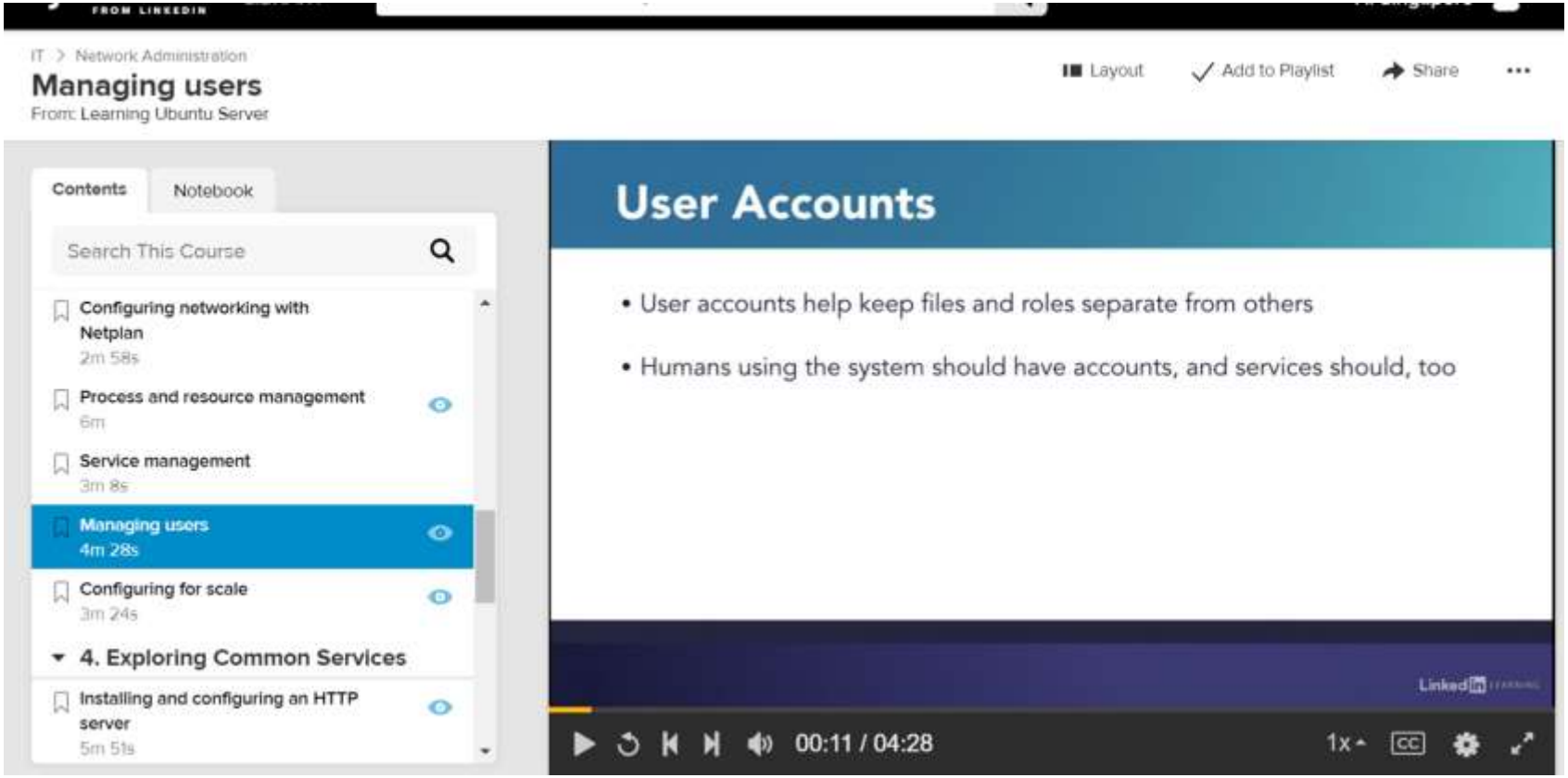
Topic 09A
Users and Groups
User and Group Administration Processes

Contents

- Linux Users and the /etc/passwd file
- Linux Groups and the /etc/group file
- Examining User Information
- User Administration
- Group Administration
- Administration using GUI & problems
- Delegating with sudo


FROM LINKEDIN
IT > Network Administration
Managing users
From: Learning Ubuntu Server
Layout
Add to Playlist
Share
Contents
Notebook
Search This Course
Configuring networking with Netplan
2m 58s
Process and resource management
6m
Service management
3m 8s
Managing users
4m 28s
Configuring for scale
3m 24s
4. Exploring Common Services
Installing and configuring an HTTP server
5m 51s
User Accounts
• User accounts help keep files and roles separate from others
• Humans using the system should have accounts, and services should, too
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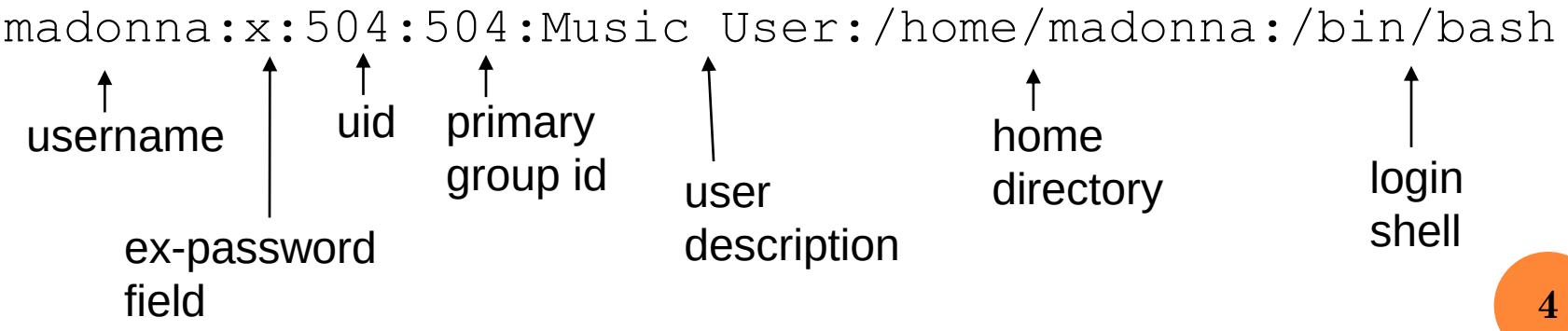
Linux Users and the /etc/passwd file

