

. What is the Ricci Luci Cluster ?

- **Ricci** is a daemon which is used for cluster management and configurations. It distributes/dispatches receiving messages to the nodes configured.
- **Luci** is a server that runs on the cluster management server and communicates with other multiple nodes. It provides a web interface to make things easier.
- **Mod_cluster** is a load balancer utility based on HTTP services and here it is used to communicate the incoming requests with the underlying nodes.
- **CCS** is used to create and modify the cluster configuration on remote nodes through ricci. It is also used to start and stop the cluster services.
- **CMAN** is one of the primary utilities other than ricci and LUCI for this particular setup, since this acts as the cluster manager. Actually, CMAN stands for CLUSTER MANAGER. It is

a high-availability add-on for RedHat which is distributed among the nodes in the cluster.

. Using Regular Expressions With GREP (Global Regular Expression Print)

On Linux, grep is a command-line utility used for searching and filtering text based on patterns. The name "grep" stands for "global regular expression print." It is a powerful tool that allows you to search for specific strings or patterns within files or the output of other commands.

1. How to Find a Matching String with grep.

- If we want to find the string "program" in the file grep.txt, we can do so like this:

```
himanshu@123:~/Desktop/grep$ grep "program" grep.txt
/* This is my first java program.
/* This is my first java program.
/* This is my first java program.
himanshu@123:~/Desktop/grep$
```

2. How to Ignore Case Distinctions using -i.

- We can command grep to return results while ignoring the case of the matching string. Let's find the word "program" from our sample file. It should match all occurrences of "program" regardless of their case.

```
himanshu@123:~/Desktop/grep$ grep -i "program" grep.txt
public class MyFirstJavaProgram {
    /* This is my first java program.
public class MyFirstJavaProgram {
    /* This is my first java program.
public class MyFirstJavaProgram {
    /* This is my first java program.
```

3. How to Select the Non-Matching Lines using -v.

- We can reverse the results of the grep command to include non-matching results. Let's say, if we want to get all the lines that do not contain the word "program", the command would look like this:

```
himanshu@123: ~/Desktop/grep$ grep -v "program" grep.txt
public class MyFirstJavaProgram {

    * This will print 'Hello World' as the output
    * This is an example of multi-line comments.
    */

    public static void main(String []args) {
        // This is an example of single line comment
        /* This is also an example of single line comment. */
        System.out.println("Hello World");
    }
}

public class MyFirstJavaProgram {

    * This will print 'Hello World' as the output
    * This is an example of multi-line comments.
    */

    public static void main(String []args) {
        // This is an example of single line comment
        /* This is also an example of single line comment. */
        System.out.println("Hello World");
    }
}

public class MyFirstJavaProgram {

    * This will print 'Hello World' as the output
    * This is an example of multi-line comments.
    */
```

The output returned all the lines that do not contain "program".

4. How to Find the Line Numbers Against Matching Input using -n.

- There are times when we want to get the line numbers against the matching string. For that, we can supply the -n flag to grep like this:

```
himanshu@123:~/Desktop/grep$ grep -n "program" grep.txt
3:  /* This is my first java program.
18: /* This is my first java program.
32: /* This is my first java program.
himanshu@123:~/Desktop/grep$
```

5. How to Find the Exact Matching Word from the Input File or String using -w.

- If you were to match an exact word rather than just the occurrence of a pattern, you can do so by using the -w flag.

```
himanshu@123:~/Desktop/grep$ grep -w "program" grep.txt
/* This is my first java program.
/* This is my first java program.
/* This is my first java program.
```

6. How to Count the Number of Occurrences of the Provided Pattern using -c

- We can count the number of times the matched string appears in the file. This is how the -c flag works:

```
himanshu@123:~/Desktop/grep$ grep -c "program" grep.txt
3
himanshu@123:~/Desktop/grep$
```

```
himanshu@123:~/Desktop/grep$ grep -c "program" grep.txt
3
himanshu@123:~/Desktop/grep$ ls -lrt
total 4
-rw-rw-r-- 1 himanshu himanshu 1149 Jul 19 09:48 grep.txt
himanshu@123:~/Desktop/grep$ cat grep.txt
```

```
himanshu@123:~/Desktop/grep$ grep -L "hello" *
grep.txt
himanshu@123:~/Desktop/grep$
```

```
himanshu@123:~/Desktop/grep$ cat grep.txt
public class MyFirstJavaProgram {

    /* This is my first java program.
     * This will print 'Hello World' as the output
     * This is an example of multi-line comments.
     */

    public static void main(String []args) {
        // This is an example of single line comment
        /* This is also an example of single line comment. */
        System.out.println("Hello World");
    }
}
```

. Archiving and Copying Files Between Systems

Archiving and copying files between systems in Linux can be accomplished using various commands and tools available in the Linux environment. Here are two commonly used approaches.

