Day-1 Hands-on Labs: Getting to Know your System

Lab-1: Understand your Distribution

1. Find the distribution name, version, and release information (**`/etc/os-release`**, **`lsb_release -a`**). What's the difference you see in both?

```
ubuntu@ip-10-0-13-44:~$ cat /etc/os-release
PRETTY_NAME="Ubuntu 24.04.3 LTS"
NAME="Ubuntu"
VERSION_ID="24.04"
VERSION="24.04.3 LTS (Noble Numbat)"
VERSION_CODENAME=noble
ID=ubuntu
ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
UBUNTU_CODENAME=noble
LOGO=ubuntu-logo
ubuntu@ip-10-0-13-44:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 24.04.3 LTS
Release:        24.04
Codename:       noble
```

2. Check which package manager the system uses (**`which yum || which apt`**).

```
ubuntu@ip-10-0-13-44:~$ which apt
/usr/bin/apt
```

3. Discover the kernel information of your system (**`uname -r`**).

```
ubuntu@ip-10-0-13-44:~$ uname -r
6.14.0-1011-aws
```

4. Check how long the system has been running (**`uptime`**).

```
ubuntu@ip-10-0-13-44:~$ uptime
 08:21:04 up  5:16,  1 user,  load average: 0.00, 0.00, 0.00
```

Lab-2: Using man Pages

1. Identify which section of the man pages documents file formats and conventions.

Ans : Section 5 documents file formats and configs

Section 7 documents overview, conventions, and miscellaneous

2. Use **`man ls`** and explain what the **`-r`** option shows. What are the other options it can be used with?

   Ans : ls -r —- -r denotes reverse order

   ls can be used with –[aAbBcCdDfFgGhHiIklLmnNopqQrRsStTuUvwxXz1]

3. With the help of **`–k`** and **`–K`** based keyword search methods, find the command that's responsible for changing the age of passwords.

```
[ubuntu@ip-10-0-13-44:~$ man -k password
chage (1)            - change user password expiry information
chgpasswd (8)        - update group passwords in batch mode
chpasswd (8)         - update passwords in batch mode
cpgr (8)             - copy with locking the given file to the password or group file
cppw (8)             - copy with locking the given file to the password or group file
expiry (1)           - check and enforce password expiration policy
git-credential-cache (1) - Helper to temporarily store passwords in memory
gitcredentials (7)   - Providing usernames and passwords to Git
grpconv (8)          - convert to and from shadow passwords and groups
grpunconv (8)        - convert to and from shadow passwords and groups
grub-mkpasswd-pbkdf2 (1) - generate hashed password for GRUB
login.defs (5)       - shadow password suite configuration
openssl-passwd (1ssl) - compute password hashes
openssl-srp (1ssl)   - maintain SRP password file
pam_pwhistory (8)    - PAM module to remember last passwords
pam_systemd_loadkey (8) - Read password from kernel keyring and set it as PAM authtok
pam_unix (8)         - Module for traditional password authentication
passwd (1)           - change user password
passwd (5)           - the password file
pwck (8)             - verify the integrity of password files
pwconv (8)           - convert to and from shadow passwords and groups
pwhistory_helper (8) - Helper binary that transfers password hashes from passwd or shadow to opasswd
pwunconv (8)         - convert to and from shadow passwords and groups
shadow (5)           - shadowed password file
systemd-ask-password (1) - Query the user for a system password
systemd-ask-password-console.path (8) - Query the user for system passwords on the console and via wall
systemd-ask-password-console.service (8) - Query the user for system passwords on the console and via wall
systemd-ask-password-wall.path (8) - Query the user for system passwords on the console and via wall
systemd-ask-password-wall.service (8) - Query the user for system passwords on the console and via wall
systemd-tty-ask-password-agent (1) - List or process pending systemd password requests
unix_chkpwd (8)      - Helper binary that verifies the password of the current user
unix_update (8)      - Helper binary that updates the password of a given user
vigr (8)             - edit the password, group, shadow-password or shadow-group file
vipw (8)             - edit the password, group, shadow-password or shadow-group file
```

