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Module 8

Ubuntu security

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Learning objectives

Participants will understand how to configure major components of Linux/Ubuntu.

Account management

Updates

Firewall

Participants will understand how to implement user-level configurations within Ubuntu.

Account settings

Group configuration

Authentication and the PAM file

Participants will understand commands that will be useful for securing a Linux machine.

Participants will understand system and audit logging.

Overview

Configuration

Section 1

Basic GUI security

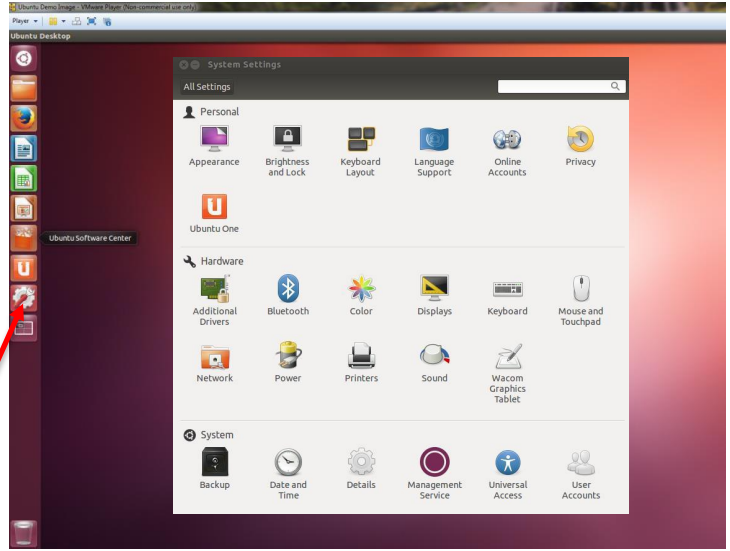
Basic Linux Security

This unit will show you how to make many of the same security settings you made on Windows in previous units.

Linux has many of the same vulnerabilities, so the fixes are similar.

Linux does not have Settings or Control Panel like in Windows.

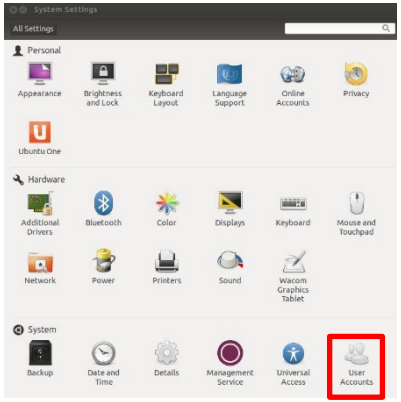
The System Settings menu offers limited security tools.



Click the System Settings button in the menu bar.

User accounts overview

Click User Accounts in the System Settings window.

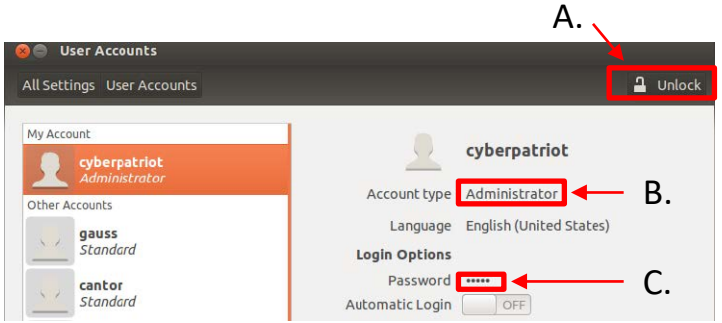


As in Windows, it is important to restrict root (Admin) privileges and password protect all accounts.

A. To make account management changes, you must enact root permissions by clicking Unlock and authenticate yourself by entering your password.

B. Switch users from Administrator to Standard User by clicking next to Account Type.

C. Change passwords by clicking the asterisks next to the Password option.



Click the System Settings button in the menu bar.