- **Gzip and gunzip command :-** On Unix-like operating systems, the **gzip** command creates, lists, modifies, and extracts data from GZIP archives. The **gunzip** command extracts data from GZIP archives.

```
himanshu@123:~/Desktop/grep$ ls -ltr
total 8
-rw-rw-r-- 1 himanshu himanshu 256 Jul 19 09:48 grep.txt.gz
-rw-rw-r-- 1 himanshu himanshu  60 Jul 19 10:35 grep2.txt
```

```
himanshu@123:~/Desktop/grep$ gunzip grep.txt.gz
himanshu@123:~/Desktop/grep$
himanshu@123:~/Desktop/grep$ ls -ltr
total 8
-rw-rw-r-- 1 himanshu himanshu 1149 Jul 19 09:48 grep.txt
-rw-rw-r-- 1 himanshu himanshu  60 Jul 19 10:35 grep2.txt
```

- **Tar command :-** The tar command is used to compress a group of files into an archive. The command is also used to extract, maintain, or modify tar archives. Tar archives combine multiple files and/or directories together into a single file.

-c : Creates archive

-f : creates archive with given filename

-W : Verifies an archive file

-t : displays or lists files in archived file

- Tar **-tf** name.tar (will show or list the content of tar file)
- Tar **CVF** and tar **XVF** (tar' stands for tape archive, is used to create Archive and extract the Archive files)

```
himanshu@123:~/Desktop$ tar cvf archive.tar grep/  
grep/  
grep/grep2.txt  
grep/grep.txt  
grep/archive.tar
```



```
himanshu@123:~/Desktop$ gzip archive.tar
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$ ls -ltr
total 12
drwxrwxr-x 3 himanshu himanshu 4096 Jul 18 17:37 Internship.AD
drwxrwxr-x 2 himanshu himanshu 4096 Jul 19 10:44 grep
-rw-rw-r-- 1 himanshu himanshu 499 Jul 19 10:45 archive.tar.gz
himanshu@123:~/Desktop$
```

```
himanshu@123:~/Desktop$ mkdir folder1
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$ cp archive.tar.gz folder1/
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$ tar xvf archive.tar.gz
grep/
grep/grep2.txt
grep/grep.txt
grep/archive.tar
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$
himanshu@123:~/Desktop$ cd folder1/
himanshu@123:~/Desktop/folder1$ ls
archive.tar.gz
himanshu@123:~/Desktop/folder1$ tar xvf archive.tar.gz
grep/
grep/grep2.txt
grep/grep.txt
grep/archive.tar
himanshu@123:~/Desktop/folder1$
himanshu@123:~/Desktop/folder1$
himanshu@123:~/Desktop/folder1$
himanshu@123:~/Desktop/folder1$ ls -ltr
total 8
drwxrwxr-x 2 himanshu himanshu 4096 Jul 19 10:44 grep
-rw-rw-r-- 1 himanshu himanshu 499 Jul 19 10:58 archive.tar.gz
```

```

himanshu@123:~/Desktop/folder1$ cd grep/
himanshu@123:~/Desktop/folder1/grep$ ls -ltr
total 20
-rw-rw-r-- 1 himanshu himanshu 1149 Jul 19 09:48 grep.txt
-rw-rw-r-- 1 himanshu himanshu 60 Jul 19 10:35 grep2.txt
-rw-rw-r-- 1 himanshu himanshu 10240 Jul 19 10:44 archive.tar

```

```

himanshu@123:~/Desktop$ tar -tf archive.tar.gz
grep/
grep/grep2.txt
grep/grep.txt
grep/archive.tar

```

```

himanshu@123:~/Desktop$ ls -ltr
total 16
drwxrwxr-x 3 himanshu himanshu 4096 Jul 18 17:37 Internship.AD
drwxrwxr-x 2 himanshu himanshu 4096 Jul 19 10:44 grep
-rw-rw-r-- 1 himanshu himanshu 499 Jul 19 10:45 archive.tar.gz
drwxrwxr-x 3 himanshu himanshu 4096 Jul 19 10:59 folder1
himanshu@123:~/Desktop$

```

- **Tar -ZCVF and -ZXVF :-** (**tar -zcvf**: This command is used to create a compressed archive) and (**tar -zxvf**: This command is used to extract files from a compressed archive)

```

himanshu@123:~/Desktop$ tar -zcvf archive.tgz folder1/
folder1/
folder1/grep/
folder1/grep/grep2.txt
folder1/grep/grep.txt

```

```
himanshu@123:~/Desktop$  
himanshu@123:~/Desktop$ tar -zxvf archive.tgz folder1/  
folder1/  
folder1/grep/  
folder1/grep/grep2.txt  
folder1/grep/grep.txt
```

. Analysing and Storing Logs

Analysing and storing logs in Linux is an essential part of system administration and troubleshooting. Logs provide valuable information about the activities and events occurring on a Linux system, helping administrators understand what is happening and identify potential issues. Here's a brief overview of how logs are analysed and stored in Linux .

