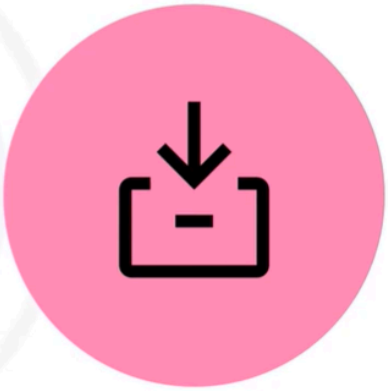
Installing software and updating

- Both software updates and software installation files for Linux operating systems are distributed in files known as packages. These packages are archive files containing the required components for either installing new software or updating existing software. You use package managers to manage the download and installation of packages. Different Linux distros provide different package managers—some are GUI-based and some are command line tools.

Deb and RPM packages

- Packages for Linux OS
- Distinct file types for different Linux OSs
- .deb files:
  - For Debian-based distributions such as Debian, Ubuntu, and Mint
  - deb stands for Debian
- .rpm files:
  - For Red Hat-based distributions such as CentOS/RHEL, Fedora, and openSUSE
  - RPM stands for Red Hat Package Manager



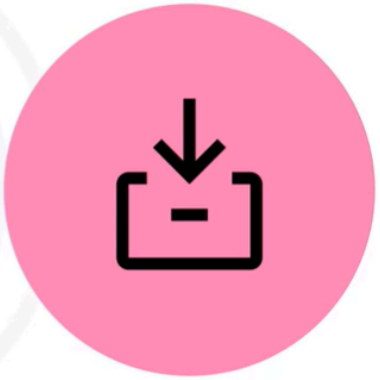
Deb and RPM packages

- deb and RPM formats are equivalent
- If a package is only available in one format, you can use alien to convert it:
  - RPM to deb:

```
alien <package-name>.rpm
```

  - deb to RPM:

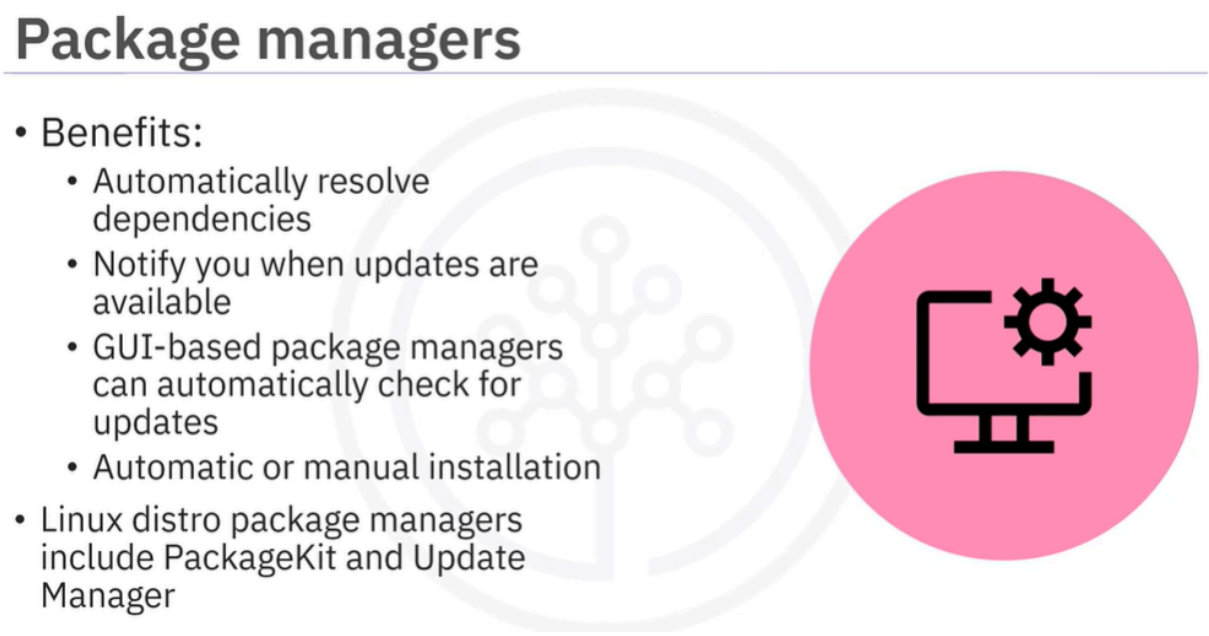
```
alien -r <package-name>.deb
```



- Deb and RPM packages are used by package managers in Linux operating systems. They are distinct file types containing software or updates for different Linux operating systems.

  .deb files are used for Debian-based distributions such as Debian, Ubuntu, and Mint. Deb stands for Debian. And .rpm files are used for Red Hat-based distributions such as CentOS/RHEL, Fedora, and openSUSE. RPM stands for Red Hat Package Manager.

- Deb and RPM formats are equivalent, so the contents of the file can be used on other types of Linux OSs. If you find that a package that you want to use is only available in the other format you can convert it using the alien tool. To convert packages from RPM format to deb, simply use the alien command and specify the package name that you want to convert. To convert to RPM format, use the –r switch with the alien command.

