

14. Create of Debian packages.

(multiple modules/code packaging of java/c/cpp).

Pull or take any FOSS project and one feature and then create the package on suitable OS

Compare RPM packaging with Debian packaging (on answer sheet)

sudo apt update

sudo apt install libcurl4-openssl-dev g++

To complete this task, you can package a feature or module of an open-source project written in Java, C, or C++ into a Debian package. For simplicity, let's use a popular open-source C++ project—**CURL** (a command-line tool for transferring data with URLs). We'll package a single feature of CURL, such as `curl_easy_perform`, which performs a file transfer in a simplified manner.

Steps for Creating the Debian Package for CURL

Step 1: Set Up the Directory Structure

Create a directory structure for the Debian package.

```
mkdir curl-feature-package
cd curl-feature-package
mkdir -p DEBIAN usr/local/bin
```

Step 2: Download and Prepare the Source Code

Download the **CURL source code** (assuming CURL is not installed) or use `apt source curl` to obtain the source if you're on a Debian-based system.

```
wget https://curl.se/download/curl-7.82.0.tar.gz
tar -xzf curl-7.82.0.tar.gz
cd curl-7.82.0
```

1. **Navigate to the specific feature** code you want to use. For this example, we'll compile a minimal code using the `curl_easy_perform` function.

Step 3: Create a Simple C++ File (Feature Extraction)

Create a new C++ file, `curl_feature.cpp`, and add the `curl_easy_perform` functionality.

```
#include <iostream>
#include <curl/curl.h>

int main() {
    CURL *curl = curl_easy_init();
```

```

    if(curl) {
        curl_easy_setopt(curl, CURLOPT_URL, "https://example.com");
        curl_easy_perform(curl);
        curl_easy_cleanup(curl);
    } else {
        std::cerr << "Failed to initialize CURL" << std::endl;
    }
    return 0;
}

```

1.

Step 4: Compile the Code

Compile the code to create an executable, assuming dependencies like `libcurl` are installed:

```
g++ curl_feature.cpp -o curl_feature -lcurl
```

First navigate to root directory

Move the executable to the Debian package directory.

```

mv curl-feature-package/curl_feature
curl-feature-package/usr/local/bin/

```

1.

Step 5: Create the Control File

Go to the DEBIAN folder in curl-feature-package and create a `control` file with package metadata.

```
Cd DEBIAN
```

```
gedit control
```

1.

Add the following content to the control file:

```

Package: curl-feature-package
Version: 1.0
Section: utils
Priority: optional
Architecture: amd64
Depends: libcurl4
Maintainer: Your Name <your.email@example.com>
Description: A feature package for CURL using curl_easy_perform

```

2.

Step 6: Build the Debian Package

Navigate to the root directory of `curl-feature-package`.

```
cd ..
```

1.

Build the package using `dpkg-deb`:

```
dpkg-deb --build curl-feature-package
```

2. This will create `curl-feature-package.deb` in the current directory.

Step 7: Install and Test the Package

Install the package using `dpkg`:

```
sudo dpkg -i curl-feature-package.deb
```

1.

Run the installed program to verify it works:

```
curl_feature
```

2.

If set up correctly, this should display the response from <https://example.com>.

Like following not exact but something

```
<!doctype html>
```

```
<html>
```

```
<head>
```

```
  <title>Example Domain</title>
```

```
  ...
```

```
</head>
```

```
<body>
```

```
  <div>
```

```
    <h1>Example Domain</h1>
```

```
    <p>This domain is for use in illustrative examples in documents. You may use this
```

domain in literature without prior coordination or asking for permission.</p><p>More information...</p></div></body></html>

Comparing RPM and Debian Packaging (Answer Sheet)

Aspect	Debian Packaging (DEB)	RPM Packaging
OS Compatibility	Primarily for Debian-based OS (e.g., Ubuntu, Debian).	Primarily for Red Hat-based OS (e.g., Fedora, CentOS, RHEL).
Package Manager	dpkg, managed by apt.	rpm, managed by yum or dnf.
File Format	.deb files	.rpm files
Dependency Handling	Dependencies are managed by apt, with dpkg for package-level operations.	Uses yum or dnf for dependency management, with rpm for package-level operations.
Structure	Requires DEBIAN/control file with package metadata.	Requires a .spec file with package metadata.
Build Tool	Built using dpkg-deb.	Built using rpmbuild.
Simplicity	More straightforward for simple scripts or packages.	Typically more complex, especially for large packages with many dependencies.
Popularity	Common in Ubuntu and Debian derivatives.	Common in Red Hat and Fedora-based distributions.

plaintext

Copy code

```
project-root/
├─ curl_feature.cpp          # Place this file here, outside the package fo
├─ curl-feature-package/
│   └─ DEBIAN/
│       └─ control          # Package metadata file
│   └─ usr/
│       └─ local/
│           └─ bin/
│               └─ curl_feature  # The compiled executable will be moved here
```