- Every user has a **username** and a **uid** (user ID)
- Usernames and uids are stored in **/etc/passwd**.

- Eg of /etc/passwd entry. Explanation of fields can also be found in “man 5 passwd”



Linux Users and the /etc/passwd file

- Local users' encrypted passwords used to be stored in **/etc/passwd** (long ago). However, because /etc/passwd is world readable, everyone can have access to the encrypted passwords. Brute forced or dictionary attacks simple.

- So now, users' encrypted passwords are stored in **/etc/shadow**. This file is readable only by the root user.
- Users change their password with the **passwd** command.
- Root can reset users' passwords with the **passwd** command.

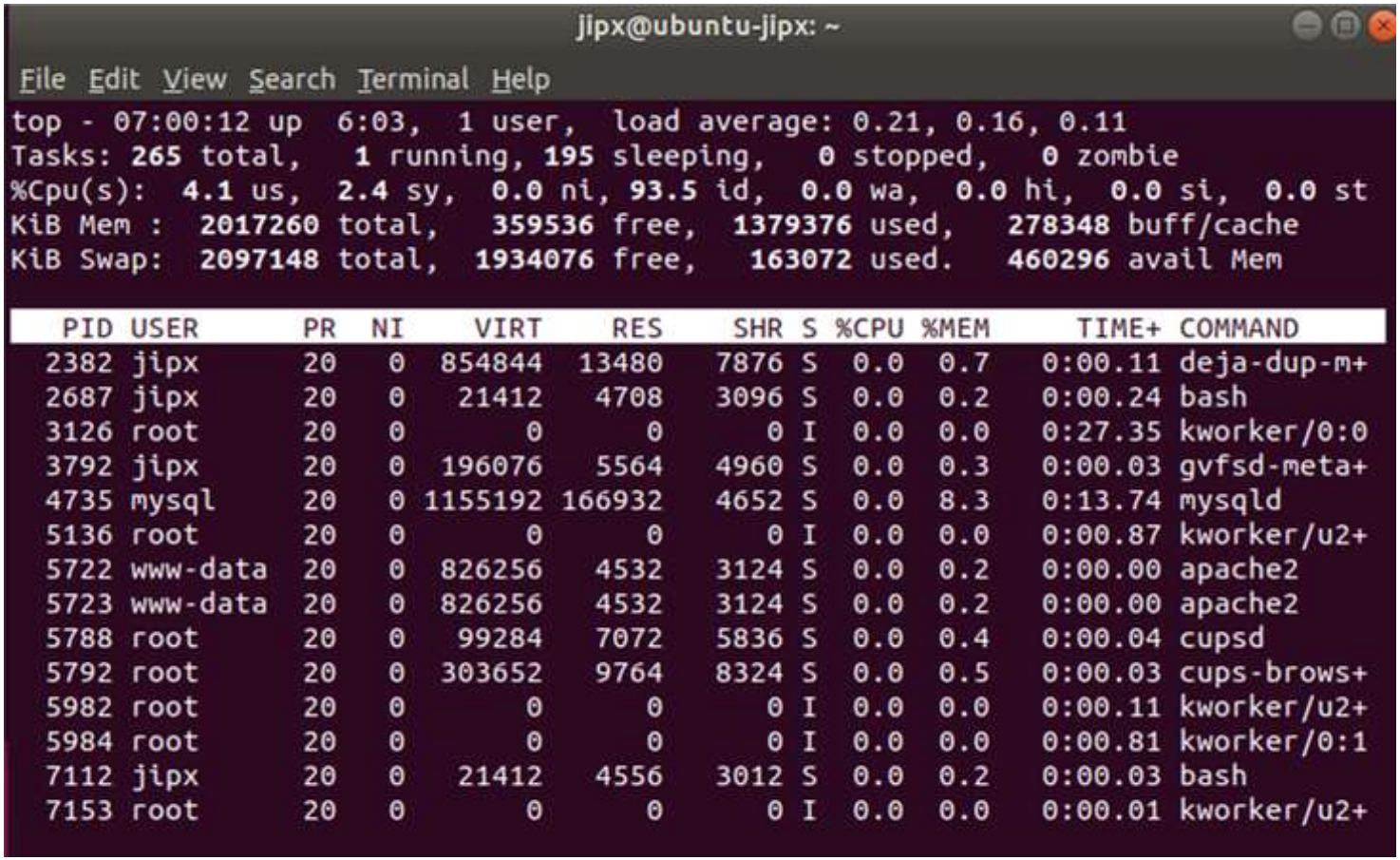
Types of Users

- There are 3 classes of Linux users:
- Normal users
  - real people who use the Linux system.
  - usually have /bin/bash as the login shell and a home directory within /home.
  - usually can only create files in their home directories and in temporary directories like /tmp and /var/tmp.
  - uids equal or greater than 500 in RHEL.

