PACKAGE MANAGEMENT SYSTEM

T.Sangeetha
sangeethat@cdac.in

OVERVIEW

- Package Management System.
- Debian Package.
- Types of Debian Packages.
- Debian package management tools.
- Packages Installation.
- Repository
- How to setup a Repository

What is a Package Management System ?

- A package management system (or PMS) is a collection of tools to automate the process of installing, upgrading, configuring, and removing software packages from a computer. Distributions of Linux typically consist of hundreds or even thousands of distinct software packages therefore managing the packages is very much essential.

Debian Package

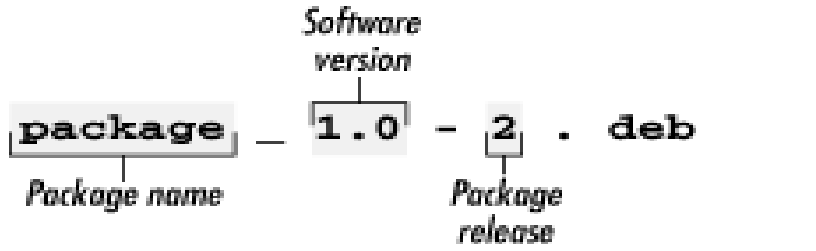
- A Debian "package", or a Debian archive file, contains the executable files, libraries, and documentation associated with a particular suite of program or set of related programs. Normally, a Debian archive file has a filename that ends in .deb.

- BOSS follows Debian Package Management System

Types of Debian Packages

There are two types of debian packages :

- Binary Package :
  - Usually distinguished with .deb file extension.
  - The Debian binary package file names conform to the following convention:



  - It contains executables, configuration files, man/info pages, copyright information, and other documentation.

Source Package

It consists of

- .dsc file
  - Package Name, version, Maintainer's Name, Build-depends.
  - Information about other files.
- .orig.tar.gz file
  - Original unmodified source in gzip-compressed tar format
- .diff file
  - Debian-specific changes to the original source

Package Management Tools

- dpkg
- apt-get
- aptitude
- Synaptic manager

Dpkg

- dpkg is Debian Package Manager
- This tool can be used with different parameters for different operations.
  - dpkg -l - lists all the packages which are installed in the system
  - dpkg -l packagename – tells whether that particular package is installed and if installed its version and a description about the package.
  - dpkg -i packagename – Installs the package in the system.

Apt

APT – Advanced Package Tool

- It provides the apt-get program and apt-get gives a simple way to retrieve and install packages from multiple sources using the command line.
- It also provides apt-cache program.
- It can only install .deb archives from the source which is specified in /etc/apt/sources.list.
- It will call dpkg directly after downloading the .deb archives from the configured sources.

Usage of apt-get

Ways to use apt-get

- To update the packages list,
  - → apt-get update
- To install a package (ex:- gdm) ,
  - → apt-get install gdm
- To remove a package (ex:- gdm) from your system
  - → apt-get remove gdm
- To remove the package and also its configuration files from your system
  - → apt-get –purge remove gdm

Contd.....

- To upgrade all the packages which is installed in your system.

  → apt-get upgrade

- To upgrade all the packages on your system, and, if needed for a package upgrade, installing extra packages or removing packages

  → apt-get dist-upgrade

How to Work with apt-get ?

- Open vi /etc/apt/sources.list and add the following repositories in it

  deb http://packages.bosslinux.in/boss tejas main contrib non- free

  deb-src http://packages.bosslinux.in/boss tejas main contib non- free

- Run apt-get update command from the prompt
- This command looks for the packages list available in the archives and saves it in /var/lib/apt/lists.
- When we install a package, apt will search for status and path of the package in package lists file

Usage of apt-cache

- To find packages whose description contain word

  → apt-cache search word

- To view the detailed information of a package

  → apt-cache show packagename

Aptitude

- Aptitude is a text-based interface, it can be used to perform management tasks in a fast and easy way.
- It provides the functionality of apt-get, as well as many additional features .
- It offers access to all versions of a package.
- Aptitude is the recommended program to install a package and/or to upgrade the system than dselect.

Packages Installation

- Packages can be installed in different ways like:
    - Installing Through utility cd.
    - Installing From shell prompt
    - Installing Through synaptic manager.
    - Installing the packages from source like .tar.gz.
    - Installing through alien.
    - Installing through wine.

