

Package Management

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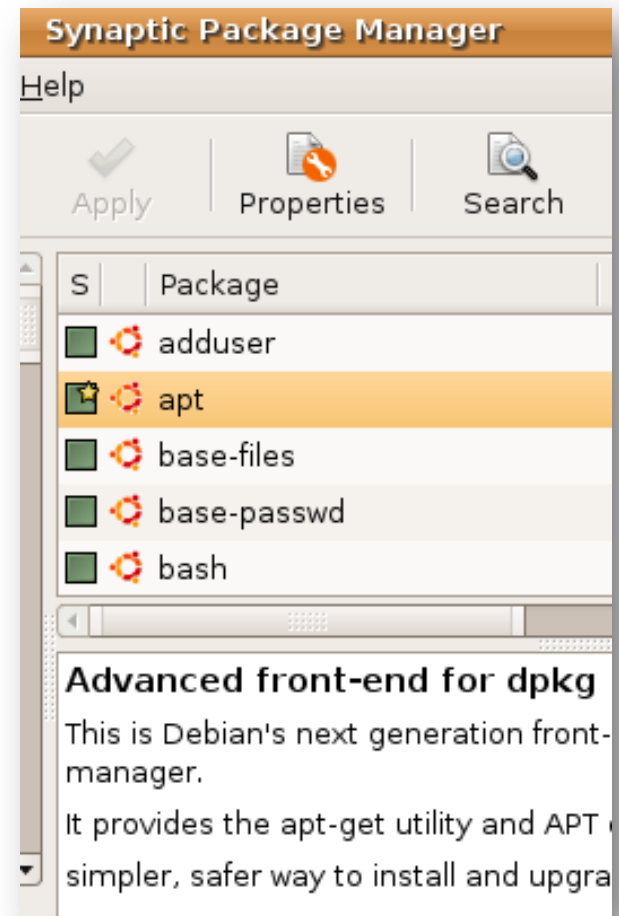
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Lesson Overview

As a Linux Administrator, you will adding, and removing software frequently to your existing installation of Linux to keep the system updated and to do maintenance.

Operating systems allow for the addition and removal of software through a variety of means. In the Windows operating system environment, each software application is bundled with its own installer that works independently of other installations. Certain files may also be written to a central registry during software installations.

In the Linux environment however, software installation and removal works differently. Linux uses a package management system to verify and manage software. You will be exploring package management in this lesson to ensure you understand the process of installing, upgrading, and removing software applications. Learning this skill is critical to the stability and maintenance of a Linux computer system.



Student Expectations

You should know what will be expected of you when you complete this lesson. These expectations are presented as objectives.

Objectives are short statements of expectations that tell you what you must be able to do, perform, learn, or adjust after reviewing the lesson.



Objective

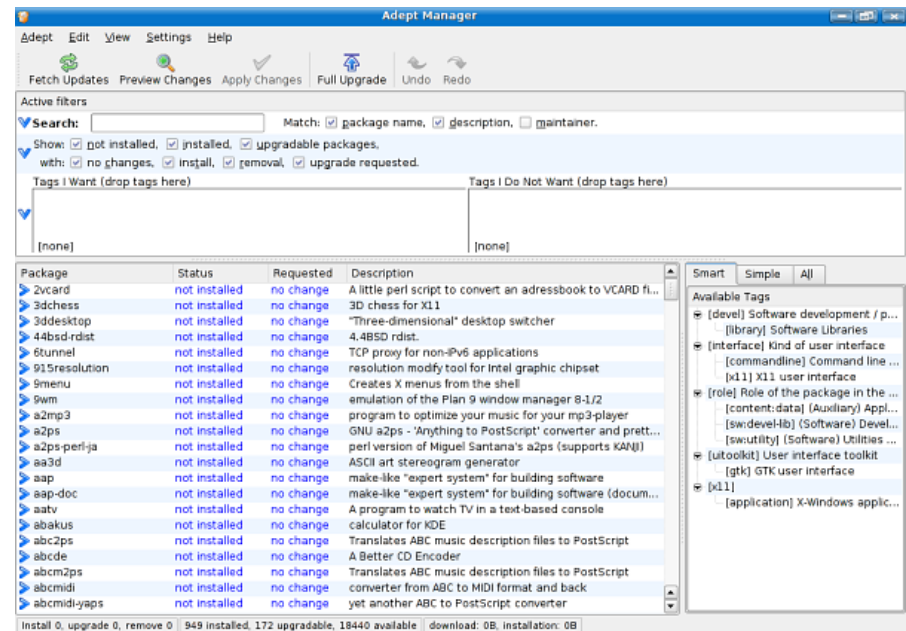
Manage software packages using various tools.