Types of Users

- The root user
  - uid of 0.
  - also known as superuser, has permission to do everything.
  - has /root as the home directory.
- System users
  - run specific processes required for the Linux system to function.
  - usually do not have login shells. Home directories are usually system directories.
  - uids ranging from 1 to 499

What are the three types of users shown by running top command?



Examining User Information

- The **id** command displays user and group information. (**whoami** command reports only current username)
- The **who**, **users** and **w** commands report users with active sessions.
- The **finger**[1] command report when users were last logged into the system and other information.
  - Use of **.plan** file

[1] Need to install “finger client” package

User Administration

- The **useradd** command adds new users.
  - The contents of ***/etc/skel*** will be copied into the user's home directory.
- The **usermod** command modifies users.
- The **userdel** command deletes users.
- The **chage** command changes password expiry info.

Common useradd options

- Commonly used (see man page for details)

-c add a comment for the user (Full User Name)

-g <GID/groupname> sets the primary group of the user

-G group1, group2… sets the secondary groups of the user

-p <encrypted password> set password for the user (The command mkpasswd can be used to generate encrypted passwords)

-e <YYYY-MM-DD> set expiry date for the account

Common usermod options

- For a complete list, see the man pages
- Common usermod options

  -d change the home directory for the user

  -u *UID* change the UID of the user

  -G *group1, group2…* sets the secondary groups of the user (any existing secondary groups are replaced)

  -aG *group1, group2…* sets the secondary groups of the user (without replacing any existing secondary groups)

Common userdel options

- For a complete list, see the man pages

- Common userdel options

  -r removes the home directory for the user too

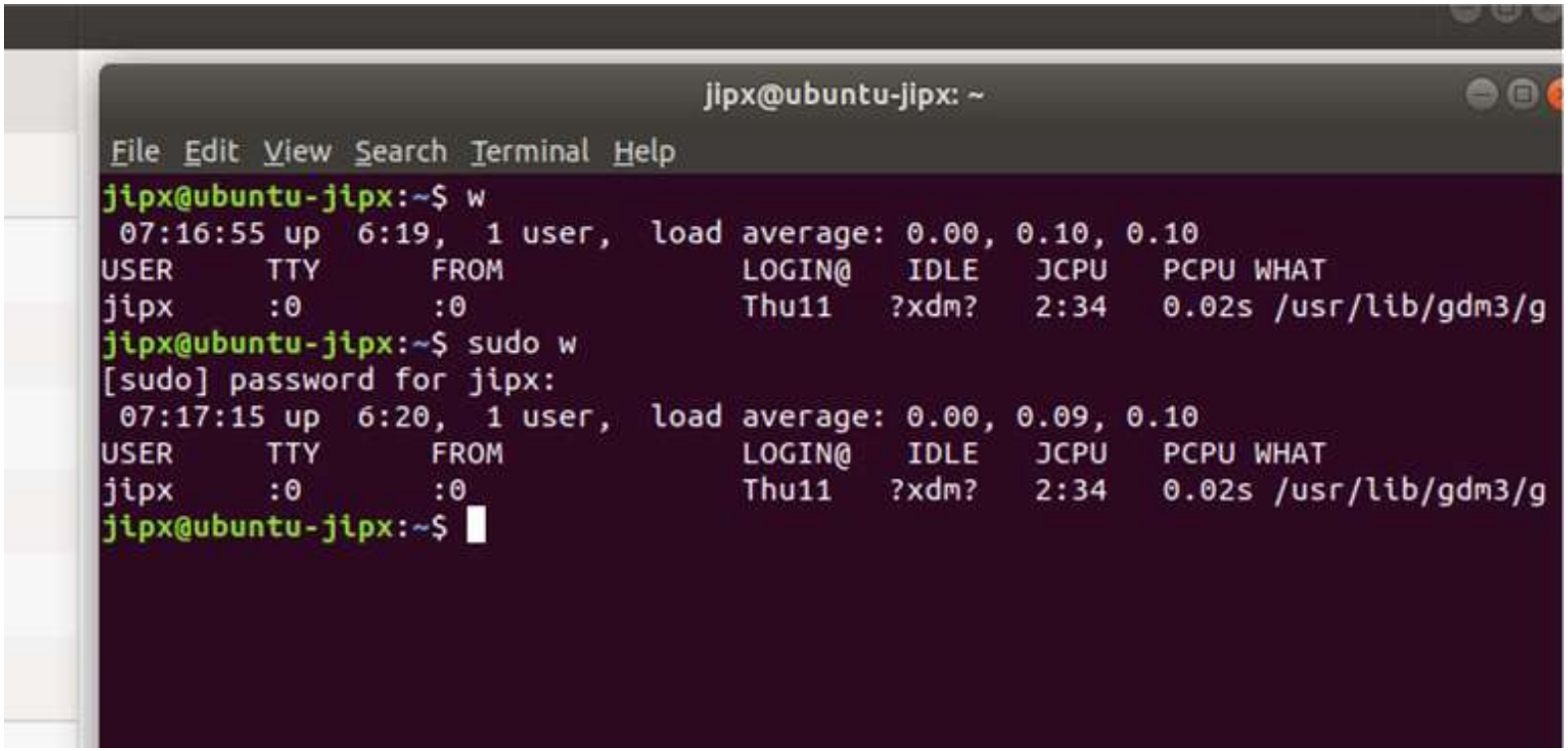
How To List All User Accounts On Ubuntu 16.04 / 18.04

```
less /etc/passwd
```

