-स्ट्रोक</th>
<th>सूटी</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ctrl + alt + f1</td>
<td>graphical display</td>
</tr>
<tr>
<td>2</td>
<td>ctrl + alt + f2</td>
<td>shell prompt</td>
</tr>
<tr>
<td>3</td>
<td>ctrl + alt + f3</td>
<td>installation log (installation program log)</td>
</tr>
<tr>
<td>4</td>
<td>ctrl + alt + f4</td>
<td>system - problem report</td>
</tr>
<tr>
<td>5</td>
<td>ctrl + alt + f5</td>
<td>other messages</td>
</tr>
</tbody>
</table>

### 8.3. Installation Method

Installation method: askmethod

Installation program supports boot media or askmethod boot options. If you select the installation method when booting, installation method selection options appear. For more information, refer to "Installation Method" (8.3).

Select the preferred installation method and press Enter. Then press Tab and OK.
8.3.1. Installing from a DVD

To install Fedora from a DVD, place the DVD your DVD drive and boot your system from the DVD. Even if you booted from alternative media, you can still install Fedora from DVD media.

The installation program then probes your system and attempts to identify your DVD drive. It starts by looking for an IDE (also known as an ATAPI) DVD drive.

---

8.3.2. Installing from a Hard Drive

The Select Partition screen applies only if you are installing from a disk partition (that is, you selected Hard Drive in the Installation Method dialog). This dialog allows you to name the disk partition and directory from which you are installing Fedora. If you used the repo=hd boot option, you already specified a partition.
Performing a Network Installation

Select Partition

What partition and directory on that partition holds the installation image for Fedora? If you don’t see the disk drive you’re using listed here, press F2 to configure additional devices.

```
/dev/sda
/dev/sda1
/dev/sda2
```

**Directory holding image:** /test/new/

Select the partition containing the ISO files from the list of available partitions. Internal IDE, SATA, SCSI, and USB drive device names begin with `/dev/sd`. Each individual drive has its own letter, for example `/dev/sda`. Each partition on a drive is numbered, for example `/dev/sda1`.

Also specify the **Directory holding images**. Enter the full directory path from the drive that contains the ISO image files. The following table shows some examples of how to enter this information:

<table>
<thead>
<tr>
<th>Partition type</th>
<th>Volume</th>
<th>Filesystem root path</th>
<th>Directory holding images</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFAT</td>
<td>D:</td>
<td>D:\Downloads\F14</td>
<td>Downloads/F14</td>
</tr>
<tr>
<td>ext2, ext3, ext4</td>
<td>/home</td>
<td>/home/user1/F14</td>
<td>user1/F14</td>
</tr>
</tbody>
</table>

If the ISO images are in the root (top-level) directory of a partition, enter a `/`. If the ISO images are located in a subdirectory of a mounted partition, enter the name of the directory holding the ISO images within that partition. For example, if the partition on which the ISO images is normally mounted as `/home/` and the images are in `/home/new/`, you would enter `/new/`.

Use a leading slash

An entry without a leading slash may cause the installation to fail.

8.3.3. Performing a Network Installation

Install the network installation program to network boot the installation program to network boot Fedora. Alternatively, `askmethod` or `repo=` FTP, HTTP, NFS, or network boot Fedora.
Installing using anaconda

If you are performing a network installation, the **Configure TCP/IP** dialog appears. This dialog asks for your IP and other network addresses. You can choose to configure the IP address and Netmask of the device via DHCP or manually.

By default, the installation program uses DHCP to automatically provide network settings. If you use a cable or DSL modem, router, firewall, or other network hardware to communicate with the Internet, DHCP is a suitable option. If your network has no DHCP server, clear the check box labeled **Use dynamic IP configuration (DHCP)**.

Enter the IP address you are using during installation and press **Enter**.

When the installation process completes, it will transfer these settings to your system.

- **NFS-**
  - ৰ মাধ্যমে ইনস্টল করা হলে, ০৮৫৪, *“Installing via NFS”* -এ এগিয়ে চলুন।

- **Web**
  - অথবা ৰ মাধ্যমে ইনস্টল করা হলে, ০৮৫৫, *“Installing via FTP or HTTP”* -এ এগিয়ে চলুন।

### 8.3.4. Installing via NFS

**Installation Method**

**NFS Image**

**NFS Repository**

repo=nfs

Enter the domain name or IP address of your NFS server. For example, if you are installing from a host named *eastcoast* in the domain *example.com* enter *eastcoast.example.com* in the **NFS Server** field.

Enter the directory which contains the root of the installation tree. You will enter an Installation Key later on in the process which will determine which subdirectories are used to install from. If everything was specified properly, a message appears indicating that the installation program for Fedora is running.

This dialog also allows you to specify NFS mount options. Refer to the *Fedora Deployment Guide* for a list of common NFS mount options, or consult the man pages for **mount** and **nfs** for a comprehensive list of options.

If the NFS server is exporting a mirror of the Fedora installation tree, enter the directory which contains the root of the installation tree. You will enter an Installation Key later on in the process which will determine which subdirectories are used to install from. If everything was specified properly, a message appears indicating that the installation program for Fedora is running.
Installing via FTP or HTTP

**NFS Setup**

Please enter the server name and path to your Fedora installation image.

<table>
<thead>
<tr>
<th>NFS server name:</th>
<th>name.domain.com</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fedora directory:</td>
<td>/mirrors/fedora/i386</td>
</tr>
</tbody>
</table>

OK  Back

NFS Setup Dialog

If the NFS server is exporting the ISO image of the Fedora DVD, enter the directory which contains the ISO image.

Proceed with `8.8, Installing using anaconda`.

**8.3.5.** Installing via FTP or HTTP

The URL dialog applies only if you are installing from a FTP or HTTP server (if you selected URL in the Installation Method dialog). This dialog prompts you for information about the FTP or HTTP server from which you are installing Fedora. If you used the `repo=ftp` or `repo=http` boot option, you already specified a server and path.

```
{ftp|http}:<user>:<password>@<hostname>[:<port>]/<directory>/images
```

Example:

```
http://install:f14pw@name.example.com/pub/fedora/linux/releases/14/Fedora/i386/os/
```
8. Installing using anaconda

URL Setup

Please enter the URL containing the Fedora installation image on your server.

http://mirrors.example.com/fedora/linux/releases_________

OK Back

8.7. URL Setup Dialog

Proceed with

8.4. Verifying Media

Verifying Media

DVD: DVD

8.5. Fedora-

The Welcome screen does not prompt you for any input.
8.6. Language Selection

Using your mouse, select a language to use for the installation (refer to "Language Selection").

The language you select here will become the default language for the operating system once it is installed. Selecting the appropriate language also helps target your time zone configuration later in the installation. The installation program tries to define the appropriate time zone based on what you specify on this screen.

রেজিস্ট্রী যোগ করার জন্য, ইনস্টলেশনের প্যাকেজে নির্দিষ্ট পর্যায়ে পূর্বে জ্ঞাত প্যাকেজে নির্দিষ্ট করুন। অথবা বর্তমানে জন্য "Customizing the Software Selection" দেখুন।
# Installing using anaconda

## Language Selection

Once you select the appropriate language, click **Next** to continue.

## Keyboard Configuration

Using your mouse, select the correct layout type (for example, U.S. English) for the keyboard you would prefer to use for the installation and as the system default (refer to the figure below).

Once you have made your selection, click **Next** to continue.
Fedora includes support for more than one keyboard layout for many languages. In particular, most European languages include a `latin1` option, which uses *dead keys* to access certain characters, such as those with diacritical marks. When you press a dead key, nothing will appear on your screen until you press another key to “complete” the character. For example, to type ё on a latin1 keyboard layout, you would press (and release) the ь key, and then press the Е key. By contrast, you access this character on some other keyboards by pressing and holding down a key (such as Alt-Gr) while you press the Е key. Other keyboards might have a dedicated key for this character.

**Note**

To change your keyboard layout type after you have completed the installation, use the `Keyboard Configuration Tool`.

Type the `system-config-keyboard` command in a shell prompt to launch the `Keyboard Configuration Tool`. If you are not root, it prompts you for the root password to continue.

You can install Fedora on a large variety of storage devices. This screen allows you to select either basic or specialized storage devices.
Installing using anaconda

What type of devices will your installation involve?

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

**Specialized Storage Devices**
- Installs or upgrades to devices such as Storage Area Networks (SANs) or mainframe attached disks (DASD), usually in an enterprise environment.

---

### Storage devices

**Basic Storage Devices**

Select **Basic Storage Devices** to install Fedora on the following storage devices:

- स্থানীয় কম্পিউটারের সাথে সংযুক্ত হার্ড-ড্রাইভ অথবা সলিড-স্টেট ডিভাইস।

**Specialized Storage Devices**

Select **Specialized Storage Devices** to install Fedora on the following storage devices:

- ####### (SAN)
- **Direct access storage devices** (DASDs)
  - ফার্মওয়্যার RAID
  - মাল্টি-পাথ ডিভাইস

Use the **Specialized Storage Devices** option to configure **Internet Small Computer System Interface** (iSCSI) and **FCoE** (Fiber Channel over Ethernet) connections.

মেইন্টেইন সংগ্রহস্থল ডিভাইস নির্বাচন করা হলে, সিস্টেমের মধ্যে শুধুমাত্র একটি সংগ্রহস্থল ডিভাইস উপস্থাপিত থাকলে

-  দ্বারা স্বয়ংক্রিয়ভাবে স্থানীয় এই সংগ্রহস্থলটিকে সনাক্ত করা হয় ও এই
-  সম্পর্কে ব্যবহারকারীর কাছে আত্তিকিত তথ্য জানার অনুরোধ করা হয় না। ####### **8.13, "Initializing the Hard Disk"**-এ এগিয়ে চলুন।
8.8.1. সংগ্রহস্থল ডিভাইস নির্বাচনের পর্দা

ব্যবহারযোগ্য সকল সংগ্রহস্থল ডিভাইসগুলি, সংগ্রহস্থল ডিভাইস নির্বাচনের পর্দায় প্রদর্শন করা হয়।

চিত্র 8.11. সংগ্রহস্থল ডিভাইস নির্বাচন — মৌলিক ডিভাইস

চিত্র 8.12. সংগ্রহস্থল ডিভাইস নির্বাচন — মাল্টি-পাথ ডিভাইস
Installing using anaconda

Please select the drives you’d like to install the operating system on, as well as any drives you’d like to automatically mount to your system, below.

<table>
<thead>
<tr>
<th>Basic Devices</th>
<th>Firmware RAID</th>
<th>Multipath Devices</th>
<th>Other SAN Devices</th>
<th>Search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter By:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0 device(s) (0 MB) selected out of 11 device(s) (43352 MB) total.

Tip: Selecting a drive on this screen does not necessarily mean it will be wiped by the installation process. Also, note that post-installation you may mount drives you did not select here by modifying your /etc/fstab file.

Please select the drives you’d like to install the operating system on, as well as any drives you’d like to automatically mount to your system, below.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Capacity</th>
<th>Vendor</th>
<th>Interconnect</th>
</tr>
</thead>
<tbody>
<tr>
<td>ccw-0.6a02-2z-fcp-cxx50050763050b073d:0x4020400300000000</td>
<td>8192 MB</td>
<td>IBM</td>
<td>SCSI</td>
</tr>
<tr>
<td>ccw-0.6a01-2z-fcp-cxx50050763050b073d:0x4020400200000000</td>
<td>8192 MB</td>
<td>IBM</td>
<td>SCSI</td>
</tr>
<tr>
<td>ccw-0.6a00-2z-fcp-cxx50050763050b073d:0x4020400100000000</td>
<td>8192 MB</td>
<td>IBM</td>
<td>SCSI</td>
</tr>
</tbody>
</table>

Search

World Wide Identifier (WWID) or port, target or devices according to logical unit number (LUN)
Each device is presented on a separate row, with a checkbox to its left. Click the checkbox to make a device available during the installation process, or click the radio button at the left of the column headings to select or deselect all the devices listed in a particular screen. Later in the installation process, you can choose to install Fedora onto any of the devices selected here, and can choose to automatically mount any of the other devices selected here as part of the installed system.

_Important_—chain loading

Any storage devices that you do not select on this screen are hidden from _anaconda_ entirely. To chain load the Fedora boot loader from a different boot loader, select all the devices presented in this screen.
8.8.1.1. #
**Advanced Storage Options**

This page contains information about installing using `anaconda`

### 8.8.1.1.1. #
**Advanced Storage Options**

This section provides information on setting up storage options in Anaconda. It includes options for configuring iSCSI (TCP/IP-based SCSI) and SAN (Storage Area Network) targets. The page also includes a table with options for network interfaces, including DHCP and static IP configurations.

#### Figure 8.16
*Advanced Storage Options*

#### Figure 8.17
*Network Interfaces Configuration*

These figures illustrate the process of configuring network interfaces and storage options using Anaconda. The table shows options for selecting network interfaces, setting IP addresses, and configuring DHCP settings. This is essential for setting up a storage infrastructure in a network environment.
- Click OK to accept these settings and continue.

8.8.1.1.2. # Configure iSCSI Parameters

Configure iSCSI Parameters

To configure an iSCSI SAN, select Add iSCSI SAN and click Add Drive.

On the menu that appears in the next dialog box, select the network interface that is connected to your iSCSI switch and click Add iSCSI Disk(s).
Data Center Bridging (DCB) is a set of enhancements to the Ethernet protocols designed to increase the efficiency of Ethernet connections in storage networks and clusters. Enable or disable the installer's awareness of DCB with the checkbox in this dialog.

**Valid Hostnames**

Upon completion of the installation process, any hostname provided in the FQDN format will be automatically resolved. Hostnames may contain letters, numbers, and hyphens. However, the presence of underscores or colons is not recommended.

**Configure FCoE Parameters**

Please select the network interface which is connected to your FCoE switch.

- eth0 - ['Advanced', 'Micro', 'Devices', 'AMD'] [79c970', 'PCnet32'] - 08:00:27:5E:1B:27

- Use DCB

| Add FCoE Disk(s) | Cancel |
If your Fedora system is connected directly to the Internet, you must pay attention to additional considerations to avoid service interruptions or risk action by your upstream service provider. A full discussion of these issues is beyond the scope of this document.

8.9.1. #নেটওয়ার্ক সংযোগ সম্পাদনা

Note

Network Administration Tool

NetworkManager
অধ্যায় 8.

Installing using anaconda

উপলব্ধ সকল কনফিগারেশনের আলোচনা এই বইয়ের মধ্যে অন্তর্ভুক্ত করা হয়নি। ইনস্টলেশনের সময় তারমুখুক্ত সংযোগে কনফিগার করার পদ্ধতি সংক্রান্ত সাধারণ কথাচূর রিপোর্ট এই বিভাগে আলোচনা করা হয়েছে।

অন্যান্য ধরনের নেটওয়ার্ক কনফিগার করার পদ্ধতি অধিকাংশ ক্ষেত্রে অনুপ্রাণিত হতে পারে কিন্তু সুনির্দিষ্ট পরামিতি অবশ্যই বিবেচনা করতে হবে।

চিত্র #8.21. নেটওয়ার্ক সংযোগ

নতুন সংযোগ যোগ করার জন্য অথবা ইনস্টলেশনের সময় কনফিগার করা কেন্দ্রীয় সংযোগের পরিবর্তন অথবা অপসারণ করার জন্য সংযোগের ট্যাপের উপর কাল্পনিক করুন। চাহিদা মতে সংযোগটি নতুন সংযোগ যোগ করার জন্য যোগ করুন। উপস্থিত কাল্পনিক সংযোগ পরিবর্তনের জন্য, তালিকা থেকে তা প্রথমে নির্বাচন করুন ও সম্পাদনা... রাটন কাল্পনিক করুন। উভয় ক্ষেত্রে, সংযোগটি নতুন এবং একটি যোগ করার জন্য প্রয়োজন।

চিত্র #8.21.1. সর্বধরনের ক্ষেত্রে ব্যবহারযোগ্য বিকল্প

সর্বধরনের ক্ষেত্রে কয়েকটি কনফিগারেশন ব্যবহার করা যাবে।

চিত্র #8.21.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টা করার জন্য সর্বমূল্যমান বিকল্প করবেন।

চিত্র #8.21.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য একটি কনফিগারেশন প্রতিফলন করবেন।

চিত্র #8.21.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য সর্বমূল্যমান বিকল্প করতে হবে।

চিত্র #8.21.1.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য একটি কনফিগারেশন প্রতিফলন করবেন।

চিত্র #8.21.1.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য সর্বমূল্যমান বিকল্প করতে হবে।

চিত্র #8.21.1.1.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য একটি কনফিগারেশন প্রতিফলন করবেন।

চিত্র #8.21.1.1.1.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য একটি কনফিগারেশন প্রতিফলন করবেন।

চিত্র #8.21.1.1.1.1.1.1.1.1. সর্বধরনের সংযোগের প্রচেষ্টা ব্যবহারযোগ্য বিকল্প

সর্বধরনের সংযোগের প্রচেষ্টার জন্য একটি কনফিগারেশন প্রতিফলন করবেন।
8.9.1.2. তারযুক্ত বিশেষিত্যরে ট্যাব

tারযুক্ত শীর্ষক ট্যাবটি ব্যবহার করুন অথবা নেটওয়ার্ক অ্যাডাপ্টারের (MAC) ঠিকানা পরিবর্তন করুন ও ইন্টারফেসের মাধ্যমে প্রচারিত (MTU, বাইট অনুসারে) নির্ধারণ করুন।

চিত্র 8.22. তারযুক্ত বিশেষিত্যরে ট্যাব

8.9.1.3. # নিরাপত্তা বিষয়ক ট্যাব

802.1x

নিরাপত্তা ট্যাবের সাহায্যে 802.1x (PNAC) কনফিগার করা যাবে। ব্যবহারাধিকার সক্রিয় করার জন্য এই সংযোগের জন্য 802.1x নির্বাচন করুন এবং এর পরে নেটওয়ার্কে বিবিরন উল্লেখ করুন। কনফিগারের মধ্যে বাকল্পগুলির মাধ্যমে রয়েছে:
াধ্যায় ৮

 Installing using anaconda

অনুমোদন ব্যবস্থা

অনুমোদনের নম্যাল্ডিভিত পাশ্চাত্যগুলির মধ্যে যে কোনো একটি নির্বাচন করুন:

• TLS

• TLS, TTLS, EAP-TTLS

• EAP (PEAP)

পরিচয়

এই সার্ভারের পরিচয় উল্লেখ করুন।

ব্যবহারকারী সার্টিফিকেট

### X.509

CA

### X.509

ব্যক্তিগত-কির পাসওয়ার্ড

ব্যক্তিগত-কির পাসওয়ার্ড। পাসওয়ার্ড লেখার সময় তা প্রদর্শন করার জন্য প্রদর্শন করা হবে নির্বাচন করুন।
চিত্র ৮.২৩. ৮০২.১x নিরাপত্তা বিষয়ক ট্যাব

৮.৯.১.৪. The IPv4 Settings tab

পূর্বে নির্বাচিত নেটওয়ার্কের সংযোগের জন্য IPv4 প্যারামিটার কনফিগার করার জন্য IPv4 বেশিরভাগের ট্যাব ট্যাবটি ব্যবহার করুন।

নেটওয়ার্কের চলমান # ৮০২.১x (DHCP) পরিসেবা থেকে সিস্টেমে দ্বারা করা বেশিরভাগের বিভিন্ন উপপাদ্য প্রাপ্ত করা হবে যা চিহ্নিত করার জন্য IPv4 পদ্ধতির ড্রপ-ডাউন মেনুয় প্রয়োজন করবে। নিম্নলিখিতির মধ্যে একটি নির্বাচন করুন:

- Available to all users
- Connect automatically
- Use 802.1x security for this connection
- Authentication: TLS
- Identity:
- User certificate: (None)
- CA certificate: (None)
- Private key: (None)
- Private key password: 

Cancel | Apply...
Installing using anaconda

**DHCP**

Using [DHCP](https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol) for IPv4 configuration in the network is suggested. However, if [Link-Local Only](https://en.wikipedia.org/wiki/Link-Local_Address) is used, only IPv4 configuration is required.

**Manual**

For IPv4 configuration, only the address, prefix, and gateway are configured by the user. However, DNS servers and resolvable domains must be configured by users as well.

**Link-Local Only**

In this case, the address 169.254/16 is used for IPv4 configuration.

**Manual**

If IPv4 configuration fails but IPv6 configuration is available, the network must be connected using IPv6.
Fedora configures a number of routes automatically based on the IP addresses of a device. To edit additional routes, click the Routes button. The Editing IPv4 routes dialog appears.
চতুর্থাংশ (৮.২৫) \# Installing using anaconda

চিত্র ৮.২৫. \# IPv4 রুট সম্পাদনার ডায়লগ

নতুন স্থায়ী রুট জন্য IP ঠিকানা, নেট-মাস্ক, গেটওয়ে ঠিকানা ও মেট্রিক যোগ করার জন্য যোগ করুন ক্লিক করুন।

Select Ignore automatically obtained routes to make the interface use only the routes specified for it here.

স্থানীয় নেটওয়ার্কের মধ্যে সংযোগ সীমাবদ্ধ রাখার জন্য শুধুমাত্র এই নেটওয়ার্কের মধ্যে উপস্থিত নামিনিত্রেসরে জন্য এই সংযোগ ব্যবহার করা যাবে নির্বাচন করুন।

৮.৯.১.৫. \# IPv6 বৈশিষ্ট্যের ট্যাব

পূর্বে নির্বাচিত নেটওয়ার্ক সংযোগের জন্য IPv6 বৈশিষ্ট্যের ট্যাব প্রয়োগ করুন।

নেটওয়ার্ককে চলমান DHCP পরিসেবা থেকে সিস্টেমে প্রাপ্ত পরমিতি কনফিগার তাদের জন্য ব্যবহার করা যাবে।

Manual বিন্দুতালিতে IPv6 কনফিগারের ক্ষেত্রে পরামিতিগুলির ব্যবহারকারীর দ্বারা কনফিগার করা হয়।
নেটওয়ার্ক সংযোগ সম্পাদনা

Link-Local Only

ইন্টারফেসের জন্য fe80::/10 প্রকাকিস সহ একটি ############### ঠিকানা বরাদ্ধ করা হয়।

নির্বাচিত পদ্ধতির ক্ষেত্রে ব্যবহারকারীর পরামর্শিত পথের পুনর্যোজন হলে, ঠিকানা শীর্ষক ক্ষেত্রে মধ্যে ইন্টারফেসের, ঠিকানা, নেটমাস্ক, ও গেটওয়ের তথ্য লিখন। ঠিকানা যোগ অথবা অপসারণে জন্য যোগ করুন ও মুছু ফলস্বরূপ নেটমাস্ক ব্যবহার করুন। সার্ভার ক্ষেত্রে কমা চাইল দ্বারা বিভাজন করে সার্ভারের ঠারক্স লিখন ও, নম সার্ভার অনুসন্ধানের জন্য ব্যবহার্যাপ্ত ডোমেইনের নাম চাইলতি করার জন্য অনুসন্ধানের ডোমেইনের ক্ষেত্রে মধ্যে কমা চাইল দ্বারা বিভাজিত ডোমেইনের ঠারক্স লিখন।

প্রয়োজন নেই, ক্ষেত্রের মধ্যে এই নেটওয়ার্ক সংযোগের জন্য একটি নাম লব্ধ হলো। সাব-নেটের মধ্যে একই নাম গুলিকে ব্যবহার করা ক্ষেত্রে, IPv6 ধর্মান্তরণ করা হল, নেটওয়ার্কের সমস্যা সমাধানের সময় এই সংযোগগুলি সম্পূর্ণ করার জন্য এই নাম ব্যবহার করা যাবে।

কনফিগারেশন বিফল হলেও ব্যবহার্যাপ্ত কনফিগারেশন উপলব্ধ থাকলে সিস্টেমে সক্রিয় নেটওয়ার্কের মাধ্যমে সংযুক্ত করার জন্য এই সংযোগগুলি সম্পূর্ণ করার জন্য ঠিকানা প্রয়োজন চেক-বক্স ব্যবহার নির্বাচন বাতিল করুন।
8.9.1.5.1. # রুট সম্পাদনা

Fedora configures a number of routes automatically based on the IP addresses of a device. To edit additional routes, click the Routes button. The Editing IPv6 routes dialog appears.
8.10. **Time Zone Configuration**

Select your computer's location in the following two ways:

- **Using your mouse**, click on the interactive map to select a specific city (represented by a yellow dot). A red X appears indicating your selection.

- You can also scroll through the list at the bottom of the screen to select your time zone. Using your mouse, click on a location to highlight your selection.

![IPv6 Editing Routes](image)

IPv6 configuration dialog for editing routes.
8. Installing using anaconda

### Configuring the Time Zone

If Fedora is the only operating system on your computer, select **System clock uses UTC**. The system clock is a piece of hardware on your computer system. Fedora uses the timezone setting to determine the offset between the local time and UTC on the system clock. This behavior is standard for systems that use UNIX, Linux, and similar operating systems.

If Windows and the System Clock

Do not enable the **System clock uses UTC** option if your machine also runs Microsoft Windows. Microsoft operating systems change the BIOS clock to match local time rather than UTC. This may cause unexpected behavior under Fedora.

**Note**

To change your timezone configuration after you have completed the installation, use the **Time and Date Properties Tool**.

Type the `system-config-date` command in a shell prompt to launch the **Time and Date Properties Tool**. If you are not root, it prompts you for the root password to continue.
8.11. Set the Root Password

In the installation process, setting the root password is extremely important. The root account, along with its password, is used for installing packages, updating RPM, and system management. Logging in as the root user allows you to control your system completely. For this reason, it is best to only log in as the root user to perform system maintenance or administration.

Note

The root user (also known as the superuser) has complete access to the entire system; for this reason, logging in as the root user is best done only to perform system maintenance or administration.

Note

To become root, type `su` at the shell prompt in a terminal window and then press `Enter`. Then, enter the root password and press `Enter`.

To become root, type `su` at the shell prompt in a terminal window and then press `Enter`. Then, enter the root password and press `Enter`.

Note

To become root, type `su` at the shell prompt in a terminal window and then press `Enter`. Then, enter the root password and press `Enter`.
Installing using anaconda

The root password must be at least six characters long; the password you type is not echoed to the screen. You must enter the password twice; if the two passwords do not match, the installation program asks you to enter them again.

You should make the root password something you can remember, but not something that is easy for someone else to guess. Your name, your phone number, qwerty, password, root, 123456, and anteteater are all examples of bad passwords. Good passwords mix numerals with upper and lower case letters and do not contain dictionary words: Aard387vark, 420BMttNT, for example. Remember that the password is case-sensitive. If you write down your password, keep it in a secure place. However, it is recommended that you do not write down this or any password you create.

Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.

### 8.12. #সংগ্রহস্থলের ডিভাইস বরাদ্দ করুন

In Linux, you can select one or more repositories to install software. If the repository is a remote one, anaconda will ask you to confirm if you want to use it.

In Fedora, system-config-users is used for user management.

Do not make root account for just one user, usually the system administrator. If a||a user's account is compromised, the entire system may be compromised. Therefore, make sure to change the root password regularly.

The root password is used primarily for system administration. It should only be used by the system administrator. Regular users should not use the root account.

The root password is stored in the /etc/shadow file, which is protected by the shadow system. Change the root password periodically to enhance system security.

### Note

Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.

**Note:** Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.

**Note:** Do not use one of the example passwords offered in this manual. Using one of these passwords could be considered a security risk.
Below are the storage devices you've selected to be a part of this installation. Please indicate using the arrows below which devices you'd like to use as data drives (these will not be formatted, only mounted) and which devices you'd like to use as system drives (these may be formatted).

<table>
<thead>
<tr>
<th>Data Storage Devices (to be mounted only)</th>
<th>Install Target Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Capacity</td>
</tr>
<tr>
<td>ATA HARDDISK</td>
<td>1024000 MB</td>
</tr>
</tbody>
</table>

Tip: Install target devices will be reformatted and wiped of any data. Make sure you have backups.

Important — chain loading

If any storage device contains a boot loader that will chain load the Fedora boot loader, include that storage device among the Install Target Devices. Storage devices that you identify as Install Target Devices remain visible to anaconda during boot loader configuration.

Important — Use All Space

Partitioning Setup
8.13. # Initializing the Hard Disk

If no readable partition tables are found on existing hard disks, the installation program asks to initialize the hard disk. This operation makes any existing data on the hard disk unreadable. If your system has a brand new hard disk with no operating system installed, or you have removed all partitions on the hard disk, click Re-initialize drive.

Certain RAID systems or other nonstandard configurations may be unreadable to the installation program and the prompt to initialize the hard disk may appear. The installation program responds to the physical disk structures it is able to detect.

```
clearpart --initlabel kickstart
```

If you have a nonstandard disk configuration that can be detached during installation and detected and configured afterward, power off the system, detach it, and restart the installation.
8.14.1. #

The Upgrade Dialog

If your system contains a Fedora installation, a dialog appears asking whether you want to upgrade that installation. To perform an upgrade of an existing system, choose the appropriate installation from the drop-down list and select Next.
Manually Installed Software

Software you have installed manually on your existing Fedora system may behave differently after an upgrade. You may need to manually reinstall or recompile this software after an upgrade to ensure it performs correctly on the updated system.

Upgrading Using the Installer

Installations are Recommended

If you choose to upgrade your system using the installation program, any software not provided by Fedora that conflicts with Fedora software is overwritten. Before you begin an upgrade this way, make a list of your system's current packages for later reference:

```
rpm -qa --queryformat='%{NAME} %{VERSION}-%{RELEASE} %{ARCH}' > ~/old-pkglist.txt
```

Next, make a backup of any system configuration data:

```
su -c 'tar czf /tmp/etc-`date +%F`.tar.gz /etc'
su -c 'mv /tmp/etc-*.tar.gz /home'
```

Storing Backups

Ubuntu users, `/home`.

A backup is recommended for `/home`.

“Finishing an Upgrade” page.

Finished upgrade.
8.14.3. # Upgrading Boot Loader Configuration

Your completed Fedora installation must be registered in the boot loader to boot properly. A boot loader is software on your machine that locates and starts the operating system. Refer to The GRUB Boot Loader for more information about boot loaders.

The installer is unable to detect the boot loader currently in use on your system.

What would you like to do?

- [ ] Update boot loader configuration
  - This will update your current boot loader.
- [ ] Skip boot loader updating
  - This option makes no changes to boot loader configuration. If you are using a third party boot loader, you should choose this.
- [ ] Create new boot loader configuration
  - This option creates a new boot loader configuration. If you wish to switch boot loaders, you should choose this.

If the existing boot loader was installed by a Linux distribution, the installation system can modify it to load the new Fedora system. To update the existing Linux boot loader, select Update boot loader configuration. This is the default behavior when you upgrade an existing Fedora installation.

GRUB is the standard boot loader for Fedora on 32-bit and 64-bit x86 architectures. If your machine uses another boot loader, such as BootMagic, System Commander, or the loader installed by Microsoft Windows, then the Fedora installation system cannot update it. In this case, select Skip boot loader updating. When the installation process completes, refer to the documentation for your product for assistance.
8.15.  
Disk Partitioning Setup

সতর্কবাণী — সংরক্ষিত তথ্য ব্যাক-আপ করুন

আপনার সিস্টেমে উপস্থিত তথ্য সর্বদা ব্যাক-আপ করে রাখা বাঞ্চনীয়। যেমন, আপনার সিস্টেমে আপগ্রেড করার সময় অথবা একটি ডুয়েল-বুট মেশিন তৈরি করার সময় তথ্য সংগ্রহের জন্য ব্যবহৃত ডিভাইসের মধ্যে উপস্থিত তথ্য রক্ষা করা উচিত। ভুল-ভ্রান্তির সম্ভাবনা সর্বদা থাকে এবং এর ফলে সংরক্ষিত তথ্য ক্ষতিগ্রস্ত হতে পারে।

গুরুত্বপূর্ণ — টেক্সট মোডে ইনস্টল করার প্রণালী

If you install Fedora in text mode, you can only use the default partitioning schemes described in this section. You cannot add or remove partitions or file systems beyond those that the installer automatically adds or removes. If you require a customized layout at installation time, you should perform a graphical installation over a VNC connection or a kickstart installation.

Furthermore, advanced options such as LVM, encrypted filesystems, and resizable filesystems are available only in graphical mode and kickstart.

Important — Booting from RAIDs

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the `/boot/` partition must be created on a partition outside of the RAID array, such as on a separate hard drive. An internal hard drive is necessary to use for partition creation with problematic RAID cards.

A `/boot/` partition is also necessary for software RAID setups.

If you have chosen to automatically partition your system, you should select Review and manually edit your `/boot/` partition.

Partitioning allows you to divide your hard drive into isolated sections, where each section behaves as its own hard drive. Partitioning is particularly useful if you run multiple operating systems. If you are not sure how you want your system to be partitioned, read for more information.

#A, An Introduction to Disk Partitions
চিত্র 8.34. Disk Partitioning Setup

ইনস্টলেশনের জন্য হার্ড-ড্রাইভ পার্টিশন করা আবশ্যক। ডিস্কের মধ্যে, অবশ্যই কোন অন্য সিস্টেমের সুবিধা বিন্যাস করে একটি পার্টিশন বিন্যাস নির্মাণ করা হয়। আপনি ডিস্কে কোন পার্টিশন নির্মাণ করতে পারেন অথবা নিজে পছন্দসই বিন্যাস নির্মাণ করতে পারবেন।

নির্ধারিত ড্রাইভের সম্পর্কে Linux পার্টিশন যুগ্ম ডিস্কে যুক্ত করার প্রয়োজন করা হয়।

☐ নিউমেশন এনক্রিপ্ট করার (€)

এই ইনস্টলেশনের জন্য ড্রাইভ (গুলি) কেন্দ্রিত করবেন (§)

- /dev/sdb: 2047 MB | ATA VBOX HARD-DISK

☐ সাধারণ কনফিগারেশনের উদাহরণ (€)

কর্ত মান ইনস্টলেশন মেনু ড্রাইভ থেকে শুরু করা হবে? (b)

- /dev/sda: 2047 MB | ATA VBOX HARD-DISK

☐ পার্টিশনের বিন্যাস নির্মাণের কারণ পরিকল্পনা করা (€)

চিত্র #8.34 # Disk Partitioning Setup

এই পদ্ধতির আপনি চারটি উপলব্ধ পদ্ধতির মধ্যে একটি পর্যন্ত করে ডিস্ট্রিবিউট পার্টিশন বিন্যাস নির্মাণ করতে পারেন, অথবা নিজে পদ্ধতির সকল পার্টিশন নির্মাণ পরিবর্তন করতে পারেন।

প্রথম চারটি বিকল্প নির্মাণ করা হলে সংযুক্তকরণ সরাসরি পার্টিশন নির্মাণ প্রক্রিয়ার সাধারণ আপনি নিজে ড্রাইভ পার্টিশন না করতে ইনস্টলেশনের প্রক্রিয়া সম্পন্ন হবে। যদি আপনি নিজে ড্রাইভ পার্টিশন করতে সরাসরি অনুভূত না করেন, তাহলে অনুগ্রহ করে এই পদ্ধতিকে বিন্যাস মধ্যে একটি নির্মাণ করে ইনস্টলেশনে প্রবেশের সাহায্যে পার্টিশন নির্মাণ করবেন। নির্ধারিত বিকল্প সম্ভবত উপলব্ধ বিকল্পের মধ্যে, আপনার কম্পিউটার থেকে অপসারণের জন্য চিহ্নিত করার মাধ্যমে আপনার কম্পিউটার অপসারণ করতে পারবেন।

উপলব্ধ বিকল্পগুলির সমন্বয়ে উপস্থিত সকল পার্টিশনের মধ্যে (অন্যান্য অপারেটিং সিস্টেমের সুবিধা বিন্যাস করণের জন্য এই বিকল্পটি নির্মাণ করুন।)

Use All Space

ইন্ডিয়ান উইন্ডোজের মধ্যে উপস্থিত সকল পার্টিশন (অন্যান্য অপারেটিং সিস্টেমের সুবিধা বিন্যাস করণের জন্য) মুছে ফেলার জন্য এই বিকল্পটি নির্মাণ করুন।

⚠️ Warning

If you select this option, all data on the selected hard drives is removed by the installation program. Do not select this option if you have information that you want to keep on the hard drives where you are installing Fedora.

In particular, do not select this option when you configure a system to chain load the Fedora boot loader from another boot loader.
Replace Existing Linux System(s)

Select this option to resize your current data and partitions manually and install a default Fedora layout in the space that is freed.

**Warning**

If you shrink partitions on which other operating systems are installed, you might not be able to use those operating systems. Although this partitioning option does not destroy data, operating systems typically require some free space in their partitions. Before you resize a partition that holds an operating system that you might want to use again, find out how much space you need to leave free.

Use Free Space

Select this option to retain your current data and partitions and install Fedora in the unused space available on the storage drives. Ensure that there is sufficient space available on the storage drives before you select this option refer to 4.4, “### # # # # # # #”.

Create Custom Layout

Select this option to retain your current data and partitions and install Fedora in the unused space available on the storage drives. Ensure that there is sufficient space available on the storage drives before you select this option refer to 4.4, “### # # # # # # #”.

To review and make any necessary changes to the partitions created by automatic partitioning, select the Review option. After selecting Review and clicking Next to move forward, the partitions created for you by anaconda appear. You can make modifications to these partitions if they do not meet your needs.

**Important** - chain loading

To configure the Fedora boot loader to chain load from a different boot loader, you must specify the boot drive manually. If you chose any of the automatic partitioning options, you must now select the Review and modify partitioning layout option before you click Next or you cannot specify the correct boot drive.

Click Next once you have made your selections to proceed.
৮.১৬. #পার্টিশন এনক্রিপশন

কেন্দ্রটি নির্বাচন করা হলে, সিস্টেমের পার্টিশনগুলি এনক্রিপ্ট করার উদ্দেশ্যে ইনস্টলেশন তূলনা করো পার্টিশন-পার্টিশন লেখার অনুরোধ জানানো হবে।

Linux Unified Key Setup সহযোগে পার্টিশন একটি নির্বাচন করা হয় — অথচ বিবরণের জন্য ####### C, ####### ####### পড়ুন।

৮.১৭. #স্বনির্ধারিত বিন্যাস নির্মাণ অথবা ডিফল্ট বিন্যাস পরিবর্তনের পদ্ধতি

আপনি যদি স্বয়ংক্রিয় পার্টিশন নির্মাণের চারটি বিকল্পের মধ্যে একটি নির্বাচন করেন, তাহলে এটি ইনস্টলেশন প্রোগ্রামে স্পষ্টভাবে উল্লেখ করা আবশ্যক।

নিজে পার্টিশন করার ইচ্ছা প্রকাশ করলে, Fedora যে স্থানে ইনস্টল করা হবে, তা ইনস্টলেশন প্রোগ্রামকে স্পষ্টভাবে উল্লেখ করা আবশ্যক।

লাইনিস্টিকে পার্টিশননগুলিতে ইনস্টল করা হবে, সেগুলোর মাউন্ট-পয়েন্ট
Installing using anaconda

नির্ধারণ করে এটাকে সম্ভব। এই স্থানে সম্ভবত কয়েকটি পার্টিশন নির্মাণ এবং/অথবা মুছে ফেলার প্রয়োজন হবে।

পার্টিশন নির্ধারণের কোন তারকা পরিকল্পনা না করে থাকলে, আপনি # A, An Introduction to Disk Partitions এবং # 8.17.5, "Recommended Partitioning Scheme" পড়তে পারবেন। ন্যূনতমভূমিক একটি সূচনা প্রায় পার্টিশন, এবং আপনার সিস্টেমে উপস্থিত অন্যান্য পরিবেশে পার্টিশনের সমন্বয়ে একটি পার্টিশন অতীর্থ.

স্বাভাবিক ইনস্টলেশন চলাকালে, পার্টিশন নির্মাণ প্রক্রিয়ার জন্য প্রয়োজনীয় সব ব্যবস্থা করতে সক্ষম।

Using your mouse, click once to highlight a particular field in the graphical display. Double-click to edit an existing partition or to create a partition out of existing free space.

Using your mouse, চিহ্নিত সকল ড্রাইভ, লজিক্যাল ভলিউম ও RAID চিরকালের উপরের অংশ ইনস্টলেশন প্যাকেজের দ্বারা সমাপ্ত করা জরুরিতে নাম, (যেমন / dev/sda)

or LogVol100, মাপ (মেগাবাইট অনুযায়ী), ও ভিতর পরিবর্তনের প্রয়োজন.

Using your mouse, click once to highlight a particular field in the graphical display. Double-click to edit an existing partition or to create a partition out of existing free space.

Using your mouse, চিহ্নিত সকল ড্রাইভ, লজিক্যাল ভলিউম ও RAID চিরকালের উপরের অংশ ইনস্টলেশন প্যাকেজের দ্বারা সমাপ্ত করা জরুরিতে নাম, (যেমন / dev/sda)

or LogVol100, মাপ (মেগাবাইট অনুযায়ী), ও ভিতর পরিবর্তনের প্রয়োজন.

Using your mouse, click once to highlight a particular field in the graphical display. Double-click to edit an existing partition or to create a partition out of existing free space.

Using your mouse, চিহ্নিত সকল ড্রাইভ, লজিক্যাল ভলিউম ও RAID চিরকালের উপরের অংশ ইনস্টলেশন প্যাকেজের দ্বারা সমাপ্ত করা জরুরিতে নাম, (যেমন / dev/sda)
সংগ্রহস্থল নির্মাণ করুন

পর্য্যন্ত অন্যান্য ডিভাইসগুলির শৃঙ্খলায় করা হয়। পর্য্যন্ত ডিভাইস পর্যন্ত পাশে পর্যন্ত তালিকা চালু করা হয়নি। পর্য্যন্ত ডিভাইসগুলির পর্যন্ত অর্থাৎ অঙ্গ করুন।

তালিকাভুক্ত পর্য্যন্ত ডিভাইসের জন্য Anaconda বা বডিসন ধরনরে বিবির্য প্রদর্শন করা হয়:

<table>
<thead>
<tr>
<th>ডিভাইস</th>
<th>ডিভাইসের নাম, লজিক্যাল ভলিউম অথবা পার্টিশন</th>
</tr>
</thead>
<tbody>
<tr>
<td>মাপ</td>
<td>(মেগাবাইট) ডিভাইসের মাপ, লজিক্যাল ভলিউম অথবা পার্টিশন (মেগাবাইট ধার)</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট/RAID/ভলিউম</td>
<td>পার্টিশনটির মধ্যে (ফাইল-সিস্টেমের মধ্যে অবস্থান) মাউন্ট করা হবে, অথবা এটি ফাইল-সিস্টেমের অংশ হলে।</td>
</tr>
<tr>
<td>ধরন</td>
<td>পার্টিশনের ধরন। সাধারণ পার্টিশনের ক্ষেত্রে পার্টিশনের মধ্যে স্থাপিত ফাইল-সিস্টেমের ধরন প্রদর্শন করা হয় (যেমন, ext4)। অন্যথায়, পার্টিশনটি একটি প্রকৃত ভলিউম (LVM), অথবা সফ্টওয়্যার RAID-এর অংশ হয়ে থাকে।</td>
</tr>
<tr>
<td>ফরম্যাট</td>
<td>ইনস্টলেশনের সময় পার্টিশনটি ফরম্যাট করার জন্য এই কলামে একটি ঠিক চিহ্ন থাকবে।</td>
</tr>
<tr>
<td>নীচের পেইনের তলায় চারটি বাটন উপস্থিত রয়েছে: Create, Edit, Delete ও Reset।</td>
<td></td>
</tr>
<tr>
<td>উপরে প্রদর্শিত শিরোনাম বর্ণনার পর্যন্ত তালিকা থেকে কলামে ডিভাইস অথবা পার্টিশন নির্দেশ করেন।</td>
<td></td>
</tr>
</tbody>
</table>

8.17.1. #সংগ্রহস্থল নির্মাণ করুন

ভাষাগত সাহায্যে সংগ্রহস্থলের তৈরি এবং এর পরিবর্তন করা যাবে। সিস্টেমের মধ্যে উপস্থিত সংগ্রহস্থল এবং সর্টিফিকেটের করার জন্য চালু করুন।

Anaconda
Install using anaconda

Create Storage

Create Partition
- Standard Partition
  General purpose partition creation

Create Software RAID
- RAID Partition
  Create a RAID formatted partition
- RAID Device
  Requires at least 2 free RAID formatted partitions
- RAID Clone
  Facilitates RAID device creation

Create LVM
- LVM Volume Group
  Requires at least 1 free LVM formatted partition
- LVM Logical Volume
  Create a logical volume on selected volume group
- LVM Physical Volume
  Create an LVM formatted partition

Refer to "8.17.2, Adding Partitions" for details of the Add Partition dialog.