Lesson Outline

During this lesson, you will explore:

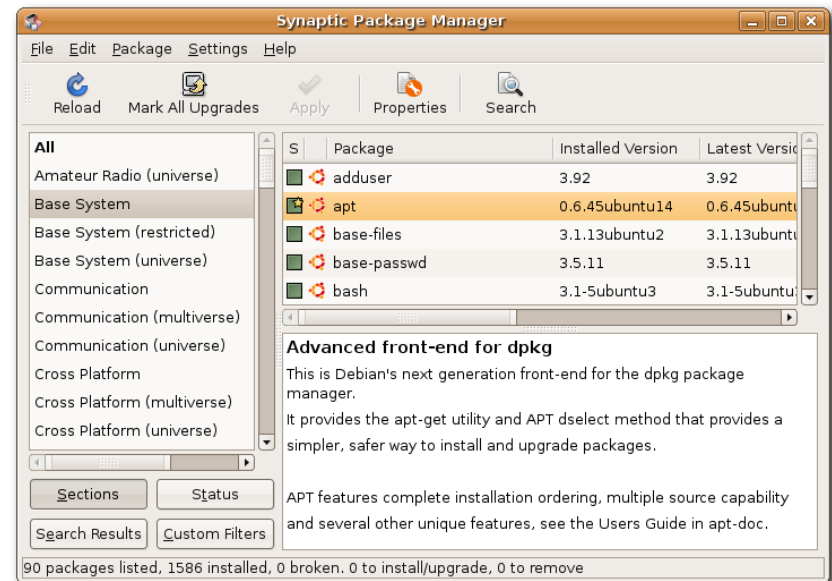
- ❖ Managing packages in Ubuntu
- ❖ Canonical
- ❖ Repository
- ❖ Package theory
- ❖ Package Management Options
 - *Apt-get, Aptitude, Dpkg*
 - *Dselect, Gnome App Install*
 - *Synaptic, Update Manager*
 - *Yum, MakeInstall*
- ❖ Dependencies



Package Management

Linux-based computers use a set of software tools called a *package management system* that assist with adding, configuring, removing, and maintaining software on a computer in an orderly way. Additionally, organizations such as Canonical Ltd works with developers to improve software compatibility.

Select the **PLAY** below for an overview of package management.



View Video

VideoLesson8PackageManagementOverview(C1L8S15).mp4



Canonical

Canonical Ltd is a private company that promotes free software and related projects. Members of Canonical include teams of designers, engineers and support staff for the Ubuntu project.

Canonical Ltd offer numerous services for supporting Ubuntu Users. Team members work with hardware manufacturers to ensure the Ubuntu platform is well-equipped to handle hardware and software as they come online.

Explore Canonical Ltd

<http://www.canonical.com/about-canonical>

<http://blog.canonical.com/>



Select the **PLAY** button below for more on Canonical and their contributions.

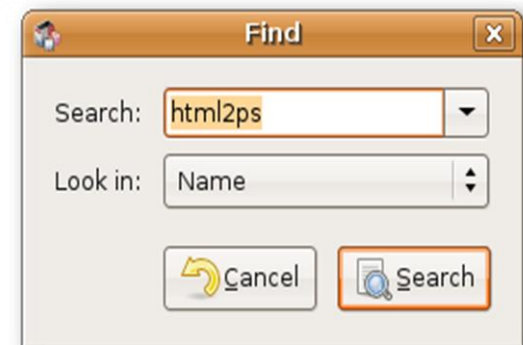
View Video
VideoLesson8Canonical(C1L8S16).mp4

Repository

The [Ubuntu repository](#) is a system of online archives that contain thousands of Ubuntu applications and utilities you may browse, download, and install to your system. Repositories contain various software applications categorized based on the kind of support offered by Ubuntu for those applications.