- **What are log files ?**

A log file stores events ,processes, messages, and other data from applications ,operating systems or devices .

They provide information based on the action performed by users , playing an important role in monitoring .

- **Log directory in linux :- /var/log**
- **Log file :- boot ,CHRONE , secure , maillog , HTTPD , messages .**

```
himanshu@123:/var/log$ ls
alternatives.log  bootstrap.log  dmesg.0      dpkg.log      hp            openvpn      ubuntu-advantage.log
apport.log        bttmp         dmesg.1.gz   faillog       installer     private      ubuntu-advantage-timer.log
apt              cups          dmesg.2.gz   fontconfig.log journal       speech-dispatcher  unattended-upgrades
auth.log          dist-upgrade  dmesg.3.gz   gdm3          kern.log      sssd         upgrade
boot.log          dmesg         dmesg.4.gz   gpu-manager.log lastlog       syslog       wtmp
himanshu@123:/var/log$ less bootstrap.log
```

- If you search any content press (/search any content)

```
gpgv: using RSA key 871920D1991BC93C
gpgv: Good signature from "Ubuntu Archive Automatic Signing Key (2018) <ftpmaster@ubuntu.com>"
dpkg: warning: parsing file '/var/lib/dpkg/status' near line 5 package 'dpkg':
missing 'Description' field
dpkg: warning: parsing file '/var/lib/dpkg/status' near line 5 package 'dpkg':
missing 'Architecture' field
Selecting previously unselected package base-passwd.
(Reading database ... 0 files and directories currently installed.)
Preparing to unpack .../base-passwd_3.5.47_amd64.deb ...
Unpacking base-passwd (3.5.47) ...
dpkg: base-passwd: dependency problems, but configuring anyway as you requested:
base-passwd depends on libc6 (>= 2.8); however:
Package libc6 is not installed.
base-passwd depends on libdebconfclient0 (>= 0.145); however:
Package libdebconfclient0 is not installed.

Setting up base-passwd (3.5.47) ...
dpkg: warning: parsing file '/var/lib/dpkg/status' near line 24 package 'dpkg':
missing 'Description' field
dpkg: warning: parsing file '/var/lib/dpkg/status' near line 24 package 'dpkg':
missing 'Architecture' field
Selecting previously unselected package base-files.
dpkg: regarding .../base-files_11ubuntu5_amd64.deb containing base-files, pre-dependency problem:
base-files pre-depends on awk
awk is not installed.

dpkg: warning: ignoring pre-dependency problem!
(Reading database ... 41 files and directories currently installed.)
Preparing to unpack .../base-files_11ubuntu5_amd64.deb ...
Unpacking base-files (11ubuntu5) ...
dpkg: base-files: dependency problems, but configuring anyway as you requested:
base-files depends on awk; however:
Package awk is not installed.
base-files depends on libc6 (>= 2.3.4); however:
Package libc6 is not installed.
base-files depends on libcrypt1 (>= 1:4.4.10-10ubuntu3); however:
Package libcrypt1 is not installed.
:
```

```
Setting up udev (245.4-4ubuntu3) ...
A chroot environment has been detected, udev not started.
Setting up sudo (1.8.31-1ubuntu1) ...
Setting up ucf (3.0038+nmu1) ...
Setting up libxtables12:amd64 (1.8.4-3ubuntu2) ...
Setting up dmsetup (2:1.02.167-1ubuntu1) ...
Setting up gpgv (2.2.19-3ubuntu2) ...
Setting up libpam-systemd:amd64 (245.4-4ubuntu3) ...
Setting up libgirepository-1.0-1:amd64 (1.64.0-2) ...
Setting up netbase (6.1) ...
Setting up isc-dhcp-common (4.4.1-2.1ubuntu5) ...
Setting up libmpdec2:amd64 (2.4.2-3) ...
Setting up openssl (1.1.1f-1ubuntu2) ...
Setting up libbsd0:amd64 (0.10.0-1) ...
Setting up libelf1:amd64 (0.176-1.1build1) ...
Setting up libpam-cap:amd64 (1:2.32-1) ...
Setting up iputils-ping (3:20190709-3) ...
Setting up readline-common (8.0-4) ...
Setting up libstdc++6:amd64 (10-20200411-0ubuntu1) ...
Setting up liblocale-gettext-perl (1.07-4) ...
Setting up libpopt0:amd64 (1.16-14) ...
Setting up logrotate (3.14.0-4ubuntu3) ...
Created symlink /etc/systemd/system/timers.target.wants/logrotate.timer -> /lib/systemd/system/logrotate.timer.
Setting up libnewt0.52:amd64 (0.52.21-4ubuntu2) ...
update-alternatives: using /etc/newt/palette.ubuntu to provide /etc/newt/palette (newt-palette) in auto mode
Setting up libdns-export1109 (1:9.11.16+dfsg-3~build1) ...
Setting up iproute2 (5.5.0-1ubuntu1) ...
Setting up libicu66:amd64 (66.1-2ubuntu2) ...
Setting up libreadline8:amd64 (8.0-4) ...
Setting up rsyslog (8.2001.0-1ubuntu1) ...
Adding user `syslog' to group `adm' ...
Adding user syslog to group adm
Done.

Creating config file /etc/rsyslog.d/50-default.conf with new version
Running in chroot, ignoring request.
invoke-rc.d: policy-rc.d denied execution of start.
```