- Create Partition
- Create Software RAID
- Create LVM

Create RAID Software

Create RAID Software

Create RAID Software

Create RAID Software

Create RAID Software

Create RAID Software

Create RAID Software

Create RAID Software
Adding Partitions

Create LVM Logical Volume

অধিক বিবরণের জন্য ####### 8.17.4, " Create LVM Logical Volume " পড়ুন।

• পূরক্ত ভলিউম — অব্যবহৃত স্থানে একটি physical volume তৈরি করুন।

LVM

• ভলিউম গ্রুপ — এক অথবা অধিক সংখ্যাক পূরক্ত ভলিউম প্রয়োগ করে একটি ###### ###### তৈরি করুন। সিস্টেমের মধ্যে অন্তত একটি পূরক্ত ভলিউম উপস্থাপন থাকলে এই বকিল্পটি উপলব্ধ থাকবে।

• লজিক্যাল ভলিউম — ভলিউম গ্রুপের মধ্যে একটি ####### ###### তৈরি করুন। সিস্টেমের মধ্যে অন্তত একটি ভলিউম গ্রুপ উপস্থাপন থাকলে এই বকিল্পটি উপলব্ধ থাকবে।

8.17.2. # Adding Partitions

একটি নতুন পার্টিশন যোগ করতে হলে, নতুন শীর্ষক বাটনটি ক্লিক করুন। একটি ডায়লগ বক্স প্রদর্শিত হবে (#### 8.38, "##### ####### ####### ####### #######" দেখুন)।

Note

You must dedicate at least one partition for this installation, and optionally more. For more information, refer to ####### A, An Introduction to Disk Partitions.
# Installing using anaconda

<table>
<thead>
<tr>
<th>Partition Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mount Point</strong></td>
<td>Enter the partition’s mount point. For example, if this partition should be the root partition, enter <code>/</code>; enter <code>/boot</code> for the <code>boot</code> partition, and so on. You can also use the pull-down menu to choose the correct mount point for your partition. For a swap partition the mount point should not be set and the filesystem type to <code>swap</code> is sufficient.</td>
</tr>
<tr>
<td><strong>File System Type</strong></td>
<td>Using the pull-down menu, select the appropriate file system type for this partition. For more information on file system types, refer to <code>File System Types</code>.</td>
</tr>
<tr>
<td><strong>Size (MB)</strong></td>
<td>Enter the size (in megabytes) of the partition. Note, this field starts with 200 MB; unless changed, only a 200 MB partition will be created.</td>
</tr>
</tbody>
</table>

• **Mount Point**: Enter the partition’s mount point. For example, if this partition should be the root partition, enter `/`; enter `/boot` for the `boot` partition, and so on. You can also use the pull-down menu to choose the correct mount point for your partition. For a swap partition the mount point should not be set and the filesystem type to `swap` is sufficient.

• **File System Type**: Using the pull-down menu, select the appropriate file system type for this partition. For more information on file system types, refer to `File System Types`.

• **Size (MB)**: Enter the size (in megabytes) of the partition. Note, this field starts with 200 MB; unless changed, only a 200 MB partition will be created.
If you choose Fill all space up to (MB) you must give size constraints in the field to the right of this option. This allows you to keep a certain amount of space free on your hard drive for future use.

- **Force to be a primary partition**: Select whether the partition you are creating should be one of the first four partitions on the hard drive. If unselected, the partition is created as a logical partition. Refer to A.1.3, “Partitions within Partitions — An Overview of Extended Partitions”, for more information.

- **Encrypt**: A virtual partition will be created in the partition table with the given name. The partition will be encrypted. If selected, the partition will be created as a logical partition. In addition, the encryption agent will be configured to encrypt the partition. Refer to C, for more information.

- **OK**: Select OK once you are satisfied with the settings and wish to create the partition.

- **Cancel**: Select Cancel if you do not want to create the partition.

### 8.17.2.1. File System Types

Fedora allows you to create different partition types and file systems. The following is a brief description of the different partition types and file systems available, and how they can be used.

- **ext4**: The ext4 file system is based on the ext3 file system and features a number of improvements. These include support for larger file systems and larger files, faster and more efficient allocation of disk space, no limit on the number of subdirectories within a directory, faster file system checking, and more robust journaling. The ext4 file system is selected by default and is highly recommended.

---

2 The fsck application is used to check the file system for metadata consistency and optionally repair one or more Linux file systems.
Installing using anaconda

- ext3 — The ext3 file system is based on the ext2 file system and has one main advantage over ext2: journaling. Using a journaling file system reduces time spent recovering a file system after a crash as there is no need to fsck the file system.

- ext2 — An ext2 file system supports standard Unix file types (regular files, directories, symbolic links, etc). It provides the ability to assign long file names, up to 255 characters.

- xfs — XFS is a highly scalable, high-performance file system that supports very large file sizes (approximately 1 exabyte), large write operations (approximately 1 million terabytes), and directory structures containing tens of millions of entries. XFS supports metadata journaling, which facilitates quicker crash recovery. The XFS file system can also be defragmented and resized while mounted and active.

- vfat — VFAT is the file system used in Microsoft Windows.

- Btrfs — Btrfs is under development as a file system capable of addressing and managing more files, larger files, and larger volumes than the ext2, ext3, and ext4 file systems. Btrfs is designed to make the file system tolerant of errors, and to facilitate the detection and repair of errors when they occur. It uses checksums to ensure the validity of data and metadata, and maintains snapshots of the file system that can be used for backup or repair.

Btrfs is still experimental

Fedora 14 includes Btrfs as a technology preview to allow you to experiment with this file system. You should not choose Btrfs for partitions that will contain valuable data or that are essential for the operation of important systems.

8.17.3. # Create Software RAID

Redundant arrays of independent disks (RAIDs) are constructed from multiple storage devices that are arranged to provide increased performance and fault tolerance. Refer to the Fedora Deployment Guide for a description of different kinds of RAIDs.

To make a RAID device, you must first create software RAID partitions. Once you have created two or more software RAID partitions, select RAID to join the software RAID partitions into a RAID device.

RAID Partition

File System Type software
Choose this option to construct a RAID device from two or more existing software RAID partitions. This option is available if two or more software RAID partitions have been configured.
Installing using anaconda

8. Installing using anaconda

Ch. 8.40. #9. RAID

Creating a RAID device

General partition of a similar type of file system is selected. RAID device is selected automatically by Anaconda, but the user can select a name between md0 to md15.

In RAID devices, adding a storage device to a RAID or removing a device from a RAID, click the checkbox next to each device.

RAID Level is also indicated in a special way. Select from the following options:

- **RAID 0** — information is distributed among multiple storage devices. RAID 0 level is more efficient in general partition, but if one device in the array is damaged, the entire array will be affected. RAID 0 requires at least two RAID partitions.

- **RAID 1** — information is distributed among a single storage device, but in the array redundancy is also available. RAID 1 requires at least two RAID partitions.

- **RAID 4** — information is distributed among multiple storage devices, but the RAID parity information is maintained in one device. If any device in the array is damaged, the array remains safe. RAID 4 requires a RAID partition.
Choose this option to set up a RAID *mirror* of an existing disk. This option is available if two or more disks are attached to the system.
8.17.4. Create LVM Logical Volume

**Important — LVM Unavailable in Text-Mode Installations**

Create LVM Logical Volume

To read more about LVM, refer to the Fedora Deployment Guide. Note, LVM is only available in the graphical installation program.

Physical Volume

To add LVM Logical Volume:

```
LVM

Physical Volume
```

```
File System Type

physical volume (LVM)
```

8.17.2, “Adding Partitions”
Create an LVM Physical Volume

LVM ভলিউমগুলি প্রয়োজনের জন্য অথবা উপস্থিত লজিক্যাল ভলিউম একটি ভলিউম গ্রুপের মধ্যে যোগ করার জন্য এই বিকল্পটি নির্বাচন করুন।
### Make LVM Volume Group

<table>
<thead>
<tr>
<th>Logical Volume Name</th>
<th>Mount Point</th>
<th>Size (MB)</th>
</tr>
</thead>
</table>

To assign one or more physical volumes to a volume group, first name the volume group. Then select the physical volumes to be used in the volume group. Finally, configure logical volumes on any volume groups using the **Add**, **Edit**, and **Delete** options.

When assigning physical volumes, ensure that the physical volumes have enough space to accommodate the logical volumes. For example, if a volume group has two 5 gigabyte physical volumes and one 8 gigabyte logical volume, the installer will not allow removal of one physical volume unless there is exactly 5 gigabytes of free space in the remaining volume group. If the logical volume size is reduced, any logical volume greater than 5 gigabytes may be removed.

### Logical Volumes

- **Logical Volume Name:**
- **Mount Point:**
- **Size (MB):**

*Note: This is a simplified representation of the actual software interface.*
8.17.5. #

Recommended Partitioning Scheme

8.17.5.1. #

x86, AMD64, Intel

---

- **A** swap partition
- **A** /boot partition
- **A** partition

A swap partition (an extended or bootable swap partition) should be used to store virtual memory. If the system needs to swap data when the RAM is not sufficient, the swap partition is used. In the past, as the amount of RAM in computers increased, the recommended amount of swap space also increased. However, in modern systems, where memory sizes have increased significantly (100GB or more), it is necessary to calculate the memory pressure on the system while installing. The table below provides the recommended swap space sizes.

<table>
<thead>
<tr>
<th>RAM Size</th>
<th>Swap Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>4GB</td>
<td>2GB</td>
</tr>
<tr>
<td>8GB</td>
<td>4GB</td>
</tr>
<tr>
<td>16GB</td>
<td>8GB</td>
</tr>
<tr>
<td>32GB</td>
<td>16GB</td>
</tr>
<tr>
<td>64GB</td>
<td>32GB</td>
</tr>
<tr>
<td>128GB</td>
<td>64GB</td>
</tr>
<tr>
<td>256GB</td>
<td>128GB</td>
</tr>
<tr>
<td>512GB</td>
<td>256GB</td>
</tr>
<tr>
<td>1TB</td>
<td>512GB</td>
</tr>
</tbody>
</table>

---

8.44. #

Make Logical Volume

<table>
<thead>
<tr>
<th>Mount Point:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>File System Type:</td>
<td>ext4</td>
<td></td>
</tr>
<tr>
<td>Logical Volume Name:</td>
<td>LogVol00</td>
<td></td>
</tr>
<tr>
<td>Size (MB):</td>
<td>4996</td>
<td></td>
</tr>
<tr>
<td>Encrypt</td>
<td>☑</td>
<td></td>
</tr>
</tbody>
</table>

---

STM 8.3. System swap space

The recommended swap space size is shown in the table above. The swap space size is calculated based on the system's RAM size.
## Installing using anaconda

**Swap**

In many systems, allocating swap space across multiple drives is possible, which can lead to better performance. Specifically, in systems with fast drives, controllers, and interfaces.

### A /boot/ partition (250 MB)

The partition mounted on /boot/ contains the operating system kernel (which allows your system to boot Fedora), along with files used during the bootstrap process. For most users, a 250 MB boot partition is sufficient.

---

**Important**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

### A root partition (3.0 GB - 5.0 GB)

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

## 8.17.5.1.1, "Advice on Partitions"

In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for /boot/ such as Btrfs, XFS, or VFAT.

---

**Note**

If your hard drive is more than 1024 cylinders (and your system was manufactured more than two years ago), you may need to create a /boot/ partition if you want the / (root) partition to use all of the remaining space on your hard drive.

---

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the /boot/ partition must be created on a partition outside of the RAID array, such as on a separate hard drive.

---

**A root partition (3.0 GB - 5.0 GB)**

This is where the root directory (sometimes pronounced “slash-root”) directory is the home directory of the user account for system administration.

A 3.0 GB partition allows you to install a minimal installation, while a 5.0 GB root partition lets you perform a full installation, choosing all package groups.

---

**Root and /root**

The / (or root) partition is the top of the directory structure. The /root directory is the home directory of the user account for system administration.
The following table summarizes minimum partition sizes for the partitions containing the listed directories. You do not have to make a separate partition for each of these directories. For instance, if the partition containing \texttt{/} foo must be at least 500 MB, and you do not make a separate \texttt{/} foo partition, then the \texttt{/} (root) partition must be at least 500 MB.

<table>
<thead>
<tr>
<th>Directory</th>
<th>Minimum size</th>
</tr>
</thead>
<tbody>
<tr>
<td>\texttt{/}</td>
<td>250 MB</td>
</tr>
<tr>
<td>\texttt{/usr}</td>
<td>250 MB, but avoid placing this on a separate partition</td>
</tr>
<tr>
<td>\texttt{/tmp}</td>
<td>50 MB</td>
</tr>
<tr>
<td>\texttt{/var}</td>
<td>384 MB</td>
</tr>
<tr>
<td>\texttt{/home}</td>
<td>100 MB</td>
</tr>
<tr>
<td>\texttt{/boot}</td>
<td>250 MB</td>
</tr>
</tbody>
</table>

\textbf{Leave Excess Capacity Unallocated}

If you are not sure how best to configure the partitions for your computer, accept the default partition layout.

\textbf{8.17.5.1.1. Advice on Partitions}

Optimal partition setup depends on the usage for the Linux system in question. The following tips may help you decide how to allocate your disk space.

- If you or other users need to store large amounts of data, consider creating a separate partition for each directory. For example, if the partition containing \texttt{/home} must be at least 100 MB, you can create a separate \texttt{/home} partition.
- If you need to encrypt partitions, consider using encryption. Even if the primary storage device is not encrypted, encrypted partitions can protect data. For example, encrypting the \texttt{/home} partition can help protect user data.
- If you plan to install a great many kernels, consider using the \texttt{/boot} partition. Unless you plan to install a great many kernels, the default partition size of 250 MB should suffice.
Installing using anaconda

### Important Supported file systems

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for `/boot` such as Btrfs, XFS, or VFAT.

- The `/var` directory holds content for a number of applications, including the Apache web server. It is also used to store downloaded update packages on a temporary basis. Ensure that the partition containing the `/var` directory has enough space to download pending updates and hold your other content.

### Warning

PackageKit অ্যাপ্লিকেশনটি আপডেট করা প্যাকেজগুলিকে ডিফল্ট অবস্থায় `/var/cache/yum`-এ ডাউনলোড করে। যদি আপনি নিজে পার্টিশনে তৈরি করে থাকনে এবং একটি পৃথক `/var/lib` পার্টিশন তৈরি করেন, তাহলে অনুগ্রহ করে ঐ পার্টিশনটিতে আপডেট করা প্যাকেজের ডাউনলোড এবং ধারণ করার জন্য প্রয়োজ্য স্থান (৩.০ গিগাবাইট অথবা তার অধিক) বরাদ্দ করুন।

- Fedora সিস্টেমের সফ্টওয়্যারের অধিকাংশ সামগ্রী `/usr` ডিরেক্টরিতে উপস্থিত থাকেন। ডিফল্ট সফ্টওয়্যার সংকলন ইনস্টল করার জন্য অন্তত ৪ গিগাবাইট স্থান বরাদ্দ করা প্রয়োজ্য। সফ্টওয়্যার ডিভেলপমেন্ট নিয়ে তৈরি হলে এই ডিরেক্টরির জন্য মাত্র ৩ গিগাবাইট স্থান বরাদ্দ করুন।

### Do not place `/usr` on a separate partition

If `/usr` is on a separate partition from `/`, the boot process becomes much more complex, and in some situations (like installations on iSCSI drives), might not work at all.

- Consider leaving a portion of the space in an LVM group unallocated. This unallocated space gives you flexibility if your space requirements change but you do not wish to remove data from other partitions to reallocate storage.

  - Consider leaving a portion of the space in an LVM group unallocated. This unallocated space gives you flexibility if your space requirements change but you do not wish to remove data from other partitions to reallocate storage.

### The following table is a possible partition setup for a system with a single, new 80 GB hard disk and 1 GB of RAM.

Note that approximately 10 GB of the volume group is unallocated to allow for future growth.
Example Usage

This setup is not optimal for all use cases.

Example partition setup

Example partition setup

<table>
<thead>
<tr>
<th>Partition</th>
<th>Size and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>boot</td>
<td>250 MB ext3</td>
</tr>
<tr>
<td>swap</td>
<td>2 GB swap</td>
</tr>
<tr>
<td>LVM physical volume</td>
<td>Remaining space, as one LVM volume group</td>
</tr>
</tbody>
</table>

The physical volume is assigned to the default volume group and divided into the following logical volumes:

Example partition setup: LVM physical volume

<table>
<thead>
<tr>
<th>Partition</th>
<th>Size and type</th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>13 GB ext4</td>
</tr>
<tr>
<td>/var</td>
<td>4 GB ext4</td>
</tr>
<tr>
<td>/home</td>
<td>50 GB ext4</td>
</tr>
</tbody>
</table>

8.18. Write changes to disk

If you are certain that you want to proceed, click **Write changes to disk**.
Last chance to cancel safely

If you are ready to go, click Go back. To cancel installation completely, switch off your computer.

8.19.1. x86, AMD64, Intel

If you install Fedora in text mode, the installer configures the bootloader automatically and you cannot customize bootloader settings during the installation process.

The GRUB boot menu

To boot the system without boot media, you usually need to install a boot loader. A boot loader is the first software program that runs when a computer starts. It is responsible for loading and transferring control to the operating system kernel software. The kernel, in turn, initializes the rest of the operating system.

To switch off most computers at this stage, press the power button and hold it down for a few seconds.

Write changes to disk

Revise any of the choices that you made up to this point, click Go back. To cancel installation completely, switch off your computer.

The GRUB boot menu

To switch off most computers at this stage, press the power button and hold it down for a few seconds.
You may have a boot loader installed on your system already. An operating system may install its own preferred boot loader, or you may have installed a third-party boot loader. If your boot loader does not recognize Linux partitions, you may not be able to boot Fedora. Use GRUB as your boot loader to boot Linux and most other operating systems. Follow the directions in this chapter to install GRUB.

If you install GRUB, it may overwrite your existing boot loader.
Installing using anaconda

Warning

If you choose not to install GRUB for any reason, you will not be able to boot the system directly, and you must use another boot method (such as a commercial boot loader application). Use this option only if you are sure you have another way of booting the system!

To add, remove, or change the detected operating system settings, use the options provided.

Add

Select Add to include an additional operating system in GRUB.

Select the disk partition which contains the bootable operating system from the drop-down list and give the entry a label. GRUB displays this label in its boot menu.

To change an entry in the GRUB boot menu, select the entry and then select Edit.

To remove an entry from the GRUB boot menu, select the entry and then select Delete.

Select Default beside the preferred boot partition to choose your default bootable OS. You cannot move forward in the installation unless you choose a default boot image.

Note

The Label column lists what you must enter at the boot prompt, in non-graphical boot loaders, in order to boot the desired operating system.

Once you have loaded the GRUB boot screen, use the arrow keys to choose a boot label or type e for edit. You are presented with a list of items in the configuration file for the boot label you have selected.

Boot loader passwords provide a security mechanism in an environment where physical access to your server is available.
GRUB Passwords Not Required

You may not require a GRUB password if your system only has trusted operators, or is physically secured with controlled console access. However, if an untrusted person can get physical access to your computer's keyboard and monitor, that person can reboot the system and access GRUB. A password is helpful in this case.

If you choose to use a boot loader password to enhance your system security, be sure to select the checkbox labeled **Use a boot loader password**

Once selected, enter a password and confirm it.

GRUB stores the password in encrypted form, so it cannot be read or recovered. If you forget the boot password, boot the system normally and then change the password entry in the `/boot/grub/grub.conf` file. If you cannot boot, you may be able to use the "rescue" mode on the first Fedora installation disc to reset the GRUB password.

GRUB recognizes only the QWERTY keyboard layout. If the system is connected to another keyboard layout, it will use this layout. GRUB passwords are case-sensitive and can only be entered in English.

To configure more advanced boot loader options, such as changing the drive order or passing options to the kernel, be sure **Configure advanced boot loader options** is selected before clicking **Next**.

8.19.1. Advanced Boot Loader Configuration

Now that you have chosen which boot loader to install, you can also determine where you want the boot loader to be installed. You may install the boot loader in one of two places:

- **Master Boot Record (MBR)** — This is recommended if you are already using another boot loader on your system.
  
- **First sector of your boot partition** — This is recommended if you are already using another boot loader on your system. In this case, your other boot loader takes control first. You can then configure that boot loader to start GRUB, which then boots Fedora.
 Installing using anaconda

**GRUB as a Secondary Boot Loader**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the boot loader should not be installed on the MBR of the RAID array. Rather, the boot loader should be installed on the MBR of the same drive as the boot partition was created.

Note

If you are using GRUB as a secondary boot loader, keep in mind that the BIOS in some older systems cannot access more than the first 1024 cylinders on a hard drive. If this is the case, leave enough room for the boot Linux partition on the first 1024 cylinders of your hard drive to boot Linux. The other Linux partitions can be after cylinder 1024:

In parted, 1024 cylinders equals 528MB. For more information, refer to:

http://www.pcguide.com/ref/hdd/bios/sizeMB504-c.html

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the boot loader should not be installed on the MBR of the RAID array. Rather, the boot loader should be installed on the MBR of the same drive as the boot partition was created.

Note

If you are using GRUB as a secondary boot loader, keep in mind that the BIOS in some older systems cannot access more than the first 1024 cylinders on a hard drive. If this is the case, leave enough room for the boot Linux partition on the first 1024 cylinders of your hard drive to boot Linux. The other Linux partitions can be after cylinder 1024:

In parted, 1024 cylinders equals 528MB. For more information, refer to:

http://www.pcguide.com/ref/hdd/bios/sizeMB504-c.html

**Note**

If you have a RAID card, be aware that some BIOSes do not support booting from the RAID card. In cases such as these, the boot loader should not be installed on the MBR of the RAID array. Rather, the boot loader should be installed on the MBR of the same drive as the boot partition was created.

Note

If you are using GRUB as a secondary boot loader, keep in mind that the BIOS in some older systems cannot access more than the first 1024 cylinders on a hard drive. If this is the case, leave enough room for the boot Linux partition on the first 1024 cylinders of your hard drive to boot Linux. The other Linux partitions can be after cylinder 1024:

In parted, 1024 cylinders equals 528MB. For more information, refer to:

http://www.pcguide.com/ref/hdd/bios/sizeMB504-c.html
Rescue Mode

8.19.2. #

**Rescue Mode**

রেসকিউ মোডের সাহায্যে বুট মিডিয়া অথবা সিস্টেমের হার্ড-ড্রাইভের পরিবর্তে অন্য কোনো মিডিয়া থেকে শুরু করা সম্ভব। কিছু পরিস্থিতিতে সম্পূর্ণভাবে কার্যকরী করা সম্ভব হয় না যার ফলে আপনার সিস্টেমের হার্ড-ড্রাইভের উপস্থিতি কার্যকরী হয় না। রেসকিউ মডের ব্যবহার করে, আপনার হার্ড-ড্রাইভ থেকে না চালানো যায়। সীমিত রূপে সাহায্য প্রদান করা ব্যবহার করতে, নিম্নোক্ত নির্দেশটি অনুসরণ করুন:

- CD, DVD, USB, অথবা PXE ব্যবহার করে একটি x86, AMD64 অথবা Intel 64 সিস্টেম বুট করার জন্য, ইনস্টলেশন প্রম্পটে `linux rescue` টাইপ করুন। রেসকিউ মোডের সম্পূর্ণ বিবরণ জানার জন্য, 18, Basic System Recovery দেখুন।

For additional information, refer to the

Fedora Deployment Guide.

8.19.3. #

**Alternative Boot Loaders**

GRUB is the default bootloader for Fedora, but is not the only choice. A variety of open-source and proprietary alternatives to GRUB are available to load Fedora, including LILO', SYSLINUX', Acronis Disk Director Suite' and Apple Boot Camp'.

**Important**

স্বতন্ত্র বুট-লোডারগুলি Red Hat দ্বারা সমর্থিত হবে না।

8.20. #

**Package Group Selection**

Now that you have made most of the choices for your installation, you are ready to confirm the default package selection or customize packages for your system.

*Installing in text mode*

টেক্সট মোডে ইনস্টল করা হলে প্যাকেজে নির্বাচন করা সম্ভব নয়। ইনস্টলার দ্বারা সবাই স্থায়ীভাবে মূল্যায়ন মেলেকি ও করে সংকলনের প্যাকেজে নির্বাচন করা হয়। ইনস্টলেশনের সম্পূর্ণতা পরে সম্পূর্ণ করা সম্ভব নয় এবং সম্পূর্ণতা প্রস্তুতি থাকে। নির্বাচিত প্যাকেজের তালিকা পরিবর্তন করার জন্য প্যাকেজ চালু করুন।
### Package Group Selection

By default, the Fedora installation process loads a selection of software that is suitable for a system deployed as a basic server. Note that this installation does not include a graphical environment. To include a selection of software suitable for other roles, click the radio button that corresponds to one of the following options:

- **Graphical Desktop**
  - OpenOffice.org Productivity Suite, GIMP, and other multimedia applications are available.

- **Web server**
  - Apache web server is available.

- **Minimal**
  - This option provides only the packages essential to run Fedora. A minimal installation provides the basis for a single-purpose server or desktop appliance and maximizes performance and security on such an installation.

---

Note that the current package list can be changed by proceeding to "Installing Packages" (8.21) if desired. For more information, see "Package Group Selection" (8.48).
To customize your package set further, select the **Customize now** option on the screen. Clicking **Next** takes you to the **Package Group Selection** screen.

### 8.20.1. # Installing from Additional Repositories

You can define additional **repositories** to increase the software available to your system during installation. A repository is a network location that stores software packages along with **metadata** that describes them. Many of the software packages used in Fedora require other software to be installed. The installer uses the metadata to ensure that these requirements are met for every piece of software you select for installation.

The basic options are:

- **The Installation Repo** repository is automatically selected for you. This represents the collection of software available on your installation CD or DVD.

- **The Fedora 14 - i386 repository** contains the complete collection of software that was released as Fedora 14, with the various pieces of software in their versions that were current at the time of release. If you are installing from the Fedora 14 DVD or set of CDs, this option does not offer you anything extra. However, if you are installing from a Fedora Live CD, this option provides access to far more software than is included on the disk. Note that the computer must have access to the internet to use this option.

- **The Fedora 14 - i386 - Updates repository** contains the complete collection of software that was released as Fedora 14, with the various pieces of software in their most current stable versions. This option not only installs the software that you select, but makes sure that it is fully updated as well. Note that the computer must have access to the internet to use this option.

To include software from **repositories** other than the Fedora package collection, select **Add additional software repositories**. You may provide the location of a repository of third-party software. Depending on the configuration of that repository, you may be able to select non-Fedora software during installation.
Installing using anaconda

If you change the repository information during a non-network installation, such as from a Fedora DVD, the installer prompts you for network configuration information.

Network Access Required

If you change the repository information during a non-network installation, such as from a Fedora DVD, the installer prompts you for network configuration information.

Add additional software repositories

Repository name

Edit repository

Repository URL

Fedora

To find a Fedora software mirror near you, refer to http://fedoraproject.org/wiki/Mirrors.

Once you have located a mirror, to determine the URL to use, find the directory on the mirror that contains a directory named repodata. For instance, the “Everything” repository for Fedora is typically located in a directory tree releases/14/Everything/arch/os, where arch is a system architecture name.

Once you provide information for an additional repository, the installer reads the package metadata over the network. Software that is specially marked is then included in the package group selection system. See #8.20.2, “Customizing the Software Selection” for more information on selecting packages.

8.20.2. #

Customizing the Software Selection

Your Fedora system automatically supports the language that you selected at the start of the installation process. To include support for additional languages, select the package group for those languages from the Languages category.

Additional Language Support

Customize now
Customizing the Software Selection

### Package Group Details

In contrast to the previous version, Fedora now allows you to select package groups, which group components together according to function (for example, **X Window System and Editors**) or individual packages, or a combination of the two.

Fedoraversity.shrtrpi mothru anntvdbdckf sytnlvsy bmbhmr jnny, pykcej xyrhcn jnl xfrf cltrx shlgr dpbn jnny.

**Package Group Details**

You can select package groups, which group components together according to function (for example, **X Window System and Editors**), individual packages, or a combination of the two.

If you select a package group, Fedora automatically installs the base and mandatory packages for that group. To change which optional packages within a selected group will be installed, select the **Optional Packages** button under the description of the group. Then use the check box next to an individual package name to change its selection.

Caro consectetur mnnkk dr gctt btbhr jk, tnnkfl tpbult pykcej xyrhcn jnl jk clyl fvlk cblk ab sv sctnl dfct fylc pykcej xyrhcn jk fylc cmnktv bftbl jk fylc.
Your Fedora system automatically supports the language that you selected at the start of the installation process. To include support for additional languages, select the package group for those languages from the Languages category.

The packages that you select are not permanent. After you boot your system, use the Add/Remove Software tool to either install new software or remove installed packages. To run this tool, from the main menu, select System → Administration → Add/Remove Software. The Fedora software management system downloads the latest packages from network servers, rather than using those on the installation discs.

8.20.2.1. Core Network Services

Fedora installs the following network services by default:

- syslog
- SMTP
- NFS
- SSH (Secure SHell)
- mDNS (multicast DNS)
- HTTP (HyperText Transfer Protocol)
- CUPS (Common UNIX Printing System)
- VNC (Virtual Network Computing)

Some automated processes on your Fedora system use the email service to send reports and messages to the system administrator. By default, the email, logging, and printing services do not accept connections from other systems. Fedora installs the NFS sharing, HTTP, and VNC components without enabling those services.
You may configure your Fedora system after installation to offer email, file sharing, logging, printing and remote desktop access services. The SSH service is enabled by default. You may use NFS to access files on other systems without enabling the NFS sharing service.

8.21. # Installing Packages

安装 packages 后，您可以在系统配置后提供电子邮件、文件共享、日志记录、打印和远程桌面访问服务。默认情况下，SSH 服务已启用。您可以使用 NFS 访问其他系统的文件，而无需启用 NFS 共享服务。

8.22. # Installation Complete

安装程序会提示您准备系统重新启动。请记住在重新启动后移除安装介质，除非它会自动弹出。

After your computer's normal power-up sequence has completed, Fedora loads and starts. By default, the start process is hidden behind a graphical screen that displays a progress bar. Eventually, a login prompt or a GUI login screen (if you installed the X Window System and chose to start X automatically) appears.
The first time you start your Fedora system in run level 5 (the graphical run level), the FirstBoot tool appears, which guides you through the Fedora configuration. Using this tool, you can set your system time and date, install software, register your machine with Red Hat Network, and more. FirstBoot lets you configure your environment at the beginning, so that you can get started using your Fedora system quickly.
9.1.1. Are You Unable to Boot With Your RAID Card?

If you have performed an installation and cannot boot your system properly, you may need to reinstall and create your partitions differently.

Some BIOSes do not support booting from RAID cards. At the end of an installation, a text-based screen showing the boot loader prompt (for example, GRUB: ) and a flashing cursor may be all that appears. If this is the case, you must repartition your system.

Whether you choose automatic or manual partitioning, you must install your `/boot` partition outside of the RAID array, such as on a separate hard drive. An internal hard drive is necessary to use for partition creation with problematic RAID cards.

You must also install your preferred boot loader (GRUB or LILO) on the MBR of a drive that is outside of the RAID array. This should be the same drive that hosts the `/boot` partition.

Once these changes have been made, you should be able to finish your installation and boot the system properly.
9.1.2. Is Your System Displaying Signal 11 Errors?

A signal 11 error, commonly known as a segmentation fault, means that the program accessed a memory location that was not assigned to it. A signal 11 error may be due to a bug in one of the software programs that is installed, or faulty hardware.

Ensure that you have the latest installation updates and images. Review the online errata to see if newer versions are available. If the latest images still fail, it may be due to a problem with your hardware. Commonly, these errors are in your memory or CPU-cache. A possible solution for this error is turning off the CPU-cache in the BIOS, if your system supports this. You could also try to swap your memory around in the motherboard slots to check if the problem is either slot or memory related.

For more information concerning signal 11 errors, refer to:

http://www.bitwizard.nl/sig11/

9.2. Trouble Beginning the Installation

9.2.1. Problems with Booting into the Graphical Installation

If your system is displaying signal 11 errors, you may need to boot into the text-mode installation.

Ensure that you have the latest installation updates and images. Review the online errata to see if newer versions are available. If the latest images still fail, it may be due to a problem with your hardware. Commonly, these errors are in your memory or CPU-cache. A possible solution for this error is turning off the CPU-cache in the BIOS, if your system supports this. You could also try to swap your memory around in the motherboard slots to check if the problem is either slot or memory related.

For more information concerning signal 11 errors, refer to:

http://www.bitwizard.nl/sig11/

9.2. Trouble Beginning the Installation

9.2.1. Problems with Booting into the Graphical Installation

If your system is displaying signal 11 errors, you may need to boot into the text-mode installation.

Ensure that you have the latest installation updates and images. Review the online errata to see if newer versions are available. If the latest images still fail, it may be due to a problem with your hardware. Commonly, these errors are in your memory or CPU-cache. A possible solution for this error is turning off the CPU-cache in the BIOS, if your system supports this. You could also try to swap your memory around in the motherboard slots to check if the problem is either slot or memory related.

For more information concerning signal 11 errors, refer to:

http://www.bitwizard.nl/sig11/
ফ্রেম বাফারের সমর্থন নিষ্ক্রিয় করে ইনস্টলেশন প্রোগ্রামকে টেক্সট মোডে চালানোর জন্য, nofb বুট অপশনটি ব্যবহার করুন। স্ক্রিন পড়ার জন্য ব্যবহৃত কোনই হার্ডওয়ের সাথে সমঝু বারো রাখতে এই কমান্ডটি ব্যবহার করার পরযে মে পারে।

9.3.1. #ইনস্টলেশন চলাকালীন সমস্যা

'Fedora ইনস্টল করার জন্য কোনো ডিভাইস পাওয়া যায়নি' ত্রুটির বার্তা ইনস্টলেশন প্রোগ্রাম যদি কোনো অপরিচিত SCSI নিয়ন্ত্রককে সমৃদ্ধীন হয়, তাহলে 'Fedora ইনস্টল করার জন্য কোনো ডিভাইস পাওয়া যায়নি' বার্তাটি প্রদর্শিত হবে।

আপনি Red Hat পড়তে পারেন, যা অনলাইন নম্বরলিখিত স্থানে অবস্থিত রয়েছে:

http://hardware.redhat.com/hcl/

9.3.2. #ট্রেসব্যাক বার্তা সংরক্ষণের পদ্ধতি

গ্রাফিক্যাল ইনস্টলেশনের সময় anaconda কোনো ত্রুটির সমৃদ্ধীন হলে, বিপর্যয় সম্পর্কে সূচনা দেওয়ার উদ্দেশ্যে একটি ডায়লগ বক্স প্রদর্শিত করা হয়:

Exception Occurred

An unhandled exception has occurred. This is most likely a bug. Please save a copy of the detailed exception and file a bug report.

Details

চিত্র#9.1. #বিপর্যয়ের রিপোর্ট সংযোজন ডায়লগ বক্স
অধ্যায় 9. অথবা অথবা AMD সিস্টেমে ইনস্টলেশনের সমস্যা সমাধানের প্রণালী

বিবরণ
ত্রুটির বিবরণ পুনর্দর্শন করা হয়:

Exception Occurred

An unhandled exception has occurred. This is most likely a bug. Please save a copy of the detailed exception and file a bug report.

Details

File "/usr/lib/anaconda/yuminstal.py", line 236, in callback
ValueError: too many values to unpack

Local variables in innermost frame:
what: 32768
h: system-config-securitylevel
self: <yuminstall.AnacondaCallback instance at 0xb42871cc>
amount: 1102

Save

স্থানীয় অথবা দূরবর্তী অবস্থানে ত্রুটির বিবরণ সংরক্ষণ করা হয়:

ইনস্টলার থেকে পুনর্স্থান করুন
ইনস্টলেশন প্রণালী থেকে পুনর্স্থান করা হয়।
If you select Save from the main dialog, you can choose from the following options:

- **Local disk**
- **Bugzilla**

### Bugzilla

Bugzilla submits details of the error to Red Hat's bug-tracking system, Bugzilla. You must supply an existing Bugzilla username and password, and a description of the bug.

**Select a destination for saving your traceback:**

Please choose a destination for saving your traceback.

1. **Local disk**
2. **Bugzilla**

**User name**

**Password**

**Bug description**

### Remote server (scp)

Bugzilla can also store bug reports on a remote server using SCP. To do this, you need to specify the remote server's name, password, host, and destination file.

**Select a destination for saving your traceback:**

Please choose a destination for saving your traceback.

1. **Remote server (scp)**
2. **User name**
3. **Password**
4. **Host (host:port)**
5. **Destination file**
9.3.3. # Trouble with Partition Tables

Installation problems with partition tables (8.15, “Disk Partitioning Setup”)

If the installation utility cannot read the partition table of the hda device, it may not be possible to create a new partition, which will cause all data on the drive to be lost.

Users who have used programs such as EZ-BIOS have experienced similar problems, causing data to be lost (assuming the data was not backed up before the installation began) that could not be recovered.

If your hard drive is more than 1024 cylinders, you must create a /boot partition if you want the / (root) partition to use all of the remaining space on your hard drive.

9.3.5. # Other Partitioning Problems

If you create partitions manually, but cannot move to the next screen, you probably have not created all the partitions necessary for installation to proceed.

You must have the following partitions as a bare minimum:

- A / (root) partition
- A <swap> partition of type swap

9.3.6. # Are You Seeing Python Errors?

If you are seeing Python errors during installation (presumably due to the Anaconda program), you may need to update or reinstall Python for correct operation.

Traceback (innermost last):
File /var/tmp/anaconda-7.1/usr/lib/anaconda/iw/progress_gui.py", line 20, in run
rc self.todo.doInstall()
Problems After Installation

<table>
<thead>
<tr>
<th>File */var/tmp/anaconda-7.1/usr/lib/anaconda/todo.py&quot;, line 1468, in doInstall</th>
</tr>
</thead>
<tbody>
<tr>
<td>self.fstab.savePartitions</td>
</tr>
<tr>
<td>File &quot;fstab.py&quot;, line 221, in savePartitions</td>
</tr>
<tr>
<td>sys.exit(0)</td>
</tr>
<tr>
<td>SystemExit: 0</td>
</tr>
<tr>
<td>Local variables in innermost frame:</td>
</tr>
<tr>
<td>self: &lt;fstab.GuiFstab instance at 0x8446fe0&gt;</td>
</tr>
<tr>
<td>sys: &lt;module 'sys' (built-in)&gt;</td>
</tr>
</tbody>
</table>
| ToDo object: (itodoToDo p1 (dp2 S'method' p3 (iimage CdromInstallMethod p4 (dp5 S'progressWindow' p6 <failed>)

This error occurs in some systems where links to / tmp/ are symbolic to other locations or have been changed since creation. These symbolic or changed links are invalid during the installation process, so the installation program cannot write information and fails.

If you experience such an error, first try to download any available updates for anaconda. Updates for anaconda and instructions for using them can be found at:

http://fedoraproject.org/wiki/Anaconda/Updates

The anaconda website may also be a useful reference and can be found online at:

http://fedoraproject.org/wiki/Anaconda

If you are experiencing problems with GRUB, you may need to disable the graphical boot screen. To do this, become the root user and edit the /boot/grub/grub.conf file.
Within the `grub.conf` file, comment out the line which begins with `splashimage` by inserting the `#` character at the beginning of the line.

Press Enter to exit the editing mode.

Once the boot loader screen has returned, type `b` to boot the system.

Once you reboot, the `grub.conf` file is reread and any changes you have made take effect.

You may re-enable the graphical boot screen by uncommenting (or adding) the above line back into the `grub.conf` file.

### 9.4.2. Booting into a Graphical Environment

If you have installed the X Window System but are not seeing a graphical desktop environment once you log into your system, you can start the X Window System graphical interface using the command `startx`.

Once you enter this command and press Enter, the graphical desktop environment is displayed.

Note, however, that this is just a one-time fix and does not change the log in process for future log ins.

To set up your system so that you can log in at a graphical login screen, you must edit one file, `/etc/inittab` by changing just one number in the runlevel section. When you are finished, reboot the computer. The next time you log in, you are presented with a graphical login prompt.

Open a shell prompt. If you are in your user account, become root by typing the `su` command.

Now, type `gedit /etc/inittab` to edit the file with `gedit`. The file `/etc/inittab` opens. Within the first screen, a section of the file which looks like the following appears:

```
# Default runlevel. The runlevels used are:
# 0  halt (Do NOT set initdefault to this)
# 1  Single user mode
# 2  Multiuser, without NFS (The same as 3, if you do not have networking)
# 3  Full multiuser mode
# 4  unused
# 5  X11
# 6  reboot (Do NOT set initdefault to this)
# id:3:initdefault:
```

To change from a console to a graphical login, you should change the number in the line `id:3:initdefault:` from a `3` to a `5`.

**Warning**

Change **only** the number of the default runlevel from `3` to `5`.

Your changed line should look like the following:

```
id:5:initdefault:
```

When you are satisfied with your change, save and exit the file using the `Ctrl + Q` keys. A window appears and asks if you would like to save the changes. Click `Save`.
The next time you log in after rebooting your system, you are presented with a graphical login prompt.