User name	password	UID	GID	Full Name	Home DIrectory	Login Shell	
jipx	x	1000	1000	jipx	/home/jipx	/bin/bash	

Show Active users

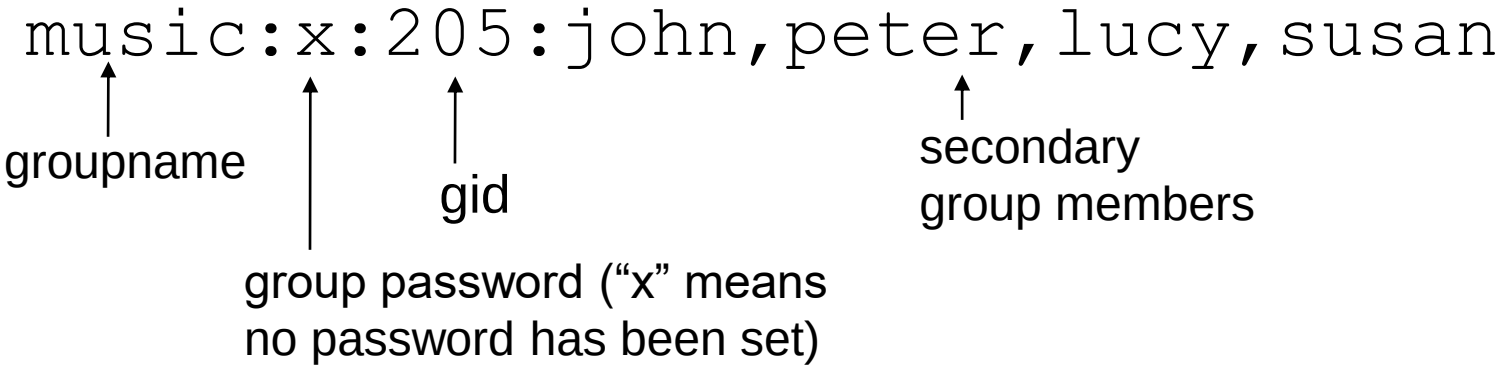
who or w command



Linux Groups and the /etc/group file

- Every user is a member of one **primary group**.
- Users can also be a member of zero or many **secondary groups**.

- Eg of /etc/group entry. Explanation of fields can also be found in “man 5 group”



Linux Groups and the /etc/group file

- Group memberships are usually used to determine who has access to what files. Every file has a user owner and a group owner.
- The user who created the file becomes the user owner of that file. The primary group of the user becomes the group owner of that file.
- The user's primary group is defined in /etc/passwd. In RHEL, the user's primary group has the same name as the username known as **private group**.
- Extra group memberships can be added known as secondary group.

Group Administration

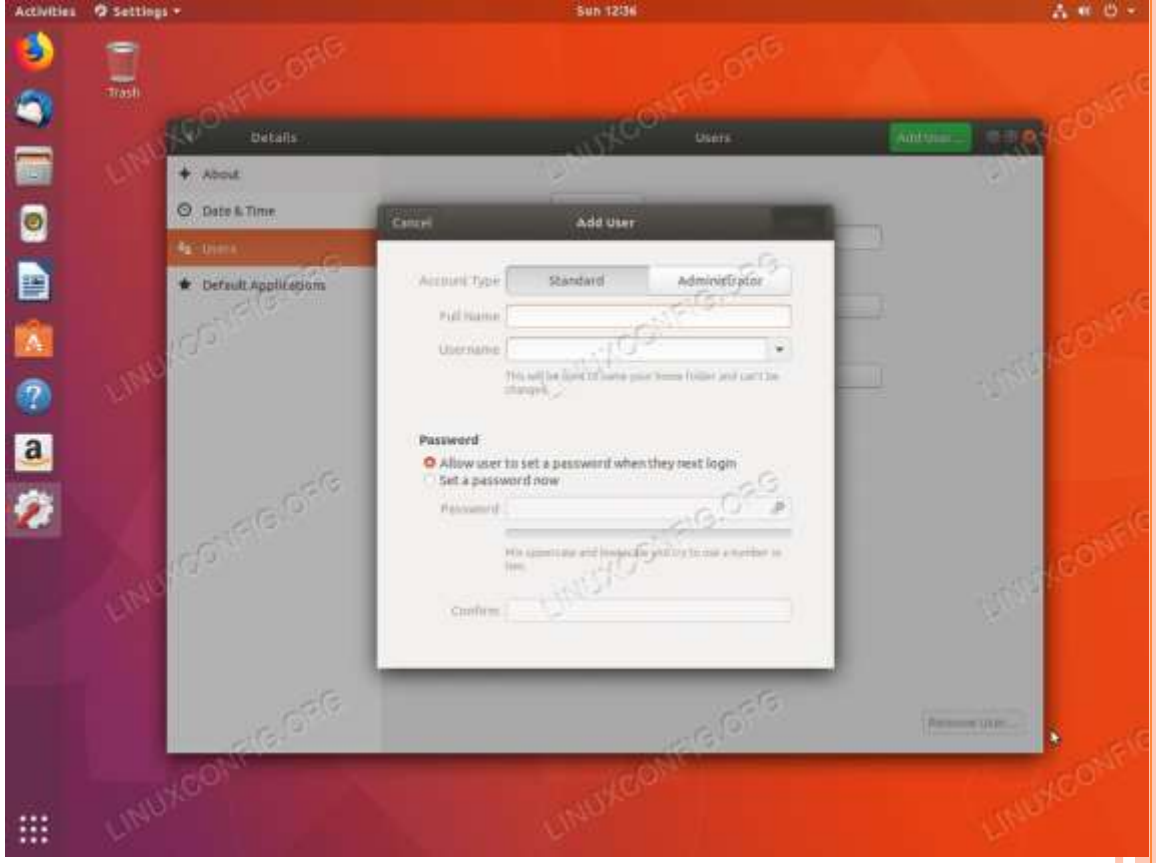
- The **groupadd** command creates new groups.
- The **groupmod** command modifies groups.
- The **groupdel** command deletes groups.
- The **newgrp** command allows a user to switch primary group during the current session
- Note: To add or remove members from a group, use the **usermod -G** or **usermod -aG** command.

