



# Switching

## Ahmed Allam



A hand holding a smartphone is shown on the left side of the slide. Overlaid on the image is a blue, semi-transparent network diagram with nodes and connecting lines, suggesting a digital or network theme.

## Session 3

- What is Mac address ?
- Difference between mac and IP ?
- What is Switching ?
- Configuration Switch ?
  - hostname
  - Password console
  - Password enable
  - VLAN
  - Protocol trunk
  - Port security



## What is Mac Address ?

- MAC(Media Access Control)
- Using in Data Link Layer (2)
- Physical address
- Write hexadecimal 0-9,A-F
- Unique in World
- 6 Octets =  $6 \times 8 = 48$  bits
- Burned-in address in NIC (Network Interface Card)

# NIC

- Network Interface Card

MAC ID

00.1A.3F.F1.4C.C6

00	1A	3F	F1	4C	C6
OUI			UAA		

OUI → Organizationally Unique Identifier.

UAA → Universally Administered Address.



كيفية اظهار MAC address الخاص بجهازك

Windows + R → cmd → getmac or ipconfig /all



# Difference between mac and IP ?

## IP

- Internet protocol.
- Logical address.
- Using in Layer 3
- 4 octets = 32 bits
- Write decimal
- Write in Router
- **192.168.1.1**



## Mac address

- Media access control.
- Physical address.
- Using in Layer 2
- 6 octets = 48bits
- Write hexadecimal
- Write in Switch
- **00.F1.3D.4C.23.FF**

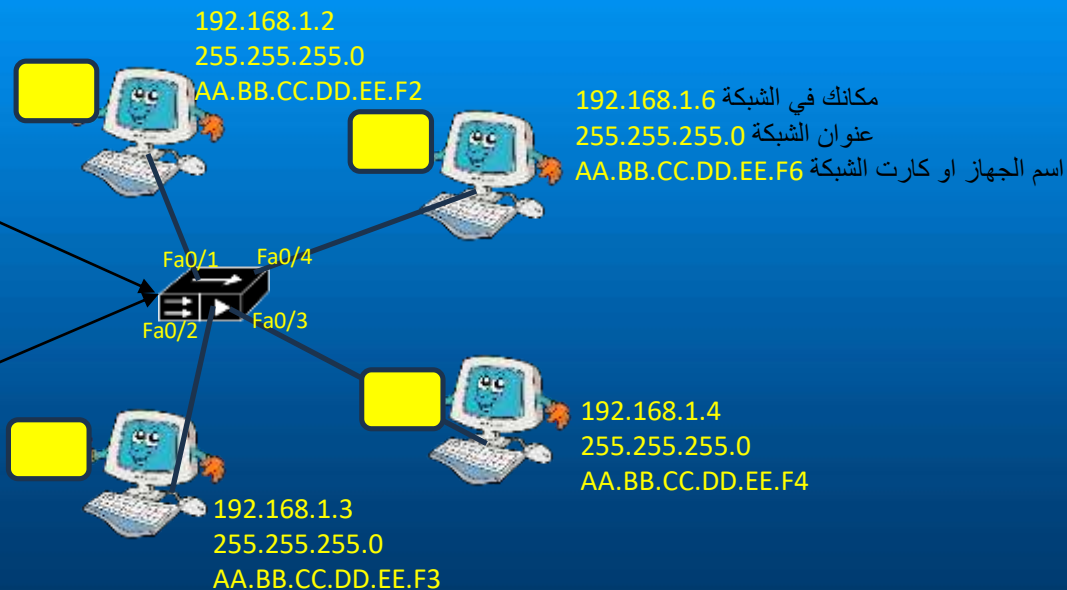




# What is Switching ?

- **Switching** is the process of transferring data from one device to another in a network.

Fa0/1	AA.BB.CC.DD.EE.F2
Fa0/2	AA.BB.CC.DD.EE.F3
Fa0/3	AA.BB.CC.DD.EE.F4
Fa0/4	AA.BB.CC.DD.EE.F6





# What is Switch ?

- **Switch** A switch is a device that connects devices within a local area network (LAN) and uses MAC addresses to forward data to the correct destination.
  1. Connect between all devices in the same network.
  2. Operate in layer(2) Data link in OSI models.
  3. Stop Collision .
  4. Create Table address .

EX:-



Why Switch is more efficient than a network Hub ?



# How Configuration Switch ?

- Access Method to configuration switch remotely
  - Console:-A physical management port used to access a device.
  - Secure Shell (SSH):-Establishes a secure remote CLI connection to a device.
  - Telnet:-Establishes a insecure remote CLI connection to a device.