9.4.3. Problems with the X Window System (GUI)

If you are having trouble getting X (the X Window System) to start, you may not have installed it during your installation. If you elect to upgrade, select the X Window System packages, and choose GNOME, KDE, or both, during the upgrade package selection process.

If you are having trouble getting X to start, you may not have installed it during your installation. If you elect to upgrade, select the X Window System packages, and choose GNOME, KDE, or both, during the upgrade package selection process.

If you are having trouble getting X to start, you may not have installed it during your installation. If you elect to upgrade, select the X Window System packages, and choose GNOME, KDE, or both, during the upgrade package selection process.

To verify that this is the problem you are experiencing, run the following command:

\[ \text{df -h} \]

The df command should help you diagnose which partition is full. For additional information about df and an explanation of the options available (such as the \(-h\) option used in this example), refer to the df man page by typing \text{man df} at a shell prompt.

A key indicator is 100% full or a percentage above 90% or 95% on a partition. The /home/ and /tmp/ partitions can sometimes fill up quickly with user files. You can make some room on that partition by removing old files. After you free up some disk space, try running X as the user that was unsuccessful before.

9.4.4. Problems with the X Server Crashing and Non-Root Users

If you are having trouble with the X server crashing when anyone logs in, you may have a full file system (or, a lack of available hard drive space).

9.4.5. Problems When You Try to Log In

If you did not create a user account in the firstboot screens, switch to a console by pressing \text{Ctrl} \ Alt \ F2’ log in as root and use the password you assigned to root.

If you cannot remember your root password, boot your system as \text{linux single}.

If you are using an x86-based system and GRUB is your installed boot loader, type \text{e} for edit when the GRUB boot screen has loaded. You are presented with a list of items in the configuration file for the boot label you have selected.

Choose the line that starts with \text{kernel} and type \text{e} to edit this boot entry.

At the end of the \text{kernel} line, add:

\[ \text{single} \]

Press \textbf{Enter} to exit edit mode.

Once the boot loader screen has returned, type \text{b} to boot the system.
Once you have booted into single user mode and have access to the “prompt, you must type `passwd root` which allows you to enter a new password for root. At this point you can type `shutdown -r` now to reboot the system with the new root password.

If you cannot remember your user account password, you must become root. To become root, type `su` - and enter your root password when prompted. Then, type `passwd <username>` This allows you to enter a new password for the specified user account.

If your graphica log-in panel is not displayed, check your hardware compatibility:

http://hardware.redhat.com/hcl/

9.4.6. Is Your RAM Not Being Recognized?

Sometimes, the kernel does not recognize all of your memory (RAM). You can check this with the `cat /proc/meminfo` command.

Verify that the displayed quantity is the same as the known amount of RAM in your system. If they are not equal, add the following line to the `/boot/grub/grub.conf`:

```
mem=xxM
```

Replace `xx` with the amount of RAM you have in megabytes.

In `/boot/grub/grub.conf` the above example would look similar to the following:

```
# NOTICE: You have a /boot partition. This means that all kernel paths are relative to `/boot/
default=0
timeout=30
splashimage=(hd0,0)/grub/splash.xpm.gz
title Fedora (2.6.27.19-170.2.35.fc10.i686)
root (hd0,1)
kernel /vmlinuz-2.6.27.19-170.2.35.fc10.i686 ro root=UUID=04a07c13-e6bf-6d5a-b207-002689545705
mem=1024M
initrd /initrd-2.6.27.19-170.2.35.fc10.i686.img
```

Once you reboot, the changes made to `grub.conf` are reflected on your system.

Once you have loaded the GRUB boot screen, type `e` for edit. You are presented with a list of items in the configuration file for the boot label you have selected.

Choose the line that starts with `kernel` and type `e` to edit this boot entry.

At the end of the `kernel` line, add:

```
mem=xxM
```
where \( xx \) equals the amount of RAM in your system.

Press **Enter** to exit edit mode.

Once the boot loader screen has returned, type **b** to boot the system.

Remember to replace \( xx \) with the amount of RAM in your system. Press **Enter** to boot.

### 9.4.7. Your Printer Does Not Work

If you are not sure how to set up your printer or are having trouble getting it to work properly, try using the **Printer Configuration Tool**.

Type the **system-config-printer** command at a shell prompt to launch the **Printer Configuration Tool**. If you are not root, it prompts you for the root password to continue.

### 9.4.8. Apache-based httpd service/Sendmail Hangs During Startup

If you are having trouble with the Apache-based **httpd** service or Sendmail hanging at startup, make sure the following line is in the **/etc/hosts** file:

```
127.0.0.1 localhost.localdomain localhost
```
III. Advanced installation options

Fedora ইনস্টলেশনের জটিল ও কিছু অজানা পদ্ধতি সম্পর্কে Fedora Installation Guide-র এই অংশে আলোচনা করা হয়েছে। এর মধ্যে রয়েছে:

- boot options.
- installing without media.
- installing through VNC.
- using kickstart to automate the installation process.
Boot Options

In Fedora, a variety of administrative tasks are performed during system installation. For booting, various options are available in the boot prompt. For example:

```
boot: linux
```

If you specify more than one option, separate each of the options by a single space. For example:

```
option1 option2 option3
```

Anaconda Boot Options

In the Anaconda Installer, there are many boot options available, which are listed on the wiki:

```
http://fedoraproject.org/wiki/Anaconda/Options
```

Kernel Boot Options

Some common boot options for the kernel are listed on the wiki:

```
http://fedoraproject.org/wiki/KernelCommonProblems
```

Rescue Mode

The Fedora installation and rescue discs may either boot with rescue mode, or load the installation system. For more information on rescue discs and rescue mode, refer to

```
10.6.3, "Booting Your Computer with the Rescue Mode"
```

10.1.

Configuring the Installation System at the Boot Menu

You can use the boot menu to specify a number of settings for the installation system, including:

- language
- display resolution
- interface type
- installation method
- network settings
## 10.1.1. Specifying the Language

To set the language for both the installation process and the final system, specify the ISO code for that language with the `lang` option. Use the `keymap` option to configure the correct keyboard layout.

For example, the ISO codes `el_GR` and `gr` identify the Greek language and the Greek keyboard layout:

```
linux lang=el_GR keymap=gr
```

## 10.1.2. Configuring the Interface

To set a specific resolution on the installation interface, use `resolution` setting.

```
linux resolution=1024x768
```

To run the installation process in `text` mode, enter:

```
linux text
```

To enable support for a serial console, enter `serial` as an additional option.

Use `display=ip:0` to allow remote display forwarding. In this command, `ip` should be replaced with the IP address of the system on which you want the display to appear.

On the system you want the display to appear on, you must execute the command `xhost +remotehostname`, where `remotehostname` is the name of the host from which you are running the original display. Using the command `xhost +remotehostname` limits access to the remote display terminal and does not allow access from anyone or any system not specifically authorized for remote access.

## 10.1.3. Updating anaconda

The boot option

```
linux updates
```

Anaconda alerts the installation program to update itself. The boot option `anaconda` checks if there is an update available for the installation program and requests to download it.
To load the anaconda updates from a network location instead, use:

```
linux updates=
```

followed by the URL for the location where the updates are stored.

### 10.1.4. Specifying the Installation Method

Use the `askmethod` option to display additional menus that enable you to specify the installation method and network settings. You may also configure the installation method and network settings at the `boot:` prompt itself.

```
boot: repo
```

By default, the installation system uses DHCP to automatically obtain the correct network settings. To manually configure the network settings yourself, either enter them in the Configure TCP/IP screen, or at the `boot:` prompt. You may specify the `ip` address, `netmask` “gateway” and `dns` server settings for the installation system at the prompt. If you specify the network configuration at the `boot:` prompt, these settings are used for the installation process, and the Configure TCP/IP screen does not appear.

```
This example configures the network settings for an installation system that uses the IP address 192.168.1.10:
```

```
192.168.1.10
```

```
255.255.255.0
```

```
192.168.1.1
```

```
192.168.1.2, 192.168.1.3
```

```
linux ip=
```

```
netmask=
```

```
gateway=
```

```
dns=
```
10.2.

**Enabling Remote Access to the Installation System**

Fedora includes the VNC client vncviewer. To obtain vncviewer, install the tigervnc package.

The installation system supports two methods of establishing a VNC connection. You may start the installation, and manually login to the graphical display with a VNC client on another system. Alternatively, you may configure the installation system to automatically connect to a VNC client on the network that is running in listening mode.

10.2.1.

**Enabling Remote Access with VNC**

Enabling remote access

To obtain vncpassword=

```
linux vnc vncpassword=
```

The vnc option enables the VNC service. The vncpassword option sets a password for remote access. The example shown above sets the password as qwerty.

**VNC Passwords**

The VNC password must be at least six characters long.

Specify the language, keyboard layout and network settings for the installation system with the screens that follow. You may then access the graphical interface through a VNC client. The installation system displays the correct connection setting for the VNC client:

```
Starting VNC...
The VNC server is now running. Please connect to computer.mydomain.com:1 to begin the install...Starting graphical installation...Press <enter> for a shell
```

10.2.2.

**Connecting the Installation System to a VNC Listener**

```
computer.mydomain.com:1
```

エラー後、クライアントのセッションをインストールのシステムからログインする方法を知るため、VNCクライアントで実行されます。タスクマネージャーのウィンドウ画面で、VNCクライアントをクリックします。コンピューターのIPアドレスを入力し、VNCクライアントでログインします。
Logging to a Remote System During the Installation

By default, `vncviewer` uses TCP port 5500 when in listening mode. To permit connections to this port from other systems, choose `5500` in the `Port(s)` field, and specify `tcp` as the Protocol. Once the listening client is active, start the installation system and set the VNC options at the boot prompt. In addition to `vnc` and `vncpassword` options, use the `vncconnect` option to specify the name or IP address of the system that has the listening client. To specify the TCP port for the listener, add a colon and the port number to the name of the system.

For example, to connect to a VNC client on the system `desktop.mydomain.com` on the port 5500,

```
linux vnc vncpassword= qwerty vncconnect= desktop.mydomain.com:5500
```

10.3. # Logging to a Remote System During the Installation

By default, the installation process sends log messages to the console as they are generated. You may specify that these messages go to a remote system that runs a `syslog` service.

To configure remote logging, add the `syslog` option. Specify the IP address of the logging system, and the UDP port number of the log service on that system. By default, syslog services that accept remote messages listen on UDP port 514.

For example, to connect to a syslog service on the system `192.168.1.20`, enter the following at the boot prompt:

```
linux syslog= 192.168.1.20:514
```

10.3.1. # Configuring a Log Server

The `rsyslog` configuration detailed below does not make use of any of the security measures available in `rsyslog`. Crackers may slow or crash systems that permit access to the logging service, by sending large quantities of false log messages. In addition, hostile users may intercept or falsify messages sent to the logging service over the network.

Only Enable Remote Syslog Access on Secured Networks
### Boot Options

In order to access another system from the network, you need to configure a Fedora system. Edit the `/etc/rsyslog.conf` file.

To make changes necessitate the `root` user's presence. At the beginning of the lines, remove the hash characters to activate:

```
$ModLoad imudp.so
$UDPServerRun 514
```

Restart the `rsyslog` service to apply the change:

```
su -c '/sbin/service rsyslog restart'
```

**Firewall Reconfiguration Required**

By default, the syslog service listens on UDP port 514. To permit connections to this port from other systems, choose `System` → `Administration` → `Firewall` → `Other ports` and **Add**. Enter 514 in the Port(s) field, and specify `udp` as the Protocol.

Every installation produces a Kickstart file, which contains the installation's properties. This file is created and modified within a Fedora environment.

### Automating the Installation with Kickstart

**Kickstart**

The `Kickstart` file provides a way to automate the installation process. It is used to specify the installation options for the system. After the installation, the `Kickstart` file can be used to add additional users or modify system configurations.

**Every Installation Produces a Kickstart File**

The `Kickstart` file is created during the installation process. It contains the configuration options used for the installation. This file can be used to automate future installations or to modify the system configuration.

**Kickstart**

When an installation is performed, a `Kickstart` file is generated. This file can be used to automate future installations or to modify the system configuration. It contains the configuration options used for the installation.

**Firstboot**

After the installation is complete, the system is booted into a `Firstboot` environment. This environment allows for the configuration of the system, such as adding users, modifying system settings, or performing other initial setup tasks.

**Fedora**

The Fedora operating system is used to perform these tasks. It provides a user-friendly interface for configuring the system and managing system resources.
Enhancing Hardware Support

system-config-kickstart

Fedora Kickstart

137

To automate the installation process with a Kickstart file, use the ks option to specify the name and location of the file:

```
location/kickstart-file.cfg
```

To obtain a Kickstart file from a script or application on a Web server, specify the URL of the application with the ks= option. If you add the option kssendmac the request also sends HTTP headers to the Web application. Your application can use these headers to identify the computer. This line sends a request with headers to the application:

```
linux ks=http://server.mydomain.com/kickstart.cgi kssendmac
```

## 10.5.1 Overriding Automatic Hardware Detection

For some models of device automatic hardware configuration may fail, or cause instability. In these cases, you may need to disable automatic configuration for that type of device, and take additional steps to manually configure the device after the installation process is complete.
**Check the Release Notes**

Refer to the Release Notes for information on known issues with specific devices.

To override the automatic hardware detection, use one or more of the following options:

<table>
<thead>
<tr>
<th>Compatibility</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disable all hardware detection</td>
<td>noprobe</td>
</tr>
<tr>
<td>Disable graphics, keyboard, and mouse detection</td>
<td>headless</td>
</tr>
<tr>
<td>SCSI and RAID</td>
<td>nostorage</td>
</tr>
<tr>
<td>Disable passing keyboard and mouse information to stage 2 of the installation program</td>
<td>nopass</td>
</tr>
<tr>
<td>Use basic VESA driver for video</td>
<td>xdriver=vesa</td>
</tr>
<tr>
<td>Disable shell access on virtual console during installation</td>
<td>noshell</td>
</tr>
<tr>
<td>Disable advanced configuration and power interface (ACPI)</td>
<td>acpi=off</td>
</tr>
<tr>
<td>Disable machine check exception (MCE) CPU self-diagnosis.</td>
<td>nomce</td>
</tr>
<tr>
<td>Disable non-uniform memory access on the AMD64 architecture</td>
<td>numa-off</td>
</tr>
<tr>
<td>Force kernel to detect a specific amount of memory, where XXX is a value in megabytes</td>
<td>XXX mem= m</td>
</tr>
<tr>
<td>Enable DMA only for IDE and SATA drives</td>
<td>libata.dma=1</td>
</tr>
<tr>
<td>Disable BIOS-assisted RAID</td>
<td>nodmraid</td>
</tr>
<tr>
<td>Disable Firewire device detection</td>
<td>nofirewire</td>
</tr>
<tr>
<td>Disable parallel port detection</td>
<td>noparport</td>
</tr>
<tr>
<td>Disable PC Card (PCMCIA) device detection</td>
<td>nopcmcia</td>
</tr>
<tr>
<td>Disable USB storage device detection</td>
<td>nousbstorage</td>
</tr>
<tr>
<td>Disable all USB device detection</td>
<td>nousb</td>
</tr>
<tr>
<td>Disable all probing of network hardware</td>
<td>nonet</td>
</tr>
</tbody>
</table>

**Additional Screen**

The *isa* option causes the system to display an additional text screen at the beginning of the installation process. Use this screen to configure the ISA devices on your computer.
Using the Maintenance Boot Modes

10.6.1. Using the Maintenance Boot Modes

Other kernel boot options have no particular meaning for anaconda and do not affect the installation process. However, if you use these options to boot the installation system, anaconda will preserve them in the bootloader configuration.

10.6.2. Verifying boot media

You can test the integrity of an ISO-based installation source before using it to install Fedora. These sources include DVD, and ISO images stored on a hard drive or NFS server. Verifying that the ISO images are intact before you attempt an installation helps to avoid problems that are often encountered during installation.

Fedora offers you two ways to test installation ISOs:

- select OK at the prompt to test the media before installation when booting from the Fedora DVD
- mediacheck Fedora

10.6.3. Booting Your Computer with the Rescue Mode

The rescue disc starts the rescue mode system by default. To load the rescue system with the installation disc, choose Rescue installed system from the boot menu.
 Specify the language, keyboard layout and network settings for the rescue system with the screens that follow. The final setup screen configures access to the existing system on your computer.

By default, rescue mode attaches an existing operating system to the rescue system under the directory `/mnt/sysimage/`.

### 10.6.4. Upgrading your computer

The installation program may not correctly detect a previous version of Fedora if the contents of the `/etc/redhat-release` file have changed. The boot option `upgradeany` relaxes the test that the installation program performs and allows you to upgrade a Fedora installation that the installation program has not correctly identified.
Installing Without Media

Linux Required

This procedure assumes you are already using Fedora or another relatively modern Linux distribution, and the GRUB boot loader. It also assumes you are a somewhat experienced Linux user.

This section discusses how to install Fedora on your system without making any additional physical media. Instead, you can use your existing GRUB boot loader to start the installation program.

11.1. Retrieving Boot Files

To perform an installation without media or a PXE server, your system must have two files stored locally, a kernel and an initial RAM disk.

Copy the `vmlinuz` and `initrd.img` files from a Fedora DVD (or DVD image) to the `/boot/` directory, renaming them to `vmlinuz-install` and `initrd.img-install`. You must have `root` privileges to write files into the `/boot/` directory.

11.2. Editing the GRUB Configuration

GRUB কনফিগারেশন ফাইল `/boot/grub/grub.conf` ব্যবহার করা হয়। নতুন ফাইলগুলির

GRUB কনফিগারের মধ্যে `/boot/grub/grub.conf` ফাইলের মধ্যে একটি

boot stanza-র মধ্যে উপস্থাপিত

A minimal boot stanza looks like the following listing:

```
title Installation
root (hd0,0)
kernel /vmlinuz-install
initrd /initrd.img-install
```

The following options are generally useful for medialess installations:

- `ip=`
- `repo=`
- `lang=`
- `keymap=`
- `ksdevice=` (if installation requires an interface other than eth0)
- `vnc` and `vncpassword=` for a remote installation
সকল পরিবর্তন করার পরে, `/boot/grub/grub.conf` ফাইলের মধ্যে `default` বিকল্পের ক্ষেত্রে সদ্য অন্তর্ভুক্ত নতুন অনুচ্ছেদটি চিহ্নিত করুন: `default 0`।

11.3. বুটিং ইনস্টলেশনের জন্য

কম্পিউটার পুনরায় আরম্ভ করুন। দূরবর্তী ইনস্টলেশন কার্যকলাপ ও `GRUB` দ্বারা ইনস্টলেশন কার্নেল ও `RAM` বুট করা হবে। ব্যবহারকারী দূরবর্তী কেন্দ্রে বকিল্প নির্দিষ্ট হয়ে থাকলে, সেগুলো গ্রহণ করা হবে। পরের ধাপ সমূহের জন্য, এই সহায়িকার প্রযোজ্য অধ্যায়টি দেখুন।

# 10.2, "Enabling Remote Access to the Installation System" অধ্যায়ের সাহায্যে সাহায্য ননি।
Setting Up an Installation Server

Experience Required

Linux-র অভিজ্ঞ ব্যবহারকারীদের জন্য এই পরিষিষ্টের মধ্যে তথ্য প্রস্তুত করা হয়েছে। নতুন ব্যবহারকারীদের ক্ষেত্রে, ইনস্টলেশনের জন্য সংক্ষিপ্ত বুট মিডিয়া অথবা ডিস্ট্রিবিউশন DVD-র ব্যবহার বাঞ্ছনীয়।

Warning

স্বয়ংক্রিয় ইনস্টলেশন সার্ভার কনফিগার করার জন্য প্রয়োজনীয় নির্দেশাবলী এই পরিষিষ্টের মধ্যে উপস্থিত করা হয়েছে। ডিফল্ট কনফিগারেশন প্রয়োগ করা হলে, ইনস্টলেশনের এই পদ্ধতি ব্যবহারকারী সকল হলোট সার্ভারের সকল ডিস্কের মধ্যে উপস্থিত তথ্য মুছে ফেলে হবে। অন্যান্য নেটওয়ার্ক ইনস্টলেশনের সার্ভার কনফিগারেশন দ্বারা কিছু ক্ষেত্রে ভিন্ন ইন্টারেক্টিভ পদ্ধতি উপলব্ধ করা হয়।

Fedora allows for installation over a network using the NFS, FTP, or HTTP protocols. A network installation can be started from a boot CD-ROM, a bootable flash memory drive, or by using the askmethod boot option with the Fedora DVD. Alternatively, if the system to be installed contains a network interface card (NIC) with Pre-Execution Environment (PXE) support, it can be configured to boot from files on another networked system rather than local media such as a DVD.

For a PXE network installation, the client's NIC with PXE support sends out a broadcast request for DHCP information. The DHCP server provides the client with an IP address, other network information such as name server, the IP address or hostname of the tftp server (which provides the files necessary to start the installation program), and the location of the files on the tftp server. This is possible because of PXELINUX, which is part of the syslinux package.

In the past, administrators needed to perform a great deal of manual configuration to produce an installation server. However, if you have a server running Fedora or a similar operating system on your local network, you can use cobbler to perform these tasks. To configure a PXE server manually, see 12.5.

To perform the tasks in this section, switch to the root account with the command su -c. As an alternative, you can run a command with the -c option, using the form su -c command.

12.1. Setting Up cobbler

To install cobbler use the following command:

```
yum -y install cobbler
```

cobbler

কমান্ড দ্বারা নিজের বৈশিষ্ট্যের বৈধতা পরীক্ষা করে ফলাফল প্রদর্শন করা সম্ভব। বৈশিষ্ট্য পরীক্ষা করার জন্য নমিলসহ কমান্ড সঞ্চালন করুন:

```
cobbler check
```
Setting Up an Installation Server

```
/  etc/cobbler/settings
server_next_server
```

To set up a distribution from a full Fedora DVD or ISO image, use this procedure.

### Network Locations

If you are using a DVD disc or ISO image, Create a directory mount point:

```
mkdir /mnt/dvd
```

To mount a physical DVD disc, use the following command:

```
mount -o context=system_u:object_r:httpd_sys_content_t:s0 /dev/dvd /mnt/dvd
```

To mount a DVD ISO image, use the following command:

```
mount -ro loop,context=system_u:object_r:httpd_sys_content_t:s0 /path/to/image.iso /mnt/dvd
```

Start the NFS server using the following commands:

```
/sbin/service rpcbind start /sbin/service nfs start
```

```
yum -y install httpd
```

Apache

```
```
12.3. Mirroring a Network Location

When Cobbler imports a distribution with the commands above, it copies all the files to the server's local storage, which may take some time. The examples above assume that your Cobbler server reaches the mirror location at the same URI as the clients. If not, substitute an appropriate URI for the `path` option. The following examples are URI:

```
cobbler import path=/mnt/dvd -- name=distro_name
```

```
cobbler import path=/var/www/html/distro -- name=distro_name
```

```
cobbler import path=/mnt/dvd -- network_uri=network_location -- name=distro_name
```

```
cobbler import path=/var/www/html/distro -- network_uri=network_location -- name=distro_name
```

12.4. Importing the Distribution

To offer a distribution through more than one installation method, perform additional `cobbler import` tasks using a different name for each method. For best results, use the installation method as part of the name, so it appears in the client's boot menu.

1. "DVD ISO" - বিদ্যমান অবস্থায়, ডিস্ট্রিবিউশন ইম্পোর্ট করার জন্য নম্বরীয় ক্যাম্পান্ড প্রয়োজক করুন:

```
cobbler import -- path=/mnt/dvd -- name=distro_name
```

```
cobbler import -- path=/var/www/html/distro -- name=distro_name
```

2. "network_location" - বিদ্যমান অবস্থায়, ডিস্ট্রিবিউশন ইম্পোর্ট করার জন্য নম্বরীয় ক্যাম্পান্ড প্রয়োজক করুন:

```
cobbler import -- path=/mnt/dvd -- network_uri=network_location -- name=distro_name
```

```
cobbler import -- path=/var/www/html/distro -- network_uri=network_location -- name=distro_name
```

For `network_uri,` substitute the appropriate network location of the distribution. This URI indicates how the server makes the distribution available to its clients. The examples above assume that your Cobbler server reaches the mirror location at the same URI as the clients. If not, substitute an appropriate URI for the `path` option. The following examples are URI:

```
cobbler import -- path=/mnt/dvd -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- path=/var/www/html/distro -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```

```
cobbler import -- network_uri=network_location -- name=distro_name -- available-as=source
```
Setting Up an Installation Server

locations that work if you have been following the procedures in this section, and your server's IP address is 192.168.1.1:

- **nfs://**
  - 192.168.1.1:/mnt/dvd
- **http://**
  - 192.168.1.1:/distro

If necessary, write the server's IP address in place of 192.168.1.1.

2. Apply these changes by running **cobbler sync**. You can use the **netstat -lp** command to check if the cobbler server is listening on the correct port.

Firewall Considerations

Depending on your server's configuration, you may need to use the **system-config-securitylevel** command to permit access to some or all of these network services:

- **DHCP/BOOTP**
  - bootps

- **PXE loader**
  - tftp

- **cobbler**
  - HTTP

- **cobbler**
  - FTP

- **cobbler**
  - NFS

- **cobbler**
  - sunrpc

12.5. #ব্যবহারকারী দ্বারা সার্ভার কনফিগারেশন

**PXE**

1. Configure an NFS, FTP, or HTTP server to export the entire installation tree for the version and variant of Fedora to be installed. Refer to "Preparing for a Network Installation" for detailed instructions.

2. Boot the client, and start the installation.
12.5.2. # PXE Boot Configuration

12.5.2.1

After installing, it is necessary to copy the files to the TFTP server. When requested by the client system, these files will be available easily. Usually, the installation tree is exported to the server.

For copying these files, use NFS, FTP, or HTTP servers. There is no need for a separate PXE server.

12.5.3. # Adding PXE Hosts

The network configuration after configuring network 12.1, “Network Interface Configuration” shows the interface.

Network Booting Tool

![Image of a network configuration tool interface]

Chittor # 12.1.1: How to add a host

This configuration determines which hosts can boot PXE. When adding a host, add it to the PXE configuration.

When adding a host, ensure that all files are installed correctly.
### Setting Up an Installation Server

![Installation Server Configuration](image)

**Enter the following information:**

- **Hostname or IP Address/Subnet:** Enter the fully qualified hostname or IP address for the server to be installed.

- **Operating System:** Select the operating system for installation.

- **Serial Console:** Check if serial console is required.

- **Network OS Install**
  - **Snapshot name:** Choose the snapshot name for installation.
  - **Kickstart File:** Select the kickstart file for installation.

- **Ethernet:** Specify the Ethernet device.

**Enter the following information:**

- **Host Name/Address/Credentials:** Enter the host name or address for PXE booting.

- **Operating System:** Specify the operating system for PXE booting.

**12.5.4. TFTP**

#### 12.5.4.1. Starting the tftp Server

On the DHCP server, verify that the `tftp-server` package is installed with the command `rpm -q tftp-server`.

```bash
/sbin/chkconfig --level 345 tftp on
/sbin/chkconfig --level 345 xinetd on
```

These commands configure the `tftp` and `xinetd` services to immediately turn on and also configure them to start at boot time in runlevels 3, 4, and 5.

#### 12.5.5. Configuring the DHCP Server

If a DHCP server does not already exist on the network, configure one. Refer to the Fedora Deployment Guide for details. Make sure the configuration file contains the following so that PXE booting is enabled for systems which support it:
allow booting; allow bootp; class "pxeclients" {
  match if substring(option vendor-class-identifier, 0, 9) = "PXEClient";
  next-server <server-ip>; filename "linux-install/pxelinux.0";
}

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

### 12.5.6. Adding a Custom Boot Message

Optionally, modify `/tftpboot/linux-install/mgs/boot.msg` to use a custom boot message.

### 12.5.7. Performing the PXE Installation

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.

where the next-server <server-ip> should be replaced with the IP address of the tftp server.
Installing Through VNC

The Red Hat Enterprise Linux and Fedora installer (anaconda) offers you two interactive modes of operation. The original mode is a text-based interface. The newer mode uses GTK and runs in the X Window environment. This chapter explains how you can use the graphical installation mode in environments where the system lacks a proper display and input devices typically associated with a workstation. This scenario is typical of systems in datacenters, which are often installed in a rack environment and do not have a display, keyboard, or mouse. Additionally, a lot of these systems even lack the ability to connect a graphical display. Given that enterprise hardware rarely needs that ability at the physical system, this hardware configuration is acceptable.

In environments where the system lacks a proper display and input devices typically associated with a workstation, this scenario is typical of systems in datacenters, which are often installed in a rack environment and do not have a display, keyboard, or mouse. Additionally, a lot of these systems even lack the ability to connect a graphical display. Given that enterprise hardware rarely needs that ability at the physical system, this hardware configuration is acceptable.

13.1. #

VNC Viewer

VNC is open source software licensed under the GNU General Public License. Versions exist for Linux, Windows, and MacOS X. Here are some recommended VNC viewers:

- VNC clients are available in the repositories of most Linux distributions. Use your package manager to search for a client for your chosen distribution. For example, on Fedora, install the package:

  # yum install tigervnc

- Windows- http://www.tightvnc.com/-এ উপলব্ধ রয়েছে।

- MacOS X includes built-in VNC support as of version 10.5: In the Finder click the Go menu and choose Connect to Server. In the server address field, you can type vnc:// where SERVER is the IP address or DNS host name of the VNC server you wish to connect to and DISPLAY is the VNC display number (usually 1), and click Connect.
13.2. #

**VNC Modes in Anaconda**

Anaconda offers two modes for VNC installation. The mode you select will depend on the network configuration in your environment.

### 13.2.1. Direct Mode

Anaconda will automatically connect to the VNC server on your target system. To activate the VNC mode, you can:

- Specify `vnc` as a boot argument.
- Specify the `vnc` command in the kickstart file used for installation.

If the VNC mode is activated,

- `anaconda` will automatically start the graphical installer.

There are some disadvantages to direct mode, including:

- Requires interactive access to the system console to complete the first stage of the installer.
- The installation process may take longer.

### 13.2.2. Connect Mode

The VNC connect mode changes how VNC is started. Rather than `anaconda` starting up and waiting for you to connect, the VNC connect mode allows `anaconda` to automatically connect to your view. You won't need to know the IP address of the target system in this case.

To activate the VNC connect mode, pass the `vncconnect` boot parameter:

```
boot: linux vncconnect=HOST
```

Replace `HOST` with your VNC viewer's IP address or DNS host name. Before starting the installation process on the target system, start up your VNC viewer and have it wait for an incoming connection.

Start the installation and when your VNC viewer displays the graphical installer, you are ready to go.
13.3. #

Installation Using VNC

VNC is a display server application which can be installed on the target system with anaconda.

13.3.1. #

Installation Example

VNC can be installed using VNC module. To install VNC, select VNC module during installation.

1. Install VNC by using a cross-over cable to connect the laptop or workstation computer to the target system. Typically, in a data center, a laptop computer can be used for this purpose. During installation, follow these steps:

   a. Boot from the installation DVD.
   
      ```
      boot: linux vnc
      ```

   b. Boot over the network.

      ```
      boot: linux vncconnect=HOST
      ```

2. Configure the target system.

   192.168.100.1/24 configuration should be used. If this address is not available, select another RFC configuration.

3. Start the installation on the target system.

   a. Installation DVD.
   
      ```
      boot: linux vnc
      ```

4. Note

   Only during installation, this IP address is used. After installation, the network configuration can be done in the next stage following installation.
13. Installing Through VNC

5. ইনস্টলার দ্বারা ব্যবহার করা হলে, সিস্টেমটিকে ভাতিয়ারের সাথে সংযুক্ত করার অনুরোধ জানানো হবে এবং ভাতিয়ারের সাথে সংযোগ স্থাপন করুন ও উপলব্ধি পরিপূর্ণ।

13.3.2. # Kickstart Considerations

নেটওয়ার্কে উদ্দিষ্ট সিস্টেম মূলত মূল্য প্রস্তর নথিপত্রে প্রস্তুতি গ্রহণ করে ইনস্টলেশনের নামে অনুমতি করতে পারবে।

নম্বরটি সিস্টেমের জন্য ব্যবহার করা হলে, পরিচিত পদ্ধতি ব্যবহার করতে হতে পারে।

VNC-র সাহায্যে উদ্দিষ্ট সিস্টেমের মধ্যে নেটওয়ার্কের পথ উন্মুক্ত থাকলে ও পোর্ট ৫৯০০ ও ৫৯০১ খোলা থাকলে VNC-র সাহায্যে উদ্দিষ্ট সিস্টেমের সাথে ভিউয়ার সংযোগ স্থাপন করার মাধ্যমে ভিউয়ারের সাথে সংযোগ স্থাপন করে অন্য ইনস্টলেশনের পূর্বে নির্দেশ করতে পারেন।

13.3.3. # Firewall Considerations

নেটওয়ার্কের সাহায্যে উদ্দিষ্ট সিস্টেম ও VNC-র ধারণকারী এবং উদ্দিষ্ট সিস্টেমের মধ্যে নেটওয়ার্কের রাউটিং সংক্রান্ত সমস্যা দেখা দিতে পারে। ভিউয়ারের সাথে পোর্ট ৫৯০০ ও ৫৯০১ খোলা থাকলে সাধারণ চেকলে সমস্যা হবে এবং ঢাকা পাওয়া যায়।

VNC-র সাহায্যে উদ্দিষ্ট সিস্টেমের মাধ্যমে মূলত মূল্য প্রস্তুতি গ্রহণ করে ইনস্টলেশনের নামে অনুমতি করতে পারবে।

13.4. References


• TigerVNC: http://tigervnc.sourceforge.net/

• RFC 1918 - Address Allocation for Private Networks: http://www.ietf.org/rfc/rfc1918.txt

• Anaconda boot options: http://fedoraproject.org/wiki/Anaconda/Options
• Kickstart documentation: [http://fedoraproject.org/wiki/Anaconda/Kickstart](http://fedoraproject.org/wiki/Anaconda/Kickstart)
14.1. #

What are Kickstart Installations?

In many cases, systems administrators wish to set up machines automatically. For example, a computer running a particular operating system needs to be installed with specific software packages. This is where kickstart comes in. Red Hat Kickstart allows you to create an installation script that can be used to install Fedora on any system. With kickstart, you can create a Fedora installation on a single server and then use that server to install Fedora on other systems. The kickstart script will automatically install Fedora and configure it using information specified in the kickstart script.

14.2. #

How Do You Perform a Kickstart Installation?

There are several methods you can use to install Fedora using kickstart.

1. Install Fedora on a local computer.
2. Create a boot medium with the kickstart file or make the kickstart file available on the network.
3. Make the installation tree available.
4. Start the kickstart installation.

This chapter explains these steps in detail.

14.3. #

Creating the Kickstart File

First, be aware of the following issues when you are creating your kickstart file:

- **Sections must be specified in order.** Items within the sections do not have to be in a specific order unless otherwise specified. The section order is:
  
  - Command
  - %packages

- **Command**
  - `# 14.4, “Kickstart Options”`

- **%packages**
  - `# 14.5, “Package Selection”`

ASCII

To use kickstart, you must:

1. Create a kickstart file.
2. Create a boot media with the kickstart file or make the kickstart file available on the network.
3. Make the installation tree available.
4. Start the kickstart installation.

This chapter explains these steps in detail.
• %pre  %post  

  ও  বিভাগ — এই বিভাগ দুটিকে কোনো অনুক্রমে চিহ্নিত করা যাবে এবং আবশ্যক না

  হলে এই বিভাগগুলি লেখার প্রয়োজন নেই। বর্ণিত জানতে 14.6, "Pre-installation Script"  ও

  14.7, "Post-installation Script" পড়ুন।

• Items that are not required can be omitted.

• Omitting any required item results in the installation program prompting the user for an answer to

  the related item, just as the user would be prompted during a typical installation. Once the answer is

  given, the installation continues unattended (unless it finds another missing item).

• Lines starting with a pound (also known as hash) sign (#) are treated as comments and are

  ignored.

• For kickstart upgrades, the following items are required:

  • Language
  • Installation method
  • Device specification (if device is needed to perform the installation)
  • Keyboard setup
  • The upgrade keyword
  • Boot loader configuration

If any other items are specified for an upgrade, those items are ignored (note that this includes

  package selection).

14.4. Kickstart Options

নিম্নলিখিত বিকল্পগুলি একটি kickstart ফাইলে লেখা যাবে।

kickstart Configurator

Note

If the option is followed by an equals mark (=), a value must be specified after it. In the example

commands, options in brackets ([ ]) are optional arguments for the command.

autopart (optional)

• --encrypted — Should all devices with support be encrypted by default? This is equivalent to

  checking the Encrypt checkbox on the initial partitioning screen.

• --passphrase= — Provide a default system-wide passphrase for all encrypted devices.
• **--escrowcert=** — URL of X.509 certificate

**Encrypted**

URL_of_X.509_certificate: escrowcert= /r

• **--escrowcert=** — URL of X.509 certificate

**Encrypted**

URL_of_X.509_certificate: escrowcert= /r

• **--backuppassphrase=** — URL_of_X.509_certificate: escrowcert= /r

**Encrypted**

The **ignoredisk** option is also useful if you have multiple paths to your disks.

The syntax is:

```
ignoredisk --drives=drive1,drive2,...
```

where `driveN` is one of `sda sdb hda` etc.

• **--only-use** — specifies a list of disks for the installer to use. All other disks are ignored. For example, to use disk `sda` during installation and ignore all other disks:

```
ignoredisk --only-use=sda
```

**autostep** (optional)

**interactive**

• **--autoscreenshot** — Take a screenshot at every step during installation and copy the images over to `/root/anaconda-screenshots` after installation is complete. This is most useful for documentation.

**auth or authconfig** (required)

**authconfig**

• **--enablemd5** — Use md5 encryption for user passwords.

• **--enablenis** — Turns on NIS support. By default, **enablenis** uses whatever domain it finds on the network. A domain should almost always be set by hand with the **nisdomain** option.

• **--nisdomain=** — NIS domain name to use for NIS services.

• **--nisserver=** — Server to use for NIS services (broadcasts by default).

• **--useshadow or --enableshadow** — Use shadow passwords.
Kickstart Installations

- `enableldap` — Turns on LDAP support in `/etc/nsswitch.conf` allowing your system to retrieve information about users (UIDs, home directories, shells, etc.) from an LDAP directory. To use this option, you must install the `nss_ldap` package. You must also specify a server and a base DN (distinguished name) with `ldapserver=` and `ldapbasedn=`.

- `enableldapauth` — Use LDAP as an authentication method. This enables the `pam_ldap` module for authentication and changing passwords, using an LDAP directory. To use this option, you must have the `nss_ldap` package installed. You must also specify a server and a base DN with `ldapserver=` and `ldapbasedn=`.

- `ldapserver=` — If you specified either `enableldap` or `enableldapauth`, use this option to specify the name of the LDAP server to use. This option is set in the `/etc/ldap.conf` file.

- `ldapbasedn=` — If you specified either `enableldap` or `enableldapauth`, use this option to specify the DN in your LDAP directory tree under which user information is stored. This option is set in the `/etc/ldap.conf` file.

- `enableldaptls` — Use TLS (Transport Layer Security) lookups. This option allows LDAP to send encrypted usernames and passwords to an LDAP server before authentication.

- `enablekrb5` — Enable Kerberos (or KDCs) that serve requests for the realm. If you have multiple KDCs in your realm, separate their names with commas.

- `krb5realm=` — The Kerberos realm to which your workstation belongs.

- `krb5kdc=` — The KDC (or KDCs) that serve requests for the realm. If you have multiple KDCs in your realm, separate their names with commas.

- `krb5admindserver=` — The KDC in your realm that is also running kdadm. This server handles password changing and other administrative requests. This server must be run on the master KDC if you have more than one KDC.

- `enablehesiod` — Enable Hesiod support for looking up user home directories, UIDs, and shells. More information on setting up and using Hesiod on your network is in `usr/share/doc/glibc-2.x.x/README.hesiod` which is included in the `glibc` package. Hesiod is an extension of DNS that uses DNS records to store information about users, groups, and various other items.

- `hesiodlhs` — `/etc/hesiod.conf` — Hesiod LHS (“left-hand side”) base DN.

- `hesiodrhs` — `/etc/hesiod.conf` — Hesiod RHS (“right-hand side”) base DN.
To look up user information for "jim", the Hesiod library looks up `jim.passwd<LHS><RHS>` for groups, the situation is identical, except `jim.group<LHS><RHS>` would be used.

• **--enablesmbauth** — Enables SMB authentication. (Samba, Windows) Enables SMB authentication. For SMB servers, separate the names with commas

• **--smbservers** — The name of the server(s) to use for SMB authentication. To specify more than one server, separate the names with commas.

• **--smbworkgroup** — The name of the workgroup for the SMB servers.

• **--enablecache** — Enables the `nscd` service. The `nscd` service caches information about users, groups, and various other types of information. Caching is especially helpful if you choose to distribute information about users and groups over your network using NIS, LDAP, or hesiod.

**bootloader** *(required)*

If you select text mode for a kickstart installation, make sure that you specify choices for the partitioning, bootloader, and package selection options. These steps are automated in text mode, and **anaconda** cannot prompt you for missing information. If you do not provide choices for these options, **anaconda** will stop the installation process.

• **--append** — Specifies kernel parameters. To specify multiple parameters, separate them with spaces. For example:

```
bootloader --append="hdd=ide-scsi ide=nodma"
```

• **--driveorder** — Specify which drive is first in the BIOS boot order. For example:

```
bootloader --driveorder=sda,hda
```
Kickstart Installations

- `--location=` Specifies where the boot record is written. Valid values are the following: `mbr` (the default), `partition` (installs the boot loader on the first sector of the partition containing the kernel), or `none` (do not install the boot loader).

- `--password=` If using GRUB, sets the GRUB boot loader password to the one specified with this option. This should be used to restrict access to the GRUB shell, where arbitrary kernel options can be passed.

- `--md5pass=` If using GRUB, similar to `--password=` except the password should already be encrypted.

- `--upgrade` Upgrade the existing boot loader configuration, preserving the old entries. This option is only available for upgrades.

`clearpart` (optional)

Nataša pärtsionu nõusolekut ees on võimalik, et pärtsioni eemaldamisest kõik pärtsionid oleksid eemaldatud. Kui kasutatakse GRUB, siis peaks vahetama sellest juhendi `--password=` väärtus.

- `--all` Erases all partitions from the system.

- `--drives=` Specifies which drives to clear partitions from. For example, the following clears all the partitions on the first two drives on the primary IDE controller:

```
clearpart --drives=hda,hdb --all
```

- `--initlabel` Specifies the default boot loader label to use for new partitions. This option is only available for upgrades.

- `--linux` Erases all Linux partitions.

- `--none` (default) Do not remove any partitions.

`cmdline` (optional)

Perform the installation in a completely non-interactive command line mode. Any prompt for interaction halts the install.

`device` (optional)

Add the following line to your kickstart file to specify a device on which to install the kernel module:

```
device <moduleName> --opts=<options>
```

- `<moduleName>` Replace with the name of the kernel module which should be installed.
• **--opts=** Mount options to use for mounting the NFS export. Any options that can be specified in `/etc/fstab` for an NFS mount are allowed. The options are listed in the `nfs(5)` man page. Multiple options are separated with a comma.

**driverdisk** (optional)

Driver diskettes can be used during kickstart installations. You must copy the driver diskettes's contents to the root directory of a partition on the system's hard drive. Then you must use the `driverdisk` command to tell the installation program where to look for the driver disk.