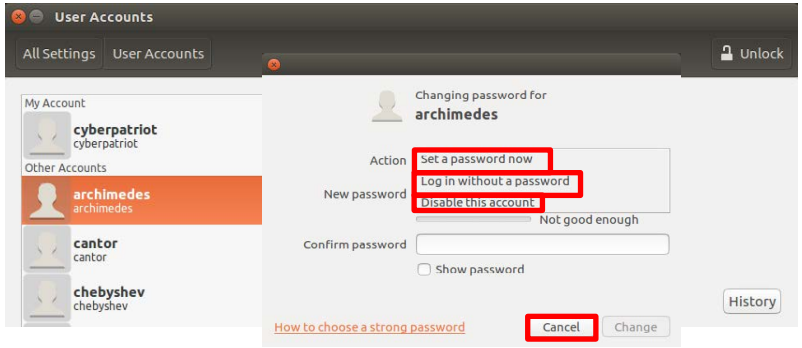
User accounts – password

Click the field next to Password.

Set a password now allows you to change a user's password.

Do not select Log in without a password.

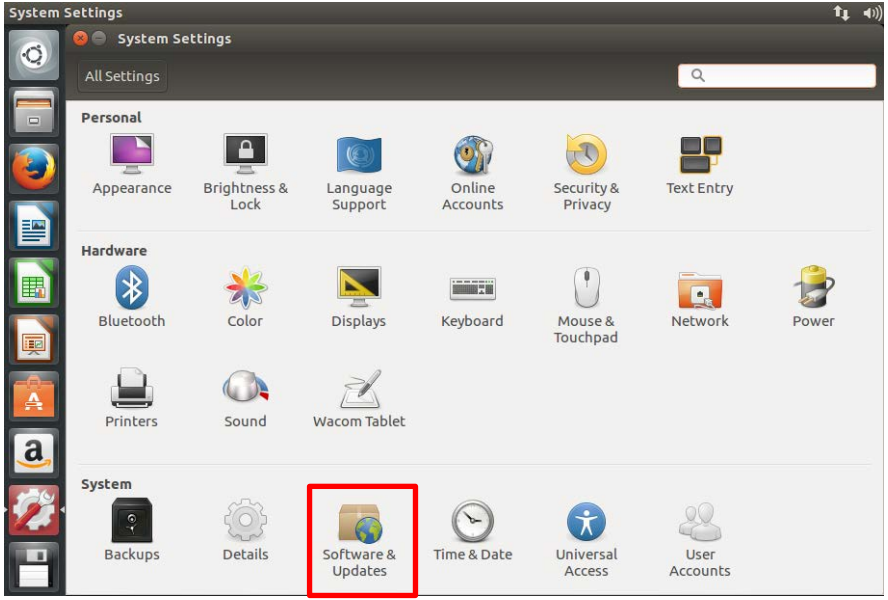
The third option allows you to disable or enable an account.



Press Cancel to return to the User Accounts windows.

Configuring updates

Click **Software & Updates** in the System Settings window.



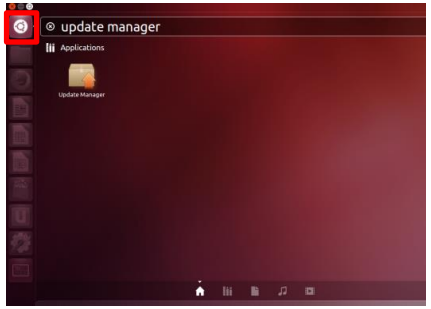
Configuring updates

The open-source community regularly develops improvements and patches for Ubuntu.

You should install these updates regularly.

1. Click the Ubuntu button in the menu bar and search for Update Manager.
2. Click Settings on the Update Manager screen.
3. To set automatic updates, go to the Updates Tab and make sure ‘Automatically check for updates’ is set to ‘Daily’.
4. After applying the changes, install any available updates from the main Update Manager window.

1.