- If you want to go to the end of the log. Press (shift+g) and want to go upstairs press n .

```
Created symlink /etc/systemd/system/timers.target.wants/apt-daily-upgrade.timer -> /lib/systemd/system/apt-daily-upgrade.timer.
Created symlink /etc/systemd/system/timers.target.wants/apt-daily.timer -> /lib/systemd/system/apt-daily.timer.
Setting up apt-utils (2.0.2) ...
Setting up python3 (3.8.2-0ubuntu2) ...
Setting up python3-six (1.14.0-2) ...
Setting up python3-gi (3.36.0-1) ...
Setting up shared-mime-info (1.15-1) ...
Setting up python3-netifaces (0.10.4-1ubuntu4) ...
Setting up lsb-release (11.1.0ubuntu2) ...
Setting up python3-cffi-backend (1.14.0-1build1) ...
Setting up python3-pkg-resources (45.2.0-1) ...
Setting up python3-dbus (1.2.16-1build1) ...
Setting up python3-yaml (5.3.1-1) ...
Setting up netplan.io (0.99-0ubuntu1) ...
Setting up ubuntu-advantage-tools (20.3) ...
Setting up python3-nacl (1.3.0-5) ...
Setting up networkd-dispatcher (2.0.1-1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/networkd-dispatcher.service -> /lib/systemd/system/networkd-dispatcher.service.
Setting up python3-pymacaroons (0.13.0-3) ...
Setting up console-setup-linux (1.194ubuntu3) ...
update-alternatives: using /etc/console-setup/vtrgb to provide /etc/vtrgb (vtrgb) in auto mode
Created symlink /etc/systemd/system/sysinit.target.wants/keyboard-setup.service -> /lib/systemd/system/keyboard-setup.service.
Created symlink /etc/systemd/system/multi-user.target.wants/console-setup.service -> /lib/systemd/system/console-setup.service.
Created symlink /etc/systemd/system/sysinit.target.wants/setvtrgb.service -> /lib/systemd/system/setvtrgb.service.
Setting up console-setup (1.194ubuntu3) ...
Setting up kbd (2.0.4-4ubuntu2) ...
Setting up ubuntu-minimal (1.450) ...
Processing triggers for libc-bin (2.31-0ubuntu9) ...
Processing triggers for systemd (245.4-4ubuntu3) ...
Processing triggers for ca-certificates (20190110ubuntu1) ...
Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
~
~
~
```

```
2022-08-31 06:52:28 URL:http://ftpmaster.internal/ubuntu/dists/focal/InRelease [264892/264892] -> "/build/chroot/var/cache/apt/archives/partial/ftpmaster.internal_ubuntu_dists_focal_InRelease" [1]
gpgv: Signature made Thu Apr 23 17:34:17 2020 UTC
gpgv: using RSA key 3B4FE6ACC0B21F32
gpgv: Good signature from "Ubuntu Archive Automatic Signing Key (2012) <ftpmaster@ubuntu.com>"
gpgv: Signature made Thu Apr 23 17:34:17 2020 UTC
gpgv: using RSA key 871920D1991BC93C
gpgv: Good signature from "Ubuntu Archive Automatic Signing Key (2018) <ftpmaster@ubuntu.com>"
2022-08-31 06:52:29 URL:http://ftpmaster.internal/ubuntu/dists/focal/main/binary-amd64/by-hash/SHA256/7757921ff8fe5f5bcd43fc9861 [970408/970408] -> "/build/chroot/var/lib/apt/lists/partial/ftpmaster.internal_ubuntu_dists_focal_main_binary-amd64_by-hash_SHA256_7757921ff8fe5f5bcd43fc9861" [1]
2022-08-31 06:52:29 URL:http://ftpmaster.internal/ubuntu/dists/focal/restricted/binary-amd64/by-hash/SHA256/b0a82ff5c1716bf58809ef9c8b [22004/22004] -> "/build/chroot/var/lib/apt/lists/partial/ftpmaster.internal_ubuntu_dists_focal_restricted_binary-amd64_by-hash_SHA256_b0a82ff5c1716bf58809ef9c8b" [1]
2022-08-31 06:52:29 URL:http://ftpmaster.internal/ubuntu/pool/main/a/adduser/adduser_3.118ubuntu2_all.deb [162792/162792] -> "/build/chroot/var/cache/apt/archives/partial/adduser_3.118ubuntu2_all.deb" [1]