```
driverdisk <partition> --source=<url> --biospart=<biospart> [--type=<fstype>]
```

Alternatively, a network location can be specified for the driver diskette:

```
driverdisk --source=ftp://path/to/dd.img
driverdisk --source=http://path/to/dd.img
driverdisk source=nfs:host:/path/to/img
```

• `<partition>` — Partition containing the driver disk.

• `<url>` — URL for the driver disk. NFS locations can be given in the form `nfs:host:/path/to/img`.

• `<biospart>` — BIOS partition containing the driver disk (for example, `82p2`).

• `--type=` File system type (for example, vfat or ext2).

**firewall** (optional)

```
firewall --enabled|--disabled [--trust=<device> [--port=]]
```

• `--enabled` or `--disable` — Do not configure any iptables rules.

• `--disable` — Do not configure any iptables rules.

• `--trust=` — Listing a device here, such as `eth0`, allows all traffic coming from that device to go through the firewall. To list more than one device, use `trust eth0 trust eth1`. Do NOT use a comma-separated format such as `trust eth0, eth1`.

• `<incoming>` — Replace with one or more of the following to allow the specified services through the firewall.

  • `--ssh`
  • `--telnet`
  • `--smtp`
  • `--http`
• `ftp`

• `port= --` You can specify that ports be allowed through the firewall using the `port:protocol` format. For example, to allow IMAP access through your firewall, specify `imap:tcp`. Numeric ports can also be specified explicitly; for example, to allow UDP packets on port `1234` through, specify `1234:udp` to specify multiple ports, separate them by commas.

`firstboot` (optional)

Firstboot will begin when the system boots. If it is active, the firstboot package is required. If not set, this option will be disabled by default.

• `-- enable` or `-- enabled` — The Setup Agent is started the first time the system boots.

• `-- disable` or `-- disabled` — The Setup Agent is not started the first time the system boots.

• `-- reconfig` — Enable the Setup Agent to start at boot time in reconfiguration mode. This mode enables the language, mouse, keyboard, root password, security level, time zone, and networking configuration options in addition to the default ones.

`graphical` (optional)

Kickstart installation.

`halt` (optional)

The `halt` option is roughly equivalent to the `shutdown -h` command.

For other completion methods, refer to the `poweroff` `reboot` and `shutdown` kickstart options.

`install` (optional)

Install from a Red Hat installation tree on a local drive, which must be either vfat or ext2.

• `cdrom` — Install from a Red Hat installation tree on a local drive.

• `harddrive` — Install from a Red Hat installation tree on a local drive.

• `-- biospart= --` BIOS partition to install from (such as `sda2`).

• `-- partition= --` Partition to install from (such as `sdb2`).

• `-- dir= --` Directory containing the `variant` directory of the installation tree.
Kickstart Options

```
harddrive --partition=hdb2 --dir=/tmp/install-tree
```

- **nfs**  Install from the NFS server specified.
  - `--server=`
    Server from which to install (hostname or IP).
  - `--dir=`
    Directory containing the `variant` directory of the installation tree.
  - `--opts=`
    Mount options to use for mounting the NFS export. (optional)

  **Example:**
  ```
nfs --server=nfsserver.example.com --dir=/tmp/install-tree
  ```

- **url**  Install from an installation tree on a remote server via FTP or HTTP.

  **Example:**
  ```
url --url http://<server>/<dir>
  ```
  Alternatively:
  ```
url --url ftp://<username>:<password>@<server>/<dir>
  ```

**interactive (optional)**

- **kickstart**

  When installing, if a kickstart file is available, kickstart is used as the source of configuration. Kickstart files are typically used for custom installations, providing a way to specify detailed configuration options and tailor the installation to specific needs. This allows for automation and reproducibility in deployment processes.

**autostep**

- **iscsi** (optional)

  ```
  iscsi ipaddr= [options].
  ```

  iSCSI (Internet Scsi) is a protocol that allows storage devices to be accessed over a network. Using iSCSI, you can remotely access storage devices and configure them as part of the installation process. This is particularly useful in environments where physical access to the disk devices is not possible or for systems that require high availability and fault tolerance.

  ```
  kickstart
  ```

  This command is used to specify iSCSI configuration options for kickstart. It allows for the configuration of iSCSI targets, initiator names, and other parameters necessary for the successful connection and use of iSCSI devices during the installation process. This command is typically used in conjunction with the `iscsi` command to configure iSCSI devices for use in the installation.

  ```
  iscsi --iSCSI iscsiname kickstart
  ```

  This command is used to configure iSCSI devices for use with kickstart. The `iscsiname` parameter specifies the name of the iSCSI target, which is used to identify the storage device during the installation process. The `kickstart` command is used to read the kickstart file and use it as the source of configuration. This allows for the customization of the installation process, providing a way to specify detailed configuration options and tailor the installation to specific needs.

  ```
  iscsi --iSCSI iscsiname --kickstart
  ```

  This command is used to configure iSCSI devices for use with kickstart. The `iscsiname` parameter specifies the name of the iSCSI target, which is used to identify the storage device during the installation process. The `--kickstart` option specifies that the kickstart file should be used as the source of configuration. This allows for the customization of the installation process, providing a way to specify detailed configuration options and tailor the installation to specific needs.

  ```
  iscsi --iSCSI iscsiname --kickstart
  ```

  This command is used to configure iSCSI devices for use with kickstart. The `iscsiname` parameter specifies the name of the iSCSI target, which is used to identify the storage device during the installation process. The `--kickstart` option specifies that the kickstart file should be used as the source of configuration. This allows for the customization of the installation process, providing a way to specify detailed configuration options and tailor the installation to specific needs.
Kickstart Installations

iscsi parameter must be used as a part of the installation before checking whether the network is active or not, and kickstart file must mention iSCSI parameter in the kickstart file before clearpart or ignoredisk parameter.

- **port** (mandatory) — port number (usually, `--port=3260`)
- **user** — target account for permission
- **password** — target account for permission
- **reverse-user** — account for permission for initiator to target
- **reverse-password** — password for permission for initiator

**iscsiname** (optional)
Indicates iSCSI storage to be connected during installation. If the iSCSI parameter is used, the iscsiname parameter must be specified in the kickstart file to specify the name of an iSCSI node.

**key** (optional)
Specifies an installation key, which is needed to aid in package selection and identify a Red Hat Enterprise Linux system for support purposes. This command is specific to Red Hat Enterprise Linux and is meaningless in Fedora.

- **skip** — Skip entering a key. Usually if the key command is not given, anaconda will pause at this step to prompt for a key. This option allows automated installation to continue if you do not have a key or do not want to provide one.

**keyboard** (required)
Sets the keyboard type and language to use during installation. The file `/usr/lib/python2.2/site-packages/rhpl/keyboard_models.py` also contains this list and is part of the `rhpl` package.

**lang** (optional)
Sets the language to use during installation and the default language to use on the installed system. For example, to set the language to English, the kickstart file should contain the following line:

```
lang en_US
```
The file `/usr/share/system-config-language/locale-list` provides a list of the valid language codes in the first column of each line and is part of the `system-config-language` package.

Certain languages (mainly Chinese, Japanese, Korean, and Indic languages) are not supported during text mode installation. If one of these languages is specified using the `lang` command, installation will continue in English though the running system will have the specified language by default.

**langs**

The `langs` keyword is deprecated and its use will cause an error message to be printed to the screen and installation to halt. Instead of using the `langs` keyword, you should now list the support package groups for all languages you want supported in the `%packages` section of your kickstart file. For instance, adding support for French means you should add the following to `%packages`:

```
@french-support
```

**logvol**

Create a logical volume for Logical Volume Management (LVM) with the syntax:

```
logvol <mntpoint> --vgname=<name> --size=<size> --name=<name> <options>
```

The options are as follows:

- **--noformat** — Use an existing logical volume and do not format it.
- **--useexisting** — Use an existing logical volume and reformat it.
- **--fstype=** — Sets the file system type for the logical volume. Valid values are `xfs`', `ext2`', `ext3`', `ext4`', `swap`', `vfat`' and `hfs`.
- **--fsoptions=** — Specifies a free form string of options to be used when mounting the filesystem. This string will be copied into the `/etc/fstab` file of the installed system and should be enclosed in quotes.
- **--bytes-per-inode=** — Specifies the size of inodes on the filesystem to be made on the logical volume. Not all filesystems support this option, so it is silently ignored for those cases.
- **--grow=** — Tells the logical volume to grow to fill available space (if any), or up to the maximum size setting.
- **--maxsize=** — The maximum size in megabytes when the logical volume is set to grow. Specify an integer value here, and do not append the number with MB.
- **--recommended=** — Determine the size of the logical volume automatically.
- **--percent=** — Specify the size of the logical volume as a percentage of available space in the volume group.
- **--encrypted** — ডিভাইসটি এনক্রিপ্ট করার জন্য চিহ্নিত করা হয়।
- **--passphrase=** — এই অনেকগুলো একক পরিচিতি করার জন্য চিহ্নিত করা হয়।
Kickstart Installations

হবে। ডিফল্ট পরিচয় পংক্তি উপস্থিত না থাকলে ইনস্টলার নজিবে কমন স্থগতি করে এই সূচনা বার্তা প্রদর্শন করবে।

• -- **escrowcert=** — সকল এককরিতি করার ভলাডিমর ডাটা এনক্রিপ্ট করার পরিকল তিনি একটি URL এবং একটি X.509 সার্টিফিকেট সহযোগে একটি পরিকল তিনি এককরিতি করার ভলাডিমর নজিবে কমন স্থগতি করে এই বকিপপ্তি ব্যবহার করা সম্ভব।

• -- **backuppassphrase=** — এককরিতি করার পরিকল তিনি একটি URL এবং একটি X.509 সার্টিফিকেট সহযোগে একটি পরিকল তিনি এককরিতি করার ভলাডিমর নজিবে কমন স্থগতি করে এই বকিপপ্তি ব্যবহার করা সম্ভব।

Create the partition first, create the logical volume group, and then create the logical volume. For example:

```
part pv.01 -- size=3000
volgroup myvg pv.01
logvol / -- vname=myvg -- size=2000 -- name=rootvol
```

logging (ঐচ্ছিক)

This command controls the error logging of anaconda during installation. It has no effect on the installed system.

• -- **host=** — Send logging information to the given remote host, which must be running a syslogd process configured to accept remote logging.

• -- **port=** — If the remote syslogd process uses a port other than the default, it may be specified with this option.

• -- **level=** — One of debug, info, warning, error, or critical.

Specify the minimum level of messages that appear on tty3. All messages will still be sent to the log file regardless of this level, however.

mediacheck (ঐচ্ছিক)

If given, this will force anaconda to run mediacheck on the installation media. This command requires that installs be attended, so it is disabled by default.

monitor (ঐচ্ছিক)

If the monitor command is not given, anaconda will use X to automatically detect your monitor settings. Please try this before manually configuring your monitor.

• -- **hsync=** — Specifies the horizontal sync frequency of the monitor.

• -- **monitor=** — Use specified monitor; monitor name should be from the list of monitors in /usr/share/hwdata/MonitorsDB from the hwdata package. The list of monitors can also be found on the X Configuration screen of the Kickstart Configurator. This is ignored if hsync or vsync is provided. If no monitor information is provided, the installation program tries to probe it automatically.

• -- **noprobe=** — Do not try to probe the monitor.

• -- **vsync=** — Specifies the vertical sync frequency of the monitor.
Kickstart Options

mouse

The mouse keyword is deprecated.

network

Configures network information for the system. If the kickstart installation does not require networking (in other words, it is not installed over NFS, HTTP, or FTP), networking is not configured for the system. If the installation does require networking and network information is not provided in the kickstart file, the installation program assumes that the installation should be done over eth0 via a dynamic IP address (BOOTP/DHCP), and configures the final, installed system to determine its IP address dynamically. The `network` option configures networking information for kickstart installations via a network as well as for the installed system.

- **bootproto=** One of `dhcp`, `bootp` or `static`

  It defaults to `dhcp`, `bootp` and `dhcp` are treated the same.

  The DHCP method uses a DHCP server system to obtain its networking configuration. As you might guess, the BOOTP method is similar, requiring a BOOTP server to supply the networking configuration. To direct a system to use DHCP:

  ```
  network bootproto=dhcp
  ```

  To direct a machine to use BOOTP to obtain its networking configuration, use the following line in the kickstart file:

  ```
  network bootproto=bootp
  ```

  The static method requires that you enter all the required networking information in the kickstart file. As the name implies, this information is static and is used during and after the installation. The line for static networking is more complex, as you must include all network configuration information on one line. You must specify the IP address, netmask, gateway, and nameserver.

  Note that although the presentation of this example on this page has broken the line, in a real kickstart file, you must include all this information on a single line with no break.

  ```
  network bootproto=static ip=10.0.2.15 netmask=255.255.255.0 gateway=10.0.2.254 nameserver=10.0.2.1
  ```

  If you use the static method, be aware of the following two restrictions:

  - All static networking configuration information must be specified on one line; you cannot wrap lines using a backslash, for example.

  - You can also configure multiple nameservers here. To do so, specify them as a comma-delimited list in the command line.

  Note that although the presentation of this example on this page has broken the line, in a real kickstart file, you must include all this information on a single line with no break.

  ```
  network bootproto=static ip=10.0.2.15 netmask=255.255.255.0 gateway=10.0.2.254 nameserver=192.168.2.1,192.168.3.1
  ```

- **device=** Information about the device that is used to install the system.

  ```
  kickstart ks=hd device=
  ```
অধ্যায় 14. # Kickstart Installations

রুপকর ফলপ্রসূ হবে না, কারণ ইনস্টলেশন প্রোগ্রাম দ্বারা kickstart ফাইল অনুসারে জন্য নেটওয়ার্ককৃত কম্পিউটার করা হয়। উদাহরণসমূহ:

```
network --bootproto= dhcp --device= eth0
```

• `ip=` IP address for the machine to be installed.
• `gateway=` Default gateway as an IP address.
• `nameserver=` Primary nameserver, as an IP address.
• `nodns` Do not configure any DNS server.
• `netmask=` Netmask for the installed system.
• `hostname=` Hostname for the installed system.
• `ethtool=` Specifies additional low-level settings for the network device which will be passed to the ethtool program.
• `essid=` The network ID for wireless networks.
• `wepkey=` The encryption key for wireless networks.
• `onboot=` Whether or not to enable the device at boot time.
• `dhcppclass=` DHCP শ্রেণী।
• `mtu=` The MTU of the device.
• `noipv4` Disable IPv4 on this device.
• `noipv6` Disable IPv6 on this device.

### multipath

```
multipath --name= --device= --rule= 
```

### partition

```
part --partition
```

Creates a partition on the system.

েকত্র সিস্টেমের ধরনী পার্টিশনের উপর একাধিক Fedora ইনস্টলেশন উপস্থাপিত থাকলে আপগ্রেড করার উদ্দেশ্যে ইনস্টলেশনটি চাইতে করার জন্য ইনস্টলেশন পৃষ্ঠপোষ্ট দ্বারা ব্যবহারকারীকে অনুরোধ করা হবে।

### Warning

All partitions created are formatted as part of the installation process unless `noformat` and `onpart` are used.
If you select text mode for a kickstart installation, make sure that you specify choices for the partitioning, bootloader, and package selection options. These steps are automated in text mode, and anaconda cannot prompt you for missing information. If you do not provide choices for these options, anaconda will stop the installation process.

If you use `--grow` without setting `--maxsize` on a swap partition, Anaconda will limit the maximum size of the swap partition. For systems that have less than 2GB of physical memory, the imposed limit is twice the amount of physical memory. For systems with more than 2GB, the imposed limit is the size of physical memory plus 2GB.

### 14.4.1, “Advanced Partitioning Example”

#### part

- `<mntpoint>`
  - The `<mntpoint>` is where the partition is mounted and must be of one of the following forms:
  - `/<path>`
    - For example, `/`, `/usr`, `/home`
  - swap
    - The partition is used as swap space.
    - To determine the size of the swap partition automatically, use the `--recommended` option:
      ```
      swap --recommended
      ```
    - The recommended maximum swap size for machines with less than 2GB of RAM is twice the amount of RAM. For machines with 2GB or more, this recommendation changes to 2GB plus the amount of RAM.
  - `<id>`
    - raid.
      - The partition is used for software RAID (refer to `raid`).
  - `<id>`
    - pv.
      - The partition is used for LVM (refer to `logvol`).
  - `--size=`
    - The minimum partition size in megabytes. Specify an integer value here such as 500.
    - Do not append the number with MB.
  - `--grow`
    - Tells the partition to grow to fill available space (if any), or up to the maximum size setting.

#### Note

- If you use `--grow` without setting `--maxsize` on a swap partition, Anaconda will limit the maximum size of the swap partition. For systems that have less than 2GB of physical memory, the imposed limit is twice the amount of physical memory. For systems with more than 2GB, the imposed limit is the size of physical memory plus 2GB.
• `-- maxsize=` The maximum partition size in megabytes when the partition is set to grow. Specify an integer value here, and do not append the number with MB.
• `-- noformat` Tells the installation program not to format the partition, for use with the `-- onpart` command.
• `--` or `--` `already existing` `onpart= usepart=` Put the partition on the already existing device. For example:

```
partition /home -- onpart=hda1
```

puts `home` on `/dev/hda1` which must already exist.
• `-- ondisk=` or `-- ondrive=` Forces the partition to be created on a particular disk. For example, `-- ondisk=sdb` puts the partition on the second SCSI disk on the system.
• `-- asprimary=` Forces automatic allocation of the partition as a primary partition, or the partitioning fails.
• `-- type=` (replaced by `fstype`) This option is no longer available. Use `fstype`.
• `-- fstype=` Sets the file system type for the partition. Valid values are `xfs` `ext2` `ext3` `ext4` `swap` `vfat` and `hfs`.
• `-- bytes-per-inode=` Specifies the size of inodes on the filesystem to be made on the partition. Not all filesystems support this option, so it is silently ignored for those cases.
• `-- recommended=` Determine the size of the partition automatically.
• `-- onbiosdisk=` Forces the partition to be created on a particular disk as discovered by the BIOS.
• `-- fsoptions=` — ফাইল-সিস্টেম মাউন্ট করার সময় বিভিন্ন বিকল্প উল্লেখকারী কোনো সুনির্দিষ্ট বিন্যাস বিহীন একটি পংক্তিভাবে দেওয়া হবে। এই পংক্তিটি ইনস্টল করা সিস্টেমের `/etc/fstab` ফাইলের মধ্যে রয়ে তা হবে এবং উদ্ধৃতিচিহ্নের মধ্যে লেখা হবে।
• `-- encrypted=` Specifies that this partition should be encrypted.
• `-- passphrase=` Specifies the passphrase to use when encrypting this partition. Without the above `-- encrypted` option, this option does nothing. If no passphrase is specified, the default system-wide one is used, or the installer will stop and prompt if there is no default.
• `-- URL_of_X.509_certificate` — সকল এনক্রিপ্ট করার প্রতিটি ভলিউমের জন্য এই URL অনেক ফাইলগুলির সংরক্ষণ করা হবে।
• `-- escrowcert=` URL_of_X.509_certificate এর URL থেকে প্রাপ্ত একটি X.509 সার্টিফিকেট সহযোগে ফাইলগুলি এনক্রিপ্ট করা হবে। প্রতিটি একক্রিপ্ট করার ভলিউমের জন্য কোনো পৃথীক ফাইল রূপে সংরক্ষণ করা হয়।
• `-- backuppassphrase=` — একক্রিপ্ট করার প্রতিটি ভলিউমের জন্য, যখন একথেও নির্দেশ একটি পৃথক পৃথক কিংবা এই URL এর URL থেকে প্রাপ্ত একটি X.509 সার্টিফিকেটের সহযোগে একক্রিপ্ট করা হবে।
• `-- escrowcert` URL_of_X.509_certificate এর URL থেকে প্রাপ্ত X.509 সার্টিফিকেট সহযোগে একক্রিপ্ট করা হবে।
If partitioning fails for any reason, diagnostic messages appear on virtual console.

If partitioning fails for any reason, diagnostic messages appear on virtual console.

The `poweroff` option is roughly equivalent to the `shutdown -p` command.

For other completion methods, refer to the `halt`, `reboot`, and `shutdown` kickstart options.

**raid**

Assembles a software RAID device. This command is of the form:

```
raid <mntpoint> --level=<level> --device=<mddevice> <partitions>*
```

- `--level=` RAID level to use (0, 1, or 5).
- `--device=` Name of the RAID device to use (such as md0 or md1). RAID devices range from md0 to md15, and each may only be used once.
- `--bytes-per(inode)=` Specifies the size of inodes on the filesystem to be made on the RAID device. Not all filesystems support this option, so it is silently ignored for those cases.
- `--spares=` Specifies the number of spare drives allocated for the RAID array. Spare drives are used to rebuild the array in case of drive failure.
- `--fstype=` Sets the file system type for the RAID array. Valid values are `xfs`, `ext2`, `ext3`, `ext4`, `swap`, `vfat`, and `hfs`.
- `--fsoptions=` Specifies a free form string of options to be used when mounting the filesystem. This string will be copied into the `/etc/fstab` file of the installed system and should be enclosed in quotes.
• **noformat** — Use an existing RAID device and do not format the RAID array.

• **useexisting** — Use an existing RAID device and reformat it.

• **encrypted** — Specifies that this RAID device should be encrypted.

• **passphrase=** — Specifies the passphrase to use when encrypting this RAID device. Without the above **encrypted** option, this option does nothing. If no passphrase is specified, the default system-wide one is used, or the installer will stop and prompt if there is no default.

• **escrowcert=** — The following example shows how to create a RAID level 1 partition for `/`, and a RAID level 5 for `/usr` assuming there are three SCSI disks on the system. It also creates three swap partitions, one on each drive.

```
part raid.01  size=60  ondisk=sda
part raid.02  size=60  ondisk=sdb
part raid.03  size=60  ondisk=sdc

part swap  size=128  ondisk=sda
part swap  size=128  ondisk=sdb
part swap  size=128  ondisk=sdc

part raid.11 size=1  grow  ondisk=sda
part raid.12 size=1  grow  ondisk=sdb
part raid.13 size=1  grow  ondisk=sdc

raid  / level=1  device=md0 raid.01 raid.02 raid.03
raid  /usr level=5  device=md1 raid.11 raid.12 raid.13
```

reboot (রাফতত্ত্ব)

Reboot after the installation is successfully completed (no arguments). Normally, kickstart displays a message and waits for the user to press a key before rebooting.

The **reboot** option is roughly equivalent to the **shutdown -r** command.

```bash
reboot
```

For other completion methods, refer to the **halt** and **poweroff** kickstart options.
Kickstart Options

Use of the `reboot` option may result in an endless installation loop, depending on the installation media and method.

`repo` (optional)

Configures additional yum repositories that may be used as sources for package installation. Multiple repo lines may be specified.

```
repo --name=<repoid> [--baseurl=<url> | --mirrorlist=<url>]
```

- `--name=` The repo id. This option is required.
- `--baseurl=` The URL for the repository. The variables that may be used in yum repo config files are not supported here. You may use one of either this option or `--mirrorlist`, not both.
- `--mirrorlist=` The URL pointing at a list of mirrors for the repository. The variables that may be used in yum repo config files are not supported here. You may use one of either this option or `--baseurl`, not both.

`rootpw` (required)

Sets the system's root password to the `<password>` argument.

```
rootpw [--iscrypted] <password>
```

- `--iscrypted` If this is present, the password argument is assumed to already be encrypted.

`selinux` (optional)

```
selinux [--disabled|--enforcing|--permissive]
```

- `--enforcing` Enables SELinux with the default targeted policy being enforced.
- `--permissive` Outputs warnings based on the SELinux policy, but does not actually enforce the policy.
- `--disabled` Disables SELinux completely on the system.

Note

If the `selinux` option is not present in the kickstart file, SELinux is enabled and set to `--enforcing` by default.
For more information regarding SELinux for Fedora, refer to the *Fedora Security Enhanced Linux User Guide*.

### services (optional)

This section allows you to modify the runlevel configuration. If you disable one of the services listed, then a subset of services will be enabled to allow the system to boot up.

- **--disabled** — Disable the services given in the comma separated list.
- **--enabled** — Enable the services given in the comma separated list.

**Do not include spaces in the list of services**

If you include spaces in the comma-separated list, kickstart will enable or disable only the services up to the first space. For example:

```bash
services --disabled auditd, cups, smartd, nfslock
```

will disable only the `auditd` service. To disable all four services, this entry should include no spaces between services:

```bash
services --disabled auditd,cups,smartd,nfslock
```

### shutdown (optional)

By default, the shutdown step in the install process will halt the system. However, you can specify another shutdown option if desired.

The `shutdown` option is roughly equivalent to the `shutdown` command.

For other completion methods, refer to the `halt`, `poweroff`, and `reboot` kickstart options.

### skipx (optional)

This section allows you to skip the X configuration step in the installation process.

### sshpw (optional)

The installer can start `ssh` to provide interactivity and inspection. This command controls the accounts created in the installation environment that may be remotely logged into. Each instance of this command creates a user. These users will not be created on the final system — they only exist for use while the installer is running.

```bash
sshpw --username=<name> <password> [--iscrypted|--plaintext] [--lock]
```

- **--username** — Provided by the user.
- **--iscrypted** — Use an encrypted password.
- **--plaintext** — Use a plain text password.
- **--lock** — Lock the account after it is created.
If you select text mode for a kickstart installation, make sure that you specify choices for the partitioning, bootloader, and package selection options. These steps are automated in text mode, and `anaconda` cannot prompt you for missing information. If you do not provide choices for these options, `anaconda` will stop the installation process.

**timezone (required)**
Sets the system time zone to `<timezone>` which may be any of the time zones listed by `timeconfig`.

`timezone [-utc] <timezone>`

- `--utc` — If present, the system assumes the hardware clock is set to UTC (Greenwich Mean) time.

**upgrade (optional)**
If you select text mode for a kickstart installation, make sure that you specify choices for the partitioning, bootloader, and package selection options. These steps are automated in text mode, and `anaconda` cannot prompt you for missing information. If you do not provide choices for these options, `anaconda` will stop the installation process.

**user (optional)**
Sends the name of the user. This option is required.

`user --name=<username> [--groups=<list>] [--homedir=<homedir>] [--password=<password>] [--iscrypted] [--shell=<shell>] [--uid=<uid>]`

- `--name` — Provides the name of the user. This option is required.
- `--groups` — In addition to the default group, a comma separated list of group names the user should belong to. The groups must exist before the user account is created.
- `--homedir` — The home directory for the user. If not provided, this defaults to `/home/<username>`.
- `--password` — The password provided by the user.
- `--iscrypted` — Is the password provided by `--password` already encrypted or not?
- `--shell` — The default shell for the user.
- `--uid` — The UID of the user.

**CDROM, HARDDEVE, NFS, URL (FTP or HTTP)**

- `cdrom` for a CDROM
- `harddrive` for a hard drive
- `nfs` for an NFS server
- `url` for a URL (FTP or HTTP)

```
install
```

The installation process starts.

**Kickstart Options**

- `kickstart` — A Kickstart configuration file.
- `options` — Additional Kickstart options.

**Install**

- `install` — Begins the installation process.

**Partitioning**

- `partition` — Specifies the partitioning options.

**Bootloader**

- `bootloader` — Specifies the bootloader options.

**Package Selection**

- `package` — Specifies the package selection options.

**Language**

- `language` — Specifies the language options.

**Keyboard**

- `keyboard` — Specifies the keyboard options.

**Timezone**

- `timezone` — Specifies the timezone options.

**Upgrade**

- `upgrade` — Performs an upgrade of the existing system.

**User**

- `user` — Specifies the user options.

**Password**

- `password` — Specifies the password options.

**ISCrypted**

- `iscrypted` — Specifies the iscrypted options.

**Shell**

- `shell` — Specifies the shell options.

**UID**

- `uid` — Specifies the UID options.

**Miscellaneous**

- `miscellaneous` — Specifies the miscellaneous options.

**结束**

The installation process is completed.

**Kickstart Options**

- `options` — Additional Kickstart options.

**Install**

- `install` — Begins the installation process.

**Partitioning**

- `partition` — Specifies the partitioning options.

**Bootloader**

- `bootloader` — Specifies the bootloader options.

**Package Selection**

- `package` — Specifies the package selection options.

**Language**

- `language` — Specifies the language options.

**Keyboard**

- `keyboard` — Specifies the keyboard options.

**Timezone**

- `timezone` — Specifies the timezone options.

**Upgrade**

- `upgrade` — Performs an upgrade of the existing system.

**User**

- `user` — Specifies the user options.

**Password**

- `password` — Specifies the password options.

**ISCrypted**

- `iscrypted` — Specifies the iscrypted options.

**Shell**

- `shell` — Specifies the shell options.

**UID**

- `uid` — Specifies the UID options.

**Miscellaneous**

- `miscellaneous` — Specifies the miscellaneous options.

**结束**

The installation process is completed.

**Kickstart Options**

- `options` — Additional Kickstart options.

**Install**

- `install` — Begins the installation process.

**Partitioning**

- `partition` — Specifies the partitioning options.

**Bootloader**

- `bootloader` — Specifies the bootloader options.

**Package Selection**

- `package` — Specifies the package selection options.

**Language**

- `language` — Specifies the language options.

**Keyboard**

- `keyboard` — Specifies the keyboard options.

**Timezone**

- `timezone` — Specifies the timezone options.

**Upgrade**

- `upgrade` — Performs an upgrade of the existing system.

**User**

- `user` — Specifies the user options.

**Password**

- `password` — Specifies the password options.

**ISCrypted**

- `iscrypted` — Specifies the iscrypted options.

**Shell**

- `shell` — Specifies the shell options.

**UID**

- `uid` — Specifies the UID options.

**Miscellaneous**

- `miscellaneous` — Specifies the miscellaneous options.

**结束**

The installation process is completed.
Kickstart Installations

vnc (optional)

VNC is an acronym for Virtual Network Computing. It is a remote desktop protocol that enables viewing of a computer's desktop from another computer over a network. VNC allows a user to connect to a remote computer and control it as if they were sitting right in front of the physical machine.

The command to start a VNC server is:

```
vnc [-h host=<hostname>] [-p port=<port>] [-P password=<password>]
```

- **host=** Instead of starting a VNC server on the install machine, connect to the VNC viewer process listening on the given hostname.
- **port=** Provide a port that the remote VNC viewer process is listening on. If not provided, anaconda will use the VNC default.
- **password=** Set a password which must be provided to connect to the VNC session. This is optional, but recommended.

volgroup (optional)

Logical volume management (LVM) is a technology used to manage data storage. LVM allows the creation of logical volumes that can be resized, moved, or deleted without affecting the data stored on them.

The command to create a volume group is:

```
volgroup <name> <partition> <options>
```

The options are as follows:

- **noformat** Use an existing volume group and do not format it.
- **useexisting** Use an existing volume group and reformat it.
- **pesize=** Set the size of the physical extents.

Create the partition first, create the logical volume group, and then create the logical volume. For example:

```
part pv.01 --size 3000
volgroup myvg pv.01
logvol --vgname=myvg --size=2000 --name=rootvol
```

xconfig (optional)

X Window System configuration is the process of setting up the X Server to work with the user's display. This includes setting up the correct driver and configuring the video card.

The command to specify the X driver to use is:

```
--driver X
```

- **driver** Specify the X driver to use for the video hardware.
- **videoram=** Specifies the amount of video RAM the video card has.
- **defaultdesktop=** Specify either GNOME or KDE to set the default desktop (asserts that GNOME Desktop Environment and/or KDE Desktop Environment has been installed through %packages).
- **startxonboot** Use a graphical login on the installed system.
## Advanced Partitioning Example

The following is a single, integrated example showing the `clearpart` `raid` `part` `volgroup` and `logvol` kickstart options in action:

```bash
# Raid IDE config
clearpart --drives=hda,hdc --initlabel

part raid.11 size 1000 asprimary ondrive=hda
part raid.12 size 2000 asprimary ondrive=hda
part raid.13 size 8000 asprimary ondrive=hda
part raid.14 size 8000 grow ondrive=hda
part raid.21 size 1000 asprimary ondrive=hdc
part raid.22 size 2000 asprimary ondrive=hdc
part raid.23 size 8000 asprimary ondrive=hdc
part raid.24 size 8000 grow ondrive=hdc
part raid.25 size 8000 grow ondrive=hdc

# You can add `--spares=x` to
raid / --fstype ext3 device md0 level=RAID1 raid.11 raid.21
raid safe / --fstype ext3 device md1 level=RAID1 raid.12 raid.22
raid swap / --fstype ext3 device md2 level=RAID1 raid.13 raid.23
raid /usr / --fstype ext3 device md3 level=RAID1 raid.14 raid.24
raid /var / --fstype ext3 device md4 level=RAID1 raid.15 raid.25

# LVM configuration so that we can resize /var and /usr/local later
volgroup sysvg pv0.01
logvol /var --vgname=sysvg --size=8000 --name=var
```
This advanced example implements LVM over RAID, as well as the ability to resize various directories for future growth.

## 14.5. Package Selection

### Warning

**@Everything**

Kickstartファイルで@Everythingパッケージが含まれる**@Everything**パッケージが含まれることがあります。※@Everythingが含まれるパッケージはRed Hatのインストールに含まれません。

**@Conflicts**

Kickstartファイルで@Conflictsパッケージが含まれる**@Conflicts**パッケージが含まれることがあります。

Use the %packages command to begin a kickstart file section that lists the packages you would like to install (this is for installations only, as package selection during upgrades is not supported).

Packages can be specified by group or by individual package name, including with globs using the asterisk. The installation program defines several groups that contain related packages. Refer to the `repodata/comps-* xml` file on the Fedora DVD for a list of groups. Each group has an id, user visibility value, name, description, and package list. In the package list, the packages marked as mandatory are always installed if the group is selected, the packages marked default are selected by default if the group is selected, and the packages marked optional must be specifically selected even if the group is selected to be installed.

In most cases, it is only necessary to list the desired groups and not individual packages. Note that the **Core** and **Base** groups are always selected by default, so it is not necessary to specify them in the %packages section.

Here is an example %packages selection:

```
%packages
  @ X Window System
  @ GNOME Desktop Environment
  @ Graphical Internet
  @ Sound and Video
  @ dhcp
```

As you can see, groups are specified, one to a line, starting with an @ symbol, a space, and then the full group name as given in the `comps.xml` file. Groups can also be specified using the id for the
group, such as `gnome-desktop`. Specify individual packages with no additional characters (the `dhcp` line in the example above is an individual package).

You can also specify which packages not to install from the default package list:

```
- autofs
```

The following options are available for the `%packages` option:

```
-- nobase
     @Base
```

The `-- nobase` option has been deprecated. Dependencies are resolved automatically every time now.

```
-- resolvedeps
```

The `-- resolvedeps` option has been deprecated. Dependencies are resolved automatically every time now.

```
-- ignoredeps
```

The `-- ignoredeps` option has been deprecated. Dependencies are resolved automatically every time now.

```
-- ignoremissing
```

Ignore the missing packages and groups instead of halting the installation to ask if the installation should be aborted or continued. For example:

```
%packages -- ignoremissing
```

---

14.6.1. Pre-installation Script

You can add commands to run on the system immediately after the `ks.cfg` has been parsed. This section must be at the end of the kickstart file (after the commands) and must start with the `%pre` command. You can access the network in the `%pre` section; however, name service has not been configured at this point, so only IP addresses work.

Note

Note that the pre-install script is not run in the change root environment.

```
/interpreter /usr/bin/python
```

Allows you to specify a different scripting language, such as Python. Replace `/usr/bin/python` with the scripting language of your choice.

---

14.6.1. Example

Here is an example `%pre` section:

```
%pre
#!/bin/sh
hds=""
mymedia=""/
for file in /proc/ide/* do
```
This script determines the number of hard drives in the system and writes a text file with a different partitioning scheme depending on whether there is 1 or 2 hard drives. Instead of having a set of partitioning commands in the kickstart file, include the line:

```
%include /tmp/part-include
```

The partitioning commands selected in the script are used.

### Note

The pre-installation script section of kickstart cannot manage multiple install trees or source media. This information must be included for each created ks.cfg file, as the pre-installation script occurs during the second stage of the installation process.

### Post-installation Script

You have the option of adding commands to run on the system once the installation is complete. This section must be at the end of the kickstart file and must start with the `%post` command. This section is useful for functions such as installing additional software and configuring an additional nameserver.

### Note

If you configured the network with static IP information, including a nameserver, you can access the network and resolve IP addresses in the `%post` section. If you configured the network for DHCP, the `/etc/resolv.conf` file has not been completed when the installation executes the `%post` section. You can access the network, but you cannot resolve IP addresses. Thus, if you are using DHCP, you must specify IP addresses in the `%post` section.
Examples

Note

The post-install script is run in a chroot environment; therefore, performing tasks such as copying scripts or RPMs from the installation media do not work.

`nochroot`

Allows you to specify commands that you would like to run outside of the chroot environment.

The following example copies the file `/etc/resolv.conf` to the file system that was just installed.

```
%post --nochroot
  cp /etc/resolv.conf /mnt/sysimage/etc/resolv.conf
```

`--interpreter /usr/bin/python`

Allows you to specify a different scripting language, such as Python. Replace `/usr/bin/python` with the scripting language of your choice.

`--log /path/to/logfile`

Logs the output of the post-install script. Note that the path of the log file must take into account whether or not you use the `nochroot` option. For example, without `nochroot`:

```
%post --log=/root/ks-post.log
```

With `nochroot`:

```
%post --nochroot --log=/mnt/sysimage/root/ks-post.log
```

14.7.1. Examples

Red Hat Network Satellite-

```
%post --log=/root/ks-post.log
wget -O http://proxy-or-sat.example.com/pub/bootstrap_script /usr/sbin/rhnreg_ks --activationkey=<activationkey>
```

Run a script named `runme` from an NFS share:

```
mkdir /mnt/temp
cd /mnt/temp
mount -o nolock 10.10.0.2:/usr/new-machines /mnt/temp
openvt -s -w /mnt/temp/runme
umount /mnt/temp
```

Note

NFS file locking is not supported while in kickstart mode, therefore `o nolock` is required when mounting an NFS mount.
14.8. Making the Kickstart File Available

A kickstart file must be placed in one of the following locations:

- On a boot diskette
- On a boot CD-ROM
- On a network

Normally a kickstart file is copied to the boot diskette, or made available on the network. The network-based approach is most commonly used, as most kickstart installations tend to be performed on networked computers.

Let us take a more in-depth look at where the kickstart file may be placed.

14.8.1. Creating Kickstart Boot Media

For Fedora, currently booting from a diskette is not supported. For installations on CD-ROM or flash memory, the kickstart file must be named `ks.cfg` and placed in the boot CD-ROM's top-level directory.

For network installations, the kickstart file must be `ks.cfg` and placed in the network's top-level directory. normally a kickstart file is copied to the boot diskette, or available on the network. Fedorar the network-based approach is most commonly used, as most kickstart installations tend to be performed on networked computers.

Let us take a more in-depth look at where the kickstart file may be placed.

14.8.2. Making the Kickstart File Available on the Network

Network installations using kickstart are quite common, because system administrators can easily automate the installation on many networked computers quickly and painlessly. In general, the approach most commonly used is for the administrator to have both a BOOTP/DHCP server and an NFS server on the local network. The BOOTP/DHCP server is used to give the client system its networking information, while the actual files used during the installation are served by the NFS server. Often, these two servers run on the same physical machine, but they are not required to.
Making the Installation Tree Available

The kickstart installation must access an installation tree. An installation tree is a copy of the binary Fedora DVD with the same directory structure.

If you are performing a DVD-based installation, insert the Fedora installation DVD into the computer before starting the kickstart installation.

If you are performing a hard drive installation, make sure the ISO images of the binary Fedora DVD are on a hard drive in the computer.

14.9. # Making the Installation Tree Available

Here is an example of a line from the `dhcpd.conf` file for the DHCP server:

```
filename "/usr/new-machine/kickstart/"; next-server blarg.redhat.com;
```

Note that you should replace the value after `filename` with the name of the kickstart file (or the directory in which the kickstart file resides) and the value after `next-server` with the NFS server name.

The `<ip-addr>` section of the file name should be replaced with the client’s IP address in dotted decimal notation. For example, the file name for a computer with an IP address of 10.10.0.1 would be `10.10.0.1-kickstart`.

Note that if you do not specify a server name, then the client system attempts to use the server that answered the BOOTP/DHCP request as its NFS server. If you do not specify a path or file name, the client system tries to mount `/kickstart` from the BOOTP/DHCP server and tries to find the kickstart file using the same `<ip-addr>`-`kickstart` file name as described above.
14.10. # Starting a Kickstart Installation

To begin a kickstart installation, you must boot the system from boot media you have made or the Fedora DVD, and enter a special boot command at the boot prompt. The installation program looks for a kickstart file if the ks command line argument is passed to the kernel.

With Driver Disk
If you need to use a driver disk with kickstart, specify the dd option as well. For example, to boot off a boot diskette and use a driver disk, enter the following command at the boot: prompt:

```
linux ks=hd:partition:/path/ks.cfg dd
```

Other options to start a kickstart installation are as follows:

- **askmethod**
  Do not automatically use the DVD as the install source if we detect a Fedora DVD in your DVD drive.

- **autostep**
  Make kickstart non-interactive.

- **debug**
  Start up pdb immediately.

- **dd**
  Use a driver disk.

- **dhcppclass=**
  Use a driver disk.

- ** ISC- dhcpd**
  DHCP, a standard service on the network, will be used instead.

- **vendor-class-identifier**
  To use the DHCP option vendor-class-identifier," make sure the DHCP server is configured to provide the class identifier.

---

DVD
The **linux ks=** command also works if the ks.cfg file is located on a vfat or ext2 file system on local storage and you boot from the Fedora DVD.

- **With Driver Disk**
  If you need to use a driver disk with kickstart, specify the dd option as well. For example, to boot off a boot diskette and use a driver disk, enter the following command at the boot: prompt:

```
linux ks=hd:partition:/path/ks.cfg dd
```

- **Other options**
  Other options to start a kickstart installation are as follows:

  - **askmethod**
    Do not automatically use the DVD as the install source if we detect a Fedora DVD in your DVD drive.

  - **autostep**
    Make kickstart non-interactive.

  - **debug**
    Start up pdb immediately.

  - **dd**
    Use a driver disk.

  - **dhcppclass=**
    Use a driver disk.

  - ** ISC- dhcpd**
    DHCP, a standard service on the network, will be used instead.

  - **vendor-class-identifier**
    To use the DHCP option vendor-class-identifier," make sure the DHCP server is configured to provide the class identifier.
Starting a Kickstart Installation

**dns=**<dns>

Comma separated list of nameservers to use for a network installation.

**driverdisk**

'dd'{-}

**expert**

Turns on special features:

- allows partitioning of removable media
- prompts for a driver disk

**gateway=**<gw>

Gateway to use for a network installation.

**graphical**

Force graphical install. Required to have ftp/http use GUI.

**isa**

Prompt user for ISA devices configuration.

**ip=**<ip>

IP, DHCP-{'} dhcp' or '${' d n s -}'

**keymap=**<keymap>

Kickstart 'keyboard'

**ks=nfs:**<server>/:<path>

The installation program looks for the kickstart file on the NFS server <server>, as file <path>. The installation program uses DHCP to configure the Ethernet card. For example, if your NFS server is server.example.com and the kickstart file is in the NFS share '/mydir/ks.cfg' the correct boot command would be ks=nfs:server.example.com:/mydir/ks.cfg

**ks=http://**<server>/:<path>

The installation program looks for the kickstart file on the HTTP server <server>, as file <path>. The installation program uses DHCP to configure the Ethernet card. For example, if your HTTP server is server.example.com and the kickstart file is in the HTTP directory '/mydir/ks.cfg' the correct boot command would be ks=http://server.example.com/mydir/ks.cfg

**ks=hd:**<device>/:<file>

The installation program mounts the file system on <device> (which must be vfat or ext2), and looks for the kickstart configuration file as <file> in that file system (for example, ks=hd:sda3:/mydir/ks.cfg).
Kickstart Installations

ks=bd: <biosdev>:/<path>

The installation program mounts the file system on the specified partition on the specified BIOS device <biosdev>, and looks for the kickstart configuration file specified in <path> (for example, ks=bd:80p3:/mydir/ks.cfg) Note this does not work for BIOS RAID sets.

ks=file:/<file>

The installation program tries to read the file <file> from the file system; no mounts are done. This is normally used if the kickstart file is already on the initrd image.

ks=cdrom:/<path>

The installation program looks for the kickstart file on CD-ROM, as file <path>.

ksdevice= <device>

The installation program uses this network device to connect to the network. For example, consider a system connected to an NFS server through the eth1 device. To perform a kickstart installation on this system using a kickstart file from the NFS server, you would use the command ks=nfs:/<path> ksdevice=eth1 at the boot: prompt.

kssendmac

The installation program sends the MAC address of the network device in the HTTP header when connecting to the server. This is useful in CGIs used for kickstart installations. For example, if the MAC address is 01:23:45:67:89:ab, the header sent is "X-RHN-Provisioning-MAC-0: eth0 01:23:45:67:89:ab".

lang=<lang>

Set the minimum level required for messages to be logged. Values for <level> are debug, info, warning, error, and critical. The default value is info.
Starting a Kickstart Installation

**mediacheck**
Activates loader code to give user option of testing integrity of install source (if an ISO-based method).