Lab-3: The Shell and Its Modes

1. Identify which shell you are currently running (**`echo $SHELL`**).

```
[ubuntu@ip-10-0-13-44:~$ echo $SHELL
/bin/bash
```

2. Set the default editor for your shell as Vim.

```
ubuntu@ip-10-0-13-44:~$ sudo update-alternatives --config editor
There are 4 choices for the alternative editor (providing /usr/bin/editor).

  Selection    Path                Priority   Status
------------------------------------------------------------
* 0            /bin/nano            40        auto mode
  1            /bin/ed             -100       manual mode
  2            /bin/nano            40        manual mode
  3            /usr/bin/vim.basic   30        manual mode
  4            /usr/bin/vim.tiny    15        manual mode

Press <enter> to keep the current choice[*], or type selection number: 3
update-alternatives: using /usr/bin/vim.basic to provide /usr/bin/editor (editor) in manual mode
ubuntu@ip-10-0-13-44:~$ sudo update-alternatives --config editor
There are 4 choices for the alternative editor (providing /usr/bin/editor).

  Selection    Path                Priority   Status
------------------------------------------------------------
  0            /bin/nano            40        auto mode
  1            /bin/ed             -100       manual mode
  2            /bin/nano            40        manual mode
* 3            /usr/bin/vim.basic   30        manual mode
  4            /usr/bin/vim.tiny    15        manual mode
```

3. Write a simple script named **`hello.sh`** that prints “Hello, <your-name>!” and run it.

```
ubuntu@ip-10-0-13-44:~$ cat hello.sh
echo "Hello, Hayagreevan"
ubuntu@ip-10-0-13-44:~$ bash hello.sh
Hello, Hayagreevan
```

Lab-4: Understanding the File System

1. In **`/proc`**, find the file that shows system uptime.

   Ans : uptime

2. In **`/etc`**, find the file that stores the hostname.

   Ans : hostname

3. In **`/var`**, find where log files are stored. Explore the different log files and let us know.

   Ans : log files are stored in /var/log

   It stores auth log, system log, dpkg log, kernal log, etc.,

4. In **`/dev`**, test what **`/dev/null`** does (**`echo test > /dev/null`**).

   Ans : No changes applied

```
ubuntu@ip-10-0-13-44:~$ cat /dev/null
ubuntu@ip-10-0-13-44:~$ echo test > /dev/null
ubuntu@ip-10-0-13-44:~$ cat /dev/null
ubuntu@ip-10-0-13-44:~$
```

5. Locate the current working directory of your shell process by inspecting **`/proc/<pid>/cwd`**. You can find the PID of your shell by running **`ps`**.

```
ubuntu@ip-10-0-13-44:~$ ps
    PID TTY          TIME CMD
   9203 pts/1    00:00:00 bash
   9288 pts/1    00:00:00 ps
ubuntu@ip-10-0-13-44:~$ ll /proc/9203/cwd
lrwxrwxrwx 1 ubuntu ubuntu 0 Sep  1 12:04 /proc/9203/cwd -> /home/ubuntu/
```

Lab-5: System Capabilities

1. Display CPU information from **`/proc/cpuinfo`**.

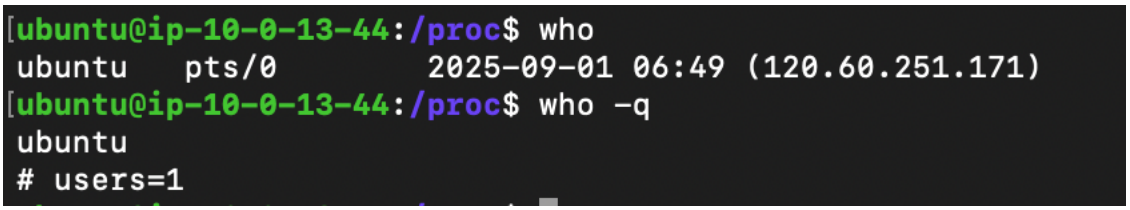
```
ubuntu@ip-10-0-13-44:~$ cd /proc
ubuntu@ip-10-0-13-44:/proc$ cat cpuinfo
processor       : 0
vendor_id       : GenuineIntel
cpu family      : 6
model           : 79
model name      : Intel(R) Xeon(R) CPU E5-2686 v4 @ 2.30GHz
stepping        : 1
microcode       : 0xd000404
cpu MHz         : 2299.998
cache size      : 46080 KB
physical id     : 0
siblings        : 1
core id         : 0
cpu cores       : 1
apicid          : 0
initial apicid  : 0
fpu             : yes
fpu_exception   : yes
cpuid level     : 13
wp              : yes
flags           : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
clflush mmx fxsr sse sse2 ht syscall nx rdtscp lm constant_tsc rep_good nopl xtopology cpu
id tsc_known_freq pni pclmulqdq ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_
deadline_timer aes xsave avx f16c rdrand hypervisor lahf_lm abm pti fsgsbase bmi1 avx2 sme
p bmi2 erms invpcid xsaveopt
bugs            : cpu_meltdown spectre_v1 spectre_v2 spec_store_bypass l1tf mds swapgs itl
b_multihit mmio_stale_data bhi its
bogomips        : 4599.99
clflush size    : 64
cache_alignment : 64
address sizes   : 46 bits physical, 48 bits virtual
power management:
```