Add user on Ubuntu GNOME Desktop

To create a new user on Ubuntu GNOME Desktop, first open **SETTINGS** window. Next navigate to `About->Users` menu.

Click `Unlock` on the top right corner and enter your administrative password.

Select whether you wish to create `Standard` or `Administrator` account. Enter required information and hit `Add` button to create a new user account.



Questions

- Can you set the password for user john as “john” ?
- When user Jen, UID=510 is created, can we change Jen’s UID to 888 ?
- Can 2 users (e.g Steven & ChenYi) have the same UID ? (see the man page for useradd)

Delegating with sudo

- Sometimes the root user wants to delegate administrative tasks to a normal user.
- For example, the root user want a co-worker to help him shutdown the server at the end of the day.
- The /etc/sudoers specifies users who have special privileges
- The **visudo** command is used to edit the /etc/sudoers file
- See **man sudoers** for details

Example: Install PHP

Installing PHP

PHP 7.2 which is the default PHP version in Ubuntu 18.04 is fully supported and recommended for WordPress.

To install PHP and all required PHP extensions run the following command:

```
sudo apt install php7.2 php7.2-cli php7.2-mysql php7.2-json php7.2-opcache php7.2-mbstring php7.2-xml php7.2-gd php7.2-curl
```

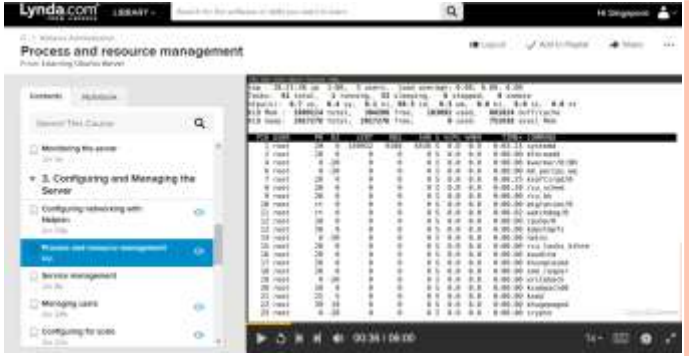
Restart apache so the newly installed PHP extensions are loaded:

```
sudo systemctl restart apache2
```

Process and Resource Management

- All processes compete for resources (memory, CPU, disk, etc.)
- The system balances resource usage for processes
- We can view and modify resource usage

top command



You can press 'q' to quit exit the window. The process list shows all the processes with various process specific details in separate columns.

PID: It is the task's unique process id.

USER: It is the effective user name of the task's owner.

PR: It is the priority of the task.

NI: The nice value of the task. A negative nice value means higher priority, whereas a positive nice value means lower priority. Zero in this field simply means priority will not be adjusted in determining a task's dispatchability.

VIRT: It is the total amount of virtual memory used by the task.

RES: It is the Resident size, the non-swapped physical memory a task has used.

SHR: It means the Shared Mem size (kb), the amount of shared memory used by a task.