```
netmask=<nm>
```
Netmask to use for a network installation.

**nofallback**
If GUI fails exit.

**nofb**
Do not load the VGA16 framebuffer required for doing text-mode installation in some languages.

**nofirewire**
Do not load support for firewire devices.

**noipv6**
Disable IPv6 networking during installation.

```
This option is not available during PXE installations
```
During installations from a PXE server, IPv6 networking might become active before `anaconda` processes the Kickstart file. If so, this option will have no effect during installation.

**nomount**
Do not auto-probe network devices.

**noparport**
Do not attempt to load support for parallel ports.

**nopass**
Do not attempt to detect hw, prompts user instead.

**nopcmcia**
Ignore PCMCIA controller in system.

**noprobe**
Do not attempt to detect hw, prompts user instead.

**noshell**
Do not put a shell on tty2 during install.

**nostorage**
Do not auto-probe storage devices (SCSI, IDE, RAID).

**nousb**
Do not load USB support (helps if install hangs early sometimes).
nousbstorage
Do not load usbstorage module in loader. May help with device ordering on SCSI systems.

repo=cdrom
  ভার্ত্তিক্কে ইনস্টলেশন করা হবে।

repo=ftp://<path>
  Use <path> for an FTP installation.

repo=hd:<dev>:<path>
  Use <path> on <dev> for a hard drive installation.

repo=http://<path>
  Use <path> for an HTTP installation.

repo=nfs:<path>
  Use <path> for an NFS installation.

rescue
  Run rescue environment.

resolution=<mode>
  উল্লিখিত মোডে ইনস্টলার চালানো হবে, উদাহরণস্বরূপ, '1024x768'.

serial
  Turns on serial console support.

skipddc
  মনিটরের জন্য DDC অনুসন্ধান উপক্রম করা হবে, সিস্টেম হ্যাং করলে সহায়তা হতে পারে।

syslog=<host>[:<port>]
  Once installation is up and running, send log messages to the syslog process on <host>, and optionally, on port <port>. Requires the remote syslog process to accept connections (the -r option).

text
  Force text mode install.

If you select text mode for a kickstart installation, make sure that you specify choices for the partitioning, bootloader, and package selection options. These steps are automated in text mode, and anaconda cannot prompt you for missing information. If you do not provide choices for these options, anaconda will stop the installation process.

updates
  আপডেট ধারণকারী ডিভাইসের জন্য অনুরোধ করা হবে (বাগ-ফিক্স)।
Starting a Kickstart Installation

updates=ftp://<path>
   Image containing updates over FTP.

updates=http://<path>
   Image containing updates over HTTP.

upgradeany  আপগ্রেডের জন্য সনিটেক্সের অনুরূপ /etc/redhat-release আবশ্যক নয়।

vnc
   Enable vnc-based installation. You will need to connect to the machine using a vnc client application.

vncconnect= <host>[::<port>]
   Once installation is up and running, connect to the vnc client named <host>, and optionally use port <port>.

   'vnc'

vncpassword=<password>
   Enable a password for the vnc connection. This will prevent someone from inadvertently connecting to the vnc-based installation.

   'vnc'
Kickstart Configurator

Kickstart Configurator allows you to create or modify a kickstart file using a graphical user interface, so that you do not have to remember the correct syntax of the file.

To use Kickstart Configurator, you must be running the X Window System and Kickstart Configurator must be installed on your system. To start Kickstart Configurator, select Applications (the main menu on the panel) \(\rightarrow\) System Tools \(\rightarrow\) Kickstart or type the command `/usr/sbin/system-config-kickstart`. If Kickstart Configurator does not appear on the menu or you cannot start it from the command line, run `su - yum install system-config-kickstart` to make sure that the package is installed, or search for the package in your graphical package manager.

As you are creating a kickstart file, you can select File \(\rightarrow\) Preview at any time to review your current selections.

To start with an existing kickstart file, select File \(\rightarrow\) Open and select the existing file.

15.1. মৌলিক কনফিগারেশন

Choose the language to use during the installation and as the default language to be used after installation from the Default Language menu.

Select the system keyboard type from the Keyboard menu.

From the Time Zone menu, choose the time zone to use for the system. To configure the system to use UTC, select Use UTC clock.

Enter the desired root password for the system in the Root Password text entry box. Type the same password in the Confirm Password text box. The second field is to make sure you do not mistype the password and then realize you do not know what it is after you have completed the installation.
To save the password as an encrypted password in the file, select Encrypt root password. If the encryption option is selected, when the file is saved, the plain text password that you typed is encrypted and written to the kickstart file. Do not type an already encrypted password and select to encrypt it. Because a kickstart file is a plain text file that can be easily read, it is recommended that an encrypted password be used.

Choosing Target Architecture specifies which specific hardware architecture distribution is used during installation.

Choosing Target Architecture specifies which specific hardware architecture distribution is used during installation.

Choosing Reboot system after installation reboots your system automatically after the installation is finished.

Kickstart installations are performed in graphical mode by default. To override this default and use text mode instead, select the Perform installation in text mode option.

You can perform a kickstart installation in interactive mode. This means that the installation program uses all the options pre-configured in the kickstart file, but it allows you to preview the options in each screen before continuing to the next screen. To continue to the next screen, click the Next button after you have approved the settings or change them before continuing the installation. To select this type of installation, select the Perform installation in interactive mode option.

15.2. Installation Method

The Installation Method screen allows you to choose whether to perform a new installation or an upgrade. If you choose upgrade, the Partition Information and Package Selection options are disabled. They are not supported for kickstart upgrades.

Choose the type of kickstart installation or upgrade from the following options:
• **DVD**  Choose this option to install or upgrade from the Fedora DVD.

• **NFS**  Choose this option to install or upgrade from an NFS shared directory. In the text field for the the NFS server, enter a fully-qualified domain name or IP address. For the NFS directory, enter the name of the NFS directory that contains the variant directory of the installation tree. For example, if the NFS server contains the directory `/mirrors/redhat/i386/Server/` enter `/mirrors/redhat/i386/` for the NFS directory.

• **FTP**  Choose this option to install or upgrade from an FTP server. In the FTP server text field, enter a fully-qualified domain name or IP address. For the FTP directory, enter the name of the FTP directory that contains the variant directory. For example, if the FTP server contains the directory `/mirrors/redhat/i386/Server/` enter `/mirrors/redhat/i386/Server/` for the FTP directory. If the FTP server requires a username and password, specify them as well.

• **HTTP**  Choose this option to install or upgrade from an HTTP server. In the text field for the HTTP server, enter the fully-qualified domain name or IP address. For the HTTP directory, enter the name of the HTTP directory that contains the variant directory. For example, if the HTTP server contains the directory `/mirrors/redhat/i386/Server/` enter `/mirrors/redhat/i386/Server/` for the HTTP directory.

*হার্ড-ড্রাইভ — হার্ড-ড্রাইভ থেকে ইনস্টল অথবা আপগ্রেড করার জন্য এই বিকল্পটি নির্বাচন করুন। হার্ড-ড্রাইভ ইনস্টলেশনের জন্য ISO ইমেজ আবশ্যক। ইনস্টলেশনের পূর্বে পরীক্ষা করুন ISO ইমেজগুলি সঠিক অবস্থায় রয়েছে কি না। এই পরীক্ষার জন্য md5sum প্রোগ্রাম ও "Verifying boot media"-এর উল্লিখিতlinux mediacheck বুট বিকল্পটি ব্যবহার করুন। হার্ড-ড্রাইভ পার্টিশন টেক্স্ট বক্সে ISO ইমেজের নাম নিয়ে হার্ড-ড্রাইভের তারিখের ইনস্টলেশনের নাম হার্ড-ড্রাইভের তারিখের টেক্স্ট বক্সে লিখুন।*
Please note that this screen will be disabled if you have specified a target architecture other than x86/x86_64.

You must choose where to install the boot loader (the Master Boot Record or the first sector of the /boot partition). Install the boot loader on the MBR if you plan to use it as your boot loader.

To pass any special parameters to the kernel to be used when the system boots, enter them in the Kernel parameters text field. For example, if you have an IDE CD-ROM Writer, you can tell the kernel to use the SCSI emulation driver that must be loaded before using cdrecord by configuring hdd=ide-scsi as a kernel parameter (where hdd is the CD-ROM device).

You can password protect the GRUB boot loader by configuring a GRUB password. Select Use GRUB password and enter a password in the Password field. Type the same password in the Confirm Password text field. To save the password as an encrypted password in the file, select Encrypt GRUB password. If the encryption option is selected, when the file is saved, the plain text password that you typed is encrypted and written to the kickstart file. If the password you typed was already encrypted, unselect the encryption option.

If Upgrade an existing installation is selected on the Installation Method page, select Upgrade existing boot loader to upgrade the existing boot loader configuration, while preserving the old entries.

15.4. Partition Information

Select whether or not to clear the Master Boot Record (MBR). Choose to remove all existing partitions, remove all existing Linux partitions, or preserve existing partitions.
Although `anaconda` and `kickstart` support Logical Volume Management (LVM), at present there is no mechanism for configuring this using the `Kickstart Configurator`.

### Creating Partitions

파라포니ন নরিমাণের জন্য যেগুলো করুন বাটনটি ক্লিক করুন। `15.5, "Creating Partitions"`-
র প্রদর্শিত

- In the Additional Size Options section, choose to make the partition a fixed size, up to a chosen size, or fill the remaining space on the hard drive. If you selected swap as the file system type, you can select to have the installation program create the swap partition with the recommended size instead of specifying a size.

- Force the partition to be created as a primary partition.

- Create the partition on a specific hard drive. For example, to make the partition on the first IDE hard disk (`/dev/hda`), specify `hda` as the drive. Do not include `/dev` in the drive name.

- Use an existing partition. For example, to make the partition on the first partition on the first IDE hard disk (`/dev/hda1`), specify `hda1` as the partition. Do not include `/dev` in the partition name.

- Format the partition as the chosen file system type.
To delete an existing partition, select the partition from the list and click the **Delete** button.

### 15.4.1.1. Creating Software RAID Partitions

To create a software RAID partition, use the following steps:

1. Click the **RAID** button.
2. Select **Create a software RAID partition**.
3. Configure the partitions as previously described, except select **Software RAID** as the file system type. Also, you must specify a hard drive on which to make the partition or specify an existing partition to use.
Repeat these steps to create as many partitions as needed for your RAID setup. All of your partitions do not have to be RAID partitions.

After creating all the partitions needed to form a RAID device, follow these steps:

1. Click the **RAID** button.
2. Select **Create a RAID device**
3. Select a mount point, file system type, RAID device name, RAID level, RAID members, number of spares for the software RAID device, and whether to format the RAID device.


4. Click **OK** to add the device to the list.
15.5. Networking Configuration Procedures

If the system to be installed via kickstart does not have an Ethernet card, do not configure one on the Network Configuration page.

Networking is only required if you choose a networking-based installation method (NFS, FTP, or HTTP). Networking can always be configured after installation with the Network Administration Tool (`system-config-network`). Refer to the Fedora Deployment Guide for details.

For each Ethernet card on the system, click Add Network Device and select the network device and network type for the device. Select eth0 to configure the first Ethernet card, eth1 for the second Ethernet card, and so on.
15.6. # Authentication

In the Authentication section, select whether to use shadow passwords and MD5 encryption for user passwords. These options are highly recommended and chosen by default.

The Authentication Configuration options allow you to configure the following methods of authentication:

- NIS
- LDAP
- Kerberos
- Hesiod
- SMB
- Name Switch Cache

These methods are not enabled by default. To enable one or more of these methods, click the appropriate tab, click the checkbox next to Enable and enter the appropriate information for the authentication method. Refer to the Fedora Deployment Guide for more information about the options.

15.7. # Firewall Configuration

The Firewall Configuration window is similar to the screen in the installation program and the Security Level Configuration Tool.
If **Disable firewall** is selected, the system allows complete access to any active services and ports. No connections to the system are refused or denied.

Selecting **Enable firewall** configures the system to reject incoming connections that are not in response to outbound requests, such as DNS replies or DHCP requests. If access to services running on this machine is required, you can choose to allow specific services through the firewall.

Only devices configured in the **Network Configuration** section are listed as available **Trusted devices**. Connections from any devices selected in the list are accepted by the system. For example, if `eth1` only receives connections from internal system, you might want to allow connections from it.

If a service is selected in the **Trusted services** list, connections for the service are accepted and processed by the system.

In the **Other ports** text field, list any additional ports that should be opened for remote access. Use the following format: `port:protocol`. For example, to allow IMAP access through the firewall, specify `imap:tcp`. Numeric ports can also be specified explicitly; to allow UDP packets on port `1234` through the firewall, enter `1234:udp`. To specify multiple ports, separate them with commas.

### 15.7.1. SELinux Configuration

Kickstart can set SELinux to **enforcing**, **permissive** or **disabled** mode. Finer grained configuration is not possible at this time.

### 15.8. Display Configuration

Kickstart can set SELinux to **enforcing**, **permissive** or **disabled** mode. Finer grained configuration is not possible at this time.
Also select whether to start the Setup Agent the first time the system is rebooted. It is disabled by default, but the setting can be changed to enabled or enabled in reconfiguration mode. Reconfiguration mode enables the language, mouse, keyboard, root password, security level, time zone, and networking configuration options in addition to the default ones.

15.9. Package Selection
The **Package Selection** window allows you to choose which package groups to install.

Package resolution is carried out automatically.

The `kickstart Configurator` allows you to choose which package groups to install. The version of `anaconda` in previous releases of Fedora included a version of `busybox` that provided shell commands in the pre-installation and post-installation environments. The version of `anaconda` in Fedora no longer includes `busybox` and uses GNU `bash` commands instead.

You can add commands to run on the system immediately after the kickstart file has been parsed and before the installation begins. If you have configured the network in the kickstart file, the network is enabled before this section is processed. To include a pre-installation script, type it in the text area.
Do not include the %pre command. It is added for you.

The pre-installation script is run after the source media is mounted and stage 2 of the bootloader has been loaded. For this reason it is not possible to change the source media in the pre-installation script.

15.11.

Post-Installation Script

You can also add commands to execute on the system after the installation is completed. If the network is properly configured in the kickstart file, the network is enabled, and the script can include...
commands to access resources on the network. To include a post-installation script, type it in the text area.

The version of *anaconda* in previous releases of Fedora included a version of *busybox* that provided shell commands in the pre-installation and post-installation environments. The version of *anaconda* in Fedora now no longer includes *busybox* and uses GNU bash commands instead.

Do not include the `%post` command. It is added for you. For example, to change the message of the day for the newly installed system, add the following command to the `%post` section:

```bash
echo "Hackers will be punished" > /etc/motd
```

### Note

14.7.1, "Examples"-এ অতিরিক্ত উদাহরণ উপস্থিতি রয়েছে।

**Chroot Environment**

To run the post-installation script outside of the chroot environment, click the checkbox next to this option on the top of the Post-Installation window. This is equivalent to using the `--nochroot` option in the `%post` section.

To make changes to the newly installed file system, within the post-installation section, but outside of the chroot environment, you must prepend the directory name with `/mnt/sysimage/`.

For example, if you select Run outside of the chroot environment’ the previous example must be changed to the following:

```bash
echo "Hackers will be punished" > /mnt/sysimage/etc/motd
```

**Use an Interpreter**

To specify a scripting language to use to execute the script, select the Use an interpreter option and enter the interpreter in the text box beside it. For example, `/usr/bin/python2.2` can be specified for a Python script. This option corresponds to using the `%post interpreter` command in your kickstart file.
15.12. **Saving the File**

To review the contents of the kickstart file after you have finished choosing your kickstart options, select **File** ➔ **Preview** from the pull-down menu.

To save the kickstart file, click the **Save to File** button in the preview window. To save the file without previewing it, select **File** ➔ **Save File** or press `Ctrl+S`. A dialog box appears. Select where to save the file.

ファイルの保存は**ファイル** ➔ **ファイルの保存**をクリックします。ファイルを保存する前に見ることのないときは、**ファイル** ➔ **ファイルの保存**もしくは`Ctrl+S`を押します。保存先を選択します。

ফাইল সংরক্ষণের পরে, টিক্যুইলিং আরম্ভের প্রণালী সম্পর্কে জানতে 14.10, “Starting a Kickstart Installation” পড়ুন।
After installation

Installation Guide-র এই অংশে আলোচনা করা হয়েছে। এর মধ্যে রয়েছে:

• ক্ষতিগ্রস্ত সিস্টেম পুনরুদ্ধার করার জন্য ইনস্টলেশন ডিস্কের ব্যবহার।
• নতুন সংস্করণে আপগ্রেড করার প্রণালী।
• কম্পিউটার থেকে সরিয়ে ফেলার প্রণালী।
Firstboot

Select Forward to start Firstboot.

16.1. License Agreement

This screen displays the overall licensing terms for Fedora. Each software package in Fedora is covered by its own license. All licensing guidelines for Fedora are located at http://fedoraproject.org/wiki/Legal/Licenses.
চিত্র 16.2. Firstboot-র লাইসেন্স সম্বন্ধী পর্দা

লাইসেন্স সংক্রান্ত তথ্য

Fedora ইনস্টল করার জন্য এটি করুন যদি চান। Firstboot-র মতো পূর্বে লাইসেন্স প্রাপ্তবয়স্ক বিনিয়োগ ধারন করা সম্ভব। এই লাইসেন্সটি GNU General Public License সংস্করণ 2-র সংস্করণ হিসেবে প্রকাশ করা হয়েছে। এর কোনো ক্ষেত্রেই অন্য কোনো পরিবর্তন করে না নির্দেশ করা হয় না।

লাইসেন্সের শর্ত অনুযায়ী সম্মত হলে হ্যাঁ, লাইসেন্সের শর্ত অনুযায়ী আমি সম্মত নির্বাচন করে পরবর্তী টিপুন।

পাশ হয়েছে, এখনো নিবন্ধন করুন।

চিত্র 16.2. # লাইসেন্স সম্বন্ধী পর্দা

লাইসেন্সের শর্ত অনুযায়ী সম্মত হলে হ্যাঁ, লাইসেন্সের শর্ত অনুযায়ী আমি সম্মত নির্বাচন করে পরবর্তী টিপুন।

16.2. # ব্যবহারকারী অ্যাকাউন্ট নির্মাণ

এই পর্দায়, নামে জন্য একটি ব্যবহারকারী অ্যাকাউন্ট নির্মাণ করুন। অ্যাকাউন্টটি ব্যবহার না করে, root সিস্টেমে লগ-ইন করার জন্য সরবর এই অ্যাকাউন্টটি ব্যবহার করুন।

Fedora
চিত্র# 16.3. ব্যবহারকারী অ্যাকাউন্ট নির্মাণ

নতুন ব্যবহারকারীর অ্যাকাউন্ট তৈরি করুন

নতুন ব্যবহারকারী অ্যাকাউন্ট তৈরি করুন। ব্যবহারকারীর নাম, সম্পূর্ণ নাম ও নির্বাচিত পাসওয়ার্ড লিখুন।

Kerberos অথবা NIS প্রকৃতির সাথে সেটান্ডার্ড নামকরণকে অনুসরণ করে এইচওক হোন।

নতুন ব্যবহারকারী অ্যাকাউন্টের নাম, সম্পূর্ণ নাম ও নির্বাচিত পাসওয়ার্ড লিখিত করুন।

If you do not create at least one user account in this step, you will not be able to log in to the Fedora graphical environment. If you skipped this step during installation, refer to "Booting into a Graphical Environment".

To add additional user accounts to your system after the installation is complete, choose System → Administration → Users & Groups.
১৬.২.১. অনুমোদন কনফিগারেশনের পর্কুর্যিয়া

কলকি করা হলে, সাপ্লিকের মধ্যে ব্যবহারকারীদের অনুমোদনের
পদ্ধতি নির্ধারণ করা অবশ্যই।

• শুধুমাত্র স্থানীয় অ্যাকাউন্ট (নেটওয়ার্কের মধ্যে উপস্থিত ব্যবহারকারীদের তথ্য বিশিষ্ট ডাটাবেস ব্যবহার
    করা সম্ভব না হলে ব্যবহারযোগ্য)

• LDAP (লাইটওয়েট ডিরেক্টরি অ্যাকসেস প্রোটোকল)

• NIS (নেটওয়ার্ক ইনফোরমেশন সার্ভিস)

• Winbind (Microsoft Active Directory)

চিত্র ১৬.৪. অনুমোদন কনফিগারেশন সম্বন্ধীয়

চিহ্নিত ডাটাবেসের জন্য ব্যবহারযোগ্য অনুমোদন ব্যবস্থা যেমন Kerberos, LDAP পাসওয়ার্ড, LDAP, অথবা NIS

Advanced Options
/etc/security/access.conf
16.3. # Date and Time

সিস্টেমের ঘড়ির তারিখ ও সময়, ইনস্টলেশনের পর পরিবর্তন করার জন্য, সিস্টেমে → প্রশাসনিক করুম → তারিখ ও সময় পরিবাদন করুন।
16.4. Hardware Profile

Firstboot displays a screen that allows you to submit your hardware information anonymously to the Fedora Project. Developers use these hardware details to guide further support efforts. You can read more about this project and its development at http://smolts.org/.
Fedora Project-র অন্তর্ভুক্ত স্মৃতি Smolt হার্ডওয়্যায়র প্রোফাইল নির্মাণে ব্যবহৃত হয়। অনলাইন হার্ডওয়্যায়র ও স্যাটেলাইটগুলো জন্য এই ডেটাটি প্রেরণ করা হয়। অনন্য অনলাইন নিবন্ধন তথ্য প্রদান করার অনুমতিও দেওয়া হয়।

фффффффффффффффффффф

To ensure the security of your system, run a package update after the installation completes.

17, Your Next Steps explains how to update your Fedora system.
Your Next Steps

Fedora provides you with a complete operating system with a vast range of capabilities, supported by a large community.

17.1. Updating Your System

The Fedora Project releases updated software packages for Fedora throughout the support period of each version. Updated packages add new features, improve reliability, resolve bugs, or remove security vulnerabilities. To ensure the security of your system, update regularly, and as soon as possible after a security announcement is issued. Refer to "Subtitle to Fedora Announcements and News" for information on the Fedora announcements services.

An update applet reminds you of updates when they are available. This applet is installed by default in Fedora. It checks for software updates from all configured repositories, and runs as a background service. It generates a notification message on the desktop if updates are found, and you can click the message to update your system's software.

To update your system with the latest packages manually, use Update System.

The following updates are available:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security updates</td>
<td>23</td>
</tr>
<tr>
<td>Bug fix updates</td>
<td>240</td>
</tr>
<tr>
<td>Enhancement updates</td>
<td>33</td>
</tr>
</tbody>
</table>

Last update: A few days ago

[Help] [Review] [Update System] [Close]

1. Choose System → Administration → Update System.
2. Click Update System to begin the update process.
3. If one or more updates require a system reboot, the update process displays a dialog with the option to Reboot Now. Either select this option to reboot the system immediately, or Cancel it and reboot the system at a more convenient time.
4. If a reboot is not required the update will conclude with a dialog that indicates that the System Update Completed and all selected updates have been successfully installed as well as a button to Close.
Your Next Steps

Update System

To update packages from the command-line, use the `yum` utility. Type this command to begin a full update of your system with `yum`:

```
su -c 'yum update'
```

Refer to [http://docs.fedoraproject.org/yum/](http://docs.fedoraproject.org/yum/) for more information on `yum`.

Ensure that your system has an active network connection before you run the Update Software tool, or the `yum` utility. The update process downloads information and packages from a network of servers.

If your Fedora system has a permanent network connection, you may choose to enable daily system updates. To enable automatic updates, follow the instructions on the webpage [http://docs.fedoraproject.org/yum/sn-updating-your-system.html](http://docs.fedoraproject.org/yum/sn-updating-your-system.html).

17.2. Finishing an Upgrade

System Updates Recommended

If you chose to upgrade your system from a previous release rather than perform a fresh installation, you may want to examine the differences in the package set. You can now use that listing to determine how to bring your new system close to the original system state.

You can obtain a list of orphaned packages (that is, packages that are no longer in the repositories) from the `package-cleanup` tool. Install the `yum-utils` package and then run `package-cleanup --orphans` The tool will show you orphaned packages and packages that are partially uninstalled but for which the `%postun` script failed.

```
awk '{print $1}' ~/old-pkglist.txt | grep 'release'
```
If necessary, retrieve and install these software repository packages from their original sources on the Internet. Follow the instructions at the originating site to install the repository configuration packages for use by `yum` and other software management tools on your Fedora system.

Missing Software

Due to changes in package complements between Fedora releases, it is possible this method may not restore all the software on your system. You can use the routines above to again compare the software on your system, and remedy any problems you find.

### 17.3. #গ্রাফিক্যাল লগ-ইনে পরিবর্তন করার প্রণালী

To switch to a graphical environment, you might need to install extra software from a repository.

You can access Fedora repositories through the Internet or use a Fedora installation CD or DVD as a repository. Refer to "[[17.3.1](#)]".

To switch to a graphical environment, you need to install additional software. You can do this by installing the graphical desktop environment. For example, to install the GNOME desktop environment, you can use the following command:

```
awk '{print $1}' ~/old-pkglist.txt | sort | uniq > ~/old-pkgnames.txt
rpm -qa --qf '%{NAME}\n' ~/new-pkgnames.txt | grep '^(%{NAME})\n' > ~/new-pkgnames.txt

diff -u ~/old-pkgnames.txt ~/new-pkgnames.txt | grep '^-' | sed 's/^-//' > /tmp/pkgs-to-install.txt

su -c 'yum install `cat /tmp/pkgs-to-install.txt`'
```

For KDE, you can use the following command:

```
yum groupinstall "X Window System" "GNOME Desktop Environmen"
```

If necessary, retrieve and install these software repository packages from their original sources on the Internet. Follow the instructions at the originating site to install the repository configuration packages for use by `yum` and other software management tools on your Fedora system.

The `su` command is useful when you need to switch to another user account. However, it is recommended to use the `sudo` command instead, especially when working with system-level tasks.

In some cases, you may need to install additional software to enable graphically based login. You can use the following command to retrieve and install the necessary packages:

```
awk '{print $1}' ~/old-pkglist.txt | sort | uniq > ~/old-pkgnames.txt
rpm -qa --qf '%{NAME}\n' ~/new-pkgnames.txt | grep '^(%{NAME})\n' > ~/new-pkgnames.txt

diff -u ~/old-pkgnames.txt ~/new-pkgnames.txt | grep '^-' | sed 's/^-//' > /tmp/pkgs-to-install.txt

su -c 'yum install `cat /tmp/pkgs-to-install.txt`'
```

After updating the software package list, you can use the following command to retrieve and install the necessary packages:

```
awk '{print $1}' ~/old-pkglist.txt | sort | uniq > ~/old-pkgnames.txt
rpm -qa --qf '%{NAME}\n' ~/new-pkgnames.txt | grep '^(%{NAME})\n' > ~/new-pkgnames.txt

diff -u ~/old-pkgnames.txt ~/new-pkgnames.txt | grep '^-' | sed 's/^-//' > /tmp/pkgs-to-install.txt

su -c 'yum install `cat /tmp/pkgs-to-install.txt`'
```
Your Next Steps

```bash
yum groupinstall "X Window System" KDE
```

This step may take some time as your Fedora system downloads and installs additional software. You may be asked to provide the installation media depending on your original installation source.

3. Run the following command to edit the `/etc/inittab` file:

```bash
vi /etc/inittab
```

4. Insert the following line into the `/etc/inittab` file:

```bash
initdefault
```

5. Find the `I` line and replace the number 3 with 5

```bash
vi :wq
```

6. Reboot the system to enable the graphical login. If you encounter any problems with the graphical login, refer to `9, IBM # AMD` or consult one of the help sources listed in `1.2`.

17.3.1. Command-line Method to Use Software Repository

The usual way to install new software on a Fedora system is through a software repository. You can access Fedora repositories through the Internet, or use a Fedora installation CD or DVD as a repository. The software that you access through online repositories is more up-to-date than what is available on an installation CD or DVD. Furthermore, configuring a Fedora system to access online repositories is generally easier than configuring the system to use an installation CD or DVD as a repository, as long as you have an existing, wired network connection available.

17.3.1.1. Internet-based Method to Use Software Repository

By default, every Fedora installation is already configured to access Fedora repositories through the Internet. Therefore, all you must do is ensure that the system can access the Internet. If you have an existing, wired network connection available, this process is straightforward:

1. If you are not root, change to root:

   ```bash
   su -
   ```

2. Use the following command to install the software:

   ```bash
   yum groupinstall "X Window System" XFCE
   ```
3. `system-config-network` Select Action

4. Select Edit a device params and press Enter. The network configuration tool displays the Select A Device screen with a list of network interfaces present on your system. The first interface is named eth0 by default.

5. Configure the network by selecting an interface. The configuration tool displays the Select A Device screen with a list of network interfaces present on your system. The first interface is typically named eth0.

6. If you are using a physical CD or DVD, insert the disc into your computer.

7. If you know the device name, mount the CD or DVD:

   ```bash
   mknod /path/to/repo
   ```

   This creates a mount point for the repository.

8. Mount the CD or DVD on the mount point you just created. If you are using a physical disc, you need to know the device name of your CD or DVD drive. You can find the names of any CD or DVD drives on your system with the command `cat /proc/sys/dev/cdrom/info`.

9. If you are using a physical disc, you need to know the device name of your CD or DVD drive. You can find the names of any CD or DVD drives on your system with the command `cat /proc/sys/dev/cdrom/info`.

   The first CD or DVD drive on the system is typically named `sr0`. When you know the device name, mount the CD or DVD:

   ```bash
   mount /dev/sr0 /mnt/repo
   ```
mount -r t iso9660 /dev/

mount -r t iso9660 /dev/sr0 /mnt/repo

mount -r t iso9660 /path/to/image/file /path/to/repo

mount -r t iso9660 /path/to/repo

mount -r t iso9660 -o loop /mnt/repo

mount -r t iso9660 -o loop /mnt/repo

mount -r t iso9660 -o loop

For example:
mount -r o loop /home/root/Downloads/Fedora-14-i386-DVD.iso /mnt/repo

mkdir /mnt/temp

mount /dev/sdb1 /mnt/temp

mkdir /mnt/repo

mount -r t iso9660 -o loop /mnt/temp/Fedora-14-i386-DVD.iso /mnt/repo

mount -r t iso9660 -o loop

For example:

mkdir /mnt/temp

mount /dev/sdb1 /mnt/temp

mkdir /mnt/repo

mount -r t iso9660 -o loop /mnt/temp/Fedora-14-i386-DVD.iso /mnt/repo

5. Edit the /etc/yum.repos.d/fedora.repo and /etc/yum.repos.d/fedora-updates.repo files to use the new repository. In each case:

1. Open the file with the vi text editor. For example:

   vi /etc/yum.repos.d/fedora.repo

2. Insert a new line after the line that starts # baseurl:

   baseurl=file:///path/to/repo

For example, baseurl=file:///mnt/repo

3. Type a # character at the start of any line in the file that starts with baseurl or mirrorlist. The # character comments out the line so that the package management software ignores it.

4. Find the [fedora] section of the fedora.repo file or the [updates] section of the fedora-updates.repo file. Note that this section includes a line that now starts # baseurl that you previously commented out.

5. Insert a new line after the line that starts # baseurl:

   baseurl=file:///path/to/repo

For example, baseurl=file:///mnt/repo

6. Press Esc to exit the text editor.
7. ফাইলটি সংরক্ষণ করে টিপুন টেক্সট এডিটর থেকে প্রস্থান করার জন্য :wq Enter।

8. After installing or upgrading software from the CD or DVD, edit the /etc/yum.repos.d/fedora.repo and /etc/yum.repos.d/fedora-updates.repo files again to undo the changes that you made.

17.4. #

**Subscribing to Fedora Announcements and News**

To receive information about package updates, subscribe to either the announcements mailing list, or the RSS feeds.

**Fedora Project announcements mailing list**

https://www.redhat.com/mailman/listinfo/fedora-announce-list

**Fedora Project RSS**

http://fedoraproject.org/infofeed/

The announcements mailing list also provides you with news on the Fedora Project, and the Fedora community.

**নারাপত্তা বিষয়ক ঘোষনা**

Announcements with the keyword [SECURITY] in the title identify package updates that resolve security vulnerabilities.

17.5. #নথিপত্র ও সহায়তা প্রাপ্তির প্রণালী

Members of the Fedora community provide support through mailing lists, Web forums and Linux User Groups (LUGs) across the world.

The Web site for the formally endorsed forums is http://forums.fedoraforum.org/.

The following resources provide information on many aspects of Fedora:

- The FAQ on the Fedora Project website
  http://fedoraproject.org/wiki/FAQ/

- The documents available from the Fedora Documentation Project Web site
  http://docs.fedoraproject.org/

- The Linux Documentation Project (LDP)
  http://www.tldp.org/

- The Red Hat Enterprise Linux documentation, much of which also applies to Fedora
  http://www.redhat.com/docs/manuals/enterprise/
Many other organizations and individuals also provide tutorials and HOWTOs for Fedora on their Web sites. You can locate information on any topic by using Google's Linux search site, located at [www.google.com/linux](http://www.google.com/linux).

### 17.6. Fedora

The Fedora Project is driven by the individuals that contribute to it. Community members provide support and documentation to other users, help to improve the software included in Fedora by testing, and develop new software alongside the programmers employed by Red Hat. The results of this work are available to all.

To make a difference, start here:

Basic System Recovery

When things go wrong, there are ways to fix problems. However, these methods require that you understand the system well. This chapter describes how to boot into rescue mode, single-user mode, and emergency mode, where you can use your own knowledge to repair the system.

18.1. #

Rescue Mode

18.1.1. #

Common Problems

You might need to boot into one of these recovery modes for any of the following reasons:

- When things go wrong, there are ways to fix problems. However, these methods require that you understand the system well.

This chapter describes how to boot into rescue mode, single-user mode, and emergency mode, where you can use your own knowledge to repair the system.

18.1.1.1. #

Fedora-

Common Problems

You might need to boot into one of these recovery modes for any of the following reasons:

- স্বাভাবিক প্রণালীতে ফেডোরা-তে বুট করতে ব্যর্থতা (runlevel 3 (৩) অথবা 5 (৫))।
- হার্ডওয়্যার অথবা সফ্টওয়্যার সংক্রান্ত সমস্যার জন্য সিস্টেমের হার্ড-ড্রাইভে উপস্থিত কিছু প্রয়োজনীয় ফাইল নরিপণ স্থানে সরিয়ে নিতে।
- Root পাসওয়ার্ড লিখতে ভুলে গেছেন।

Another common problem occurs when using a partitioning tool to resize a partition or create a new partition from free space after installation, and it changes the order of your partitions. If the partition number of your / partition changes, the boot loader might not be able to find it to mount the partition. To fix this problem, boot in rescue mode and modify the /boot/grub/grub.conf file.

18.1.1.1. #

Fedora-

18.1.1.2. #

Hardware/Software Problems

Sometimes the root password is lost or forgotten. This chapter describes how to retrieve it. Sometimes the root password is lost or forgotten. This chapter describes how to retrieve it.

18.1.1.3. #

Root Password

What can you do if you forget your root password? To reset it to a different password, boot into rescue mode or single-user mode, and use the passwd command to reset the root password.

18.1.2. #

Booting into Rescue Mode

রেসকিউ মোডে সিস্টেমের হার্ড-ড্রাইভের পরিবর্তে CD-ROM অথবা অন্য কোনো বুট পদ্ধতির মাধ্যমে সংক্ষিপ্ত রেসকিউ মোডে সিস্টেমের হার্ড-ড্রাইভের পরিবর্তে CD-ROM অথবা অন্য কোনো বুট পদ্ধতির মাধ্যমে সংক্ষিপ্ত রেসকিউ মোডে সিস্টেমের হার্ড-ড্রাইভের পরিবর্তে CD-ROM অথবা অন্য কোনো বুট পদ্ধতির মাধ্যমে সংক্ষিপ্ত রেসকিউ মোডে সিস্টেমের হার্ড-ড্রাইভের পরিবর্তে CD-ROM অথবা অন্য কোনো বুট পদ্ধতির মাধ্যমে 

227
Basic System Recovery

To boot into rescue mode, you must be able to boot the system using one of the following methods:

- By CD-ROM
- By booting the system from other installation boot media, such as USB flash devices.
- By booting the system from the Fedora installation DVD.

Once you have booted using one of the described methods, add the keyword `rescue` as a kernel parameter. For example, for an x86 system, type the following command at the installation boot prompt:

```
linux rescue
```

If you select a rescue image that does not require a network connection, you are asked whether or not you want to establish a network connection. A network connection is useful if you need to backup files to a different computer or install some RPM packages from a shared network location, for example.

The following message is displayed:

The rescue environment will now attempt to find your Linux installation and mount it under the directory `/mnt/sysimage`. You can then make any changes required to your system. If you want to proceed with this step choose 'Continue'. You can also choose to mount your file systems read-only instead of read-write by choosing 'Read-only'. If for some reason this process fails you can choose 'Skip' and this step will be skipped and you will go directly to a command shell.

If you select `Continue` it attempts to mount your file system under the directory `/mnt/sysimage/`. If it fails to mount a partition, it notifies you. If you select `Read-Only` it attempts to mount your file system under the directory `/mnt/sysimage/` but in read-only mode. If you select `Skip` your file system is not mounted. Choose `Skip` if you think your file system is corrupted.

Once you have your system in rescue mode, a prompt appears on VC (virtual console) and VC (use the `Ctrl` `Alt` `F1` key combination to access VC and `Ctrl` `Alt` `F2` to access VC):

---

1 Refer to the earlier sections of this guide for more details.
Booting into Rescue Mode

```
  sh-3.00b#
```

If you selected **Continue** to mount your partitions automatically and they were mounted successfully, you are in single-user mode.

Even if your file system is mounted, the default root partition while in rescue mode is a temporary root partition, not the root partition of the file system used during normal user mode (runlevel 3 or 5). If you selected to mount your file system and it mounted successfully, you can change the root partition of the rescue mode environment to the root partition of your file system by executing the following command:

```
  chroot /mnt/sysimage
```

This is useful if you need to run commands such as `rpm` that require your root partition to be mounted as `/`. To exit the `chroot` environment, type `exit` to return to the prompt.

If you selected **Skip**, you can still try to mount a partition or LVM2 logical volume manually inside rescue mode by creating a directory such as `/foo`, and typing the following command:

```
  mount -t ext4 /dev/mapper/VolGroup00-LogVol02 /foo
```

In the above command, `/foo` is a directory that you have created and `/dev/mapper/VolGroup00-LogVol02` is the LVM2 logical volume you want to mount. If the partition is of type `ext2` or `ext3`, replace `ext4` with `ext2` or `ext3` respectively.

If you do not know the names of all physical partitions, use the following command to list them:

```
  fdisk -l
```

If you do not know the names of all LVM2 physical volumes, volume groups, or logical volumes, use the following commands to list them:

```
  pvdisplay

  vgdisplay

  lvdisplay
```

From the prompt, you can run many useful commands, such as:

- `ssh` / `scp` and `ping` if the network is started
- `dump` and `restore` for users with tape drives
- `parted` and `fdisk` for managing partitions
18. # Basic System Recovery

- `rpm` for installing or upgrading software
- `joe` for editing configuration files

**Note**
If you try to start other popular editors such as `emacs`, `pico`, or `vi`, the `joe` editor is started.

### 18.1.2.1. # Reinstalling the Boot Loader

In many cases, the GRUB boot loader can mistakenly be deleted, corrupted, or replaced by other operating systems.

The following steps detail the process on how GRUB is reinstalled on the master boot record:

- Boot the system from an installation boot medium.
- Type `linux rescue` at the installation boot prompt to enter the rescue environment.
- Type `chroot /mnt/sysimage` to mount the root partition.
- Type `/sbin/grub-install bootpart` to reinstall the GRUB boot loader, where `bootpart` is the boot partition (typically, `/dev/sda`).
- Review the `/boot/grub/grub.conf` file, as additional entries may be needed for GRUB to control additional operating systems.
- Reboot the system.

### 18.1.3. # Booting into Single-User Mode

One of the advantages of single-user mode is that you do not need a boot CD-ROM; however, it does not give you the option to mount the file systems as read-only or not mount them at all.

If your system boots, but does not allow you to log in when it has completed booting, try single-user mode.

In single-user mode, your computer boots to runlevel 1. Your local file systems are mounted, but your network is not activated. You have a usable system maintenance shell. Unlike rescue mode, single-user mode automatically tries to mount your file system. Do not use single-user mode if your file system cannot be mounted successfully. You cannot use single-user mode if the runlevel 1 configuration on your system is corrupted.

On an x86 system using GRUB, use the following steps to boot into single-user mode:

1. At the GRUB splash screen at boot time, press any key to enter the GRUB interactive menu.
2. বুট করার সময় ব্যবহার করতে ইচ্ছুক কার্নেলের সংস্করণ সহ নির্বাচন করুন এবং পর্যায়ের শেষে নরিষ্ণু।
3. Go to the end of the line and type `single` as a separate word (press the `Spacebar` and then type `single`). Press `Enter` to exit edit mode.
18.1.4. # Booting into Emergency Mode

In emergency mode, you are booted into the most minimal environment possible. The root file system is mounted read-only and almost nothing is set up. The main advantage of emergency mode over single-user mode is that the init files are not loaded. If init is corrupted or not working, you can still mount file systems to recover data that could be lost during a re-installation.

ইমারেজন্সি মোডে বুট করার জন্য 18.1.3, “Booting into Single-User Mode”-এ উল্লিখিত সিঙ্গল ইউজার মোডে প্রবেশের নির্দেশটি কেবলমাত্র একটি পার্থক্যসহ অনুসরণ করুন। ইমারেজন্সি মোডের জন্য single শব্দটির পরিবর্তে emergency শব্দটি লিখুন।
Upgrading Your Current System

Fedora

19.1. # Determining Whether to Upgrade or Re-Install

While upgrading from Fedora #13 is supported, you are more likely to have a consistent experience by backing up your data and then installing this release of Fedora #14 over your previous Fedora installation.

To upgrade from Fedora #13 you should bring your system up to date before performing the upgrade.

###

If you currently use Fedora #13, you can perform a traditional, installation program-based upgrade.

However, before you chose to upgrade your system, there are a few things you should keep in mind:

- Individual package configuration files may or may not work after performing an upgrade due to changes in various configuration file formats or layouts.
- Red Hat-র কোনো স্তরযুক্ত উৎপাদন ইনস্টল করে থাকেন (যেমন Cluster Suite), তাহলে আপগ্রেডে পরিবর্তিত সম্পদী হলা সম্ভবত আপনাকে সেটো স্বয়ং আপগ্রেড করতে হবে।
- Third party or ISV applications may not work correctly following the upgrade.

Upgrading your system installs updated versions of the packages which are currently installed on your system.

The upgrade process preserves existing configuration files by renaming them with an .rpmsave extension (for example, sendmail.cf.rpmsave). The upgrade process also creates a log of its actions in /root/upgrade.log

⚠️ Warning

As software evolves, configuration file formats can change. It is very important to carefully compare your original configuration files to the new files before integrating your changes.

⚠️ Note

আপনার সিস্টেমে উপস্থিত তথ্য সর্বদা ব্যাক-আপ করা বাছাইয়ের জন্য যেমন, আপনার সিস্টেমে আপগ্রেড করার সময় অথবা একটি ডুয়েল-বুট মেশিন তৈরি করার সময় সঠিক হার্ড-ড্রাইভে উপস্থিত তথ্য রক্ষা করা উচিত। এর ফলে সংরক্ষিত তথ্য ক্ষতিগ্রস্ত হতে পারে।

Some upgraded packages may require the installation of other packages for proper operation. If you choose to customize your packages to upgrade, you may be required to resolve dependency problems. Otherwise, the upgrade procedure takes care of these dependencies, but it may need to install additional packages which are not on your system.
Upgrading Your Current System

Depending on how you have partitioned your system, the upgrade program may prompt you to add an additional swap file. If the upgrade program does not detect a swap file that equals twice your RAM, it asks you if you would like to add a new swap file. If your system does not have a lot of RAM (less than 256 MB), it is recommended that you add this swap file.

19.2. # Upgrading Your System

In most cases, the simplest way to upgrade an existing Fedora installation is with the `preupgrade` tool. When a new version of Fedora is available, `preupgrade` downloads the packages necessary to upgrade your installation, and initiates the upgrade process.