2022-08-31 06:52:29 URL:http://ftpmaster.internal/ubuntu/pool/main/a/apt/apt_2.0.2_amd64.deb [1288960/1288960] -> "/build/chroot/var/cache/apt/archives/partial/apt_2.0.2_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/a/apt/apt-utils_2.0.2_amd64.deb [213336/213336] -> "/build/chroot/var/cache/apt/archives/partial/apt-utils_2.0.2_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/b/base-files/base-files_11ubuntu5_amd64.deb [60608/60608] -> "/build/chroot/var/cache/apt/archives/partial/base-files_11ubuntu5_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/b/base-passwd/base-passwd_3.5.47_amd64.deb [47744/47744] -> "/build/chroot/var/cache/apt/archives/partial/base-passwd_3.5.47_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/b/bash/bash_5.0-6ubuntu1_amd64.deb [638400/638400] -> "/build/chroot/var/cache/apt/archives/partial/bash_5.0-6ubuntu1_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/u/util-linux/bsdutils_2.34-0.1ubuntu9_amd64.deb [11344/11344] -> "/build/chroot/var/cache/apt/archives/partial/bsdutils_2.34-0.1ubuntu9_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/b/bzip2/bzip2_1.0.8-2_amd64.deb [34064/34064] -> "/build/chroot/var/cache/apt/archives/partial/bzip2_1.0.8-2_amd64.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/c/ca-certificates/ca-certificates_20190110ubuntu1_all.deb [11344/11344] -> "/build/chroot/var/cache/apt/archives/partial/ca-certificates_20190110ubuntu1_all.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/c/console-setup/console-setup_1.194ubuntu3_all.deb [11344/11344] -> "/build/chroot/var/cache/apt/archives/partial/console-setup_1.194ubuntu3_all.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/c/console-setup/console-setup-linux_1.194ubuntu3_all.deb [11344/11344] -> "/build/chroot/var/cache/apt/archives/partial/console-setup-linux_1.194ubuntu3_all.deb" [1]
2022-08-31 06:52:30 URL:http://ftpmaster.internal/ubuntu/pool/main/c/coreutils/coreutils_8.30-3ubuntu2_amd64.deb [11344/11344] -> "/build/chroot/var/cache/apt/archives/partial/coreutils_8.30-3ubuntu2_amd64.deb" [1]
```



```
himanshu@123:/var/log$ cat dpkg.log | more
2022-08-31 06:52:39 startup archives install
2022-08-31 06:52:39 install base-passwd:amd64 <none> 3.5.47
2022-08-31 06:52:39 status half-installed base-passwd:amd64 3.5.47
2022-08-31 06:52:39 status unpacked base-passwd:amd64 3.5.47
2022-08-31 06:52:39 configure base-passwd:amd64 3.5.47 3.5.47
2022-08-31 06:52:39 status half-configured base-passwd:amd64 3.5.47
2022-08-31 06:52:39 status installed base-passwd:amd64 3.5.47
2022-08-31 06:52:39 startup archives install
2022-08-31 06:52:39 install base-files:amd64 <none> 11ubuntu5
2022-08-31 06:52:39 status half-installed base-files:amd64 11ubuntu5
2022-08-31 06:52:39 status unpacked base-files:amd64 11ubuntu5
2022-08-31 06:52:39 configure base-files:amd64 11ubuntu5 11ubuntu5
2022-08-31 06:52:39 status half-configured base-files:amd64 11ubuntu5
2022-08-31 06:52:39 status installed base-files:amd64 11ubuntu5
2022-08-31 06:52:39 startup archives install
2022-08-31 06:52:39 upgrade dpkg 1.19.7ubuntu3 1.19.7ubuntu3
2022-08-31 06:52:39 status half-configured dpkg 1.19.7ubuntu3
2022-08-31 06:52:39 status unpacked dpkg 1.19.7ubuntu3
2022-08-31 06:52:39 status half-installed dpkg 1.19.7ubuntu3
2022-08-31 06:52:39 status unpacked dpkg:amd64 1.19.7ubuntu3
2022-08-31 06:52:39 configure dpkg:amd64 1.19.7ubuntu3 1.19.7ubuntu3
2022-08-31 06:52:39 status half-configured dpkg:amd64 1.19.7ubuntu3
2022-08-31 06:52:39 status installed dpkg:amd64 1.19.7ubuntu3
2022-08-31 06:52:39 startup archives install
2022-08-31 06:52:39 install libc6:amd64 <none> 2.31-0ubuntu9
2022-08-31 06:52:39 status half-installed libc6:amd64 2.31-0ubuntu9
2022-08-31 06:52:39 status unpacked libc6:amd64 2.31-0ubuntu9
2022-08-31 06:52:39 configure libc6:amd64 2.31-0ubuntu9 2.31-0ubuntu9
2022-08-31 06:52:39 status half-configured libc6:amd64 2.31-0ubuntu9
2022-08-31 06:52:40 status installed libc6:amd64 2.31-0ubuntu9
2022-08-31 06:52:40 startup archives install
2022-08-31 06:52:40 install perl-base:amd64 <none> 5.30.0-9build1
2022-08-31 06:52:40 status half-installed perl-base:amd64 5.30.0-9build1
2022-08-31 06:52:40 status unpacked perl-base:amd64 5.30.0-9build1
2022-08-31 06:52:40 configure perl-base:amd64 5.30.0-9build1 5.30.0-9build1
2022-08-31 06:52:40 status half-configured perl-base:amd64 5.30.0-9build1
2022-08-31 06:52:40 status installed perl-base:amd64 5.30.0-9build1
--More--
```

```
himanshu@123:/var/log$ tail -f dpkg.log