[Repository components](#) include:

- [Main](#) - Officially supported software
- [Restricted](#) - Supported software that is not available under a completely free license
- [Universe](#) - Community maintained software, i.e. not officially supported software
- [Multiverse](#) - Software that is not free



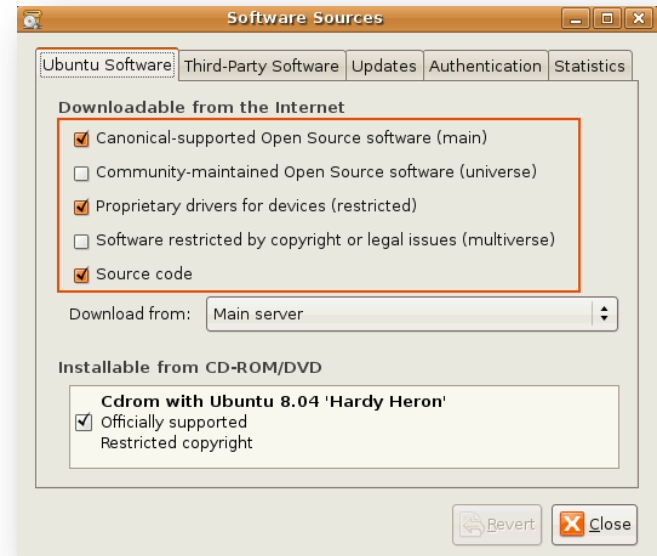
Additional Links:

- [Managing Software Repositories from CLI](#)
- [Managing Software Repositories in Kubuntu](#)
- [Adding extra repositories](#)
- [Adding, Removing and Updating Applications](#)

Package Theory

Package management systems were developed for Linux to provide a quick mechanism for offering new software and updates to existing software components and to provide ongoing operating system support and maintenance in an efficient and effective manner.

The default Ubuntu installation includes software that allows the user to find, browse, download, install, remove, and maintain software applications. Through the package management system, end users can customize their specific installation to meet their individual needs by adding and removing software.



Select **PLAY** to review Package Manager

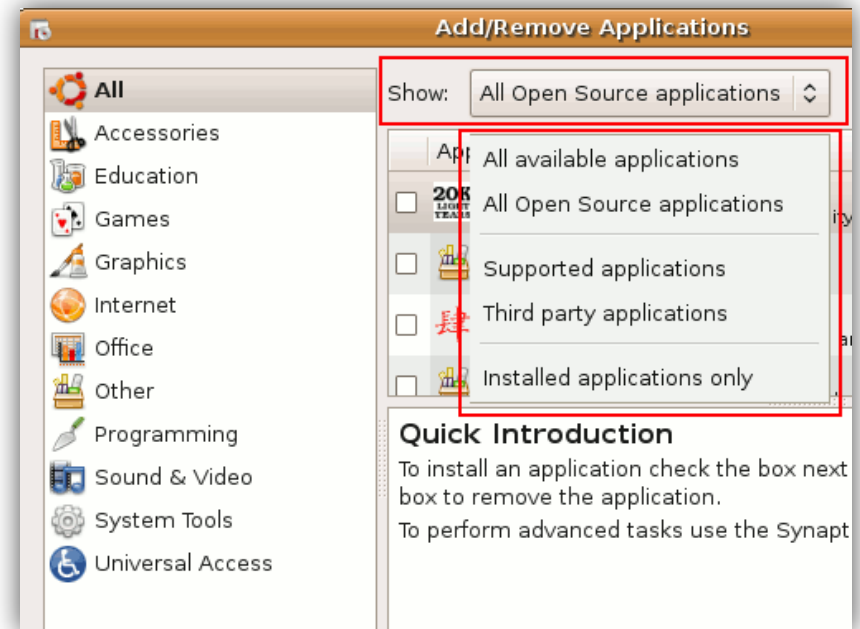
View Video
VideoLesson8PackageTheory(C1L8S18).mp4

Package Management Options

A number of package managers have been developed for Linux systems. Some of the popular options include:

- APT-Get
- Aptitude
- Dpkg
- Dselect
- Gnome-app-install
- Synaptic
- Yum
- Update Manager
- Make Install

Each will be explored.



PM Options: APT-GET

Apt-get is a command line utility that provides the commands to install, remove and manage applications and utilities on your system.

Explore the following links to learn more about Apt-Get:

[Ubuntu Documentation for Apt-Get](#)

[Apt-Get guide](#)

[Package Management using CLI](#)

[Apt-Get Tool](#)



The screenshot shows the Ubuntu documentation page for Apt-Get. It features the Ubuntu logo and the text 'ubuntu documentation'. Below the logo, there is a breadcrumb trail: 'Ubuntu Documentation > Ubuntu 6.06 LTS > Apt-Get'. The main heading is 'Apt-Get'. The text describes the 'apt-get' command as a powerful tool for performing functions like installation, removal, and management of packages. It also mentions that 'apt-get' is a simple command-line tool used by server administrators. The page lists examples of popular uses for 'apt-get', including installing and removing packages. Two code blocks are shown: 'sudo apt-get install nmap' and 'sudo apt-get remove nmap'.