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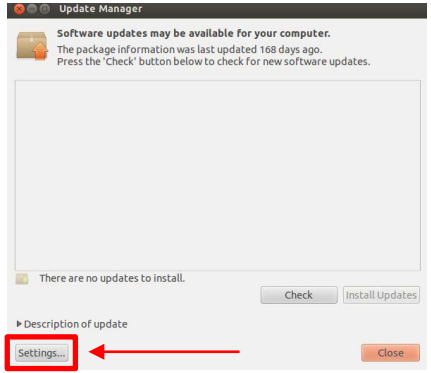

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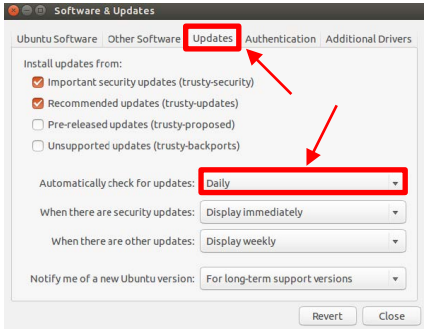

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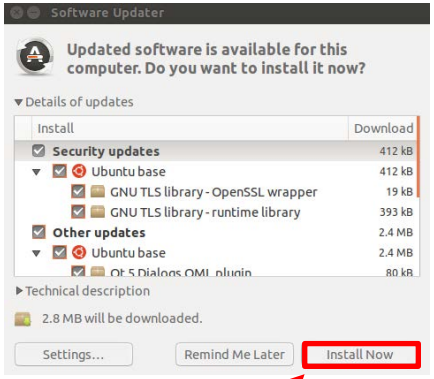
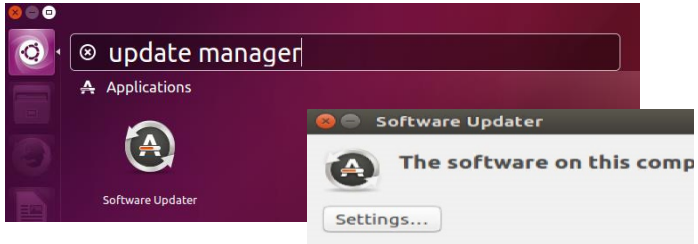


Installing updates

Click the Ubuntu button in the left-hand menu and search for Update Manager.



Enabling the Firewall

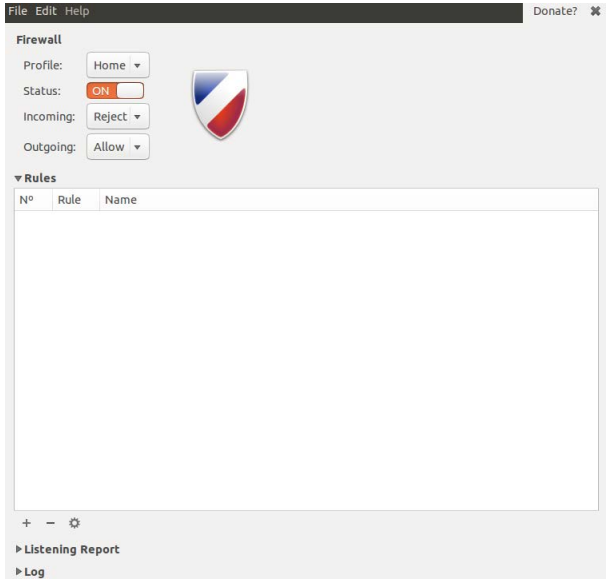
Enable the Ubuntu Built-in Firewall (UFW) to prevent unauthorized access to the computer.

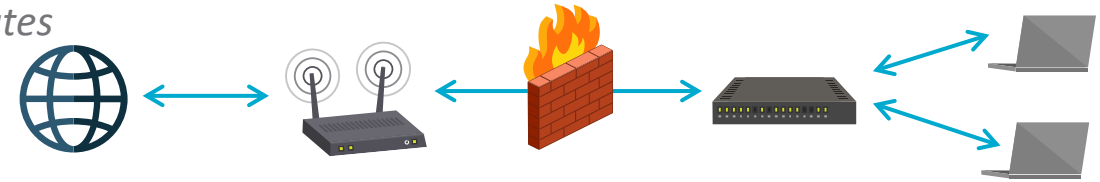
The UFW is deactivated by default.

By default, UFW is only accessible by command line.

You can download Gufw, a graphical firewall interface, from the Software Centre and use it to make changes to the UFW in the GUI.

You might need to install Ubuntu updates before installing Gufw.