2023-07-20 09:51:33 status half-installed libcurl3-gnutls:amd64 7.81.0-1ubuntu1.10
2023-07-20 09:51:33 status unpacked libcurl3-gnutls:amd64 7.81.0-1ubuntu1.13
2023-07-20 09:51:33 startup packages configure
2023-07-20 09:51:33 configure libcurl3-gnutls:amd64 7.81.0-1ubuntu1.13 <none>
2023-07-20 09:51:33 status unpacked libcurl3-gnutls:amd64 7.81.0-1ubuntu1.13
2023-07-20 09:51:33 status half-configured libcurl3-gnutls:amd64 7.81.0-1ubuntu1.13
2023-07-20 09:51:33 status installed libcurl3-gnutls:amd64 7.81.0-1ubuntu1.13
2023-07-20 09:51:33 trigproc libc-bin:amd64 2.35-0ubuntu3.1 <none>
2023-07-20 09:51:33 status half-configured libc-bin:amd64 2.35-0ubuntu3.1
2023-07-20 09:51:33 status installed libc-bin:amd64 2.35-0ubuntu3.1
```

```
himanshu@123:/var/log$ sudo tail -f ubuntu-advantage.log
[sudo] password for himanshu:
["2023-07-20T09:26:16.305", "DEBUG", "root", "load_file", 452, "Reading file: /var/lib/ubuntu-advantage/user-config.json", {}]
["2023-07-20T09:26:16.305", "DEBUG", "uaclient.files.files", "read", 55, "File does not exist: /var/lib/ubuntu-advantage/user-config.json", {}]
["2023-07-20T09:26:16.352", "DEBUG", "uaclient.config", "parse_config", 644, "Using client configuration file at /etc/ubuntu-advantage/uaclient.conf", {}]
["2023-07-20T09:26:16.352", "DEBUG", "root", "load_file", 452, "Reading file: /etc/ubuntu-advantage/uaclient.conf", {}]
["2023-07-20T09:26:16.356", "DEBUG", "root", "load_file", 452, "Reading file: /var/lib/ubuntu-advantage/user-config.json", {}]
["2023-07-20T09:26:16.357", "DEBUG", "uaclient.files.files", "read", 55, "File does not exist: /var/lib/ubuntu-advantage/user-config.json", {}]
["2023-07-20T09:26:16.357", "DEBUG", "root", "load_file", 452, "Reading file: /etc/os-release", {}]
["2023-07-20T09:26:16.369", "DEBUG", "root", "load_file", 452, "Reading file: /var/lib/ubuntu-advantage/status.json", {}]
["2023-07-20T09:26:16.373", "DEBUG", "root", "load_file", 452, "Reading file: /var/lib/ubuntu-advantage/private/machine-token.json", {}]
["2023-07-20T09:26:16.373", "DEBUG", "uaclient.files.files", "read", 55, "File does not exist: /var/lib/ubuntu-advantage/private/machine-token.json", {}]
```

```
himanshu@123:/var/log$ grep -i "install" alternatives.log
update-alternatives 2022-08-31 06:52:40: run with --quiet --install /usr/bin/awk awk /usr/bin/mawk 5 --slave /usr/share/man/man1/awk.1.gz awk.1.gz /usr/share/man/man1/mawk.1.gz --slave /usr/bin/nawk nawk /usr/bin/mawk --slave /usr/share/man/man1/nawk.1.gz nawk.1.gz /usr/share/man/man1/mawk.1.gz
update-alternatives 2022-08-31 06:52:44: run with --quiet --install /usr/bin/awk awk /usr/bin/mawk 5 --slave /usr/share/man/man1/awk.1.gz awk.1.gz /usr/share/man/man1/mawk.1.gz --slave /usr/bin/nawk nawk /usr/bin/mawk --slave /usr/share/man/man1/nawk.1.gz nawk.1.gz /usr/share/man/man1/mawk.1.gz
update-alternatives 2022-08-31 06:52:44: run with --install /usr/share/man/man7/builtins.7.gz builtins.7.gz /usr/share/man/man7/bash-builtins.7.gz 10
update-alternatives 2022-08-31 06:52:45: run with --install /usr/sbin/rmt rmt /usr/sbin/rmt-tar 50 --slave /usr/share/man/man8/rmt.8.gz rmt.8.gz /usr/share/man/man8/rmt-tar.8.gz
update-alternatives 2022-08-31 06:52:45: run with --install /usr/bin/w w /usr/bin/w.procps 50 --slave /usr/share/man/man1/w.1.gz w.1.gz /usr/share/man/man1/w.procps.1.gz
update-alternatives 2022-08-31 06:52:45: run with --install /usr/bin/pager pager /bin/more 50 --slave /usr/share/man/man1/pager.1.gz pager.1.gz /usr/share/man/man1/more.1.gz
update-alternatives 2022-08-31 06:52:58: run with --quiet --install /usr/bin/pager pager /usr/bin/less 77 --slave /usr/share/man/man1/pager.1.gz pager.1.gz /usr/share/man/man1/less.1.gz