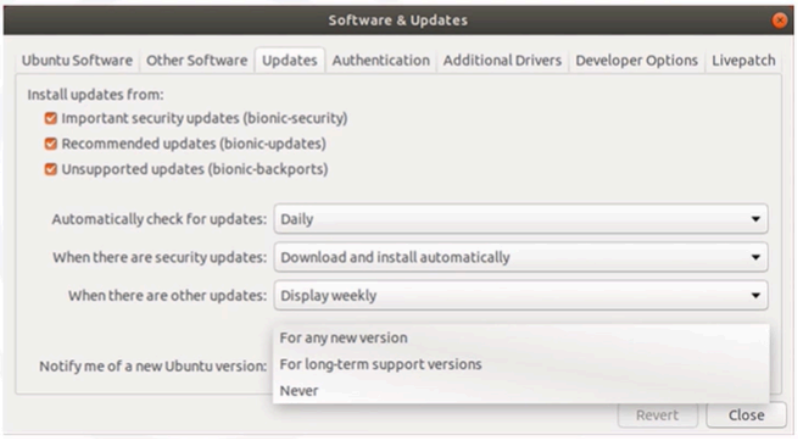


- Package managers provide several benefits: They can automatically resolve dependencies between packages They can notify you when updates are available GUI-based package managers can automatically check for security and software updates on a regular basis And they can automatically install updates or let you select and install just the ones you want. GUI-based Linux distro package managers include PackageKit and Update Manager.

Updating deb-based Linux

GUI tool: **Update Manager**

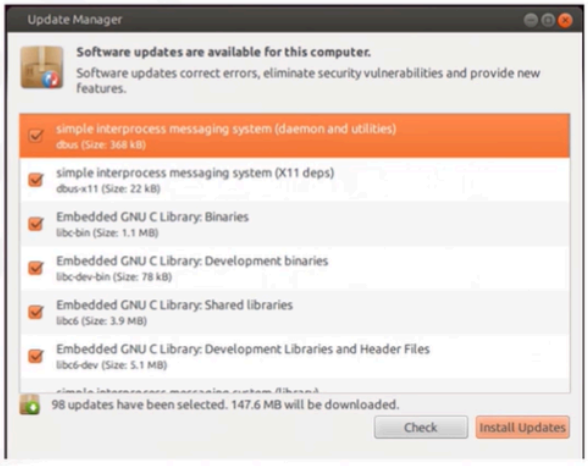
- Automatically checks for updates at configurable intervals
- Supports manual checking for updates



Updating deb-based Linux

GUI tool: **Update Manager**

- When available, software updates are listed:
  - Select the updates you want to install
  - Click 'Install Updates'
  - Enter your user password and click OK
- Installs updates in the background while you work



- Update Manager is a GUI tool for updating deb-based Linux systems. By default, Update Manager checks for software updates daily, and automatically downloads and installs any security updates daily. All other updates are displayed weekly. You can also manually check for updates at any time.

- Update Manager will notify you when software updates are available: Select the updates you want to install Click ‘Install Updates’ If prompted, enter your user password, and click OK. And Update Manager installs the updates in the background while you continue working.