Step-by-Step Directory Guide

File structure should look alike this

```
vedant@vedpathak:~$ sudo apt update
sudo apt install libcurl4-openssl-dev g++
[sudo] password for vedant:
Hit:2 https://packages.microsoft.com/repos/vscode stable InRelease
Hit:1 https://packages.microsoft.com/repos/code stable InRelease
Hit:3 https://download.docker.com/linux/ubuntu jammy InRelease
Hit:4 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 https://developer.download.nvidia.com/hpc-sdk/ubuntu/amd64 InRelease
Hit:6 http://security.ubuntu.com/ubuntu jammy-security InRelease
Ign:7 https://ppa.launchpadcontent.net/mrazavi/openvas/ubuntu jammy InRelease
Err:8 https://ppa.launchpadcontent.net/mrazavi/openvas/ubuntu jammy Release
  404 Not Found [IP: 2620:2d:4000:1::81 443]
Hit:9 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Hit:10 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:11 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:12 https://apt.repos.intel.com/oneapi all InRelease
Reading package lists... Done
E: The repository 'https://ppa.launchpadcontent.net/mrazavi/openvas/ubuntu jammy Release' does not have a
N: Updating from such a repository can't be done securely, and is therefore disabled by default.
N: See apt-secure(8) manpage for repository creation and user configuration details.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
g++ is already the newest version (4:11.2.0-1ubuntu1).
libcurl4-openssl-dev is already the newest version (7.81.0-1ubuntu1.18).
The following packages were automatically installed and are no longer required:
  docker-scan-plugin intel-oneapi-common-licensing-2024.1 intel-oneapi-common-oneapi-vars-2024.1
  libflashrom1 libftdi1-2 libllvm13
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
vedant@vedpathak:~$ mkdir curl-feature-package
cd curl-feature-package
mkdir -p DEBIAN usr/local/bin
vedant@vedpathak:~/curl-feature-package$ wget https://curl.se/download/curl-7.82.0.tar.gz
tar -xzf curl-7.82.0.tar.gz
cd curl-7.82.0
--2024-11-09 13:31:08-- https://curl.se/download/curl-7.82.0.tar.gz
Resolving curl.se (curl.se)... 2a04:4e42::347, 2a04:4e42:600::347, 2a04:4e42:200::347, ...
Connecting to curl.se (curl.se)|2a04:4e42::347|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 4106857 (3.9M) [application/x-gzip]
Saving to: 'curl-7.82.0.tar.gz'

curl-7.82.0.tar.gz      100%[=====] 3.92M  2.19MB/s  in 1.8s

2024-11-09 13:31:10 (2.19 MB/s) - 'curl-7.82.0.tar.gz' saved [4106857/4106857]
```

```

curl-7.82.0.tar.gz          100%[=====>]    3.92M  2.19MB/s   in 1.8s
2024-11-09 13:31:10 (2.19 MB/s) - 'curl-7.82.0.tar.gz' saved [4106857/4106857]

vedant@vedpathak:~/curl-feature-package/curl-7.82.0$ cd ..
vedant@vedpathak:~/curl-feature-package$ gedit curl_feature.cpp
vedant@vedpathak:~/curl-feature-package$ g++ curl_feature.cpp -o curl_feature -lcurl
vedant@vedpathak:~/curl-feature-package$ cd ..
vedant@vedpathak:~$ mv curl_feature curl-feature-package/usr/local/bin/
mv: cannot stat 'curl_feature': No such file or directory
vedant@vedpathak:~$ mv curl-feature-package/curl_feature curl-feature-package/usr/local/bin/
vedant@vedpathak:~$ cd curl-feature-package
vedant@vedpathak:~/curl-feature-package$ ls
curl-7.82.0  curl-7.82.0.tar.gz  curl_feature.cpp  DEBIAN  usr
vedant@vedpathak:~/curl-feature-package$ cd DEBIAN
vedant@vedpathak:~/curl-feature-package/DEBIAN$ ls
vedant@vedpathak:~/curl-feature-package/DEBIAN$ gedit control
vedant@vedpathak:~/curl-feature-package/DEBIAN$ cd ..
vedant@vedpathak:~/curl-feature-package$ cd ..
vedant@vedpathak:~$ dpkg-deb --build curl-feature-package
dpkg-deb: building package 'curl-feature-package' in 'curl-feature-package.deb'.
vedant@vedpathak:~$ sudo dpkg -i curl-feature-package.deb
(Reading database ... 306614 files and directories currently installed.)
Preparing to unpack curl-feature-package.deb ...
Unpacking curl-feature-package (1.0) over (1.0) ...
Setting up curl-feature-package (1.0) ...
vedant@vedpathak:~$ curl_feature
<!doctype html>
<html>
<head>
  <title>Example Domain</title>

  <meta charset="utf-8" />
  <meta http-equiv="Content-type" content="text/html; charset=utf-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1" />
  <style type="text/css">
    body {
      background-color: #f0f0f2;
      margin: 0;
      padding: 0;
      font-family: -apple-system, system-ui, BlinkMacSystemFont, "Segoe UI", "Open Sans", "Helvetica Neu
    }
  </style>
  <div>
    <div style="width: 600px; margin: 0 auto; text-align: center;">
      <h1>Example Domain</h1>
      <p>This domain is for use in illustrative examples in documents. You may use this
    </div>
  </div>
</html>

```