```
install preupgrade Enter
```

You can also upgrade a Fedora installation by starting the installation process by any of the methods described in `8, Installing using anaconda`. If the installer detects a previous Fedora installation on the system, it will ask you whether you want to upgrade that installation — refer to `8.14.1, “The Upgrade Dialog”`

The **Upgrade Examine** screen appears if you have instructed the installation program to perform an upgrade.

---

Note

If the `etc/redhat-release` file contains the version number of your existing Fedora installation, the upgrade process will skip over this upgrade step. If the installer detects a previous Fedora installation on the system, it will ask you whether you want to upgrade that installation — refer to `8.14.1, “The Upgrade Dialog”`

You can relax some of the checks against this file by booting with the following boot command:

```
linux upgradeany
```

To perform an upgrade, select **Perform an upgrade of an existing installation** and click **Next** when you are ready to begin your upgrade.

To re-install your system, select **Perform a new Fedora installation** and refer to `8, Installing` for further instructions.
Fedora

We respect your freedom to choose an operating system for your computer. This section explains how to uninstall Fedora.

⚠️ These instructions may destroy data!

If you have data from Fedora that you want to keep, back it up before you proceed. Write your data to CD, DVD, external hard disk, or other storage device.

If you back up data from Fedora to be used later in another operating system, make sure that the storage medium or device is readable by that other operating system. For example, without extra third-party software, Microsoft Windows cannot read an external hard drive that you have formatted with Fedora to use the ext2, ext3, or ext4 file system.

To uninstall Fedora from your x86-based system, you must remove the Fedora boot loader information from your master boot record (MBR) and remove any partitions that contain the operating system.

The method for removing Fedora from your computer varies, depending on whether Fedora is the only operating system installed on the computer, or whether the computer is configured to dual-boot Fedora and another operating system.

Legacy versions of Microsoft operating systems

Fdisk’ the disk partitioning tool provided with MS-DOS and Microsoft Windows, is unable to remove the file systems used by Fedora. MS-DOS and versions of Windows prior to Windows XP (except for Windows 2000) have no other means of removing or modifying partitions. Refer to

20.3, “Fedora-#-MS-DOS-#-Microsoft Windows-#” for alternative removal methods for use with MS-DOS and these versions of Windows.

If Fedora is the only operating system on your computer, use the installation media for the replacement operating system to remove Fedora. Examples of installation media include the Windows XP installation CD, Windows Vista installation DVD, Mac OS X installation CDs or DVD, or the installation CD, CDs, or DVD of another Linux distribution.
Note that some manufacturers of factory-built computers pre-installed with Microsoft Windows do not supply the Windows installation CD or DVD with the computer. The manufacturer may instead have supplied their own “system restore disk”, or have included software with the computer that allowed you to create your own “system restore disk” when you first started the computer. In some cases, the system restore software is stored on a separate partition on the system’s hard drive. If you cannot identify the installation media for an operating system that was pre-installed on your computer, consult the documentation supplied with the machine, or contact the manufacturer.

When you have located the installation media for your chosen operating system:

1. Back up any data that you want to keep.
2. Shut down the computer.
3. Boot your computer with the installation disk for the replacement operating system.
4. Follow the prompts presented during the installation process. Windows, OS X, and most Linux installation disks allow you to manually partition your hard drive during the installation process, or will offer you the option to remove all partitions and start with a fresh partition scheme. At this point, remove any existing partitions that the installation software detects or allow the installer to remove the partitions automatically. “System restore” media for computers pre-installed with Microsoft Windows might create a default partition layout automatically without input from you.

20.2. If your computer is configured to dual-boot Fedora and another operating system, removing Fedora without removing the partitions containing the other operating system and its data is more complicated. Specific instructions for a number of operating systems are set out below. To keep neither Fedora nor the other operating system, follow the steps described for a computer with only Fedora installed:

```
# 20.1, "## Fedora ##
### "
```
If you start this procedure and do not complete it, you could leave your computer in a condition where you cannot boot it. The "system restore disk" supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Console.

Windows will not display a file system type for these partitions, but may allocate drive letters to some of them.

c. Right-click on one of the Fedora partitions, then click Delete Partition and click Yes to confirm the deletion. Repeat this process for the other Fedora partitions on your system. As you delete partitions, Windows labels the space on the hard drive previously occupied by those partitions as unallocated.


This procedure relies on the Windows Recovery Console that loads from the Windows installation disk, so you will not be able to complete the procedure without access to this disk.

If you start this procedure and do not complete it, you could leave your computer in a condition where you cannot boot it. The "system restore disk" supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Console.

Windows will not display a file system type for these partitions, but may allocate drive letters to some of them.

c. Right-click on one of the Fedora partitions, then click Delete Partition and click Yes to confirm the deletion. Repeat this process for the other Fedora partitions on your system. As you delete partitions, Windows labels the space on the hard drive previously occupied by those partitions as unallocated.


This procedure relies on the Windows Recovery Console that loads from the Windows installation disk, so you will not be able to complete the procedure without access to this disk. If you start this procedure and do not complete it, you could leave your computer in a condition where you cannot boot it. The "system restore disk" supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Console.

Windows will not display a file system type for these partitions, but may allocate drive letters to some of them.

c. Right-click on one of the Fedora partitions, then click Delete Partition and click Yes to confirm the deletion. Repeat this process for the other Fedora partitions on your system. As you delete partitions, Windows labels the space on the hard drive previously occupied by those partitions as unallocated.
This step is not required to remove Fedora from your computer. However, if you skip this step, you will leave part of your hard drive’s storage capacity unusable by Windows. Depending on your configuration, this might be a significant portion of the storage capacity of the drive.

Extending an existing Windows partition

Adding a new Windows partition

3. Restore the Windows bootloader
Fedora and Microsoft Windows

If you have both a Fedora and Microsoft Windows operating system installed on your computer and you want to boot from the CD, press any key to initiate booting from CD. If you get a window displayed, you need to load the Windows installation software.

b. Welcome to Setup
Windows Recovery Console

- On Windows 2000 and Windows Server 2000, press the R key, then the C key.

Windows Recovery Console

c. Windows Recovery Console

d. Windows

- The system restore disk supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Environment.

1. If you start this procedure and do not complete it, you could leave your computer in a condition where you cannot boot it. The “system restore disk” supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Environment.

20.2.1.2. 
Windows Vista and Windows Server 2008

This procedure relies on the Windows Recovery Environment that loads from the Windows installation disk and you will not be able to complete the procedure without access to this disk.

If you start this procedure and do not complete it, you could leave your computer in a condition where you cannot boot it. The “system restore disk” supplied with some factory-built computers that are sold with Windows pre-installed on them might not include the Windows Recovery Environment.

a. Boot your computer into your Microsoft Windows environment.

b. Start Search diskmgmt.msc

The tool displays a graphical representation of your disk, with bars representing each partition. The first partition is usually labeled NTFS and corresponds to your C: drive. At least two

239
Fedora partitions will be visible. Windows will not display a file system type for these partitions, but may allocate drive letters to some of them.

c. Right-click on one of the Fedora partitions, then click Delete Partition and click Yes to confirm the deletion. Repeat this process for the other Fedora partitions on your system. As you delete partitions, Windows labels the space on the hard drive previously occupied by those partitions as unallocated.

2. Extending an existing Windows partition

   a. Disk Management

      1. Press any key to boot from CD or DVD

      2. Install Windows
dialog's language, date and keyboard layout.

      3. Next


      5. Accept

      6. License Agreement.

      7. Next

      8. Continue

      9. Install

      10. Finish

      11. Restart

      12. Log in.

   b. New Simple Volume Wizard

      1. Drive letter.

      2. Format

      3. NTFS

      4. OK

      5. Create new partition.

      6. Finish

      7. Restart

      8. Log in.

2. Adding a new Windows partition

   a. Disk Management

      1. Press any key to boot from CD or DVD

      2. Install Windows
dialog's language, date and keyboard layout.

      3. Next


      5. Accept

      6. License Agreement.

      7. Next

      8. Continue

      9. Install

      10. Finish

      11. Restart

      12. Log in.

   b. New Simple Volume Wizard

      1. Drive letter.

      2. Format

      3. NTFS

      4. OK

      5. Create new partition.

      6. Finish

      7. Restart

      8. Log in.

2. Restore the Windows bootloader

   a. Windows
dialog's language, date and keyboard layout.

      3. Next

      4. Finish

      5. Restart


   b. Install Windows

      3. Next

      4. Finish

      5. Restart

c. Click **Repair your computer**.

d. **Windows 8** is **Windows Recovery Environment (WRE)**.

   **রাখা সনাক্ত করার পর, পুনরায় ও পুনরায় জন্য, **নিরাপত্তার ইনস্টলেশন নাম্বারি করিন**.

   **রাখা সনাক্ত করার পর, পুনরায় ও পুনরায় জন্য, **নিরাপত্তার ইনস্টলেশন নাম্বারি করিন**.

e. Click **Command prompt**. A command window will open.

f. Type `bootrec /fixmbr` and press **Enter**.

g. When the prompt reappears, close the command window, then click **Restart**.

h. Your computer will restart and boot your Windows operating system.

20.2.2. #ডুয়াল বুটের জন্য কম্পিউটারে Fedora ও Mac OS X

The procedure to remove Fedora from a system that dual-boots Fedora and Mac OS X varies depending on whether you have installed **Boot Camp** on your computer:

---

**রাখা সনাক্ত করার পর, **গার্ডিয়ান ইনস্টলেশন নাম্বারি করিন**.

1. `/Applications/Utilities` - the `Disk Utility` window will open.

2. Select the entry on the left for the disk volume containing Fedora.

3. `Partition` - the `Partition` window will open.

4. **Fedora** partitions will be displayed and Fedora partitions will be listed.

5. Your computer will restart and boot your Windows operating system.

---

20.2.3. #ঝাড়খনি কম্পিউটারে Fedora ও একটি ভিন্ন Linux ডিস্ট্রিবিউশন

The procedure to remove Fedora from a system that dual-boots Fedora and Mac OS X varies depending on whether you have installed **Boot Camp** on your computer:

---

**রাখা সনাক্ত করার পর, **গার্ডিয়ান ইনস্টলেশন নাম্বারি করিন**.

1. `/Applications/Utilities` - the `Disk Utility` window will open.

2. Select the entry on the left for the disk volume containing Fedora.

3. `Partition` - the `Partition` window will open.

4. **Fedora** partitions will be displayed and Fedora partitions will be listed.

5. Your computer will restart and boot your Windows operating system.

---

1. GParted - the `GParted` window will open.

   a. **Fedora** partitions will be displayed and Fedora partitions will be listed.

   **রাখা সনাক্ত করার পর, **গার্ডিয়ান ইনস্টলেশন নাম্বারি করিন**.
b. Open **GParted** either from a desktop menu or by typing `gparted` at the command line and pressing **Enter**.

c. Compute the partitions under the system and then mark the ones to be deleted (press **Delete**). Then run **GParted**.

2. **Booting** from the Fedora partition

**Example only**

These instructions assume that your system uses the **GRUB** bootloader. If you use a different bootloader (such as **LILO**), consult the documentation for that software to identify and remove Fedora entries from its list of boot targets and to ensure that your default operating system is correctly specified.

a. **Root** as the user, type `su` and press **Enter**. Then type **root** and press **Enter**.

b. Type `gedit /boot/grub/grub.conf` and press **Enter**. Gedit will open the text editor.

c. A typical Fedora entry in the **grub.conf** file consists of four lines:

```
Example Fedora entry in grub.conf

title Fedora (2.6.27.19-170.2.35.fc10.i686)
root (hd0,1)
kernel /vmlinuz-2.6.27.19-170.2.35.fc10.i686 ro root=UUID=04a07c13-e6bf-6d5a-b207-002689545705 rhgb quiet
initrd /initrd-2.6.27.19-170.2.35.fc10.i686.img
```

Depending on the configuration of your system, there may be multiple Fedora entries in **grub.conf**, each corresponding to a different version of the Linux kernel. Delete each of the Fedora entries from the file.

d. **GRUB.conf**

When the bootloader reads the partition table, it will run **GRUB**. This is where the boot loader will decide which kernel to load. By default, **GRUB** will load the kernel associated with the first partition.

```
default=
```

Depending on the configuration of your system, there may be multiple Fedora entries in **grub.conf**, each corresponding to a different version of the Linux kernel. Delete each of the Fedora entries from the file.

d. **GRUB.conf**

When the bootloader reads the partition table, it will run **GRUB**. This is where the boot loader will decide which kernel to load. By default, **GRUB** will load the kernel associated with the first partition.

```
default=
```

Depending on the configuration of your system, there may be multiple Fedora entries in **grub.conf**, each corresponding to a different version of the Linux kernel. Delete each of the Fedora entries from the file.

d. **GRUB.conf**

When the bootloader reads the partition table, it will run **GRUB**. This is where the boot loader will decide which kernel to load. By default, **GRUB** will load the kernel associated with the first partition.

```
default=
```

Depending on the configuration of your system, there may be multiple Fedora entries in **grub.conf**, each corresponding to a different version of the Linux kernel. Delete each of the Fedora entries from the file.
Save the updated `grub.conf` file and close `gedit`.

3. Make space available to your operating system.

This step is not required to remove Fedora from your computer. However, if you skip this step, you will leave part of your hard drive's storage capacity unusable by your other Linux operating system. Depending on your configuration, this might be a significant portion of the storage capacity of the drive.

The method to make the space freed by removing the Fedora partitions available to your other Linux operating system differs, depending on whether your chosen operating system is installed on disk partitions configured to use Logical Volume Management (LVM) or not.

- **If you do not use LVM**
  a. Boot your computer from Linux live media, and install `gparted` if it is not already present.
  b. Open `GParted` either from a desktop menu or by typing `gparted` at the command line and pressing `Enter`.
  c. `GParted` displays the partitions on your system both as a graph and as a table. Click on the partition that you want to extend to use the space freed by removing Fedora, and click the `Resize/Move` button.
  d. Partitions on your system will now be extended. In the `GParted` window, click the partition you want to extend, and click the `Resize/Move` button.
  e. In the `GParted` window, click the `Apply` button to apply the changes.
  f. Partitions on your system will now be extended. In the command line, type `e2fsck` followed by the name of the partition you want to extend, for example:

```
   e2fsck /dev/sda3
```

  g. Partitions on your system will now be extended. In the command line, type `resize2fs` followed by the name of the partition you want to extend, for example:

```
   resize2fs /dev/sda3
```
If you use LVM

- **a.** Linux
  - **gparted**
  - **lvm2**

- **b.** Create a new partition in the free space on the disk
  - **i.** Open **GParted’** either from a desktop menu or by typing **gparted** at the command line and pressing **Enter**
  - **ii.** **GParted** displays the partitions on your system both as a graph and as a table. The space freed by removing Fedora is labeled **unallocated**. Right-click on the unallocated space and select **New**. Accept the defaults and **GParted** will create a new partition that fills the space available on the drive.

- **c.** Change the partition type identifier
  - **i.** **Fdisk**
    - **device**
      - **fdisk**
      - **/dev/sda**
    - **LVM**
      - **fdisk**
      - **/dev/sda**
  - **ii.** **Command (m for help)**
    - **partition**
      - **fdisk**
      - **/dev/sda**
    - **t**
      - **fdisk**
      - **/dev/sda**
  - **iii.** **Partition number**
    - (1-4): **partition**, **lvm**
  - **iv.** **Hex code (type L to list codes):**
    - **1**
      - **fdisk**
    - **Enter**
  - **v.** **Command (m for help)**
    - **gparted**
  - **GParted**
    - **disk**
      - **lvm2**
      - **/dev/sda3**
    - **Enter**
    - **Fdisk**

- **d.** Expand the volume group
  - **i.** At the command prompt, type **lvm** and press **Enter** to start the **lvm2** tool.
  - **ii.** At the **lvm>** prompt, type **pvcreate** and press **Enter**
    - where **partition** is the partition that you recently created. For example, **pvcreate** **/dev/sda3**. This creates **/dev/sda3** as a physical volume in LVM.
  - **iii.** At the **lvm>** prompt, type **vgextend** and press **Enter**
    - where **VolumeGroup** is the LVM volume group on which Linux is installed and **partition** is the partition that you recently created. For example, if Linux is installed on **/dev/VolumeGroup00** you would type **vgextend** **/dev/VolumeGroup00** **/dev/sda3** to extend that volume group to include the physical volume at **/dev/sda3**.
iv. At the \texttt{lvm> } prompt, type \texttt{lvextend -l 1+100\%FREE LogVol } and press \texttt{Enter} where \texttt{LogVol} is the logical volume that contains your Linux filesystem. For example, to extend \texttt{LogVol00} to fill the newly-available space in its volume group, \texttt{VolGroup00}, type \texttt{lvextend -l 1+100\%FREE dev/VolGroup00/LogVol00}.

v. At the \texttt{lvm> } prompt, type \texttt{exit} and press \texttt{Enter} to exit \texttt{lvm2}.

e. In DOS and Windows, use the Windows \texttt{fdisk} utility to create a new MBR with the undocumented \texttt{/mbr} flag. This \texttt{fdisk} command only rewriting the MBR to boot the primary DOS partition. The command should look like the following:

\begin{center}
\texttt{fdisk /mbr}
\end{center}

f. After selecting \texttt{Skip}, you are given a command prompt where you can access the partitions you would like to remove.

20.3. # র পরিবর্তে অথবা # র কনো লিগ্যাসি সংস্করণের পূর্বে

In DOS and Windows, use the Windows \texttt{fdisk} utility to create a new MBR with the undocumented \texttt{/mbr} flag. This \texttt{fdisk} command only rewriting the MBR to boot the primary DOS partition. The command should look like the following:

\begin{center}
\texttt{fdisk /mbr}
\end{center}

If you need to remove Linux from a hard drive and have attempted to do this with the default DOS \texttt{fdisk}, you will experience the \textit{Partitions exist but they do not exist} problem. The best way to remove non-DOS partitions is with a tool that understands partitions other than DOS.

After selecting \texttt{Skip}, you are given a command prompt where you can access the partitions you would like to remove.
First, type the command `list-harddrives` This command lists all hard drives on your system that are recognizable by the installation program, as well as their sizes in megabytes.

**Warning**

To remove partitions, use the partitioning utility `parted` where `dev/hda` is the device on which to remove the partition:

```
parted /dev/hda
```

Using the `print` command, view the current partition table to determine the minor number of the partition to remove:

```
print
```

Remove the partition with the command `rm` For example, to remove the partition with minor number 3:

```
rm 3
```

**Important**

The changes start taking place as soon as you press [Enter], so review the command before committing to it.

After removing the partition, use the `print` command to confirm that it is removed from the partition table.

Once you have removed the Linux partitions and made all of the changes you need to make, type `quit` to quit `parted`.

After quitting `parted` type `exit` at the boot prompt to exit rescue mode and reboot your system, instead of continuing with the installation. The system should reboot automatically. If it does not, you can reboot your computer using `Control`+`Alt`+`Delete`.
V. Technical appendixes

Fedora installation is not mentioned in this section. However, the technology related to various stages of Fedora preparation is analyzed to help users understand the steps of preparation with the help of various tools.
A. An Introduction to Disk Partitions

Note

This appendix is not necessarily applicable to non-x86-based architectures. However, the general concepts mentioned here may apply.

If you are reasonably comfortable with disk partitions, you could skip ahead to "Fedora-# ***** ***** *******" for more information on the process of freeing up disk space to prepare for a Fedora installation. This section also discusses the partition naming scheme used by Linux systems, sharing disk space with other operating systems, and related topics.

A.1. Hard Disk Basic Concepts

Hard disks perform a very simple function—they store data and reliably retrieve it on command.

Not much to look at, is it? But if we are talking about disk drives on a basic level, it is adequate. Say that we would like to store some data on this drive. As things stand now, it will not work. There is something we need to do first.

A.1.1. It is Not What You Write, it is How You Write It

অভিজ্ঞ কম্পিউটার ব্যবহারকারীরা প্রথম প্রচেষ্টায় এটা জেনে থাকবেন। ড্রাইভটা প্রথমে ******* করতে হবে ফরম্যাটিং প্রক্রিয়ায় (সাধারণত যা "******* ******* নির্দেশনাদুপে পরিচিতি") ড্রাইভের উপর কিছু তথ্য লিখতে, ফর্ম্যাট না-করা ড্রাইভটির শুরুতে পরিসীমার করা হয়।
A. An Introduction to Disk Partitions

A.2. Disk Drive with a File System

Given that file systems make things like directories and files possible, these trade-offs are usually seen as a small price to pay.

It is also worth noting that there is no single, universal file system. As A.3, “Disk Drive with a Different File System”, shows, a disk drive may have one of many different file systems written on it. As you might guess, different file systems tend to be incompatible; that is, an operating system that supports one file system (or a handful of related file system types) may not support another. This last statement is not a hard-and-fast rule, however. For example, Fedora supports a wide variety of file systems (including many commonly used by other operating systems), making data interchange between different file systems easy.

Of course, writing a file system to disk is only the beginning. The goal of this process is to actually store and retrieve data. Let us take a look at our drive after some files have been written to it.
Partitions: Turning One Drive Into Many

As with most computer-related technologies, disk drives changed over time after their introduction. In particular, they got bigger. Not larger in physical size, but bigger in their capacity to store information. And, this additional capacity drove a fundamental change in the way disk drives were used.

A.1.2. Partitions: Turning One Drive Into Many

As disk drive capacities soared, some people began to wonder if having all of that formatted space in one big chunk was such a great idea. This line of thinking was driven by several issues, some philosophical, some technical. On the philosophical side, above a certain size, it seemed that the additional space provided by a larger drive created more clutter. On the technical side, some file systems were never designed to support anything above a certain capacity. Or the file systems support larger drives with a greater capacity, but the overhead imposed by the file system to track files became excessive.

The solution to this problem was to divide disks into partitions. Each partition can be accessed as if it was a separate disk. This is done through the addition of a partition table.

Note

While the diagrams in this chapter show the partition table as being separate from the actual disk drive, this is not entirely accurate. In reality, the partition table is stored at the very start of the disk, before any file system or user data. But for clarity, they are separate in our diagrams.
A. An Introduction to Disk Partitions

Each partition table entry contains several important characteristics of the partition:

- The points on the disk where the partition starts and ends
- The partition's type
- Whether the partition is "active" or not
- The partition's size
- Which operating system is bootable from this partition
- Which file system is used on this partition
- The physical location of the partition

In many cases, there is only a single partition spanning the entire disk, essentially duplicating the method used before partitions. The partition table has only one entry used, and it points to the start of the partition.

We have labeled this partition as being of the "DOS" type. Although it is only one of several possible partition types listed in A.1, "Partition Types", it is adequate for the purposes of this discussion.

### A.1, "Partition Types"-এর জন্য আমন্ত্রিত জোগাড় অন্যতম সংক্ষেপ প্রদত্ত হয়েছে। একটি একটি অপারেটিং সিস্টেমের জন্য সংমিশ্রিত তথ্য ব্যক্ত করে।
A.1.3. **Partitions within Partitions** — An Overview of Extended Partitions

Of course, over time it became obvious that four partitions would not be enough. As disk drives continued to grow, it became more and more likely that a person could configure four reasonably-sized partitions and still have disk space left over. There needed to be some way of creating more partitions.

Enter the extended partition. As you may have noticed in the "Partition Types", there is an "Extended" partition type. It is this partition type that is at the heart of extended partitions.

When a partition is created and its type is set to "Extended," an extended partition table is created. In essence, the extended partition is like a disk drive in its own right (it has a partition table that points to one or more partitions (now called logical partitions, as opposed to the four primary partitions) contained entirely within the extended partition itself. shows a disk drive with one primary partition and one extended partition containing two logical partitions (along with some unpartitioned free space).
A. An Introduction to Disk Partitions

As this figure implies, there is a difference between primary and logical partitions — there can only be four primary partitions, but there is no fixed limit to the number of logical partitions that can exist. However, due to the way in which partitions are accessed in Linux, you should avoid defining more than two logical partitions on a single disk drive.

Asus, Fedora

A.7. Disk Drive With Extended Partition

The following list presents some possible scenarios you may face when attempting to repartition your hard disk:

- Unpartitioned free space is available
- An unused partition is available
- Free space in an actively used partition is available

Let us look at each scenario in order.

Note

A.1.4.1. Using Unpartitioned Free Space

In this scenario, if the partitions are not fully utilized, you can add free space to the unpartitioned part of the drive.

A.8. Disk Drive with Unpartitioned Free Space
A.8, “Disk Drive with Unpartitioned Free Space”-এ পার্টিশন না করা অব্যবহৃত স্থানসহ ডিস্ক-ড্রাইভের ছবি, যেখানে 1 বরাদ্দ না করা স্থানসহ একটি অনিয়োক্ত পার্টিশনকে চিহ্নিত করে এবং 2 বরাদ্দ করা স্থানসহ একটি নির্দিষ্ট পার্টিশনকে চিহ্নিত করে।

If you think about it, an unused hard disk also falls into this category. The only difference is that all the space is not part of any defined partition.

In any case, you can create the necessary partitions from the unused space. Unfortunately, this scenario, although very simple, is not very likely (unless you have just purchased a new disk just for Fedora). Most pre-installed operating systems are configured to take up all available space on a disk drive (refer to A.4.3, "Using Free Space from an Active Partition").

Next, we will discuss a slightly more common situation.

A.1.4.2. Using Space from an Unused Partition

এই পরিস্থিতিতে, সম্ভবত আপনার সিস্টেমে এক অথবা একাধিক পার্টিশন উপস্থিত রয়েছে যেগুলি আপনি বর্তমানে ব্যবহার করছেন না। সম্ভবত আপনি কোনো ভিন্ন অপারেটিং সিস্টেমে নয়ে পরীক্ষা করেছিলেন এবং সেটির জন্য বরাদ্দ করা পার্টিশনগুলি এখন ব্যবহৃত হচ্ছে না। A.9, "Disk Drive With an Unused Partition"-এ এই রকমের একটি পরিস্থিতির বর্ণনা করা হয়েছে।

If you find yourself in this situation, you can use the space allocated to the unused partition. You first must delete the partition and then create the appropriate Linux partition(s) in its place. You can delete the unused partition and manually create new partitions during the installation process.

A.1.4.3. Using Free Space from an Active Partition

This is the most common situation. It is also, unfortunately, the hardest to handle. The main problem is that, even if you have enough free space, it is presently allocated to a partition that is already in use. If you purchased a computer with pre-installed software, the hard disk most likely has one massive partition holding the operating system and data.

Aside from adding a new hard drive to your system, you have two choices:
A. An Introduction to Disk Partitions

Basically, you delete the single large partition and create several smaller ones. As you might imagine, any data you had in the original partition is destroyed. This means that making a complete backup is necessary. For your own sake, make two backups, use verification (if available in your backup software), and try to read data from your backup before you delete the partition.

### Warning

If there was an operating system of some type installed on that partition, it needs to be reinstalled as well. Be aware that some computers sold with pre-installed operating systems may not include the CD-ROM media to reinstall the original operating system. The best time to notice if this applies to your system is before you destroy your original partition and its operating system installation.

After creating a smaller partition for your existing operating system, you can reinstall any software, restore your data, and start your Fedora installation. "Disk Drive Being Destructively Repartitioned" shows this being done.

Here, you run a program that does the seemingly impossible: it makes a big partition smaller without losing any of the files stored in that partition. Many people have found this method to be reliable and trouble-free. What software should you use to perform this feat? There are several disk management software products on the market. Do some research to find the one that is best for your situation.

While the process of non-destructive repartitioning is rather straightforward, there are a number of steps involved:
• Compress and backup existing data
  • উপস্থিত পার্টিশনের মাপ পরিবর্তন করুন
  • নতুন পার্টিশন নির্মাণ করুন

Next we will look at each step in a bit more detail.

A.1.4.3.1. Compress existing data

As A.11, “Disk Drive Being Compressed”, shows, the first step is to compress the data in your existing partition. The reason for doing this is to rearrange the data such that it maximizes the available free space at the “end” of the partition.

Chitat
A.11. Disk Drive Being Compressed

This step is crucial. Without it, the location of your data could prevent the partition from being resized to the extent desired. Note also that, for one reason or another, some data cannot be moved. If this is the case (and it severely restricts the size of your new partition(s)), you may be forced to destructively repartition your disk.

A.1.4.3.2. উপস্থিত পার্টিশনের মাপ পরিবর্তন করুন

As A.12, “Disk Drive with Partition Resized”, shows, the new freed space can be used to create a new partition or extend the existing one. It is important to understand what the resizing software you use does with the newly freed space, so that you can take the appropriate steps. In the case we have illustrated, it would be best to delete the new DOS partition and create the appropriate Linux partition(s).
A. An Introduction to Disk Partitions

A.1.4.3.3. নতুন পার্টিশন নির্মাণ করুন

পূর্ববর্তী ধাপের ইঙ্গিত অনুযায়ী নতুন পার্টিশন নির্মাণের পূর্যন্ত হতেও পারে অথবা নাও হতে পারে। কিন্তু আপনার পার্টিশনের মাঝে পরিবর্তনকারী সফ্টওয়্যার যদি Linux সম্পর্কে অবগত হয়ে থাকে, তাহলে সম্ভবত আপনাকে মাঝে পরিবর্তন করার সময় নরমিতি পার্টিশনটি মুছে ফেলতে হবে। # A.13, “Disk Drive with Final Partition Configuration”-এ এই পূর্বকর্ময় বর্ণনা দেওয়া হয়েছে।

চিত্র A.13. Disk Drive with Final Partition Configuration

# A.13, “Disk Drive with Final Partition Configuration”-র মধ্যে ১-এ পূর্ববর্তী রূপ এবং ২-এ পরবর্তী রূপ প্রদর্শিত হয়েছে।

Note

The following information is specific to x86-based computers only.
As a convenience to our customers, we provide the parted utility. This is a freely available program that can resize partitions.

If you decide to repartition your hard drive with parted it is important that you be familiar with disk storage and that you perform a backup of your computer data. You should make two copies of all the important data on your computer. These copies should be to removable media (such as tape, CD-ROM, or diskettes), and you should make sure they are readable before proceeding.

If you decide to repartition your hard drive with parted it is important that you be familiar with disk storage and that you perform a backup of your computer data. You should make two copies of all the important data on your computer. These copies should be to removable media (such as tape, CD-ROM, or diskettes), and you should make sure they are readable before proceeding.

A.1.5. পার্টিশন নামাঙ্কনের পদ্ধতি

লিনাক্সের পার্টিশনকে অক্ষর এবং সংখ্যার সংমিশ্রণে চিহ্নিত করে থাকে যার ফলে বিভাগনিত স্থানের সম্ভাবনা হয়,যা বিশেষ কর্তা যদি হাটা-ড্রাইভ এবং তাপীয় অবস্থার পার্টিশনগুলি প্রত্যেকে পূর্ত হয় উল্লেখ করা যেতে পারে।

র কৃত্রিম নমুনা প্লানের অবস্থান যদি বিভাগনিত হয় থাকে:

- তাড়াতাড়ি করা জানার জন্য পূর্তপরীক্ষার পার্টিশনের ধরন পরিকৃত করা হয়।
- পার্টিশনের ধরন সম্পর্কে তথ্যদান করা তার জন্য একটি ”ড্রাইভ চালকৃত্তার অক্ষর” নরমিতি করা যায়। ড্রাইভকে চালিয়ে দিতে আরম্ভ হয় এবং যে সংখ্যক পার্টিশন নামাঙ্কন করা পূর্যন্ত তার উপর নরমিতি করতে অক্ষর ব্যবহৃত হয়।

The drive letter can then be used to refer to that partition as well as the file system contained on that partition.

1. The following information is specific to x86-based computers only.
2. As a convenience to our customers, we provide the parted utility. This is a freely available program that can resize partitions.
3. If you decide to repartition your hard drive with parted it is important that you be familiar with disk storage and that you perform a backup of your computer data. You should make two copies of all the important data on your computer. These copies should be to removable media (such as tape, CD-ROM, or diskettes), and you should make sure they are readable before proceeding.
4. A.1.5. পার্টিশন নামাঙ্কনের পদ্ধতি
5. উল্লেখিত পার্টিশনকে অক্ষর এবং সংখ্যার সংমিশ্রণে চিহ্নিত করে থাকে যার ফলে বিভাগনিত স্থানের সম্ভাবনা হয়, যা বিশেষ কর্তা যদি হাটা-ড্রাইভ এবং তাপীয় অবস্থার পার্টিশনগুলি।
6. র কৃত্রিম নমুনা প্লানের অবস্থান যদি বিভাগনিত হয় থাকে:
7. তাড়াতাড়ি করা জানার জন্য পূর্তপরীক্ষার পার্টিশনের ধরন পরিকৃত করা হয়।
8. পার্টিশনের ধরন সম্পর্কে তথ্যদান করা তার জন্য একটি ”ড্রাইভ চালকৃত্তার অক্ষর” নরমিতি করা যায়। ড্রাইভকে চালিয়ে দিতে আরম্ভ হয় এবং যে সংখ্যক পার্টিশন নামাঙ্কন করা পূর্যন্ত তার উপর নরমিতি করতে অক্ষর ব্যবহৃত হয়।
9. The drive letter can then be used to refer to that partition as well as the file system contained on that partition.

258
Here is how to decipher the partition naming scheme:

/\dev/

This is the name of the directory in which all device files reside. Since partitions reside on hard disks, and hard disks are devices, the files representing all possible partitions reside in `/\dev/`.

xx

The first two letters of the partition name indicate the type of device on which the partition resides, usually either `hd` (for IDE disks) or `sd` (for SCSI disks).

y

This letter indicates which device the partition is on. For example, `/\dev/hda` (the first IDE hard disk) or `/\dev/sdb` (the second SCSI disk).

N

The final number denotes the partition. The first four (primary or extended) partitions are numbered 1 through 4. Logical partitions start at 5. So, for example, `/\dev/hda3` is the third primary or extended partition on the first IDE hard disk, and `/\dev/sdb6` is the second logical partition on the second SCSI hard disk.

Note

A.1.6. Disk Partitions and Other Operating Systems

Fedora

Linux-

DOS/Windows-

র থেকে ভিন্ন এই নামাঙ্কন পদ্ধতির কোনো অংশ পার্টিশনের ধরনের উপর ভিত্তি করে নয়। বাকী নামাঙ্কন পদ্ধতির কোনো অংশের ধরনের উপর ভিত্তি করে না হলেও, অন্যান্য অপারেটিং সিস্টেমগুলো ফাইল-ভিত্তিক এবং `/\dev/` রূপে ব্যবহার করা হয়।

A.1.7. Disk Partitions and Mount Points

Fedora

Linux-

DOS/Windows-

This is entirely different from how Linux deals with partitions and, for that matter, with disk storage in general. The main difference is that each partition is used to form part of the storage necessary to support a single set of files and directories. This is done by associating a partition with a directory through a process known as mounting. Mounting a partition makes its storage available starting at the specified directory (known as a mount point).
For example, if partition /dev/hda5 is mounted on /usr/ that would mean that all files and directories under /usr/ physically reside on /dev/hda5. So the file /usr/share/doc/FAQ/txt/Linux-FAQ would be stored on /dev/hda5 while the file /etc/gdm/custom.conf would not.

Continuing our example, it is also possible that one or more directories below /usr/ would be mount points for other partitions. For instance, a partition (say, /dev/hda7) could be mounted on /usr/local/ meaning that /usr/local/man/whatis would then reside on /dev/hda7 rather than /dev/hda5.

A.1.8. How Many Partitions?

In Fedora installation process, certain system partitions are necessary and may be needed for various reasons. In the Linux community, there is a lot of debate about how many partitions to have and how to choose them. In general, a minimum of:

- swap
- /boot
- (root)

For more details, please refer to Section 8.17.5, "Recommended Partitioning Scheme".
B. iSCSI disks

Internet Small Computer System Interface (iSCSI) is a protocol that allows computers to communicate with storage devices by SCSI requests and responses carried over TCP/IP. Because iSCSI is based on the standard SCSI protocols, it uses some terminology from SCSI. The device on the SCSI bus to which requests get sent (and which answers these requests) is known as the target and the device issuing requests is known as the initiator. In other words, an iSCSI disk is a target and the iSCSI software equivalent of a SCSI controller or SCSI Host Bus Adapter (HBA) is called an initiator. This appendix only covers Linux as an iSCSI initiator: how Linux uses iSCSI disks, but not how Linux hosts iSCSI disks.

Linux has a software iSCSI initiator in the kernel that takes the place and form of a SCSI HBA driver and therefore allows Linux to use iSCSI disks. However, as iSCSI is a fully network-based protocol, iSCSI initiator support needs more than just the ability to send SCSI packets over the network. Before Linux can use an iSCSI target, Linux must find the target on the network and make a connection to it. In some cases, Linux must send authentication information to gain access to the target. Linux must also detect any failure of the network connection and must establish a new connection, including logging in again if necessary.

The discovery, connection, and logging in is handled in userspace by the iscsiadm utility, and the error handling is also handled in userspace by iscsid.

Fedora-iscsiadm and iscsid’ iscsi-initiator-utils

B.1. iSCSI disks in anaconda

Anaconda can discover (and then log in to) iSCSI disks in two ways:

1. When anaconda starts, it checks if the BIOS or add-on boot ROMs of the system support iSCSI.

Boot Firmware Table

(iBFT), a BIOS extension for systems which can boot from iSCSI. If the BIOS supports iBFT, anaconda will read the iSCSI target information for the configured boot disk from the BIOS and log in to this target, making it available as an installation target.

2. Before installation, anaconda will discover all available targets, then prompt the user to choose a target to be used for installation.

Advanced storage configuration

IP: IP address of iSCSI target.

Anacconda

iSCSI

If is placed on an iSCSI target, anaconda sets NetworkManager to ignore any network interfaces that were active during the installation process. These interfaces will also be configured by initrd when
the system starts. If NetworkManager were to reconfigure these interfaces, the system would lose its connection to `/`.

### B.2. iSCSI disks during start up

iSCSI-related events might occur at a number of points while the system starts:

1. The init script in the `initrd` will log in to iSCSI targets used for `/` (if any). This is done using the `iscsistart` utility (which can do this without requiring `iscsid` to run).

2. When the root filesystem has been mounted and the various service initscripts get run, the `iscsid` initscript will get called. This script will then start `iscsid` if any iSCSI targets are used for `/` or if any targets in the iSCSI database are marked to be logged in to automatically.

3. After the classic network service script has been run (or would have been run if enabled) the `iscsi` initscript will run. If the network is accessible, this will log in to any targets in the iSCSI database which are marked to be logged in to automatically. If the network is not accessible, this script will exit quietly.

4. When using NetworkManager to access the network (instead of the classic network service script), NetworkManager will call the `iscsi` initscript. See: `/etc/NetworkManager/dispatcher.d/04-iscsi`

Because NetworkManager is installed in `/usr` you cannot use it to configure network access if `/usr` is on network-attached storage such as an iSCSI target.

If `iscsid` is not needed as the system starts, it will not start automatically. If you start `iscsiadm` `iscsiadm` will start `iscsid` in turn.
C. What is block device encryption?

A block device encryption is a method of encrypting the contents of a block device. This can be used to protect the data on the device against unauthorized access. When a block device is encrypted, all data written to it is encrypted, and all data read from it is decrypted. This ensures that the data remains confidential and secure, even if the device is lost or stolen.

C.2. Encrypting block devices using dm-crypt/LUKS

Linux Unified Key Setup (LUKS) is a standard for encrypting block devices. It is commonly used with dm-crypt, a module in the Linux kernel that allows for the encryption of block devices. LUKS is designed to be used with removable storage media, such as USB flash drives, and laptop disk drives.

C.2.1. Overview of LUKS

• What LUKS does:
  • LUKS encrypts entire block devices
  • LUKS is thereby well-suited for protecting the contents of mobile devices such as:
    • Removable storage media
    • Laptop disk drives
  • This makes it useful for encrypting swap devices.
  • This can also be useful with certain databases that use specially formatted block devices for data storage.
  • LUKS uses the existing device mapper kernel subsystem.
  • This is the same subsystem used by LVM, so it is well tested.
  • LUKS provides passphrase strengthening.
  • This protects against dictionary attacks.
  • LUKS devices contain multiple key slots.
  • This allows users to add backup keys/passphrases.

• What LUKS does not do:
  • LUKS is not well-suited for applications requiring many (more than eight) users to have distinct access keys to the same device.
  • LUKS is not well-suited for applications requiring file-level encryption.

LUKS

রয়েছে।

সম্বন্ধে অধিক তথ্য http://code.google.com/p/cryptsetup/-র প্রজেক্ট ওয়েব-সাইটে উপস্থিত রয়েছে।
C.2.2. How will I access the encrypted devices after installation? (System Startup)

During system startup you will be presented with a passphrase prompt. After the correct passphrase has been provided the system will continue to boot normally. If you used different passphrases for multiple encrypted devices you may need to enter more than one passphrase during the startup.

**Consider using the same passphrase for all encrypted block devices in a given system. This will simplify system startup and you will have fewer passphrases to remember. Just make sure you choose a good passphrase!**

C.2.3. Choosing a Good Passphrase

While dm-crypt/LUKS supports both keys and passphrases, the anaconda installer only supports the use of passphrases for creating and accessing encrypted block devices during installation.

LUKS দ্বারা পরিচয়পংক্তি দৃঢ় করার সুবিধা উপলব্ধ হলেও, একটি সুদৃঢ় (অর্থাৎ "অনুমান করতে কঠিন") পরিচয়পংক্তি নির্ধারণ করা বার্ষিকীয় উল্লেখ্যা, “পাসওয়ার্ড”-র পরিবর্তে ইচ্ছাকর্তব্য পরিচয়পংক্তি” শব্দটি ব্যবহার করা হয়েছে। তথ্যের নিরাপত্তা বৃদ্ধি করার জন্য মূল বিষয়টি একটি পংক্তির ব্যবহার জন্য পরিচয়পংক্তি নির্ধারণ করা সুবিধা উপলব্ধ হলেও এটি পরিচয়পংক্তি নির্ধারণ করার জন্য যথেষ্ট পরিচয়পংক্তি নির্ধারণ করা পরিচয়পংক্তি উদ্দেশ্যে করা হয়ে থাকে। তথ্যের নিরাপত্তা বৃদ্ধি করার জন্য একাধিক শব্দ বিশিষ্ট একটি পংক্তির ব্যবহার জন্য পরিচয়পংক্তি নির্ধারণ করা জন্য যথেষ্ট।

C.3. Creating Encrypted Block Devices in Anaconda

You can create encrypted devices during system installation. This allows you to easily configure a system with encrypted partitions.

You can use **kickstart** to set a separate passphrase for each new encrypted block device.

C.3.1. What Kinds of Block Devices Can Be Encrypted?

Most types of block devices can be encrypted using LUKS. From anaconda you can encrypt partitions, LVM physical volumes, LVM logical volumes, and software RAID arrays.
# C.3.2. Encrypted Block Devices

**Install**

When installing, you can use the kickstart file to install encrypted block devices. This can be done at install time (via `anaconda`) or at boot time (via `systemd`). For boot-time encryption, you must use a certificate that is trusted by `systemd`. To do this, you need to have a certificate available, and you can use the `--escrowcert` option with the `autopart`, `logvol`, `part`, or `raid` command to specify the certificate.

### Warning

The commands below will destroy any existing data on the device.

- **The best way**, which provides high quality random data but takes a long time (several minutes per gigabyte on most systems):

  ```
  dd if=/dev/urandom of=<device>
  ```

- **Fastest way**, which provides lower quality random data:

### C.4. Creating Encrypted Block Devices on the Installed System After Installation

Encrypted block devices can be created and configured after installation.

# C.4.1. Create the block devices

Create the block devices you want to encrypt by using `parted` and `pvcreate`, `lvcreate`, and `mdadm`.

# C.4.2. Optional: Fill the device with random data

Filling `<device>` (e.g. `/dev/sda3`) with random data before encrypting it greatly increases the strength of the encryption. The downside is that it can take a very long time.

### Warning

The commands below will destroy any existing data on the device.
C.4.3. Format the device as a dm-crypt/LUKS encrypted device

⚠️ Warning

The command below will destroy any existing data on the device.
```
cryptsetup luksFormat <device>
```

🔥 Source

For more information, read the `cryptsetup(8)` man page.
```
After supplying the passphrase twice the device will be formatted for use. To verify, use the following command:
```
```
cryptsetup isLuks <device> && echo Success
```
To see a summary of the encryption information for the device, use the following command:
```
cryptsetup luksDump <device>
```

C.4.4. # cópercíyêt córá təxɔyɛ́ɛ bɔywбра́, bəmua təməpbə́ aájomə́, bəmũyə́ nənu də́nə́ jə́nə́

Để định nghĩa một bảng mã hóa cho một thiết bị yêu cầu kernel-device-mapper và LUKS.

Để xác định một tên mã hóa biết được mỗi thiết bị LUKS UUID (Universally Unique Identifier), sử dụng UUID của /dev/sda3. Dựa vào UUID này, viết tên mã hóa bằng `luks-<uuid>` và chạy lại lệnh `luksOpen <device> <name>`.