Using Gufw

After downloading Gufw from the Software Centre, click the Ubuntu button in your menu bar → Search → Firewall configuration.

Click the Unlock button on the Gufw window → Enact root permissions by authenticating → Turn firewall status on.

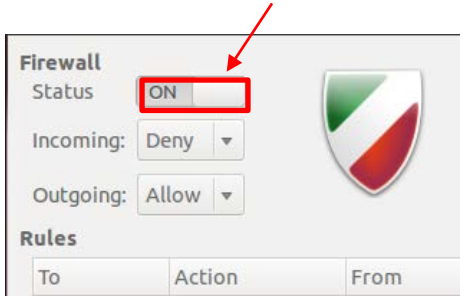
The default (and recommended) rules governing traffic are to Deny all incoming traffic and Allow all outgoing traffic.

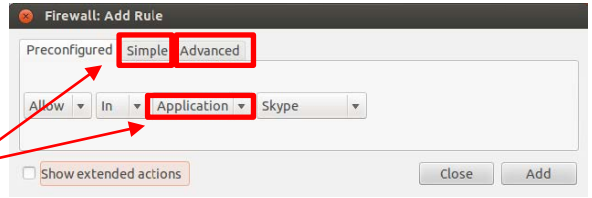
The Reject option is the same as Deny, but also sends a notification to the sender that connection has been blocked.

The Preconfigured rule panel allows incoming and/or outgoing traffic to be controlled for certain applications or services.

Similar to the Windows Firewall Exceptions list.

Open entire ports by clicking the Simple or Advanced tabs.





Section 2

Basic command line security

The password file

/etc/passwd

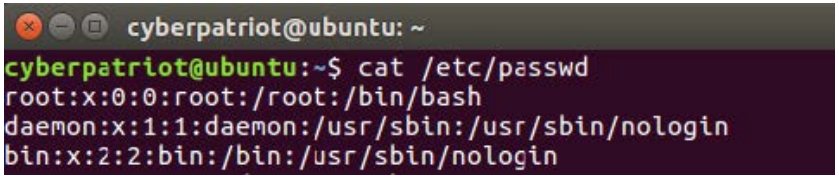
Usually does not contain passwords (anymore).

Contains user information.

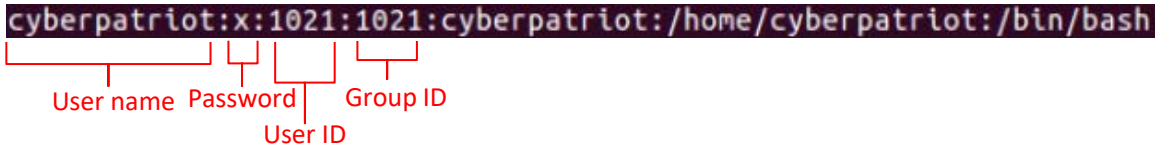
Type cat /etc/passwd

Type man 5 passwd to view the manual for the password file.

When you are done, press q to quit.



The password file



User Name

The name associated with this user account.

This is primarily used by humans to identify a user account.

Password

x denotes password is stored in shadow file.

User ID

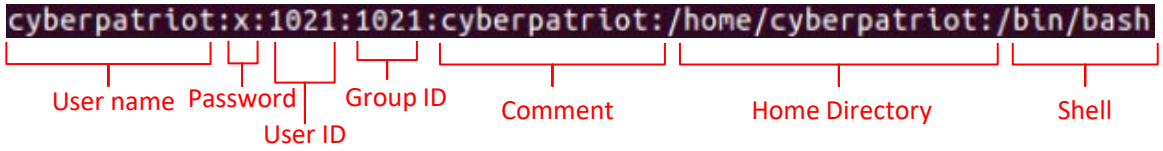
Numerical user ID, or 'UID'.

The OS internally identifies users using their UID not Username.

Group ID

Numerical primary group ID, or 'GID'.

The password file



Comment

Typically used to store the user's 'real name'.

Home Directory

The current working directory when this user logs in.