Synaptic Package Manager

- Synaptic Package Manager enables you to install software onto your system and to manage the software that is already installed.This software is pundled in so called packages.
  - A single application can even exist in several packages.Nearly all applications reuse the functionality of other applications or libraries to avoid doubled efforts. So most of the packages depends on other packages.
  - Synaptic Package Manager resolves the dependencies automatically.

Features

- Install, remove, configure, upgrade single and multiple packages.
- Upgrade your whole system.
- Manage package repositories.
- Search packages by name.
- Browse all available online documentation related to a package.
- Lock packages to a current version

Installation through prompt

There are two methods to install through shell prompt

First Method

- If a package is downloaded from the Boss repository manually, it can be installed using the following command
    - dpkg -i package name
- If it asks for any dependancies, then the dependant package should also be downloaded manually and installed.

Contd...

Second Method

- Add the following line in the /etc/apt/sources.list
  - deb http://packages.bosslinux.in/boss main and save the file and quit.
- Then run apt-get update in the shell prompt, this will update the packages list.
- To install the package run apt-get install packagename

Installation of rpm and exe

- Installing rpm packages

  Rpm packages can be installed using a tool called alien.

  - Alien -i <rpm package name>
  - Alien -d <rpm package name>

- Installing exe files

  Exe packages can be installed using a tool called wine.

  - Wine <name of the exe file>

Installation from compressed files

Tar.gz or zip files installation

- Right click on the corresponding file and choose “extract here “ option
- Follow the instructions in README file or install file

  Mostly the steps will be

  - ./configure
  - make
  - make install

Repository

- A repository is a set of packages organized in a special directory tree which also contains a few additional files containing indexes and checksums of the packages.
- Repositories can be online and offline (cdrom).
- The components are main, contrib and non-free.
- The different distributions in Boss are Tarang,Anant,Tejas and Savir.
- Index files are Packages.gz and Sources.gz.

Components

- Main
  - Include packages which comply with DFSG(debian free software guidelines).
- Non-free
  - Include packages which do not comply with the DFSG.
- Contrib
  - Include packages which do comply with the DFSG, but may fail other requirements. For instance, they may depend on packages which are in non-free.

DFSG

Some of the Debian free software guidelines

- Free redistribution.
- Inclusion of source code.
- Allowing for modifications and derived works.
- Integrity of the author's source code
- The license needs to apply to all to whom the program is redistributed.
- The GPL, BSD licenses are examples of licenses considered free.

GPL License

- Freedom to use the software for any purpose.
- Freedom to change the software to suit your needs.
- Freedom to share the software with your friends and neighbours.
- Freedom to share the changes you make.

How Repository Works ?

- A repository consists of at least one directory with some DEB packages in it, and two special files:
  - Packages.gz for the binary packages,
  - Sources.gz for the source packages.
- apt-get will fetch the Packages.gz index if the binary packages are listed (with the keyword 'deb').
- It will fetch the Sources.gz index if the sources are listed (with the deb-src keyword).

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- Packages.gz contains the name, version, size, the short and the long description, and the dependencies of each package.
- Sources.gz contains the name, version and the build dependencies (the packages needed to build) of each package, that information is used by apt-get source and similar tools.
- Release file contains some information about the repository like architectures supported, codename, MD5Sum of packages.gz and sources.gz etc.,

How to setup repository ?

- Create directories namely dists and pool in the path of the repository.
- Create folders for different architectures inside dists directory.
- Copy the packages into the pool directory.
- To generate packages and packages.gz , running the following command :
  - dpkg-scanpackages pool/main /dev/null > dists/dist_name/main/binary- i386/Packages
  - gzip -9c dists/dist_name/main/binary-i386/Packages > dists/dist_name/main/binary-i386/Packages.gz

Contd...

- To generate sources and sources.gz files, use the following command :
  - dpkg-scansources pool/<dist_name>/main /dev/null > dists/dist_name/main/source/Sources
  - gzip -9c dists/dist_name/main/source/Sources > dists/dist_name/main/source/Sources.gz
- To generate release file, use the following command :
  - apt-ftparchive release dists/dist_name > dists/dist_name/Release

Tool to download repo

- Debmirror

This program downloads and maintains a partial local mirror. It can mirror any combination of architectures, distributions and sections. Files are transferred by ftp, http, or rsync, and package pools are fully supported.

- Execute the following command to mirror a repository through debmirror
  - debmirror -a i386,amd64,arm -s main,main/debian-installer,non-free,contrib -h packages.bosslinux.in -d savir --progress --method=http /opt/bossrepository

Thank You