 **ubuntu**
documentation

[Ubuntu Documentation](#) > [Ubuntu 6.06 LTS](#) > [Apt-Get](#)

Apt-Get

The **apt-get** command is a powerful command-line utility for performing such functions as installation of packages, removal of packages, package list index, and even upgrading the system.

Being a simple command-line tool, **apt-get** is a useful tool for Ubuntu for server administrators. Some of the features of **apt-get** include the ability to be used in system administration.

Some examples of popular uses for the **apt-get** command are:

- **Install a Package:** Installation of a package scanner nmap, type the following:

```
sudo apt-get install nmap
```
- **Remove a Package:** Removal of a package nmap package installed in the previous example:

```
sudo apt-get remove nmap
```

PM Options: Aptitude

Aptitude is a text-based package manager that allows you to download, install, and remove software packages. [Aptitude](#) serves as a front-end to lower level utilities such as apt-get and dpkg, and must be run from a *Terminal* window.

Explore the following links to learn more about Aptitude:

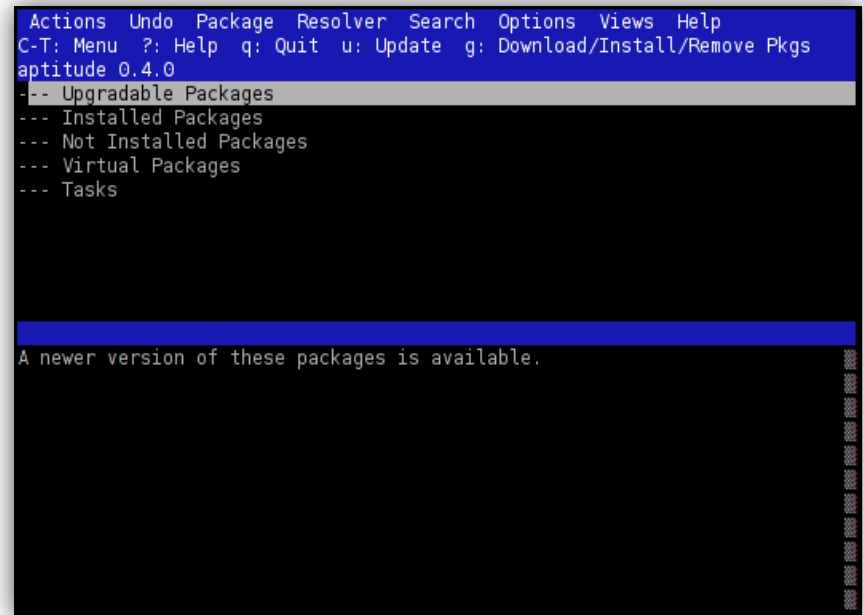
[Official Ubuntu documentation on Aptitude](#)

[Aptitude Survival Guide](#)

[Ubuntu guide for Aptitude \(Part 1\)](#)

[Ubuntu guide for Aptitude \(Part 2\)](#)

[Aptitude and Synaptic compared](#)



```
Actions Undo Package Resolver Search Options Views Help
C-T: Menu ?: Help q: Quit u: Update g: Download/Install/Remove Pkgs
aptitude 0.4.0
-- Upgradable Packages
--- Installed Packages
--- Not Installed Packages
--- Virtual Packages
--- Tasks

A newer version of these packages is available.
```

PM Options: Dpkg

Dpkg is the basic command-line tool for installing, removing, querying, and managing packages in Ubuntu.

Explore the following links to learn more about Dpkg:

- [Package Management using Dpkg](#)
- [Dpkg Ubuntu](#)
- [Manpage on Dpkg](#)

Using dpkg to install packages

dpkg is a command-line tool used to install packages. To install a

```
cd directory
sudo dpkg -i package_name.deb
```

Note: replace directory with the directory in which the package

It is recommended that you read the dpkg manual page before using the package database. To view the manual page for dpkg, open a Terminal and

Getting a list of recently installed packages

You can also use the dpkg logs to discover recently installed packages and return installations to a previous system state.

```
zcat -f /var/log/dpkg.log* | grep "\ install\ " |
```

More detailed information on this can be found [here](#).