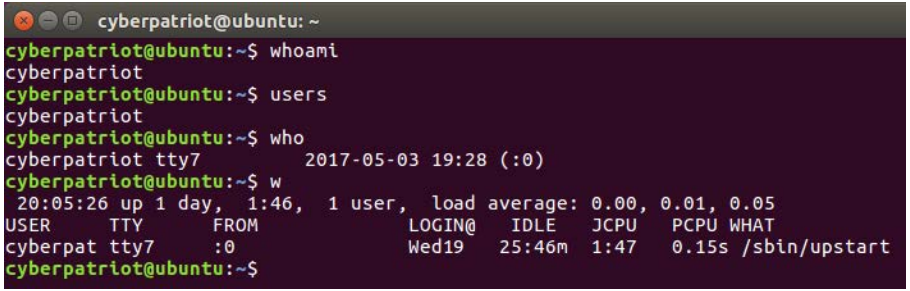
Shell

The shell (or command) that gets executed when you log in.

How this user interacts with the computer when logging in on the command line.

Listing users

Try running the following commands in the terminal:



whoami

Prints your current username.

users

Prints the user names of users currently logged in to the current host.

who

Prints information about users who are currently logged in.

w

Displays information about the users currently on the machine, and their processes.

The gedit command

Gedit is one of many text editor commands in Ubuntu.

Syntax: gedit [filepath]

Unlike with other text editors, using gedit will cause a second window to pop-up where you can easily change the text of a file.

This command will allow you to edit security policy files.

You need to enact root permissions before using gedit to edit files that cannot be accessed by standard users (e.g. system and security files).

When using gedit for the first time, go to Edit → Preferences → Uncheck 'Create a backup copy of files' to avoid saving issues.

Try using gedit by opening Terminal and entering gedit hello2.txt.

You will not be prompted to authenticate because this is a public file.

Using gedit to turn off the Guest account

Like in Windows, the Ubuntu Guest account is turned on by default.

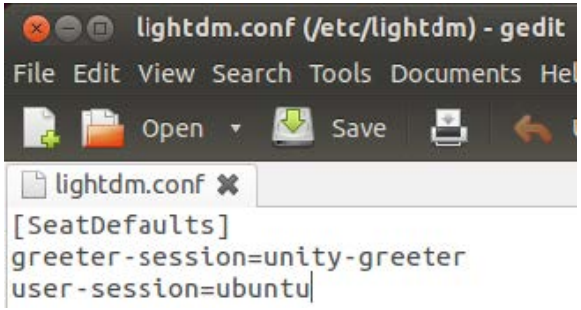
You should disable it so people can't access the computer anonymously.

The Guest account is controlled by LightDM, the display manager controlling the Ubuntu login screen.

To turn off the guest account, edit the LightDMfile:

After root authenticating, type gedit/etc/lightdm/lightdm.conf

```
root@ubuntu:/home/cyberpatriot# gedit /etc/lightdm/lightdm.conf
```



Add the line allow-guest=false to the end of the Light DM file that pops up and click Save.

Restart your system and click your username button in the top-right corner of your desktop. The guest account should be disabled.

Sources: https://help.ubuntu.com/8.04/serverguide/C/user-management.html
http://askubuntu.com/questions/451526/removing-guest-session-at-login-in-ubuntu-14-04

Using gedit to edit password history

Type gedit/etc/login.defs

This is a much longer file. To easily find the section to edit, type Ctrl+F and then 'PASS_MAX_AGE'.

Modify the following variables to the same recommended settings used in Windows:

Maximum Password Duration

PASS_MAX_DAYS90

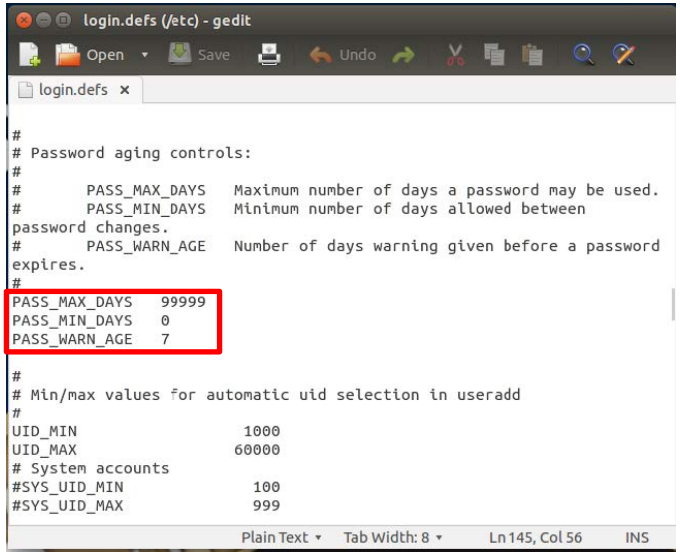
Minimum Password Duration

PASS_MIN_DAYS10

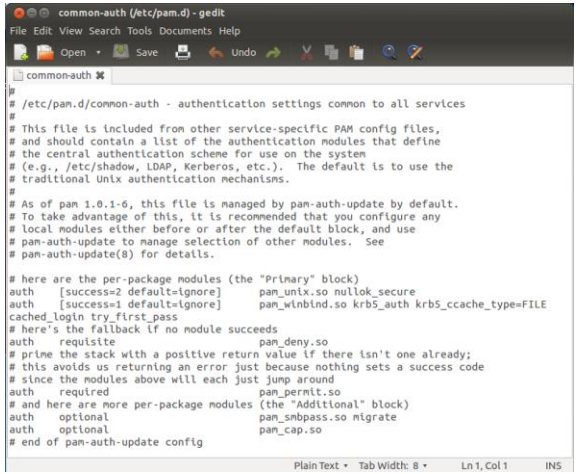
Days Before Expiration to Warn Users to Change Their Password

PASS_WARN_AGE7

Save the file and close it.



Using gedit to set account policy



Type gedit/etc/pam.d/common-auth

This file allows you to set an account lockout policy.

Add this line to the end of the file:

auth required pam_tally2.so deny=5 onerr=fail unlock_time=1800

Save the file and close it.

Sets the number of allowed failed login attempts (in this case 5).

Sets the account lockout duration in seconds (in this case, 30 minutes).

Source: http://linux.die.net/man/8/pam_tally

Section 3

Advanced Ubuntu security

Turn off the guest account

Turned on by default.

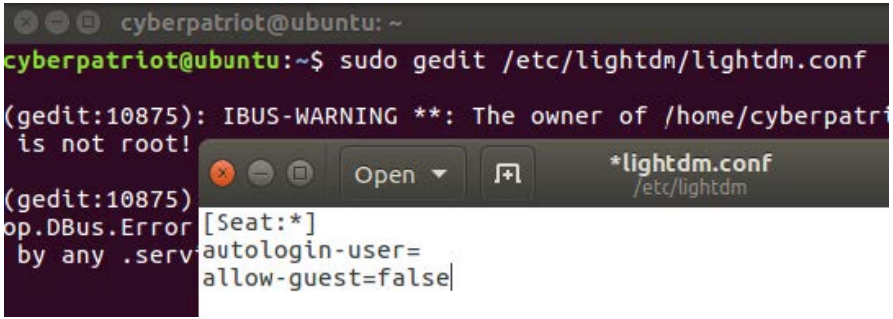
LightDM

Display manager controlling the login screen.

Type:
sudogedit/etc/lightdm/lightdm.conf

Add the line:

allow-guest=false under [Seat:*]



Password age policy

In a terminal, type sudogedit/etc/login.defs

Maximum Password Duration:

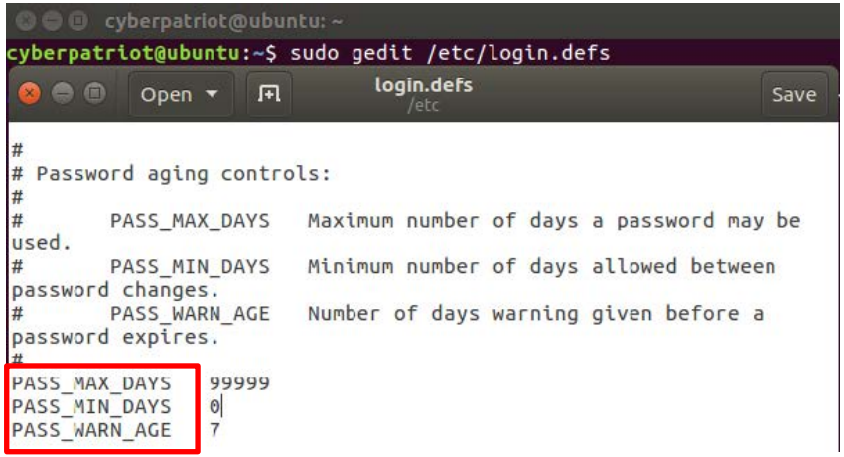
PASS_MAX_DAYS 90

Minimum Password Duration:

PASS_MIN_DAYS 5

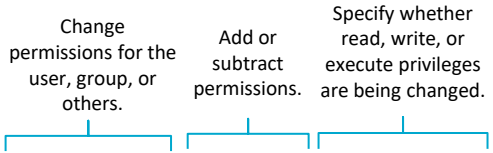
Password Warning Before Expiration:

PASS_WARN_AGE 7



The chmod command

Chmod allows you to change file permissions.



Syntax: chmod [u,g or o][+ or -][r,w, or x] [filepath]

Do not put spaces between the three fields after 'chmod'.

Example

1. Type chmodo-r hello2.txt
2. Type 1s –1 hello2.txt
3. If your permissions originally matched those on the last slide, you should see hello2.txt's new file permissions as shown below:

```
cyberpatriot@ubuntu:~$ ls -l hello.txt
-rw-rw---- 1 cyberpatriot cybercamp 57 May 29 09:34 hello.txt
```

Groups

Work very similarly to Windows.

Root permissions are required.

1. To list all groups:
   cat/etc/group
2. To add a group:
   addgroup[groupname]
3. To add a user to a group:
   adduser[username] [groupname]

Services

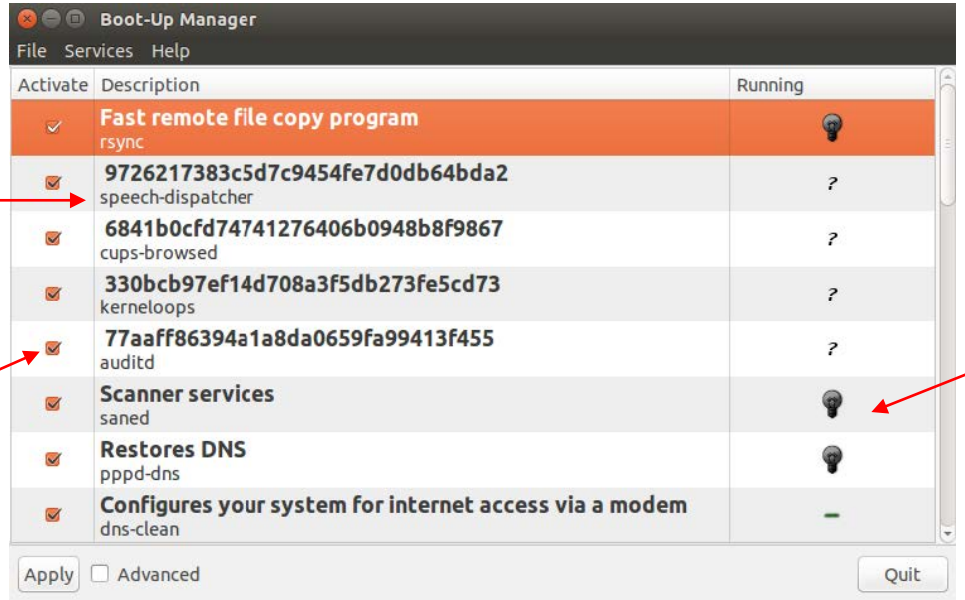
Can be viewed and managed in the GUI.

To install, type apt-get install bum in Terminal.

After installing, type bum to run.

To start a service, right-click it and select ‘Start’.

To enable a service, check the box next to it.



When a service is started, the light bulb will light up. When stopped, the light bulb will be dark.