update-alternatives 2022-08-31 06:52:59: run with --install /usr/bin/lzma lzma /usr/bin/xz 20 --slave /usr/share/man/man1/lzma.1.gz lzma.1.gz /usr/share/man/man1/xz.1.gz --slave /usr/bin/unlzma unlzma /usr/bin/unxz --slave /usr/share/man/man1/unlzma.1.gz unlzma.1.gz /usr/share/man/man1/unxz.1.gz --slave /usr/bin/lzcat lzcat /usr/bin/xzcat --slave /usr/share/man/man1/lzcat.1.gz lzcat.1.gz /usr/share/man/man1/xzcat.1.gz --slave /usr/bin/lzmore lzmore /usr/bin/xzmore --slave /usr/share/man/man1/lzmore.1.gz lzmore.1.gz /usr/share/man/man1/xzmore.1.gz --slave /usr/bin/lzless lzless /usr/bin/xzless --slave /usr/share/man/man1/lzless.1.gz lzless.1.gz /usr/share/man/man1/xzless.1.gz --slave /usr/bin/lzdiff lzdiff /usr/bin/xzdiff --slave /usr/share/man/man1/lzdiff.1.gz lzdiff.1.gz /usr/share/man/man1/xzdiff.1.gz --slave /usr/bin/lzcmp lzcmp /usr/bin/xzcmp --slave /usr/share/man/man1/lzcmp.1.gz lzcmp.1.gz /usr/share/man/man1/xzcmp.1.gz --slave /usr/bin/lzgrep lzgrep /usr/bin/xzgrep --slave /usr/share/man/man1/lzgrep.1.gz lzgrep.1.gz /usr/share/man/man1/xzgrep.1.gz --slave /usr/bin/lzegrep lzgrep /usr/bin/xzegrep --slave /usr/share/man/man1/lzegrep.1.gz lzgrep.1.gz /usr/share/man/man1/xzegrep.1.gz --slave /usr/bin/lzfgrep lzfgrep /usr/bin/xzfgrep --slave /usr/share/man/man1/lzfgrep.1.gz lzfgrep.1.gz /usr/share/man/man1/xzfgrep.1.gz
```

```
himanshu@123:/var/log$ egrep -i "openjdk" alternatives.log
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/java java /usr/lib/jvm/java-11-openjdk-amd64/bin/java 1111 --slave /usr/share/man/man1/java.1.gz java.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/java.1.gz
update-alternatives 2023-07-17 14:38:52: link group java updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/java
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/jjs jjs /usr/lib/jvm/java-11-openjdk-amd64/bin/jjs 1111 --slave /usr/share/man/man1/jjs.1.gz jjs.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/jjs.1.gz
update-alternatives 2023-07-17 14:38:52: link group jjs updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/jjs
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/keytool keytool /usr/lib/jvm/java-11-openjdk-amd64/bin/keytool 1111 --slave /usr/share/man/man1/keytool.1.gz keytool.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/keytool.1.gz
update-alternatives 2023-07-17 14:38:52: link group keytool updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/keytool
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/rmid rmid /usr/lib/jvm/java-11-openjdk-amd64/bin/rmid 1111 --slave /usr/share/man/man1/rmid.1.gz rmid.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/rmid.1.gz
update-alternatives 2023-07-17 14:38:52: link group rmid updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/rmid
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/rmiregistry rmiregistry /usr/lib/jvm/java-11-openjdk-amd64/bin/rmiregistry 1111 --slave /usr/share/man/man1/rmiregistry.1.gz rmiregistry.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/rmiregistry.1.gz
update-alternatives 2023-07-17 14:38:52: link group rmiregistry updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/rmiregistry
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/pack200 pack200 /usr/lib/jvm/java-11-openjdk-amd64/bin/pack200 1111 --slave /usr/share/man/man1/pack200.1.gz pack200.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/pack200.1.gz
update-alternatives 2023-07-17 14:38:52: link group pack200 updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/pack200
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/unpack200 unpack200 /usr/lib/jvm/java-11-openjdk-amd64/bin/unpack200 1111 --slave /usr/share/man/man1/unpack200.1.gz unpack200.1.gz /usr/lib/jvm/java-11-openjdk-amd64/man/man1/unpack200.1.gz
update-alternatives 2023-07-17 14:38:52: link group unpack200 updated to point to /usr/lib/jvm/java-11-openjdk-amd64/bin/unpack200
update-alternatives 2023-07-17 14:38:52: run with --install /usr/bin/jexec jexec /usr/lib/jvm/java-11-openjdk-amd64/lib/jexec 1111 --slave /usr/share/man/man1/jexec.1.gz jexec.1.gz /usr/lib/jvm/java-11-openjdk-amd64/lib/jexec.1.gz
```

```
himanshu@123:/var/log$ cat alternatives.log | grep -i "install" | wc -l
250
himanshu@123:/var/log$
```