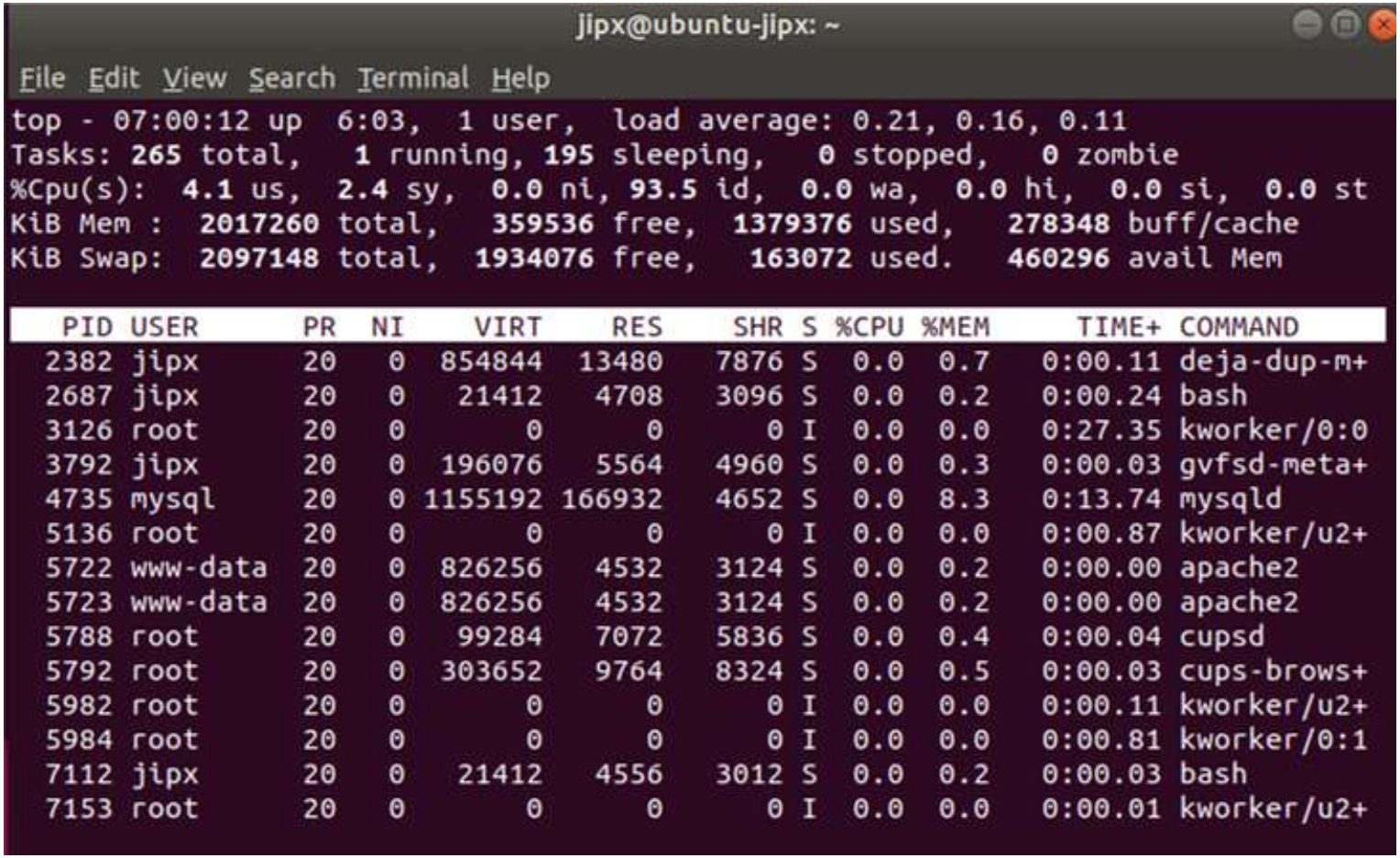
%CPU: It shows the CPU usage. The task's share of the elapsed CPU time since the last screen update, expressed as a percentage of total CPU time.

%MEM: It shows the Memory usage, a task's currently used share of available physical memory.