2. Display memory information from **`/proc/meminfo`**.

```
ubuntu@ip-10-0-13-44:/proc$ cat /proc/meminfo
MemTotal:         980324 kB
MemFree:          152800 kB
MemAvailable:     604528 kB
Buffers:           16672 kB
Cached:           541700 kB
SwapCached:            0 kB
Active:           162404 kB
Inactive:         454764 kB
Active(anon):      44672 kB
Inactive(anon):    36744 kB
Active(file):     117732 kB
Inactive(file):   418020 kB
Unevictable:       40248 kB
Mlocked:           27284 kB
SwapTotal:             0 kB
SwapFree:              0 kB
Zswap:                 0 kB
Zswapped:              0 kB
Dirty:                 0 kB
Writeback:             0 kB
AnonPages:         99116 kB
Mapped:           115296 kB
Shmem:               904 kB
KReclaimable:      87508 kB
Slab:             140124 kB
SReclaimable:      87508 kB
SUnreclaim:        52616 kB
KernelStack:        2620 kB
PageTables:         3552 kB
SecPageTables:         0 kB
NFS_Unstable:          0 kB
Bounce:                0 kB
WritebackTmp:          0 kB
CommitLimit:      490160 kB
Committed_AS:     692964 kB
VmallocTotal:   34359738367 kB
VmallocUsed:        8708 kB
VmallocChunk:          0 kB
Percpu:             8128 kB
HardwareCorrupted:     0 kB
AnonHugePages:         0 kB
ShmemHugePages:        0 kB
ShmemPmdMapped:        0 kB
FileHugePages:         0 kB
FilePmdMapped:         0 kB
Unaccepted:            0 kB
HugePages_Total:       0
HugePages_Free:        0
HugePages_Rsvd:        0
HugePages_Surp:        0
Hugepagesize:       2048 kB
Hugetlb:               0 kB
DirectMap4k:       57344 kB
DirectMap2M:      991232 kB
```

3. Count the number of processes currently running (**`ps -ef | wc -l`**).

4. Identify how many users are currently logged in (**`who`**).



Short Notes :

uname – system information

ls – list directory contents

lsb_release – (linux standard base release) Minimal information about distro

man – system referrel manual

There are 9 sections in man :

1. User commands
2. System calls (functions provided by the kernel)
3. Library calls (functions within program libraries)
4. Special files (usually found in /dev)
5. File formats and Configuration files
6. Games
7. Miscellaneous (including macro packages and conventions)
8. System administration commands (for root user)
9. Kernel routines (Non – standard)

man-pages – contains conventions for writing man pages

ps – snapshot of current processes

wc – word count

who – shows who is logged in

Symlink – (symbolic link) It is file refers to other target file

Filesystem Hierarchy Standard (FHS)

Referred Resources:

man pages for ls, lsb_release, uname, man , man-pages, ps, wc ,who

/proc, /etc and other directories

Online Resources :

https://askubuntu.com/tags/symbolic-link/info

https://www.geeksforgeeks.org/linux-unix/linux-file-hierarchy-structure/

https://roadmap.sh/linux (getting started)