PM Options: Dselect

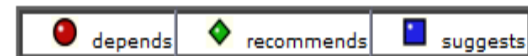
Dselect is a high-level interface for managing the installation and removal of Ubuntu software packages.

Dselect can be difficult for inexperienced users but frequent interaction with Dselect will improve your comfort level and expertise.

Explore the following links to learn more about Dselect:

- [Dselect package](#)
- [Debian Package Management](#)
- [Ubuntu Package tricks](#)

Other Packages Related to dselect



- [dpkg](#) ($\geq 1.13.1$)
Debian package management system
- [libc6](#) (≥ 2.4)
GNU C Library: Shared libraries
also a virtual package provided by [libc6-udeb](#)
- [libgcc1](#) ($\geq 1:4.1.1$)
GCC support library
- [libncursesw5](#) ($\geq 5.6+20071006-3$)
shared libraries for terminal handling (wide character)
- [libstdc++6](#) ($\geq 4.1.1$)
The GNU Standard C++ Library v3

Download dselect

Architecture	Package Size	Installed Size	Files
amd64	326.1 kB	2108 kB	[list of files]
i386	318.0 kB	2088 kB	[list of files]

PM Options: Gnome-App-Install

















The gnome-app-install utility is a [graphical application](#) that runs when you select **Add/Remove** programs from the **Applications** menu on your Ubuntu system.

Select **PLAY** to view a video on Gnome-App.

View Video
VideoLesson8GnomeAppInst
all(C1L8S24).mp4



Other Packages Related to gnome-

 depends	 recommends	 suggests
 app-install-data (>= 0.4.0) Ubuntu applications (data files)		
 gconf2 (>= 2.10.1-2) GNOME configuration database system (support)		
 gksu graphical frontend to su		
 gnome-icon-theme GNOME Desktop icon theme		
 python An interactive high-level object-oriented language		
 python-apt (>= 0.7.4ubuntu4) Python interface to libapt-pkg		
 python-central (>= 0.6.11) register and build utility for Python packages		
 python-dbus simple interprocess messaging system (Python bindings)		
 python-gconf Python bindings for the GConf configuration database		
 python-gdbm GNU dbm database support for Python		
 python-gst0.10 generic media-playing framework (Python bindings)		
 python-gtk2 (>= 2.10.1) Python bindings for the GTK+ widget set		
 python-gtkhtml2		

- [Make your app appear in Add/Remove](#)
- [Gnome application Installer](#)
- [Make installation idiot proof](#)

PM Options: Synaptic

[Synaptic](#) is a graphical, [X window system](#) tool for installing, removing, querying, and managing software utilities and applications on your Ubuntu system. Synaptic is the preferred management application for most users who maintain Ubuntu systems.

Explore the following links to learn more about Synaptic:

- [Synaptic Howto](#)
- [Synaptic Guide](#)
- [Installing Apps Screencast](#)
- [Simple Package Management](#)



Update Manager Videos



View Video
VideoLesson8UpdateManag
erpt1(C1L8S26V1).mp4

Part 1

Select each **PLAY** button to view videos demonstrating the Update Manager.



View Video
VideoLesson8UpdateManag
erpt2(C1L8S26V2).mp4

Part 2



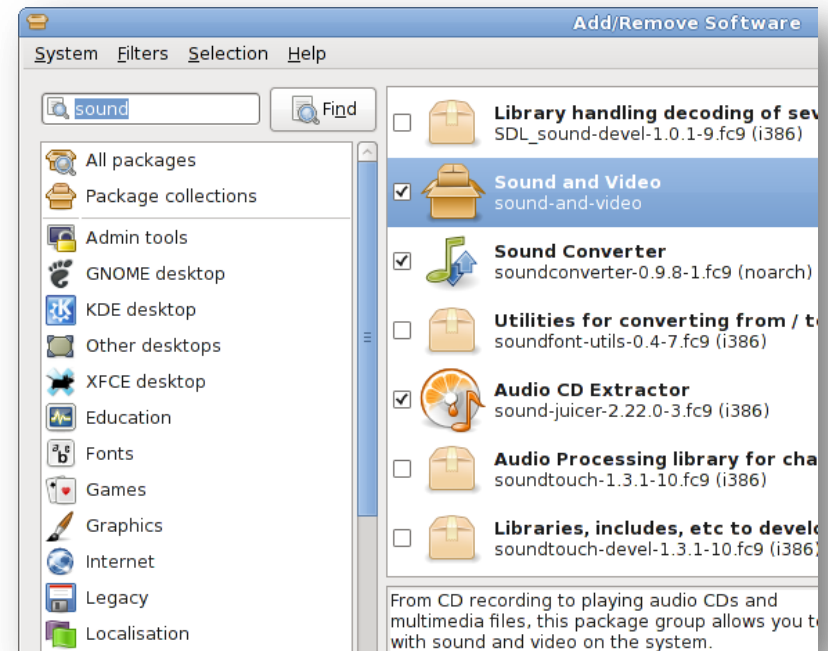
View Video
VideoLesson8UpdateManag
erpt3(C1L8S26V3).mp4