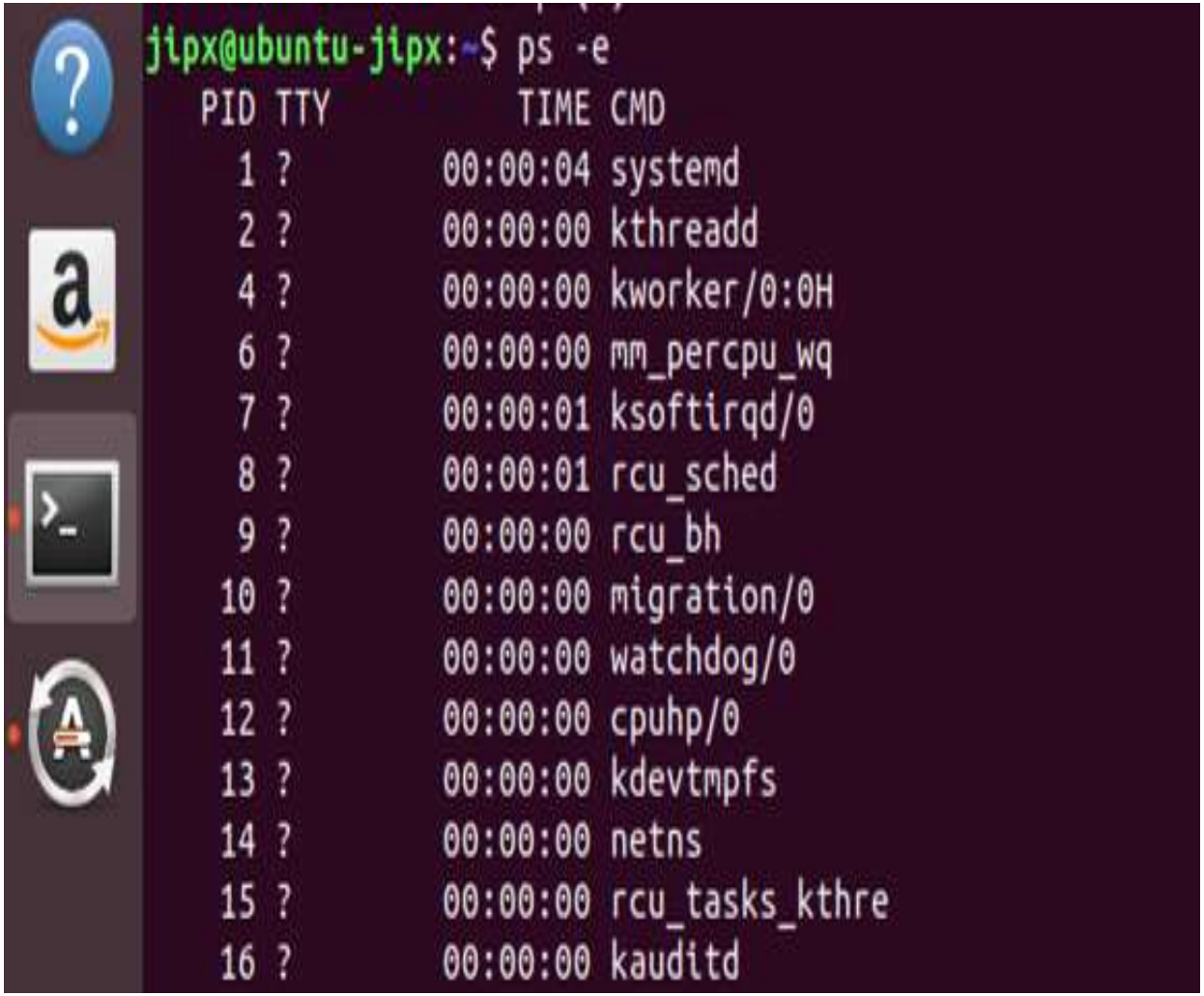
TIME+: CPU Time, the same as 'TIME', but reflecting more granularity through hundredths of a second.

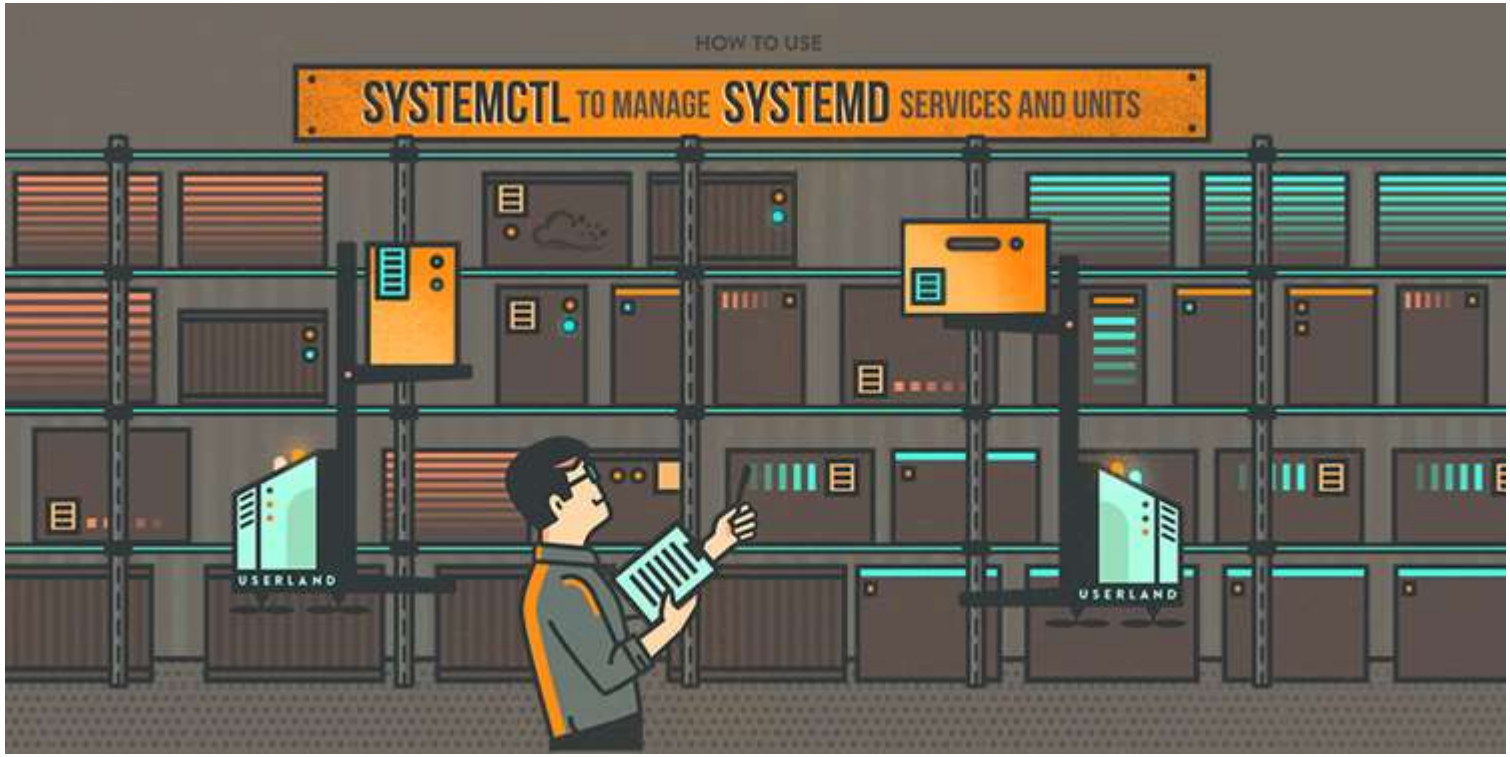
COMMAND: Display the command line used to start a task or the name of the associated program.

