



# Lab 4: Linux File System Permission

***ITCS461: Computer and Communication Security***

Mahidol University



# Agenda

Prerequisites

Review Linux Commands

Part I: Alice

Part II: Bob

Part III: Charlie



# Prerequisite

1. Download [VirtualBox](#) and install it on your computer.
2. Import [security-lab-4.ova file](#) into the VirtualBox to create a VM.
3. Start the VM and login as:

username: **alice**

password: **password**

After you get access to the system, you can try the following commands.



# Review Linux Commands

## whoami

see current user name

```
alice@security-lab-4:~$whoami  
alice
```

## id

see current user id, group id, and groups

```
alice@security-lab-4:~$ id  
uid=1002(alice) gid=1005(alice) groups=....
```



# Review Linux Commands

## pwd

see current directory (present working directory)

```
alice@security-lab-4:~$ pwd  
/home/alice
```

## cd

change directory

go outside a directory (go up)

```
alice@security-lab-4:~$ cd ..  
alice@security-lab-4:$ pwd  
/home
```

go inside a directory

```
alice@security-lab-4:/home$ cd  
alice alice@security-lab-4:~$ pwd  
/home/alice
```

Note: use “**cd [directory]**” to go to a specific directory. For example, “**cd /share**”



# Review Linux Commands

## ls

see list of files in the current directory

```
alice@security-lab-4:~$ls  
README.txt
```

add -l for more detail

```
alice@security-lab-4:~$ ls -l  
total 4  
-rw-r--r-- 1 root root 36 Feb 28 16:00 README.txt
```

## cat

see content of the file

```
alice@security-lab-4:~$ cat README.txt  
Nothing here  
See /team1 and /team2
```

# Review Permissions

## Basic File and Directory Permissions

d	r	w	x	r	-	x	r	-	-
	read	write	exec	read	write	exec	read	write	exec
File type	Owner permissions			Group permissions			User permissions		
(directory)	4	2	1	4	2	1	4	2	1
	7			5			4		

“754” is a combination of the binary number from each group.

**Owner permission = 7** (111 in binary),

allows the owner of the file to **read**, **write** and **execute** **Group**

**permission = 5** (101 in binary),

allows users in the same group as the file to **read** and **execute**

**Other user permission = 4** (100 in binary),

allows other users (not owner/not in the same group) to only **read**

Note: For a directory, “x” does not mean execute, but it means allowing to go inside the directory.



## Part I: Overview

### Part I: Login as Alice

- ★ Logging in
- ★ Exploring /team1
- ★ Exploring /team2





# Part I: Login as Alice

## Logging in

Login to the virtual machine using username & password as “**alice**” & “**password**”.

### Question 1:

Try the command “**id**”, then write down these values

“uid”: \_\_\_\_\_

“gid”: \_\_\_\_\_

“groups”: \_\_\_\_\_

What is your current directory? \_\_\_\_\_

Is there any file inside the current directory? \_\_\_\_\_ (Y/N)

If the answer is yes, what is the file's content \_\_\_\_\_



# Part I: Login as Alice

## Exploring /team1

Go to directory “/team1”

### Question 2:

How many files are inside the directory? \_\_\_\_\_

See the content inside “members.txt”, who are the members listed in the file?  
\_\_\_\_\_

What is the permission of “members.txt” (answer using both “rwx” format and number format)? \_\_\_\_\_

Can you see inside “secret.txt”? \_\_\_\_\_(Y/N)

If yes, what is the secret? \_\_\_\_\_

What is the permission of “secret.txt” (answer using both “rwx” format and number format)? \_\_\_\_\_

Who is the owner of “secret.txt”? \_\_\_\_

What is the group of “secret.txt”? \_\_\_\_



## Part I: Login as Alice

### Exploring /team2

Go to directory “/team2”

#### Question 3:

Can you go inside directory “/team2”? \_\_ (Y/N) If yes,  
how many files are inside “/team2”? \_\_\_\_

What is the permission of the directory “/team2” (answer only in “rwx”  
formats)?

Who is the owner and group of “/team2” directory? \_\_\_\_\_



## Part II: Overview

### Part II: Login as Bob

- ★ Logging in
- ★ Exploring /team1 & /team2
- ★ Bob v.s. /share



## Part II: Login as Bob

### Logging in

Type “exit” to logout from the virtual machine, then login to the virtual machine again using “**bob**” & “**password**” as username and password.

#### Question 4:

Try the command “**id**”, then write down these values “uid”: \_\_\_\_\_

“gid”: \_\_\_\_\_

“groups”: \_\_\_\_\_

Does Bob have any same group as Alice? \_(Y/N)

If yes, what are they? \_\_\_\_\_



## Part II: Login as Bob

### Exploring /team1 & /team2

Go to directory “/team1”

#### Question 5:

How many files are inside the directory? \_\_\_\_\_

Is it changed from Question 1? \_\_\_\_\_(Y/N)

Can you (as Bob) see inside “secret.txt”? \_\_\_\_\_(Y/N)

If yes, what is the secret? \_\_\_\_\_

If no, why can't you see it? \_\_\_\_\_

Go to directory “/team2”

#### Question 6:

Can you go inside “/team2” directory? \_\_ (Y/N)

Can you see files inside “/team2” directory? \_\_ (Y/N)

We know that there is “members.txt” inside this directory.

Can you see the content of this file? \_\_ (Y/N)



## Part II: Login as Bob

### Bob v.s. /share

Go to directory “/share”

#### Question 7:

What is the permission of “announcement.txt” (answer in both “rwx” format and number format)? \_\_\_\_\_

Who is the owner and group of “announcement.txt”? \_\_\_\_\_

See inside “announcement.txt”, what is the code? \_\_\_\_\_

What is the permission of this directory (answer in “rwx” format)?

\_\_\_\_\_



## Part III: Overview

### Part III: Login as Charlie

- ★ Logging in
- ★ Exploring /team1 & /team2
- ★ Charlie v.s. /share





## Part III: Login as Charlie

### Logging in

Type “exit” to logout from the virtual machine, then login to the virtual machine again using “**charlie**” & “**password**” as username and password.

#### Question 8:

Try the command “**id**”, then write down these values “uid”: \_\_\_\_\_

“gid”: \_\_\_\_\_

“groups”: \_\_\_\_\_

Does Charlie have any same group as Alice? \_\_\_\_\_(Y/N)

If yes, what are they? \_\_\_\_\_



## Part III: Login as Charlie

### Exploring /team1 & /team2

Go to directory “/team2”

#### Question 9:

Can you go inside the directory “/team2”? \_\_ (Y/N)

Can you see files inside the directory “/team2”? \_\_ (Y/N)

Who is the owner and group of the file “secret.txt”? \_\_

What is the permission of “secret.txt” (answer both “rwx” format and number format)? \_\_\_\_\_

Can you read the file “secret.txt”? \_\_ (Y/N)

If yes, what is the secret inside the file? \_\_\_\_\_

#### Question 10:

Can you go inside the directory “/team1”? \_\_ (Y/N)

Can you list the files inside directory “/team1”? \_\_ (Y/N)

We know that there is “members.txt” in this directory.

Can you see the content of the file? \_\_ (Y/N)



## Part III: Login as Charlie

### Charlie v.s. /share

Go to directory “/share”

#### Question 11:

Can you go inside the directory “/share”? \_\_\_\_\_(Y/N)

Can you list files inside the directory? \_\_\_\_\_(Y/N)

Can you see the content of “announcement.txt”? \_\_\_\_\_(Y/N)