Part 3

PM Options: YUM

Yum is an interactive, rpm-based, package manager. It can automatically perform system updates, including dependency analysis and obsolete processing based on "repository" metadata. It can install new packages, remove old packages, and perform queries on the installed and/or available packages.

Yum is similar to other high-level package managers like apt-get. The YUM command is the tool update of choice for users on a CENTOS or Fedora/Redhat Platform.



Select **PLAY** for a video review of YUM.

View Video
VideoLesson8YumUpdate(C1L8S27).mp4



[Yum command reference](#)
[Yum howto](#)
[Yum manpage](#)
[Linux configuration](#)

PM Options: Update Manager

Update Manager is a graphical, X window system tool for identifying and updating applications already installed on your system.

Explore the following links to learn more about the Ubuntu Update Manager:

[Installing software](#)

[Ubuntu Update Manager](#)

[Windows Update Vs Ubuntu Update](#)

Select **PLAY** to view a video on Update Manager.

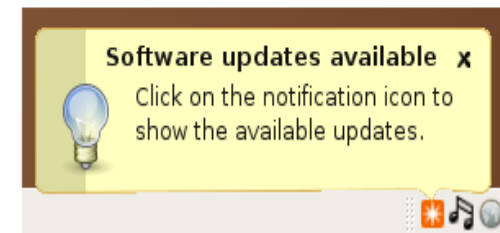
View Video
VideoLesson8UpdateManager(C1L8S28).mp4



Automatic updates: Update Manager

Ubuntu will automatically notify you when security updates are available. To install updates using the simple and easy to use application that helps users to keep their system up to date (which will appear in the notification area), type in your super-user/administrator password and install the updates.

Keeping up to date is important, as security fixes which protect your system.



Dependencies

Dependencies in Linux are programs that rely on other programs to run. In other words, certain programs will not work if a dependent file is missing from the system. When using *apt-get* or other package managers, the process of installing, maintaining, or removal of software will be automated to include dependencies.

Be aware that removing unwanted applications can be complicated if dependencies are also removed in the process. Other programs may rely on those dependent files to run, and if they are missing, some programs may not work.

Select **PLAY** to view a video on dependencies.

View Video
VideoLesson8Dependency
(C1L8S29).mp4



PM Options: Make Install

Make is a series of command line instructions (CLI) that allow an administrator to compile and install applications that are part of a source code project.

Make can be a long and tedious process and is not normally recommended for new users.

Select **PLAY** to view a video on the *Make* command.

View Video
VideoLesson8Make(C
1L8S3o).mp4



Additional Videos

Select each bulleted link below to review important videos for package management functions:



View Video
VideoLesson8UbuntuSoftwareCenter(C1L8S31).mp4

Ubuntu software center



View Video
VideoLesson8UpdateManagerAV(C1L8S31).mp4

Update manager



View Video
VideoLesson8AddRemoveMenu(C1L8S31).mp4














Add/remove menu

Summary

The Ubuntu OS offers several choices for installing, removing, and updating software programs and applications on an Ubuntu system. These choices meet the needs of both the experienced and novice users by keeping software utilities simple, functional, efficient, and current.

Linux systems do not have a central registry like Windows systems. Instead, Linux uses a centralized method for software updates, installation, and removal using an effective package management system that maintains information about installed software in a database. Consequently, programs in Linux do not require their own installation and removal routines because the package management utilities within Linux provide all the necessary tools to handle these operations.

Finally, package management in Linux is a sophisticated method to update systems and manage installed programs.

-  Marked for installation
-  Marked for re-installation
-  Marked for upgrade
-  Marked for downgrade
-  Marked for removal
-  Marked for complete removal
- Not installed
-  Not installed (locked)
-  Installed
-  Installed (upgradable)
-  Installed (locked to the current version)
-  Broken
-  Not installed (new in repository)
-  Package is supported