top command


jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
top - 07:00:12 up 6:03, 1 user, load average: 0.21, 0.16, 0.11
Tasks: 265 total, 1 running, 195 sleeping, 0 stopped, 0 zombie
%Cpu(s): 4.1 us, 2.4 sy, 0.0 ni, 93.5 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 2017260 total, 359536 free, 1379376 used, 278348 buff/cache
KiB Swap: 2097148 total, 1934076 free, 163072 used. 460296 avail Mem
PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2382 jipx 20 0 854844 13480 7876 S 0.0 0.7 0:00.11 deja-dup-m+
2687 jipx 20 0 21412 4708 3096 S 0.0 0.2 0:00.24 bash
3126 root 20 0 0 0 0 I 0.0 0.0 0:27.35 kworker/0:0
3792 jipx 20 0 196076 5564 4960 S 0.0 0.3 0:00.03 gvfsd-meta+
4735 mysql 20 0 1155192 166932 4652 S 0.0 8.3 0:13.74 mysqld
5136 root 20 0 0 0 0 I 0.0 0.0 0:00.87 kworker/u2+
5722 www-data 20 0 826256 4532 3124 S 0.0 0.2 0:00.00 apache2
5723 www-data 20 0 826256 4532 3124 S 0.0 0.2 0:00.00 apache2
5788 root 20 0 99284 7072 5836 S 0.0 0.4 0:00.04 cupsd
5792 root 20 0 303652 9764 8324 S 0.0 0.5 0:00.03 cups-brows+
5982 root 20 0 0 0 0 I 0.0 0.0 0:00.11 kworker/u2+
5984 root 20 0 0 0 0 I 0.0 0.0 0:00.81 kworker/0:1
7112 jipx 20 0 21412 4556 3012 S 0.0 0.2 0:00.03 bash
7153 root 20 0 0 0 0 I 0.0 0.0 0:00.01 kworker/u2+

ps -e | grep bash





Starting and Stopping Services

sudo systemctl start application.service
sudo systemctl stop application.service

Restarting and Reloading

sudo systemctl restart application.service
sudo systemctl reload application.service
sudo systemctl reload-or-restart application.service

Enabling and Disabling Services

sudo systemctl enable application.service
sudo systemctl disable application.service

Checking the Status of Services

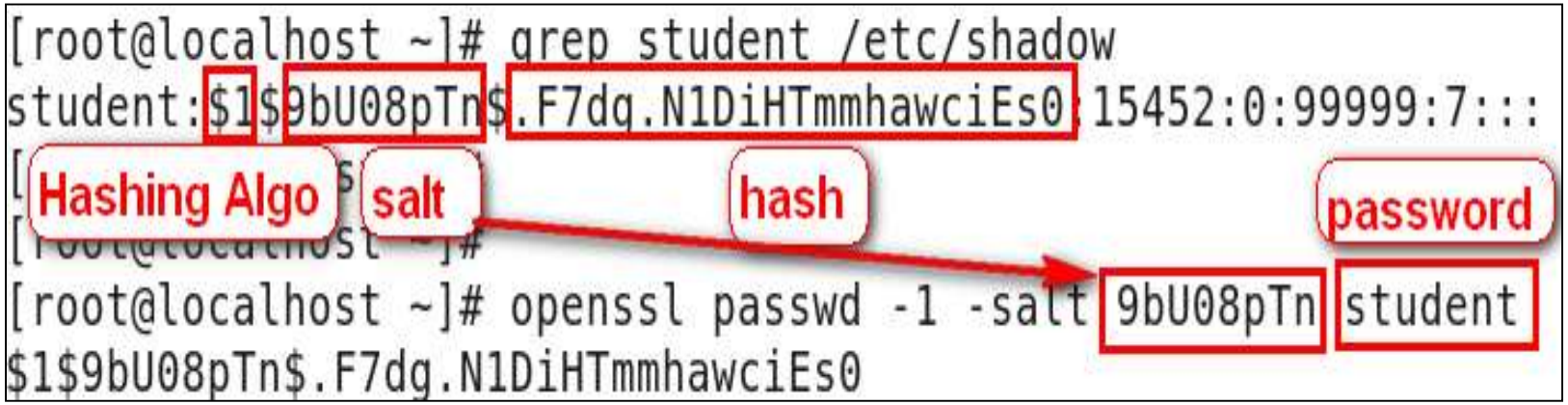
systemctl status application.service

Summary

- Linux Users and the /etc/passwd file
- Three types of users
  - normal, root and system
- How to examine User Information
- Linux Groups and the /etc/group file
  - Primary, secondary, private group
- How to add, modify and delete users and groups
- Delegating with sudo

Extra (not tested)

- System Administration Authentication Adva



More info check out **man 3 crypt**