Updating deb-based Linux

Command line: **apt**

```
$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
…
Get:27 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [14.1 kB]
Fetched 7935 kB in 2s (4746 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
50 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

Updating deb-based Linux

Command line: **apt**

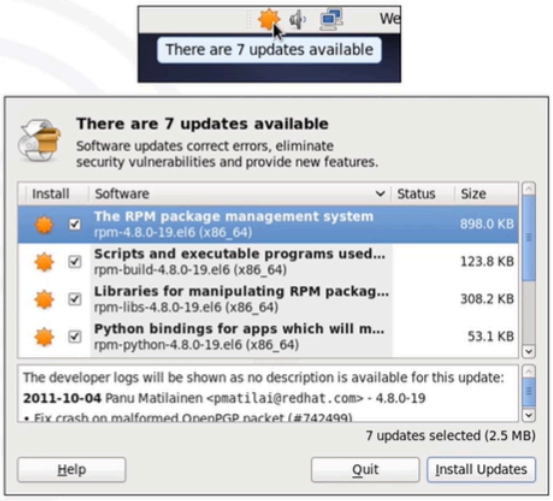
```
$ sudo apt upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
…
After this operation, 12.1 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu focal/main amd64 libpython3.7-stdlib amd64 3.7.13-1+focal1 [1788 kB]
…
Get:14 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu focal/main amd64 libpython3.7-minimal amd64 3.7.13-1+focal1 [597 kB]
Preconfiguring packages ...
…
Preparing to unpack .../00-rsync_3.1.3-8ubuntu0.2_amd64.deb ...
Unpacking rsync (3.1.3-8ubuntu0.2) over (3.1.3-8ubuntu0.1) ...
…
Unpacking python3.7 (3.7.13-1+focal1) over (3.7.12-1+focal2) ...
…
Processing triggers for systemd (245.4-4ubuntu3.15) ...
Processing triggers for man-db (2.9.1-1) ...
```

- apt is a command-line tool for updating deb-based Linux systems. You use the “sudo apt update” command to find available packages for your distro. The output of this command lists each available package, builds a dependency tree, and lets you know how many packages can be upgraded.
- To upgrade all installed packages on a system, use the “sudo apt upgrade” command. If you want to only install a specific package, you can use “sudo apt install package_name” PackageKit is a GUI tool for updating RPM-based Linux systems

Updating RPM-based Linux

GUI tool: **PackageKit**

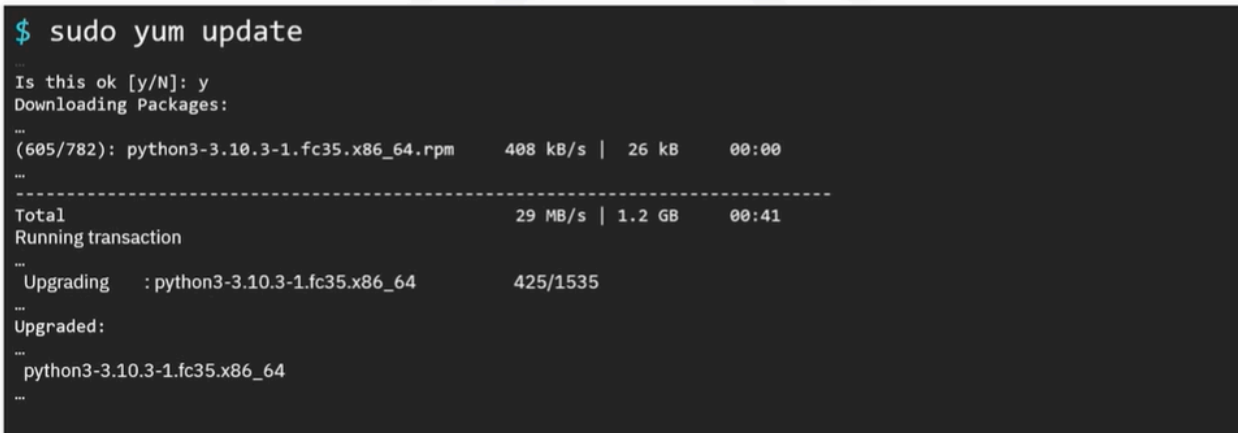
- Notifies you when updates are available
- Lists available software updates
- Installs updates in the background while you work



- When updates are available, PackageKit displays a starburst icon in the notification area. It automatically checks for updates at a configurable interval, and you can also manually check for them at any time. Clicking the starburst icon opens the Software Update window, which lists all available software updates: Select the updates you want to install and then click Install Updates. If requested, enter your user password, and click OK And PackageKit installs the updates in the background while you continue working.

Updating RPM-based Linux

Command line tool: **yum**



- yum is a command-line tool for updating RPM-based systems. yum stands for Yellowdog Updater, Modified. To update all packages in your system, type "sudo yum update" After you enter your password, Yum fetches all available package updates. And then it displays a summary of the updates and asks you to confirm the download. If confirmed, yum downloads all the package updates, and updates the packages on your system. And when finished, it displays the success message "Complete!”

Installing new software

Installing a deb package with apt:

```
sudo apt install <package-name>
```

Installing an RPM package with yum:

```
sudo yum install <package-name>
```

- You can also use command line tools to install new software. Use the apt command with the install switch to install a package on a deb-based system. And use the yum command with the install switch to install software on an RPM-based system.

Other software package managers

- Python package managers include pip and conda
- Installing the pandas library:

```
pip install pandas

Collecting pandas
Downloading pandas-1.4.1-cp38-cp38-manylinux1_x86_64.whl (10.3 MB)
Requirement already satisfied: python-dateutil>=2.7.3 in
/usr/lib/python3/dist-packages (from pandas) (2.7.3)
Requirement already satisfied: pytz>=2017.2 in /usr/lib/python3/dist-
packages (from pandas) (2019.3)
Requirement already satisfied: numpy>=1.15.4 in /usr/lib/python3/dist-
packages (from pandas) (1.17.4)
Installing collected packages: pandas
Successfully installed pandas-1.4.1
```

- Many software applications use package managers, such as the popular pip or conda packages, for managing Python environments. For example, assuming

you already have a Python environment and the relevant pip package, you can easily install the popular “pandas” library used for data wrangling in Python. Enter “pip install pandas” to instruct the pip package manager to: Search for the latest pandas package, Download the pandas package, Check for dependencies and update as required, And install the pandas package. When the installation is complete, the package manager displays the new software version number.

Recap

In this video, you learned that:

- .deb and .rpm are distinct file types used by package managers in Linux operating systems
- deb and RPM formats can be converted from one to the other
- Update Manager and PackageKit are popular GUI-based package managers used in deb- and RPM-based distros, respectively
- apt and yum are popular command line package managers used in deb- and RPM-based distros, respectively