. Change Management

Change management in the context of Linux refers to the process of planning, implementing, and

controlling changes to the Linux operating system environment. It aims to ensure that modifications, updates, and enhancements to the system are carried out in a controlled and systematic manner, minimising risks and disruptions to the overall system stability and security.

Package Management

- apt (Advanced Package Tool): Used in Debian and Ubuntu-based systems to manage packages and software installation. Example commands include:
- `sudo apt update`: Updates the package database.
- `sudo apt upgrade`: Upgrades installed packages to their latest versions.
- `sudo apt install package_name`: Installs a new package.
- `sudo apt remove package_name`: Uninstalls a package.

- yum and DNF: Used in Red Hat-based systems (CentOS, Fedora) to manage packages and software installation. Example commands include:
- sudo yum/dnf update: Updates installed packages to their latest versions.
- sudo yum/dnf install package_name: Installs a new package.
- sudo yum/dnf remove package_name: Uninstalls a package.

Configuration Management

- SYSTEMCTL: Manages system services in Linux systems that use SYSTEMCTL. Example commands include:
- sudo SYSTEMCTL start service_name: Starts a system service.
- sudo SYSTEMCTL stop service_name: Stops a running service.

- `sudo SYSTEMCTL restart service_name:`
Restarts a service.
- `sudo SYSTEMCTL enable service_name:`
Enables a service to start automatically on boot.
- `sudo SYSTEMCTL disable service_name:`
Disables a service from starting automatically on boot.
- `ufw` (Uncomplicated Firewall): Provides an easy-to-use interface for managing the system firewall. Example commands include:
- `sudo UFW enable:` Enables the firewall.
- `sudo UFW disable:` Disables the firewall.
- `sudo UFW allow port:` Allows incoming traffic on a specific port.
- `sudo UFW deny port:` Denies incoming traffic on a specific port.

Version Control:

- git: Version control tool used to track changes in source code and configuration files. Example commands include.
- git init: Initialises a new git repository in the current directory.
- git add file_name: Adds a file to the staging area.
- git commit -m "commit message": Commits the changes to the repository with a descriptive message.

Operating system upgrade

If you want to upgrade your operating system to the latest version then follow these steps.

- Sudo apt dist-upgrade
- Sudo do-release-upgrade
–check-dist-upgrade-only
- Sudo do-release -upgrade -d