```
cryptsetup luksUUID <device>
```

Một ví dụ của một tên mã hóa đáng tin cậy, cung cấp thông tin và một tên mã hóa độc đáo có thể là `luks-<uuid>` trong đó `<uuid>` được thay thế bằng UUID của LUKS (ví dụ: `luks-50ec957a-5b5a-47ee-85e6-f8085bbc97a8`). Biểu thức tên mã hóa này có thể dường như quá phức tạp nhưng không cần thiết phải nhập nó thường xuyên.
```
cryptsetup luksOpen <device> <name>
```

Nếu bây giờ cần một tên mã hóa `/dev/mapper/<name>` để biểu diễn thiết bị mã hóa. Thiết bị mã hóa có thể đọc và ghi vào như bất kỳ thiết bị block không mã hóa nào khác.

Để xem một số thông tin về thiết bị được mã hóa, sử dụng lệnh sau:
```
```
Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device.

```bash
dmsetup info <name>
```

For more information, read the `dmsetup(8)` man page.

**C.4.5. Create filesystems on the mapped device, or continue to build complex storage structures using the mapped device**

Use the mapped device node (`/dev/mapper/<name>`) as any other block device. To create an `ext2` filesystem on the mapped device, use the following command:

```bash
mke2fs /dev/mapper/<name>
```

To mount this filesystem on `/mnt/test` use the following command:

```bash
mount /dev/mapper/<name> /mnt/test
```

The directory `/mnt/test` must exist before executing this command.

**C.4.6. Add the mapping information to `/etc/crypttab**

Add an entry to `/etc/crypttab`. This is only necessary if you want to establish a persistent association between the device and a mountpoint. Use the decrypted device, `/dev/mapper/<name>` in the `/etc/fstab` file.

In many cases it is desirable to list devices in `/etc/fstab` by UUID or by a filesystem label. The main purpose of this is to provide a constant identifier, in the event that the device name (e.g. `/dev/sda4`) changes. LUKS device names in the form of `/dev/mapper/luks-<luks_uuid>` are based
only on the device's LUKS UUID, and are therefore guaranteed to remain constant. This fact makes them suitable for use in `/etc/fstab`.

<table>
<thead>
<tr>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>For details on the format of the <code>/etc/fstab</code> file, read the <code>fstab(5)</code> man page.</td>
</tr>
</tbody>
</table>

### C.5. Common Post-Installation Tasks

The following sections are about common post-installation tasks.

### C.5.1. Set a randomly generated key as an additional way to access an encrypted block device

These sections are about generating keys and adding keys.

#### C.5.1.1. Generate a key

This will generate a 256-bit key in the file `$HOME/keyfile`.

```
dd if=/dev/urandom of=$HOME/keyfile bs=32 count=1
chmod 600 $HOME/keyfile
```

#### C.5.1.2. Add the key to an available keyslot on the encrypted device

```
cryptsetup luksAddKey <device> ~/keyfile
```

### C.5.2. Add a new passphrase to an existing device

```
cryptsetup luksAddKey <device>
```

After being prompted for any one of the existing passphrases for authentication, you will be prompted to enter the new passphrase.

### C.5.3. Remove a passphrase or key from a device

```
cryptsetup luksRemoveKey <device>
```

You will be prompted for the passphrase you wish to remove and then for any one of the remaining passphrases for authentication.
**D. Understanding LVM**

LVM (Logical Volume Management) partitions provide a number of advantages over standard partitions. LVM partitions are formatted as physical volumes. One or more physical volumes are combined to form a volume group. Each volume group’s total storage is then divided into one or more logical volumes. The logical volumes function much like standard partitions. They have a file system type, such as `ext4` and a mount point.

### The `/boot` Partition and LVM

By default, the installation process creates `/` and swap partitions within LVM volumes, with a separate `/boot` partition.
E. The GRUB Boot Loader

Fedora's GRUB boot loader enables the selection of the installed operating system or kernel to be loaded at system boot time. It also allows the user to pass arguments to the kernel.

E.1. GRUB and the x86 Boot Process

The x86 boot process involves several stages:

1. **The Stage 1.5 boot loader is read into memory by the Stage 1 boot loader, if necessary.** Some hardware requires an intermediate step to get to the Stage 2 boot loader. This is sometimes true when the `/boot` partition is above the last cylinder head of the hard drive or when using LBA mode. The Stage 1.5 boot loader is found either on the `/boot` partition or on a small part of the MBR.

2. **The Stage 2 or secondary boot loader is read into memory.** The secondary boot loader displays the GRUB menu and command environment. This interface allows the user to select which kernel or operating system to boot, pass arguments to the kernel, or look at system parameters.

---

**Important**

**Supported file systems**

The GRUB bootloader in Fedora supports only the ext2, ext3, and ext4 (recommended) file systems. You cannot use any other file system for `/boot`, such as Btrfs, XFS, or VFAT.

---

**x86**

Fedora's GRUB-
4. The secondary boot loader reads the operating system or kernel as well as the contents of `/boot/sysroot/` into memory. Once GRUB determines which operating system or kernel to start, it loads it into memory and transfers control of the machine to that operating system.

The method used to boot Linux is called direct loading because the boot loader loads the operating system directly. There is no intermediary between the boot loader and the kernel.

The boot process used by other operating systems may differ. For example, the Microsoft® Windows® operating system, as well as other operating systems, are loaded using chain loading. Under this method, the MBR points to the first sector of the partition holding the operating system, where it finds the files necessary to actually boot that operating system.

GRUB supports both direct and chain loading boot methods, allowing it to boot almost any operating system.

**Warning**

Installation of Microsoft®-DOS or Windows installation programs overwrites MBR information, which can cause GRUB to disappear. To create a dual-boot system, Microsoft® operating system must be installed first.

**E.2.2. Features of GRUB**

GRUB contains several features that make it preferable to other boot loaders available for the x86 architecture. Below is a partial list of some of the more important features:

- **GRUB provides a true command-based, pre-OS environment on x86 machines.** This feature affords the user maximum flexibility in loading operating systems with specified options or gathering information about the system. For years, many non-x86 architectures have employed pre-OS environments that allow system booting from a command line.

- **GRUB uses LBA (Logical Block Addressing).** LBA file system address translation system allows hard drives and all types of hard drives to be used. Before the introduction of LBA, boot loaders were limited to 1024 cylinders, which meant that files after the first 1024 cylinders could not be loaded. With LBA, GRUB is able to boot operating systems that are located after the first 1024 cylinders.

- **GRUB, ext2 file systems.** GRUB reads its own configuration file `/boot/grub/grub.conf` every time it boots, and these configuration files can be modified to customize the boot process. To install GRUB to the MBR, only the `/boot` partition needs to be moved. Read E.3, "Installing GRUB" for more information.
E.3. Installing GRUB

If GRUB was not installed during the installation process, it can be installed afterward. Once installed, it automatically becomes the default boot loader.

Before installing GRUB, make sure to use the latest GRUB package available or use the GRUB package from the installation DVD. For instructions on installing packages, refer to the chapter titled Package Management with RPM in the Fedora Deployment Guide.

Once the GRUB package is installed, open a root shell prompt and run the command `/sbin/grub-install <location>`, where `<location>` is the location that the GRUB Stage 1 boot loader should be installed. For example, the following command installs GRUB to the MBR of the master IDE device:

```
/sbin/grub-install /dev/hda
```

The next time the system boots, the GRUB graphical boot loader menu appears before the kernel loads into memory.

E.4. GRUB Terminology

One of the most important things to understand before using GRUB is how the program refers to devices, such as hard drives and partitions. This information is particularly important when configuring GRUB to boot multiple operating systems.

E.4.1. Device Names

When referring to a specific device with GRUB, do so using the following format (note that the parentheses and comma are very important syntactically):

```
(<type-of-device><bios-device-number>,<partition-number>)
```

The `<type-of-device>` specifies the type of device from which GRUB boots. The two most common options are `hd` for a hard disk or `fd` for a 3.5 inch diskette. A lesser used device type is also available called `nd` for a network disk. Instructions on configuring GRUB to boot over the network are available online at [http://www.gnu.org/software/grub/manual/](http://www.gnu.org/software/grub/manual/).
E. The GRUB Boot Loader

The `<bios-device-number>` is the BIOS device number. The primary IDE hard drive is numbered 0 and a secondary IDE hard drive is numbered 1. This syntax is roughly equivalent to that used for devices by the kernel. For example, the `a` in `hda` for the kernel is analogous to the 0 in `hd0` for GRUB, the `b` in `hdb` is analogous to the 1 in `hd1` and so on.

The `<partition-number>` specifies the number of a partition on a device. Like the `<bios-device-number>`, most types of partitions are numbered starting at 0. However, BSD partitions are specified using letters, with `a` corresponding to 0, `b` corresponding to 1, and so on.

**Note**

The numbering system for devices under GRUB always begins with 0, not 1. Failing to make this distinction is one of the most common mistakes made by new users.

To give an example, if a system has more than one hard drive, GRUB refers to the first hard drive as `(hd0)` and the second as `(hd1)` Likewise, GRUB refers to the first partition on the first drive as `(hd0,0)` and the third partition on the second hard drive as `(hd1,2)`

In general, the following rules apply when naming devices and partitions under GRUB:

- It does not matter if system hard drives are IDE or SCSI, all hard drives begin with the letters `hd`. The letters `fd` are used to specify floppy diskettes.

- To specify an entire device without respect to partitions, leave off the comma and the partition number. This is important when telling GRUB to configure the MBR for a particular disk. For example, `(hd0)` specifies the MBR on the first device and `(hd3)` specifies the MBR on the fourth device.

- If a system has multiple drive devices, it is very important to know how the drive boot order is set in the BIOS. This is a simple task if a system has only IDE or SCSI drives, but if there is a mix of devices, it becomes critical that the type of drive with the boot partition be accessed first.

### E.4.2. File Names and Blocklists

When typing commands to GRUB that reference a file, such as a menu list, it is necessary to specify an absolute file path immediately after the device and partition numbers.

The following illustrates the structure of such a command:

```
(<device-type><device-number>,<partition-number>)<path/to/file>
```

In this example, replace `<device-type>` with `hd`, `fd`, or `nd`. Replace `<device-number>` with the integer for the device. Replace `<path/to/file>` with an absolute path relative to the top-level of the device.

It is also possible to specify files to GRUB that do not actually appear in the file system, such as a chain loader that appears in the first few blocks of a partition. To load such files, provide a `blocklist` that specifies block by block where the file is located in the partition. Since a file is often comprised of several different sets of blocks, blocklists use a special syntax. Each block containing the file is
specified by an offset number of blocks, followed by the number of blocks from that offset point. Block offsets are listed sequentially in a comma-delimited list.

The following is a sample blocklist:

\[
0+50,100+25,200+1
\]

This sample blocklist specifies a file that starts at the first block on the partition and uses blocks through \([0, 49]\), \([100, 124]\), and \([200, 201]\).

Knowing how to write blocklists is useful when using GRUB to load operating systems which require chain loading. It is possible to leave off the offset number of blocks if starting at block 0. As an example, the chain loading file in the first partition of the first hard drive would have the following name:

\[
(hd0,0)+1
\]

The following shows the \texttt{chainloader} command with a similar blocklist designation at the GRUB command line after setting the correct device and partition as root:

\[
\texttt{chainloader} +1
\]

### E.4.3. The Root File System and GRUB

The GRUB root file system is the top level of the specified device. For example, the image file \((hd0,0)/\text{grub}/\text{splash}.xpm.gz\) is located within the \texttt{/grub} directory at the top-level (or root) of the \((hd0,0)\) partition (which is actually the \texttt{/boot} partition for the system).

Next, the \texttt{kernel} command is executed with the location of the kernel file as an option. Once the Linux kernel boots, it sets up the root file system that Linux users are familiar with. The original GRUB root file system and its mounts are forgotten; they only existed to boot the kernel file.

### E.5. GRUB Interfaces

GRUB features three interfaces which provide different levels of functionality. Each of these interfaces allows users to boot the Linux kernel or another operating system.

The interfaces are as follows:

\[\text{Note}\]

The following GRUB interfaces can only be accessed by pressing any key within the three seconds of the GRUB menu bypass screen.
This is the default interface shown when GRUB is configured by the installation program. A menu of operating systems or preconfigured kernels are displayed as a list, ordered by name. Use the arrow keys to select an operating system or kernel version and press the Enter key to boot it. If you do nothing on this screen, then after the time out period expires GRUB will load the default option.

Press the e key to enter the entry editor interface or the c key to load a command line interface.

To access the menu entry editor, press the e key from the boot loader menu. The GRUB commands for that entry are displayed here, and users may alter these command lines before booting the operating system by adding a command line `o` inserts a new line after the current line and 0 inserts a new line before it), editing one `e`, or deleting one `d`.

After all changes are made, the b key executes the commands and boots the operating system. The Esc key discards any changes and reloads the standard menu interface. The c key loads the command line interface.

The command line interface is the most basic GRUB interface, but it is also the one that grants the most control. The command line makes it possible to type any relevant GRUB commands followed by the Enter key to execute them. This interface features some advanced shell-like features, including Tab key completion based on context, and Ctrl key combinations when typing commands, such as Ctrl+a to move to the beginning of a line and Ctrl+e to move to the end of a line. In addition, the arrow, Home' End' and Delete keys work as they do in the bash shell.

The command line interface is the most basic GRUB interface, but it is also the one that grants the most control. The command line makes it possible to type any relevant GRUB commands followed by the Enter key to execute them. This interface features some advanced shell-like features, including Tab key completion based on context, and Ctrl key combinations when typing commands, such as Ctrl+a to move to the beginning of a line and Ctrl+e to move to the end of a line. In addition, the arrow, Home' End' and Delete keys work as they do in the bash shell.

The command line interface is the most basic GRUB interface, but it is also the one that grants the most control. The command line makes it possible to type any relevant GRUB commands followed by the Enter key to execute them. This interface features some advanced shell-like features, including Tab key completion based on context, and Ctrl key combinations when typing commands, such as Ctrl+a to move to the beginning of a line and Ctrl+e to move to the end of a line. In addition, the arrow, Home' End' and Delete keys work as they do in the bash shell.

The command line interface is the most basic GRUB interface, but it is also the one that grants the most control. The command line makes it possible to type any relevant GRUB commands followed by the Enter key to execute them. This interface features some advanced shell-like features, including Tab key completion based on context, and Ctrl key combinations when typing commands, such as Ctrl+a to move to the beginning of a line and Ctrl+e to move to the end of a line. In addition, the arrow, Home' End' and Delete keys work as they do in the bash shell.

****** E.5.1. Interfaces Load Order

When GRUB loads its second stage boot loader, it first searches for its configuration file. Once found, the menu interface bypass screen is displayed. If a key is pressed within three seconds, GRUB builds a menu list and displays the menu interface. If no key is pressed, the default kernel entry in the GRUB menu is used.

If the configuration file cannot be found, or if the configuration file is unreadable, GRUB loads the command line interface, allowing the user to type commands to complete the boot process.

If the configuration file is not valid, GRUB prints out the error and asks for input. This helps the user see precisely where the problem occurred. Pressing any key reloads the menu interface, where it is
then possible to edit the menu option and correct the problem based on the error reported by GRUB. If
the correction fails, GRUB reports an error and reloads the menu interface.

# E.6. GRUB Commands

GRUB allows a number of useful commands in its command line interface. Some of the commands
accept options after their name; these options should be separated from the command and other
options on that line by space characters.

The following is a list of useful commands:

- **boot** — Boots the operating system or chain loader that was last loaded.
  - Path loaded as a chain loader. If the file is
    located on the first sector of the specified partition, use the blocklist notation, +1, instead of the file
    name.

The following is an example `chainloader` command:

```
chainloader +1
```

- **displaymem** — Displays the current use of memory, based on information from the BIOS. This is
  useful to determine how much RAM a system has prior to booting it.

- **initrd** — Enables users to specify an initial RAM disk to use when
  booting. An `initrd` is necessary when the kernel needs certain modules in order to boot properly,
  such as when the root partition is formatted with the ext3 or ext4 file system.

The following is an example `initrd` command:

```
initrd /initrd-2.6.8-1.523.img
```

- **<stage-1> <install-disk> <stage-2> p config-file** — Installs GRUB to the
  system MBR.
  - `<stage-1>` — Signifies a device, partition, and file where the first boot loader image can be
    found, such as (hd0,0)/grub/stage1.
  - `<install-disk>` — Specifies the disk where the stage 1 boot loader should be installed, such as
    (hd0).
  - `<stage-2>` — Passes the stage 2 boot loader location to the stage 1 boot loader, such as
    (hd0,0)/grub/stage2.
  - `<config-file>` — This option tells the `install` command to look for the menu
    configuration file specified by `<config-file>`, such as (hd0,0)/grub/grub.conf.
E. The GRUB Boot Loader

### Warning

The `install` command overwrites any information already located on the MBR.

- `<path/to/kernel>` <option-1> <option-N> ... — Specifies the kernel file to load when booting the operating system. Replace `<path/to/kernel>` with an absolute path from the partition specified by the root command. Replace `<option-1>` with options for the Linux kernel, such as `root=/dev/VolGroup00/LogVol00` to specify the device on which the root partition for the system is located. Multiple options can be passed to the kernel in a space separated list.

The following is an example `kernel` command:

```
kernel /vmlinuz-2.6.8-1.523 ro root=/dev/VolGroup00/LogVol00
```

The option in the previous example specifies that the root file system for Linux is located on the `hda5` partition.

- `<device-type><device-number>,<partition>` — Configures the root partition for GRUB, such as `(hd0,0)` and mounts the partition.

The following is an example `root` command:

```
root (hd0,0)
```

- `rootnoverify` — Configures the root partition for GRUB, just like the `root` command, but does not mount the partition.

Other commands are also available; type `help --all` for a full list of commands. For a description of all GRUB commands, refer to the documentation available online at [http://www.gnu.org/software/grub/manual/](http://www.gnu.org/software/grub/manual/).

E.7. GRUB Menu Configuration File

The configuration file (`/boot/grub/grub.conf`), which is used to create the list of operating systems to boot in GRUB's menu interface, essentially allows the user to select a pre-set group of commands to execute. The commands given in E.6, “GRUB Commands” can be used, as well as some special commands that are only available in the configuration file.

E.7.1. Configuration File Structure

The GRUB menu interface configuration file is `/boot/grub/grub.conf`. The commands to set the global preferences for the menu interface are placed at the top of the file, followed by stanzas for each operating kernel or operating system listed in the menu.
Configuration File Directives

Fedora, Microsoft Windows

GRUB

```
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
hiddenmenu
title Fedora (2.6.27.19-170.2.35.fc10.i686)
root (hd0,1)
kernel /vmlinuz-2.6.27.19-170.2.35.fc10.i686 ro root=UUID=04a07c13-e6bf-6d5a-b207-002689545705
rhgb quiet
initrd /initrd-2.6.27.19-170.2.35.fc10.i686.img

# section to load Windows
title Windows
rootnoverify (hd0,0)
chainloader +1
```

Note

Note that the default is specified as an integer. This refers to the first `title` line in the GRUB configuration file. For the Windows section to be set as the default in the previous example, change the `default=0` to `default=1`.

---

E.7.2. Configuration File Directives

The following are directives commonly used in the GRUB menu configuration file:

- `</path/to/file>` — Loads the specified file as a chain loader. Replace `<</path/to/file>` with the absolute path to the chain loader. If the file is located on the first sector of the specified partition, use the blocklist notation, `+1`.

- `<normal-color> <selected-color>` — Allows specific colors to be used in the menu, where two colors are configured as the foreground and background. Use simple color names such as `red/black`. For example:

  - `color red/black green/blue`

- `default= <integer>` — Replace `default=` with the default entry title number to be loaded if the menu interface times out.
E. The GRUB Boot Loader

- **fallback**= *<integer>*  Replace *<integer>* with the entry title number to try if the first attempt fails.

- **hiddenmenu** Prevents the GRUB menu interface from being displayed, loading the **default** entry when the **timeout** period expires. The user can see the standard GRUB menu by pressing the **Esc** key.

- **initrd**= *<path/to/initrd>* Enables users to specify an initial RAM disk to use when booting. Replace *<path/to/initrd>* with the absolute path to the initial RAM disk.

- **kernel**= *<path/to/kernel>*<option-1><option-N>* Specifies the kernel file to load when booting the operating system. Replace *<path/to/kernel>* with an absolute path from the partition specified by the **root** directive. Multiple options can be passed to the kernel when it is loaded.

  These options include:

  - **rhgb** *(Red Hat graphical boot)* — displays an animation during the boot process, rather than lines of text.

  - **quiet** — suppresses all but the most important messages in the part of the boot sequence before the Red Hat graphical boot animation begins.

- **password**= *<password>* Prevents a user who does not know the password from editing the entries for this menu option.

Optionally, it is possible to specify an alternate menu configuration file after the **password** directive. In this case, GRUB restarts the second stage boot loader and uses the specified alternate configuration file to build the menu. If an alternate menu configuration file is left out of the command, a user who knows the password is allowed to edit the current configuration file.

For more information about securing GRUB, refer to the chapter titled **Workstation Security** in the *Fedora Linux Deployment Guide*.

- **map** — Swaps the numbers assigned to two hard drives. For example:

  ```
  map (hd0) (hd3)
  map (hd3) (hd0)
  ```

  assigns the number 0 to the fourth hard drive, and the number 3 to the first hard drive. This option is especially useful if you configure your system with an option to boot a Windows operating system, because the Windows boot loader must find the Windows installation on the first hard drive.

For example, if your Windows installation is on the fourth hard drive, the following entry in **grub.conf** will allow the Windows boot loader to load Windows correctly:

```
title Windows
map (hd0) (hd3)
map (hd3) (hd0)
rootnoverify (hd3,0)
```
E.8. Additional Resources

This chapter is only intended as an introduction to GRUB. Consult the following resources to discover more about how GRUB works.

E.9.1. Installed Documentation

- 
  /usr/share/doc/grub-<version-number>/ — This directory contains good information about using and configuring GRUB, where <version-number> corresponds to the version of the GRUB package installed.

- info grub — The GRUB info page contains a tutorial, a user reference manual, a programmer reference manual, and a FAQ document about GRUB and its usage.
E. The GRUB Boot Loader

E.9.2. Useful Websites

- [http://www.gnu.org/software/grub/](http://www.gnu.org/software/grub/) — The home page of the GNU GRUB project. This site contains information concerning the state of GRUB development and an FAQ.

- [http://kbase.redhat.com/faq/docs/DOC-6864](http://kbase.redhat.com/faq/docs/DOC-6864) — Details booting operating systems other than Linux.
F. Boot Process, Init, and Shutdown

Understanding how the boot and shutdown processes work not only allows customization, but also makes it easier to troubleshoot problems related to starting or shutting down the system.

F.1. The Boot Process

Below are the basic stages of the boot process for an x86 system:

1. The system BIOS checks the system and launches the first stage boot loader on the MBR of the primary hard disk.

2. The first stage boot loader loads itself into memory and launches the second stage boot loader from the `/boot/` partition.

3. The second stage boot loader loads the kernel into memory, which in turn loads any necessary modules and mounts the root partition read-only.

4. The kernel transfers control of the boot process to the `/sbin/init` program.

5. The `/sbin/init` program loads all services and user-space tools, and mounts all partitions listed in `/etc/fstab`.

6. The user is presented with a login screen for the freshly booted Linux system.

Because configuration of the boot process is more common than the customization of the shutdown process, the remainder of this chapter discusses in detail how the boot process works and how it can be customized to suite specific needs.

F.2. A Detailed Look at the Boot Process

The beginning of the boot process varies depending on the hardware platform being used. However, once the kernel is found and loaded by the boot loader, the default boot process is identical across all architectures. This chapter focuses primarily on the x86 architecture.

F.2.1. The BIOS

When an x86 computer is booted, the processor looks at the end of system memory for the Basic Input/Output System (BIOS) program and runs it. The BIOS controls not only the first step of the boot process, but also provides the lowest level interface to peripheral devices. For this reason it is written into read-only, permanent memory and is always available for use.
Once loaded, the BIOS tests the system, looks for and checks peripherals, and then locates a valid device with which to boot the system. Usually, it checks any diskette drives and optical drives present for bootable media, then, failing that, looks to the system's hard drives. In most cases, the order of the drives searched while booting is controlled with a setting in the BIOS, and it looks on the master IDE device on the primary IDE bus. The BIOS then loads into memory whatever program is residing in the first sector of this device, called the Master Boot Record or MBR. The MBR is only 512 bytes in size and contains machine code instructions for booting the machine, called a boot loader, along with the partition table. Once the BIOS finds and loads the boot loader program into memory, it yields control of the boot process to it.

F.2.2. The Boot Loader

This section looks at the default boot loader for the x86 platform, GRUB. Depending on the system's architecture, the boot process may differ slightly. Refer to F.2.2.1, “F.2.2.1” for a brief overview of non-x86 boot loaders. For more information about configuring and using GRUB, see E, The GRUB Boot Loader.

A boot loader for the x86 platform is broken into at least two stages. The first stage is a small machine code binary on the MBR. Its sole job is to locate the second stage boot loader and load the first part of it into memory.

The GRUB bootloader in Fedora supports ext2, ext3, and ext4 file systems. It does not support other file systems such as VFAT, Btrfs or XFS. Furthermore, GRUB does not support LVM.

Important Supported file systems

The GRUB boot loader in Fedora supports ext2, ext3, and ext4 file systems. It does not support other file systems such as VFAT, Btrfs or XFS. Furthermore, GRUB does not support LVM.

Note

If upgrading the kernel using the Red Hat Update Agent the boot loader configuration file is updated automatically. More information on Red Hat Network can be found online at the following URL: https://rhn.redhat.com/.

Once the second stage boot loader is in memory, it presents the user with a graphical screen showing the different operating systems or kernels it has been configured to boot. On this screen a user can use the arrow keys to choose which operating system or kernel they wish to boot and press Enter. If no key is pressed, the boot loader loads the default selection after a configurable period of time has passed.
Once the second stage boot loader has determined which kernel to boot, it locates the corresponding kernel binary in the `boot` directory. The kernel binary is named using the following format:

```
<kernel-version>file
```

where `<kernel-version>` corresponds to the kernel version specified in the boot loader's settings.

The boot loader then places one or more appropriate `initramfs` images into memory. Next, the kernel decompresses these images from memory to `sysroot/`, a RAM-based virtual file system, via `cpio`. The `initramfs` is used by the kernel to load drivers and modules necessary to boot the system. This is particularly important if SCSI hard drives are present or if the systems use the ext3 or ext4 file system.

Once the kernel and the `initramfs` image(s) are loaded into memory, the boot loader hands control of the boot process to the kernel.

The boot loader then places one or more appropriate `initramfs` images into memory. Next, the kernel decompresses these images from memory to `/sysroot/`, a RAM-based virtual file system, via `cpio`. The `initramfs` is used by the kernel to load drivers and modules necessary to boot the system. This is particularly important if SCSI hard drives are present or if the systems use the ext3 or ext4 file system.

Once the kernel is loaded and hands off the boot process to the `init` command, the same sequence of events occurs on every architecture. So the main difference between each architecture's boot process is in the application used to find and load the kernel.

Once the kernel loads and hands off the boot process to the `init` command, the same sequence of events occurs on every architecture. So the main difference between each architecture's boot process is in the application used to find and load the kernel.

At this point, the kernel is loaded into memory and operational. However, since there are no user applications that allow meaningful input to the system, not much can be done with the system.

To set up the user environment, the kernel executes the `/sbin/init` program.
F. Boot Process, Init, and Shutdown

When the `init` command starts, it becomes the parent or grandparent of all of the processes that start up automatically on the system. First, it runs the `/etc/rc.d/rc.sysinit` script, which sets the environment path, starts swap, checks the file systems, and executes all other steps required for system initialization. For example, most systems use a clock, so `rc.sysinit` reads the `/etc/sysconfig/clock` configuration file to initialize the hardware clock. Another example is if there are special serial port processes which must be initialized, `rc.sysinit` executes the `/etc/rc.serial` file.

The `init` command then processes the jobs in the `/etc/event.d` directory, which describe how the system should be set up in each `SysV init runlevel`. Runlevels are a state, or `mode`, defined by the services listed in the `SysV/etc/rc.d/rc<x>.d/` directory, where `<x>` is the number of the runlevel. For more information on SysV init runlevels, refer to "SysV Init Runlevels".

Next, the `init` command sets the source function library, `/etc/rc.d/init.d/functions` for the system, which configures how to start, kill, and determine the PID of a program.

The `init` program starts all of the background processes by looking in the appropriate `rc` directory for the runlevel specified as the default in `/etc/inittab`. The `rc` directories are numbered to correspond to the runlevel they represent. For instance, `/etc/rc.d/rc5.d/` is the directory for runlevel 5.

When booting to runlevel 5, the `init` program looks in the `/etc/rc.d/rc5.d/` directory to determine which processes to start and stop.

Below is an example listing of the `/etc/rc.d/rc5.d/` directory:

```
K05innd -> ../init.d/innd
K05saslauthd -> ../init.d/saslauthd
K10dc_server -> ../init.d/dc_server
K10psacct -> ../init.d/psacct
K10radiusd -> ../init.d/radiusd
K12dc_client -> ../init.d/dc_client
K12FreeWnn -> ../init.d/FreeWnn
K12mailman -> ../init.d/mailman
K12mysqlld -> ../init.d/mysqlld
K15httpd -> ../init.d/httpd
K20netdump-server -> ../init.d/netdump-server
K20rstatd -> ../init.d/rstatd
K20rusersd -> ../init.d/rusersd
K20rwhod -> ../init.d/rwhod
K24irda -> ../init.d/irda
K25squid -> ../init.d/squid
K28amd -> ../init.d/amd
K30spamassassin -> ../init.d/spamassassin
K34dchcrelay -> ../init.d/dchcrelay
K34yppasswdd -> ../init.d/yppasswdd
K35dhcpd -> ../init.d/dhcpd
K35smb -> ../init.d/smb
K35vncserver -> ../init.d/vncserver
K36lisa -> ../init.d/lisa
K45arpwatch -> ../init.d/arpwatch
K45named -> ../init.d/named
K46radvd -> ../init.d/radvd
K50netdump -> ../init.d/netdump
K50snmpd -> ../init.d/snmpd
K50snmptrapd -> ../init.d/snmptrapd
K50tux -> ../init.d/tux
K50vsftpd -> ../init.d/vsftpd
K54dovecot -> ../init.d/dovecot
```
As illustrated in this listing, none of the scripts that actually start and stop the services are located in the `/etc/rc.d/rc5.d/` directory. Rather, all of the files in `/etc/rc.d/init.d/` are symbolic links pointing to scripts located in the `/etc/rc.d/init.d/` directory. Symbolic links are used in each of the `rc` directories so that the runlevels can be reconfigured by creating, modifying, and deleting the symbolic links without affecting the actual scripts they reference.

The name of each symbolic link begins with either a `K` or an `S`. The `K` links are processes that are killed on that runlevel, while those beginning with an `S` are started.
F. Boot Process, Init, and Shutdown

The `init` command first stops all of the \$K\ symbolic links in the directory by issuing the `/etc/rc.d/init.d/\$command\ start` command, where \$command\ is the process to be killed. It then starts all of the \$ symbolic links by issuing `/etc/rc.d/init.d/\$command\ stop`. Each of the symbolic links are numbered to dictate start order. The order in which the services are started or stopped can be altered by changing this number. The lower the number, the earlier it is started. Symbolic links with the same number are started alphabetically.

After the `init` command has progressed through the appropriate `rc` directory for the runlevel, Upstart forks an `/sbin/mingetty` process for each virtual console (login prompt) allocated to the runlevel by the job definition in the `/etc/event.d` directory. Runlevels 0 through 5 have all six virtual consoles, while runlevel 6 (single user mode) has one, and runlevels 1 and 7 have none. The `/sbin/mingetty` process opens communication pathways to tty devices, sets their modes, prints the login prompt, accepts the user's username and password, and initiates the login process.

In runlevel 5, Upstart runs a script called `/etc/X11/prefdm`. The `prefdm` script executes the preferred X display manager `gdm`, `kdm` or `xdm` depending on the contents of the `/etc/sysconfig/desktop` file.

Once finished, the system operates on runlevel 5 and displays a login screen.

F.2.5. Job definitions

Previously, the `sysvinit` package provided the `init` daemon for the default configuration. When the system started, this `init` daemon ran the `/etc/inittab` script to start system processes defined for each runlevel. The default configuration now uses an event-driven `init` daemon provided by the `Upstart` package. Whenever particular events occur, the `init` daemon processes jobs stored in the `/etc/event.d` directory. The `init` daemon recognises the start of the system as such an event.

Each job typically specifies a program, and the events that trigger `init` to run or to stop the program.

Some jobs are constructed as `tasks`, which perform actions and then terminate until another event...
triggers the job again. Other jobs are constructed as *services*, which keep running until another event (or the user) stops it.

For example, the `etc/events.d/tty2` job is a service to maintain a virtual terminal on tty2 from the time that the system starts until the system shuts down, or another event (such as a change in runlevel) stops the job. The job is constructed so that *init* will restart the virtual terminal if it stops unexpectedly during that time:

```bash
# tty2 - getty
# This service maintains a getty on tty2 from the point the system is
# started until it is shut down again.

start on stopped rc2
start on stopped rc3
start on stopped rc4
start on started precmd

stop on runlevel 0
stop on runlevel 1
stop on runlevel 6

respawn
exec /sbin/minigetty tty2
```

### F.3. Running Additional Programs at Boot Time

The `/etc/rc.d/rc.local` script is executed by the *init* command at boot time or when changing runlevels. Adding commands to the bottom of this script is an easy way to perform necessary tasks, like starting special services or initialize devices without writing complex initialization scripts in the `/etc/rc.d/init.d/` directory and creating symbolic links.

The configuration files for SysV init are located in the `/etc/rc.d/` directory. Within this directory, are the `rc` `/rc.local` `/rc.sysinit` and, optionally, the `rc.serial` scripts as well as the following directories:

```
```

The idea behind SysV init runlevels revolves around the idea that different systems can be used in different ways. For example, a server runs more efficiently without the drag on system resources.
created by the X Window System. Or there may be times when a system administrator may need to operate the system at a lower runlevel to perform diagnostic tasks, like fixing disk corruption in runlevel 1.

The characteristics of a given runlevel determine which services are halted and started by init. For instance, runlevel 0 (single user mode) halts any network services, while runlevel 3 starts these services. By assigning specific services to be halted or started on a given runlevel, init can quickly change the mode of the machine without the user manually stopping and starting services.

Fedora-

- 0 — Halt
- 1 — Single-user text mode
- 2 — Not used (user-definable)
- 3 — Full multi-user text mode
- 4 — Not used (user-definable)
- 5 — Full multi-user graphical mode (with an X-based login screen)
- 6 — Reboot

The default runlevel for the system is listed in `/etc/inittab`. To find out the default runlevel for a system, look for the line similar to the following near the bottom of `/etc/inittab`:

```
id:5:initdefault:
```

The default runlevel listed in this example is five, as the number after the first colon indicates. To change it, edit `/etc/inittab` as root.

![Warning]

Be very careful when editing `/etc/inittab`. Simple typos can cause the system to become unbootable. If this happens, either use a boot diskette, enter single-user mode, or enter rescue mode to boot the computer and repair the file.

For more information on single-user and rescue mode, refer to the chapter titled `Basic System Recovery` in the `Fedora Deployment Guide`.

র অধীন নিম্নলিখিত রান-লেভেলগুলি সম্পর্কে ডিফল্টরূপে ব্যাখ্যা করা হয়েছে:

- 0 — হাল্ট
- 1 — একক সার্বিস তথ্য মডেল
- 2 — ব্যবহার না করা (ব্যবহারকারীর্দের পদ্ধতি)
- 3 — কমপ্লেক্স অর্থনীতি মডেল
- 4 — ব্যবহার না করা (ব্যবহারকারীর্দের পদ্ধতি)
- 5 — কমপ্লেক্স অর্থনীতি গ্রাফিক্যাল মডেল (এক ভিত্তিক লজিন স্ক্রিন সাথে)
- 6 — রিপুইট

সাধারণত, ব্যবহারকারীরা runlevel 3 অথবা runlevel 5-এ ফেডোরা ব্যবহার করে থাকেন — উভয় সম্পূর্ণ মাল্টি-ইউজার মডেল।

2 ও 4 রানলেভেল না হওয়ার ফলে ব্যবহারকারীরা বিশেষ প্রয়োজনের জন্য এই দুটি কনফিগার করে থাকেন।

The default runlevel for the system is listed in `/etc/inittab`. To find out the default runlevel for a system, look for the line similar to the following near the bottom of `/etc/inittab`:

```
id:5:initdefault:
```

The default runlevel listed in this example is five, as the number after the first colon indicates. To change it, edit `/etc/inittab` as root.

![Warning]

Be very careful when editing `/etc/inittab`. Simple typos can cause the system to become unbootable. If this happens, either use a boot diskette, enter single-user mode, or enter rescue mode to boot the computer and repair the file.

For more information on single-user and rescue mode, refer to the chapter titled `Basic System Recovery` in the `Fedora Deployment Guide`.
F.4.2. Runlevel Utilities

One of the best ways to configure runlevels is to use an *initscript utility*. These tools are designed to simplify the task of maintaining files in the SysV init directory hierarchy and relieves system administrators from having to directly manipulate the numerous symbolic links in the subdirectories of `/etc/rc.d/`.

Fedora-র মধ্যে এই ধরনের তিনটি সামগ্রী উপস্থিত রয়েছে:

- `/sbin/chkconfig` — The `/sbin/chkconfig` utility is a simple command line tool for maintaining the `/etc/rc.d/init.d/` directory hierarchy.
- `/usr/sbin/ntsysv` — The ncurses-based `/sbin/ntsysv` utility provides an interactive text-based interface, which some find easier to use than `chkconfig`.
- **Services Configuration Tool** — The graphical Services Configuration Tool (`system-config-services`) program is a flexible utility for configuring runlevels.

Refer to the chapter titled *Controlling Access to Services* in the *Fedora Deployment Guide* for more information regarding these tools.

F.5. Shutting Down

Fedora-র /sbin/shutdown কমান্ড প্রয়োগ করতে পারেন।

শুধুমাত্র সম্পূর্ণ বকিল্পের ভালকে উপস্থিত থাকলেও, সর্বোচ্চ ব্যবহৃত বকিল্প দুটি হলে:

```
/sbin/shutdown -h now
```

এবং

```
/sbin/shutdown -r now
```

After shutting everything down, the `-h` option halts the machine, and the `-r` option reboots.

PAM console users can use the `reboot` and `halt` commands to shut down the system while in runlevels `1` through `5`. For more information about PAM console users, refer to the Fedora Deployment Guide.

If the computer does not power itself down, be careful not to turn off the computer until a message appears indicating that the system is halted.

Failure to wait for this message can mean that not all the hard drive partitions are unmounted, which can lead to file system corruption.
Unlike previous releases of Fedora, Fedora 14 does not include a version of busybox to provide shell commands in the pre-installation and post-installation environments.

Table G.1, “busybox” contains a list of busybox commands, equivalent ways to implement the same functionality in bash, and the availability of these alternatives in the %pre and %post environments. The table also indicates the exact path to the command, although you do not generally need to specify the path because the PATH environment variable is set in the installation environment.

If a command is only available in %post, the command is running on the target system and its availability therefore depends on whether the package that provides the command is installed. Every command that appears in the “New command or alternative” column of Table G.1, “busybox” is available for Fedora 14, although not every command is available on every installed system.

<table>
<thead>
<tr>
<th>Busybox Command</th>
<th>%pre</th>
<th>%post</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>addgroup</td>
<td>no</td>
<td>yes</td>
<td>/usr/sbin/groupadd</td>
</tr>
<tr>
<td>adduser</td>
<td>no</td>
<td>yes</td>
<td>/usr/sbin/useradd</td>
</tr>
<tr>
<td>adjtimex</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>ar</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/ar</td>
</tr>
<tr>
<td>arping</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/arping, /usr/sbin/arping</td>
</tr>
<tr>
<td>ash</td>
<td>yes</td>
<td>yes</td>
<td>/bin/bash</td>
</tr>
<tr>
<td>awk</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/awk, /usr/bin/gawk</td>
</tr>
<tr>
<td>basename</td>
<td>yes</td>
<td>yes</td>
<td>/bin/bash, /usr/bin/basename</td>
</tr>
<tr>
<td>bbconfig</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>bunzip2</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/bunzip2, /usr/bin/bzip2 -d</td>
</tr>
<tr>
<td>busybox</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>bzcat</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/bzcat, /usr/bin/bzip2 -d</td>
</tr>
<tr>
<td>cal</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/cal</td>
</tr>
<tr>
<td>cat</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/cat</td>
</tr>
</tbody>
</table>
| Command | %pre | %post | Notes
|---------|------|-------|------|
| catv    | no   | no    | cat -vET cat A
| chattr  | yes  | yes   | /usr/bin/chattr
| chgrp   | yes  | yes   | /usr/bin/chgrp
| chmod   | yes  | yes   | /usr/bin/chmod
| chown   | yes  | yes   | /usr/bin/chown
| chroot  | yes  | yes   | /usr/sbin/chroot
| chvt    | yes  | yes   | /usr/bin/chvt
| cksum   | no   | yes   | /usr/bin/cksum
| clear   | yes  | yes   | /usr/bin/clear
| cmp     | no   | yes   | /usr/bin/cmp
| comm    | no   | yes   | /usr/bin/comm
| cp      | yes  | yes   | /usr/bin/cp
| cpio    | yes  | yes   | /usr/bin/cpio
| crond   | no   | no    | none
| crontab | no   | yes   | /usr/bin/crontab
| cut     | yes  | yes   | /usr/bin/cut
| date    | yes  | yes   | /usr/bin/date
| dc      | no   | yes   | /usr/bin/dc
| dd      | yes  | yes   | /usr/bin/dd
| deallocvt | no  | yes   | /usr/bin/deallocvt
| delgroup| no   | yes   | /usr/sbin/groupdel
| deluser | no   | yes   | /usr/sbin/userdel
| devfsd  | no   | no    | none
| df      | yes  | yes   | /usr/bin/df
| diff    | no   | yes   | /usr/bin/diff
| dirname | yes  | yes   | /bin/bash /usr/bin/dirname
| dmesg   | yes  | yes   | /usr/bin/dmesg
| dnsd    | no   | no    | none
| dos2unix| no   | no    | sed 's/. $/'
| dpkg    | no   | no    | Debian

{parishitety # # কমান্ডের বক্সিল্প}
<table>
<thead>
<tr>
<th>Busybox</th>
<th>%pre</th>
<th>%post</th>
<th>নতুন কমান্ড অথবা বিকল্প</th>
</tr>
</thead>
<tbody>
<tr>
<td>dpkg-deb</td>
<td>no</td>
<td>no</td>
<td>শুধুমাত্র Debian প্যাকেজে সমর্থন করা হয় না</td>
</tr>
<tr>
<td>du</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/du</td>
</tr>
<tr>
<td>dumpkmap</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>dumpleases</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>e2fsck</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/e2fsck</td>
</tr>
<tr>
<td>e2label</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/e2label</td>
</tr>
<tr>
<td>echo</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/echo</td>
</tr>
<tr>
<td>ed</td>
<td>no</td>
<td>no</td>
<td>/sbin/sed /usr/bin/sed</td>
</tr>
<tr>
<td>egrep</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/egrep /usr/bin/egrep</td>
</tr>
<tr>
<td>eject</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/eject</td>
</tr>
<tr>
<td>env</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/env</td>
</tr>
<tr>
<td>ether-wake</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>expr</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/expr</td>
</tr>
<tr>
<td>fakeidentd</td>
<td>no</td>
<td>no</td>
<td>none — স্ক্রিপ্ট-লেটের জন্য কোনো ডেমন উপলব্ধ নেই</td>
</tr>
<tr>
<td>false</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/false</td>
</tr>
<tr>
<td>fbset</td>
<td>no</td>
<td>yes</td>
<td>/usr/sbin/fbset</td>
</tr>
<tr>
<td>fdflush</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>fdformat</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/fdformat</td>
</tr>
<tr>
<td>fdisk</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/fdisk</td>
</tr>
<tr>
<td>fgrep</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/fgrep /usr/bin/fgrep</td>
</tr>
<tr>
<td>find</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/find</td>
</tr>
<tr>
<td>findfs</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>fold</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/fold</td>
</tr>
<tr>
<td>free</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/free</td>
</tr>
<tr>
<td>freeramdisk</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>fsck</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/fsck</td>
</tr>
<tr>
<td>fsck.ext2</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/fsck.ext2 /usr/sbin/e2fsck</td>
</tr>
<tr>
<td>fsck.ext3</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/fsck.ext3 /usr/sbin/e2fsck</td>
</tr>
<tr>
<td>Busybox</td>
<td>%pre</td>
<td>%post</td>
<td>New command or option</td>
</tr>
<tr>
<td>----------</td>
<td>------</td>
<td>-------</td>
<td>----------------------</td>
</tr>
<tr>
<td>fsck.minix</td>
<td>no</td>
<td>no</td>
<td>— Minix filesystem support not included</td>
</tr>
<tr>
<td>ftpget</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/ftp (Python ftpplib)</td>
</tr>
<tr>
<td>ftpput</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/ftp (Python ftpplib)</td>
</tr>
<tr>
<td>fuser</td>
<td>no</td>
<td>yes</td>
<td>/sbin/fuser</td>
</tr>
<tr>
<td>getopt</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/getopt</td>
</tr>
<tr>
<td>getty</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>grep</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/grep /usr/bin/grep</td>
</tr>
<tr>
<td>gunzip</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/gunzip /usr/bin/gzip (-d)</td>
</tr>
<tr>
<td>gzip</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/gzip</td>
</tr>
<tr>
<td>hdparm</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/hdparm</td>
</tr>
<tr>
<td>head</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/head</td>
</tr>
<tr>
<td>hexdump</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/hexdump</td>
</tr>
<tr>
<td>hostname</td>
<td>no</td>
<td>yes</td>
<td>/sbin/hostname /usr/bin/hostname</td>
</tr>
<tr>
<td>httpd</td>
<td>no</td>
<td>no</td>
<td>none — Scriptlet's domain is not available</td>
</tr>
<tr>
<td>hush</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>hwclock</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/hwclock</td>
</tr>
<tr>
<td>id</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/id (Python)</td>
</tr>
<tr>
<td>ifconfig</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/ifconfig /usr/sbin/ifconfig</td>
</tr>
<tr>
<td>ifdown</td>
<td>no</td>
<td>no</td>
<td>device ifconfig down</td>
</tr>
<tr>
<td>ifup</td>
<td>no</td>
<td>no</td>
<td>device ifconfig up</td>
</tr>
<tr>
<td>inetd</td>
<td>no</td>
<td>no</td>
<td>none — Scriptlet's domain is not available</td>
</tr>
<tr>
<td>insmod</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/insmod /usr/sbin/insmod</td>
</tr>
</tbody>
</table>
| Busybox | %pre | %post | নতুন কমান্ড অথবা বক্ষণ
|----------|------|------|----------------------------------|
| install  | no   | yes  | `/usr/bin/install
mkdir/cp/
chown/chgrp` |
<p>| ip       | yes  | yes  | <code>/sbin/ip</code> | <code>/usr/sbin/ip</code> |
| ipaddr   | no   | no   | <code>ipconfig</code> | <code>ip</code> |
| ipcalc   | yes  | yes  | <code>/sbin/ipcalc</code> | <code>/usr/ipcalc</code> |
| ipcrm    | no   | yes  | <code>/usr/bin/ipcrm</code> |
| ipcs     | no   | yes  | <code>/usr/bin/ipcs</code> |
| iplink   | no   | no   | <code>ip</code> |
| iproute  | no   | no   | <code>ip</code> |
| iptunnel | no   | yes  | <code>/sbin/ip_tunnel</code> |
| kill     | yes  | yes  | <code>/sbin/kill</code> | <code>/usr/bin/kill</code> |
| killall  | yes  | yes  | <code>/usr/bin/killall</code> |
| lash     | no   | no   | none |
| last     | no   | yes  | <code>/usr/bin/last</code> |
| length   | no   | no   | <code>Python</code> | <code>bash</code> |
| less     | yes  | yes  | <code>/usr/bin/less</code> |
| linux32  | no   | no   | none |
| linux64  | no   | no   | none |
| ln       | yes  | yes  | <code>/sbin/ln</code> | <code>/usr/bin/ln</code> |
| load_policy | yes  | yes  | <code>/sbin/load_policy</code> | <code>/usr/sbin/load_policy</code> |
| loadfont | no   | no   | none |
| loadkmap | no   | no   | none |
| login    | yes  | yes  | <code>/usr/bin/login</code> |
| logname  | no   | yes  | <code>/usr/bin/logname</code> |
| losetup  | yes  | yes  | <code>/usr/bin/losetup</code> |
| ls       | yes  | yes  | <code>/usr/bin/ls</code> |
| lsattr   | yes  | yes  | <code>/usr/bin/lsattr</code> |
| lsmod    | yes  | yes  | <code>/usr/bin/lsmod</code> |
| lzmacat  | no   | yes  | <code>/usr/bin/lzmadec</code> |
| makedevs | no   | no   | <code>/usr/bin/mknod</code> |
| md5sum   | yes  | yes  | <code>/usr/bin/md5sum</code> |
| mdev     | no   | no   | none |</p>
<table>
<thead>
<tr>
<th>Command</th>
<th>%pre</th>
<th>%post</th>
<th>New Command/Alternative Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>mesg</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/mesg</td>
</tr>
<tr>
<td>mkdir</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/mkdir`/usr/bin/mkdir</td>
</tr>
<tr>
<td>mke2fs</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/mke2fs</td>
</tr>
<tr>
<td>mkfifo</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/mkfifo</td>
</tr>
<tr>
<td>mkfs.ext2</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/mkfs.ext2</td>
</tr>
<tr>
<td>mkfs.ext3</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/mkfs.ext3</td>
</tr>
<tr>
<td>mkfs.minix</td>
<td>no</td>
<td>no</td>
<td>Minix filesystem supported not available</td>
</tr>
<tr>
<td>mknod</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/mknod</td>
</tr>
<tr>
<td>mkswap</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/mkswap</td>
</tr>
<tr>
<td>mktemp</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/mktemp</td>
</tr>
<tr>
<td>modprobe</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/modprobe`/usr/sbin/modprobe</td>
</tr>
<tr>
<td>more</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/more</td>
</tr>
<tr>
<td>mount</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/mount`/usr/bin/mount</td>
</tr>
<tr>
<td>mountpoint</td>
<td>no</td>
<td>no</td>
<td>mount command output displayed</td>
</tr>
<tr>
<td>msh</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>mt</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/mt</td>
</tr>
<tr>
<td>mv</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/mv</td>
</tr>
<tr>
<td>nameif</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>nc</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/nc</td>
</tr>
<tr>
<td>netstat</td>
<td>no</td>
<td>yes</td>
<td>/bin/netstat</td>
</tr>
<tr>
<td>nice</td>
<td>no</td>
<td>yes</td>
<td>/bin/nice</td>
</tr>
<tr>
<td>nohup</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/nohup</td>
</tr>
<tr>
<td>nslookup</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/nslookup</td>
</tr>
<tr>
<td>od</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/od</td>
</tr>
<tr>
<td>openvt</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/openvt</td>
</tr>
<tr>
<td>passwd</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/passwd</td>
</tr>
<tr>
<td>patch</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/patch</td>
</tr>
<tr>
<td>pidof</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/pidof</td>
</tr>
<tr>
<td>ping</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/ping</td>
</tr>
<tr>
<td>ping6</td>
<td>no</td>
<td>yes</td>
<td>/bin/ping6</td>
</tr>
<tr>
<td>pipe_progress</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>pivot_root</td>
<td>no</td>
<td>yes</td>
<td>/sbin/pivot_root</td>
</tr>
<tr>
<td>Busybox কমান্ড</td>
<td>%pre</td>
<td>%post</td>
<td>নতুন কমান্ড অথবা বিকল্প</td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>printenv</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/printenv</td>
</tr>
<tr>
<td>printf</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/printf</td>
</tr>
<tr>
<td>ps</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/ps</td>
</tr>
<tr>
<td>pwd</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/pwd</td>
</tr>
<tr>
<td>rdate</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/rdate</td>
</tr>
<tr>
<td>readlink</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/readlink’/usr/bl/readlink</td>
</tr>
<tr>
<td>readprofile</td>
<td>no</td>
<td>yes</td>
<td>/usr/sbin/readprofile</td>
</tr>
<tr>
<td>realpath</td>
<td>no</td>
<td>no</td>
<td>Python os.path.realpath()</td>
</tr>
<tr>
<td>renice</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/renice</td>
</tr>
<tr>
<td>reset</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/reset</td>
</tr>
<tr>
<td>rm</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/rm’/usr/bin/rm</td>
</tr>
<tr>
<td>rmdir</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/rmdir’/usr/bin/rmdir</td>
</tr>
<tr>
<td>rmmod</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/rmmod’/usr/bin/rmmod</td>
</tr>
<tr>
<td>route</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/route’/usr/bin/route</td>
</tr>
<tr>
<td>rpm</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/rpm</td>
</tr>
<tr>
<td>rpm2cpio</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/rpm2cpio</td>
</tr>
<tr>
<td>run-parts</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>runlevel</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>rx</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>sed</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/sed’/usr/bin/sed</td>
</tr>
<tr>
<td>seq</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/seq</td>
</tr>
<tr>
<td>setarch</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/setarch</td>
</tr>
<tr>
<td>setconsole</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>setkeycodes</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/setkeycodes</td>
</tr>
<tr>
<td>setlogcons</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>setsid</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/setsid</td>
</tr>
<tr>
<td>sh</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/sh’/usr/bin/sh</td>
</tr>
<tr>
<td>sha1sum</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/sha1sum</td>
</tr>
<tr>
<td>sleep</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/sleep’/usr/bin/sleep</td>
</tr>
<tr>
<td>sort</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/sort</td>
</tr>
<tr>
<td>Command</td>
<td>%pre</td>
<td>%post</td>
<td>New Command/Alternative</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>start-stop-daemon</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>stat</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/stat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Python</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>os.stat()</td>
</tr>
<tr>
<td>strings</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/strings</td>
</tr>
<tr>
<td>stty</td>
<td>no</td>
<td>yes</td>
<td>/bin/stty</td>
</tr>
<tr>
<td>su</td>
<td>no</td>
<td>yes</td>
<td>/bin/su</td>
</tr>
<tr>
<td>sulogin</td>
<td>no</td>
<td>yes</td>
<td>/sbin/sulogin</td>
</tr>
<tr>
<td>sum</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/sum</td>
</tr>
<tr>
<td>swapoff</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/swapoff</td>
</tr>
<tr>
<td>swapon</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/swapon</td>
</tr>
<tr>
<td>switch_root</td>
<td>no</td>
<td>yes</td>
<td>/sbin/switch_root</td>
</tr>
<tr>
<td>sync</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/sync</td>
</tr>
<tr>
<td>sysctl</td>
<td>no</td>
<td>yes</td>
<td>/sbin/sysctl</td>
</tr>
<tr>
<td>tail</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/tail</td>
</tr>
<tr>
<td>tar</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/tar</td>
</tr>
<tr>
<td>tee</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/tee</td>
</tr>
<tr>
<td>telnet</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/telnet</td>
</tr>
<tr>
<td>telnetd</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— Script-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— For the sake of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— It is not available</td>
</tr>
<tr>
<td>test</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/test</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in bash</td>
</tr>
<tr>
<td>tftp</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/tftp</td>
</tr>
<tr>
<td>time</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Python</td>
</tr>
<tr>
<td>top</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/top</td>
</tr>
<tr>
<td>touch</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/touch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/usr/bin/touch</td>
</tr>
<tr>
<td>tr</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/tr</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Python</td>
</tr>
<tr>
<td>traceroute</td>
<td>no</td>
<td>yes</td>
<td>/bin/traceroute</td>
</tr>
<tr>
<td>true</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/true</td>
</tr>
<tr>
<td>tty</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/tty</td>
</tr>
<tr>
<td>tune2fs</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/tune2fs</td>
</tr>
<tr>
<td>udhcpc</td>
<td>no</td>
<td>no</td>
<td>/sbin/dhcclient</td>
</tr>
<tr>
<td>udhcpd</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— Script-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— For the sake of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>— It is not available</td>
</tr>
<tr>
<td>umount</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/umount</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>/usr/bin/umount</td>
</tr>
<tr>
<td>Busybox</td>
<td>%pre</td>
<td>%post</td>
<td>নতুন কমান্ড অথবা বক্তব্য</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td>-------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>uname</td>
<td>no</td>
<td>yes</td>
<td>/bin/uname অথবা Python os.uname()</td>
</tr>
<tr>
<td>uncompress</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>uniq</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/uniq</td>
</tr>
<tr>
<td>unix2dos</td>
<td>no</td>
<td>no</td>
<td>sed s/$/'/</td>
</tr>
<tr>
<td>unlzma</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/unlzma</td>
</tr>
<tr>
<td>unzip</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/unzip</td>
</tr>
<tr>
<td>uptime</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/uptime অথবা Python /proc/uptime পাঠ</td>
</tr>
<tr>
<td>usleep</td>
<td>no</td>
<td>yes</td>
<td>/bin/usleep অথবা Python</td>
</tr>
<tr>
<td>uudecode</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/uudecode অথবা Python</td>
</tr>
<tr>
<td>uuencode</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/uuencode অথবা Python</td>
</tr>
<tr>
<td>vconfig</td>
<td>yes</td>
<td>yes</td>
<td>/usr/sbin/vconfig</td>
</tr>
<tr>
<td>vi</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/vi</td>
</tr>
<tr>
<td>vlock</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>watch</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/watch</td>
</tr>
<tr>
<td>watchdog</td>
<td>no</td>
<td>no</td>
<td>none</td>
</tr>
<tr>
<td>wc</td>
<td>yes</td>
<td>yes</td>
<td>/bin/wc</td>
</tr>
<tr>
<td>wget</td>
<td>yes</td>
<td>yes</td>
<td>/sbin/wget, /usr/bin/wget</td>
</tr>
<tr>
<td>which</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/which</td>
</tr>
<tr>
<td>who</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/who</td>
</tr>
<tr>
<td>whoami</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/whoami</td>
</tr>
<tr>
<td>xargs</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/xargs</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>/usr/bin/yes</td>
</tr>
<tr>
<td>zcat</td>
<td>yes</td>
<td>yes</td>
<td>/usr/bin/zcat</td>
</tr>
<tr>
<td>zcip</td>
<td>no</td>
<td>no</td>
<td>NetworkManager পৃথিবীর এইটি পরিচালিত হওয়া উচিত</td>
</tr>
</tbody>
</table>

# 14 Fedora ships with GNU awk rather than the busybox awk in the installation environment.

2 GNU bash can provide basename functionality using string manipulation. If var="/usr/bin/command" then echo ${var##*/} gives command

3 GNU bash can provide dirname functionality using string manipulation. If var="/usr/bin/command" then echo ${var%/*} gives `/usr/bin`
Documentation

To learn more about the Fedora installation program, visit the project Web page: http://www.fedoraproject.org/wiki/Anaconda.

Both anaconda and Fedora systems use a common set of software components. For detailed information on key technologies, refer to the Web sites listed below:

Boot Loader
Fedora uses the GRUB boot loader. Refer to http://www.gnu.org/software/grub/ for more information.

Disk Partitioning
Fedora uses parted to partition disks. Refer to http://www.gnu.org/software/parted/ for more information.

Storage Management
Logical Volume Management (LVM) provides administrators with a range of facilities to manage storage. By default, the Fedora installation process formats drives as LVM volumes. Refer to http://www.tldp.org/HOWTO/LVM-HOWTO/ for more information.

Audio Support
The Linux kernel used by Fedora incorporates PulseAudio audio server. For more information about PulseAudio, refer to the project documentation: http://www.pulseaudio.org/wiki/Documentation.

Graphics System
Both the installation system and Fedora use the Xorg suite to provide graphical capabilities. Components of Xorg manage the display, keyboard and mouse for the desktop environments that users interact with. Refer to http://www.x.org/ for more information.

Remote Displays
Fedora and anaconda include VNC (Virtual Network Computing) software to enable remote access to graphical displays.

For more information about VNC, refer to the documentation on the RealVNC Web site: http://www.realvnc.com/documentation.html.

Command-line Interface
By default, Fedora uses the GNU bash shell to provide a command-line interface. The GNU Core Utilities complete the command-line environment. Refer to http://www.gnu.org/software/bash/bash.html for more information on bash.

To learn more about the GNU Core Utilities, refer to http://www.gnu.org/software/coreutils/.

Remote System Access
Fedora incorporates the OpenSSH suite to provide remote access to the system. The SSH service enables a number of functions, which include access to the command-line from other systems, remote command execution, and network file transfers. During the installation process anaconda may use the scp feature of OpenSSH to transfer crash reports to remote systems. Refer to the OpenSSH Web site for more information:

Access Control
SELinux দ্বারা উপলব্ধ ম্যান্ডেটোরি অ্যাকসেস কন্ট্রোল (MAC) বৈশিষ্ট্যের সাহায্যে Linux-র নিরাপত্তা উপলব্ধকারী ক্ষমতা বৃদ্ধি করা হয়। অধিক বিবরণের জন্য SELinux প্রজেক্ট পেজ পড়ুন: http://docs.fedoraproject.org/selinux-guide.

Firewall
The Linux kernel used by Fedora incorporates the netfilter framework to provide firewall features. The Netfilter project website provides documentation for both netfilter’ and the iptables administration facilities: http://netfilter.org/documentation/index.html.

Software Installation
Fedora uses yum to manage the RPM packages that make up the system. Refer to http://docs.fedoraproject.org/yum/ for more information.

Virtualization
Virtualization provides the capability to simultaneously run multiple operating systems on the same computer. Fedora also includes tools to install and manage the secondary systems on a Fedora host. You may select virtualization support during the installation process, or at any time thereafter. Refer to the Fedora Virtualization Guide available from http://docs.fedoraproject.org/ for more information.
I.1. "Bangladesh: Office Participation Plan"

- Fab Fab (German translator)
- Aman Alom (Punjabi translator)
- Jean-Philippe Béche (French translator)
- David Bajl (Brazilian Portuguese translator)
- Susanta Behura (Orissa translator)
- Michael Bentkowski (Polish translator)
- Rahul Bhalerao (Marathi translator)
- Runa Bhattacharyya (Bengali (India) translator)
- VNC Installation Plan
- Guido Caruso (Italian translator)
- Guillaume Chardieu (French translator)
- Nikos Charonitakis (Greek translator)
- Chester Cheng (Chinese (Traditional) translator)

• III. (translator - Chinese (traditional))
  • felix.sha (translating: Chinese)
• III. (translator - Brazilian Portuguese)
• Fabian Durand (translating: French)
• II. (translating: Polish)
• II. (translating: French)
• II. (writer, editor)
• II. (translator - Persian)
• II. (translator - Tamil)
• II. (translator - simplified Chinese)
• II. (translator - Japanese)
• Shri Ganesh (translating: Telugu)
• II. (translator - Greek)
• II. (translator - Spanish)
• II. (translator - Russian)
• II. (translator - Portuguese)
• Kyoto James Hashida (translating: Japanese)
• Severin Heinig (translating: German)

8 http://fedoraproject.org/wiki/Tomchiukc
9 https://fedoraproject.org/wiki/HansdeGoede
10 http://fedoraproject.org/wiki/PiotrDr%C4%85g
11 http://fedoraproject.org/wiki/DamienDurand
12 https://fedoraproject.org/wiki/StuartEllis
14 https://fedoraproject.org/wiki/User:Pfrields
15 http://fedoraproject.org/wiki/DimitrisGlezos
16 http://fedoraproject.org/wiki/GuillermoGomez
17 http://fedoraproject.org/wiki/Igorbounov
18 http://fedoraproject.org/wiki/RuiGouveia
• জি হুয়াং (অনুবাদক - চীনা (সরলীকৃত))
• রুইচি হিউগাবারু (অনুবাদক - জাপানি)
• জয়রাধা এন (অনুবাদক - তামিল)
• ক্রিস জনসন (লেখক)
• ইউনজু কিম (অনুবাদক - কোরিয়ান)
• মিশেল জে কিম (অনুবাদক - কোরিয়ান)
• ফফফফফফফফফফফফফ (অনুবাদক - সার্বিয়ান)
• অ্যালেক্সি কোস্টিউক (অনুবাদক - রাশিয়ান)
• ডানিয়েলা কুগেলম্যান (অনুবাদক - জার্মান)
• ফফফফফফফফফফফফফ (অনুবাদক - সুইডিশ)
• ফ্লোরেন্ট লে কজ (অনুবাদক - ফ্রেঞ্চ)
• এরিক লেমন (লেখক)
• নোরিকো মিজুমুতো (অনুবাদক - জাপানি)
• জেরেমি ডব্লিউ. মুনি (লেখক)
• এনিকো নেগি (অনুবাদক - হাঙ্গেরিয়ান)
• ইগোর নেস্টোরোভিক (অনুবাদক - সার্বিয়ান)

19 http://translate.fedoraproject.org/people/kmilos
20 https://fedoraproject.org/wiki/User:Rlandmann
21 http://translate.fedoraproject.org/people/raada
22 https://fedoraproject.org/wiki/ChristopherusLaurentius
23 http://fedoraproject.org/wiki/User:Jensm
24 http://fedoraproject.org/wiki/IgorMiletic
• ###### 25 (লেখক, সম্পাদক)
  • জন নগুয়েন (লেখক)
  • মেনুয়েল ওস্পিনা (অনুবাদক - লাটভিয়ান)
  • জানিস ওজওলিন্স (অনুবাদক - রাশিয়ান)
  • আনেকতি পাটিলে (অনুবাদক - পুজারাতী)
  • ###### 26 (অনুবাদক - ব্রাজিলিয়ান পোর্তুগিজ)
  • অনন্দপিটার (অনুবাদক - মালায়ালাম)

• ####### 27 (অনুবাদক - অসমীয়া)

• ####### 28 (অনুবাদক - ইটালিয়ান)

• ####### 29 (অনুবাদক - জার্মান)
  • হোসে নুনের পরিস (অনুবাদক - পোর্তুগিজ)
  • পিয়েরো পাড়িয়ালারসক (অনুবাদক - পোলিশ)
  • ইউলিয়া পোয়ারকোভা (অনুবাদক - রাশিয়ান)
  • সঙ্কর প্রসাদ (অনুবাদক - কন্নড়)
  • রাজেশ রঞ্জন (অনুবাদক - হিন্দি)

• #### 30 (লেখক)
  • শমি রিখার্ট (অনুবাদক - জার্মান)

• ####### 31 (অনুবাদক - জার্মান)

• ####### 32 (অনুবাদক - মালায়)

• ####### 33 (অনুবাদক - ফার্সি)

26 http://fedoraproject.org/wiki/User:Dpaulo
27 https://translate.fedoraproject.org/people/aphukan
29 https://fedoraproject.org/wiki/User:Barney
30 https://fedoraproject.org/wiki/TommyReynolds
31 http://fedoraproject.org/wiki/DominikSandjaja
32 http://translate.fedoraproject.org/people/szaman
33 https://fedoraproject.org/wiki/User:Saeedi
• 34 (অনুবাদক - চীনা (সরলীকৃত))
    অড্রি সিমোন্স (অনুবাদক - ফ্রেঞ্চ)
    কেল্ড সিমেন্সেন (অনুবাদক - ড্যানিশ)
    35 (নথক, সম্পাদক)
    এস্পেন স্টেফানসেন (অনুবাদক - নরওয়েজিয়ান বকেমাল)
    36 (অনুবাদক - হাঙ্গেরীয়)
    37 (অনুবাদক - হাঙ্গেরীয়)
    38 (অনুবাদক - ইটালীয়)
    টিমো ট্রিংক্স (অনুবাদক - জার্মান)
    39 (অনুবাদক - গ্রিক)
    গারোন উড্ডেবোর্গ (অনুবাদক - সুইডিশ)
    40 (অনুবাদক - ফ্রেঞ্চ)
    ফ্রাঞ্চেস্কো ভেলেন্টে (অনুবাদক - ইটালীয়)
    41 (লেখক, সম্পাদক, প্রকাশক)
    সারা সাইহরি ওয়াং (অনুবাদক - চীনা (সরলীকৃত))
    42 (অনুবাদক - ডাচ)
    এলজিব্যান জুয়ান ওয়াইল্ড (সম্পাদক)
    টিরোন উইকরামারাত্নে (অনুবাদক - সিংহলিজ)
    বেন উ (অনুবাদক - চীনা (পারম্পরিক))
    জায়িওফান ইয়াং (অনুবাদক - চীনা (সরলীকৃত))

34 https://fedoraproject.org/wiki/User:Tiansworld
35 https://fedoraproject.org/wiki/User:Jsmith
36 https://fedoraproject.org/wiki/User:Peti
37 https://fedoraproject.org/wiki/User:Zoli73
38 http://fedoraproject.org/wiki/DimitriosTypaldos
40 http://fedoraproject.org/wiki/KarstenWade
41 http://fedoraproject.org/wiki/GeertWarrink
I. অংশগ্রহণকারী ও নির্মাণের প্রণালী

- ৩১  (অনুবাদক - চীনা (সরলীকৃত))
- ৩৪  (অনুবাদক - ব্রাজিলিয়ান পোর্তুগিজ)
- ৪৫  (অনুবাদক - স্প্যানিশ)

http://docs.fedoraproject.org/install-guide/

I.2. নির্মাণ পদ্ধতি

লেখকরা সরাসরি DocBook XML সহযোগে ইনস্টলেশন সহায়িকাটি লেখেন ও একটি রিপোসিটোরিয়াল রিপোসিটোরিয়ার মধ্যে তা সংরক্ষিত হয়। সহায়িকাটির বিবরণ প্রাপ্ত করেন লেখকরা এবং একটি রিপোসিটোরিয়াল রিপোসিটোরিয়ার মধ্যে তা সংরক্ষিত হয়। এর পরে, তারা রিপোসিটোরিয়াল এবং বিষয়বস্তুর সম্পর্কে তথ্য সংরক্ষিত হয়। এর পরে, অনুবাদকরা নোটগুলিকে অন্যান্য ভাষায় অনুবাদ করেন ও সেগুলির অংশ রূপে তাদের সংরক্ষিত করেন।

http://translate.fedoraproject.org/people/bbbush
http://fedoraproject.org/wiki/DiegoZacarao
http://fedoraproject.org/wiki/User:Izaac

310
Fix references to RHEL and Telnet BZ#640271 and BZ#640309

Import fixes from enterprise version
সূচি

প্রতীক /

/boot/ (প্রতীক পার্টিশন)
/root/install.log
/install log file location, 115
/var/

প্রতীক /

/ boot/ (পার্টিশন)
/proc/ (প্রস্তাবিত পার্টিশন পদ্ধতি, 99)
/root/install.log
/install log file, 115
/var/

প্রতীক /

/ boot/
/proc/ (পার্টিশন)
/proc/ (আপগ্রেড প্রণালী, 233)
/swap/
/swap/ (ইউজার ইন্টারফেস, টেক্সট-মোড ইনস্টলেশন, 43)

ইনস্টলেশন

DVD, 48
kickstart (দেখুন kickstart ইনস্টলেশন), 39
mediacheck, 39
NFS

সূচী

সংক্রান্ত তথ্য, 51

কিবোর্ডের মাধ্যমে চলাচল, 45
নেটওয়ার্ক থেকে, 38

পদ্ধতি DVD, 25
NFS, 26
URL

ইনস্টলেশনের পরিকল্পনা, 47

ইনস্টলেশন প্রোগ্রাম

x86, AMD64, Intel, 64

ইমার্জেন্সি মোড, 231

একটি পার্টিশনের নির্মাণ, 253
নতুন নির্মাণ

ফাইল-সিস্টেমের ধরন, 91

পার্টিশন যোগ, 254
নতুন নির্মাণ, 89

চক-ম্যাপ,

চক-ম্যাপ, 54
চক-ম্যাপ হ্রদ নির্বাচন, 54
চক-ম্যাপ, 73
চকিত পার্টিশন ব্যবস্থা,
চকিত পার্টিশন, 89
চকিত নির্বাচন পরিবেশ

DHCP

কনফিগারেশন, 148
চকিত পার্টিশন নির্মাণ পরিকল্পনা, 82

চকিত পার্টিশন ব্যবস্থার জন্য
ব্যবহার করা হয়, 45
কনফিগারেশন, 54

cd-rom

CD-ROM DVD

চকিত পার্টিশন নির্মাণ করার প্রণালী, 26

চকিত পার্টিশন নির্মাণ করার প্রণালী, 109
চকিত পার্টিশন

FTP, 51
HTTP, 50

নেটওয়ার্ক ইনস্টলেশন

সঞ্চালনা, 49

পরিসেবা

chkconfig সহযোগে কনফিগার করার প্রণালী, 291
ntsysv সহযোগে কনফিগার করার প্রণালী, 291

(আরো দেখুন পরিসেবা)

পরিসেবা

চকিত পার্টিশন ব্যবস্থা, 291

চকিত পার্টিশন নির্মাণ করার প্রণালী, 291
<table>
<thead>
<tr>
<th>সূচী</th>
</tr>
</thead>
<tbody>
<tr>
<td>প্রধান পার্টিশন, 252</td>
</tr>
<tr>
<td>পূর্বভাবত, 99</td>
</tr>
<tr>
<td>বলবতী পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মাতলিক বিষয়, 249</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>নির্বাচন প্রণালী, 99</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>নির্বাচন প্রণালী, 99</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>নির্বাচন প্রণালী, 99</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>নির্বাচন প্রণালী, 99</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>নির্বাচন প্রণালী, 99</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
<tr>
<td>পার্টিশন যোগ</td>
</tr>
<tr>
<td>ফাইল-সিস্টেমের ধরন, 91</td>
</tr>
<tr>
<td>পার্টিশন যোগ করার পদ্ধতি, 89</td>
</tr>
<tr>
<td>প্রারম্ভিক তথ্য, 251</td>
</tr>
<tr>
<td>ব্যবহৃত পার্টিশনের ব্যবহার, 255</td>
</tr>
<tr>
<td>মাউন্ট-পয়েন্ট এবং, 259</td>
</tr>
<tr>
<td>মৌলিক বিষয়, 249</td>
</tr>
<tr>
<td>স্বয়ংক্রিয়, 82</td>
</tr>
</tbody>
</table>
RAID, 117
কার্ড, 117
ক্ষতি ১১ সংক্রান্ত ত্রুটি, 118
সময়ের অঞ্চল 73
কনফিগারেশন, 73
সিঙ্গেল ইউজার মড, 230
সদ্য খন্ড (দখুন কমান্ড)
সিস্টেমের সংক্রান্ত ত্রুটি, 118
সাধারণ সমস্যা, 227
root পাসওয়ার্ড হারিয়ে গেলে, 227
রান্না-লোডার পুনরায় ইনস্টল করার প্রণালী, 230
হার্ডওয়্যার/সফ্টওয়্যার সংক্রান্ত সমস্যা,
227
স্ক্রিন-শট ইনস্টলেশন চলাকালে, 46
স্থগিত, 291
(আরো দেখুন বন্ধ)

A
aboot, 285
anaconf, 303
anaconda, 117
anaconda.log, 8
architecture, 7
Determining, 82, 82
automatic partitioning,

B
BIOS, 283
(আরো দেখুন বুট করার প্রক্রিয়া)
(ব্যাখ্যা)
(Bayesian Fingerprint/Agent Fingerprint), 35
BIOS
BitTorrent, 6
seeding, 6
boot loader installing on boot partition, 107
boot options serial mode, 39
UTF-8, 38
text mode,
316

boot loaders documentation, 303

documentation, 303

additional material, 281

install notes, 281

helpful website, 282

install process, 273

interface, 275

order, 276

command line, 275

menu, 275

menu entry editor, 275

configuration, 104

pathname, 278

configuration file /boot/grub/grub.conf, 278

configuration directory, 278

option, 109

root file system, 275

device, 273

file, 274

view, 272

virtual consoles, 47

disks, 24

FTP, 27, 51

GUI, 43

hard drive, 30, 48

HTTP, 27, 51

network, 27

NFS, program

graphical user interface, 46

virtual consoles, 39

serial mode, 39

UTF-8, 38

text mode, 62

IPv4, iscsi

installation, 60

ISO mount to install, 1, 5

K

kernel

ISO image download process, 1, 5

kernel, 136

Kickstart, kickstart

archive content, 186

kickstart file %include, 179

auth, 159

authconfig, 158

autopart, 159

autostep, 161

bootloader, 162

clearpart, 162

cmdline, 162

device, 163

driverdisk, 163

firewall, 164

firstboot, 164

graphical

halt, 164

ignoredisk, 159

include contents of another file, 179

install', 164

interactive, iscsi, 165

iscsiname, 166

iscsikey, 166

keyboard, 166

lang, 166

langspects, 167

logging, 167

logvol

K

hostname, 62, 62

HTTP installation, 27, 51

I

init, 285

Systv init

configuration file, 289

/etc/inittab, 289

boot loader configuration, 285

boot loader configuration, install

pathname, 289

# # # # # configuration

view boot loader, 289

install log file

/root/install.log, 115

installation
mediacheck', 168, 168, 175
mouse', 168
multipath', 170
network', 169
part', 170
partition', 170
poweroff', 173
raid', 173
reboot', 174
rootpw', 175
selinux', 175
services', 176
shutdown', 176
skipx', 176
text', 177
timezone', 177
upgrade', 177
user', 178
vnc', 178
volgroup', 178
xconfig', 178
zerombr', 179
zfcp'

kickstart installations
LVM, 167
starting
from a boot CD-ROM, 186
from DVD with a diskette, 187
Kickstart
kickstart
CD-ROM
flash

Kickstart

%post script, 206
%pre script, 205
root

SE Linux

Master Boot Record, 227

MBR

mirror, 6

N
network installation preparing for, NFS
installation, 27, 50
(NFS - Network File System)
installation notes, 49
NTFS partitions
resizing, 2
NTP (Network Time Protocol), 73, 215
(see also: DSN vs.
root level)
OpenSSH, 304
(see also: SSH)
OS/2
booting, 107
P
parted
partitioning
destructive, 256
how many partitions, 252, 260
program.log, 117
PulseAudio, 303
PXE (Pre-Boot Execution Environment), 42
PXE installation
Kickstart configuration, 198
RAID
Kickstart configuration, 148
RAID card, 147
not supported, 146
USB storage, 149
screencap, 149
screencap, 146
startup, 147
Root
/ partition
proposed partition scheme, 99
Swap
partition
upgrade method, 234
Syslog, 117, 135
system recovery
common problems
unable to boot into Fedora, 227
system-config-kickstart (see also: Kickstart configuration)
SysV init
init
TCP/IP
configuration, 49
text interface, 132
tftp, 148
traceback messages
saving traceback messages without removable media, 119
troubleshooting
during the installation, 119
No devices found to install Fedora error message, 122
partition tables,
USB মিডিয়া প্রণালী, 35
user interface, graphical installation program, 46

V (তথ্য ফাইল-সিস্টেম)
vfat, 47
virtual consoles, 47
Virtualization documentation, 304
VNC (Virtual Network Computing)
documentation, 303
enabling, 134
installing client, 134
listening mode, 134
VNC (ভার্চুয়াল নেটওয়ার্ক কম্পিউটিং), 134

X
Xorg, 303

Y
yum, 220
documentation, 304
yum.log, 117