# How Configuration Switch ?

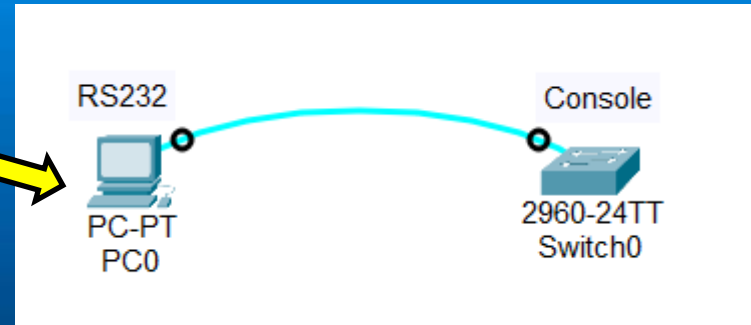
- Access Method to configuration switch remotely
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# LAP1

- Using Packet tracer , extract a computer and a switch Connect the switch(port console) to the computer (port RS232) with the console cable.

Click PC + Desktop + Terminal + OK

```
Switch>  
Switch>|
```





# Configuration Switch

- Primary Command Modes

- ☐ **User mode (Console)**

→  
`Switch>`  
`Switch>`

- ☐ **Privileged Mode (Enable)**

→  
`Switch>`  
`Switch>enable`  
`Switch#`  
`Switch#`

- ☐ **Configuration Mode**

→  
`Switch(config)#`  
`Switch(config)#`  
`Switch(config)#`  
`Switch(config)#`



# Configuration Switch

## ❑ Line mode (Console)

- ❑ Using configuration console and telnet .

```
Switch(config-line)#  
Switch(config-line)#  
Switch(config-line)#  
Switch(config-line)#
```

## ❑ Interface Mode (Enable)

- ❑ Using configuration port in switch .

```
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#  
Switch(config-if)#
```

لو عايز ترجع من mode الى mode اخر استخدم Exit .



# How Configuration Switch ?

- How change hostname Switch

Click PC + Desktop + Terminal + OK

```
Switch>                → First mode (Console)
Switch>enable
Switch#                 → Second mode (Enable)
Switch#config
Switch(config)#         → Third mode (Configuration)
Switch(config)#hostname SW1
SW1(config)#
```

```
Switch>enable
Switch#config
Configuring from terminal, m
[terminal]?
Enter configuration commands
CNTL/Z.
Switch(config)#
Switch(config)#hostname SW1
SW1(config)#
SW1(config)#
SW1(config)#
```





# How Configuration Switch ?

- How Create Password console to Switch

Click PC + Desktop + Terminal + OK

```
Switch>enable
```

```
Switch#config
```

```
Switch(config)#line console 0
```

```
Switch(config-line)#pass 12345
```

```
Switch(config-line)# login
```

```
SW1(config)#line console 0  
SW1(config-line)#pass 12345  
SW1(config-line)#login  
SW1(config-line)#
```

```
User Access Verification
```

```
Password:
```

```
SW1>
```



# How Configuration Switch ?

- How Create Password enable to Switch

```
Switch>enable
```

```
Switch#config
```

```
Switch(config)#enable password 12345
```

---

```
Switch>enable
```

```
Switch#config
```

```
Switch(config)#enable secret 12345
```

---

```
SW1(config)#  
SW1(config)#  
SW1(config)#enable password 12345  
SW1(config)#
```

```
SW1(config)#  
SW1(config)#enable secret 2468  
SW1(config)#
```

```
User Access Verification
```

```
Password:
```

```
SW1>enable
```

```
Password:
```

```
Password:
```

```
Password:
```

```
SW1#
```

```
SW1#
```



# How Configuration Switch ?

- Show configuration in Switch

Switch# show running config

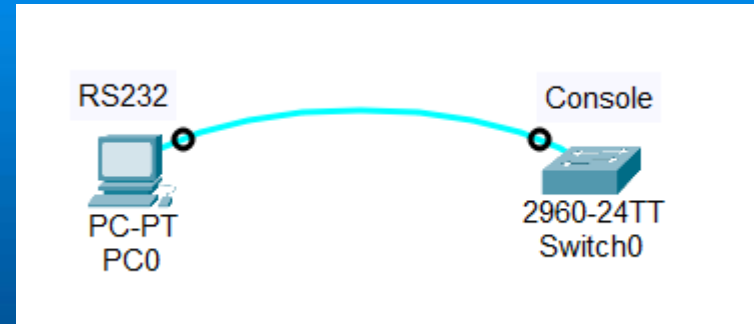
هذا الامر يقوم بعرض جميع اعدادات السويتش

```
SW1#show running-config
Building configuration...

Current configuration : 1171 bytes
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname SW1
!
enable secret 5 $1$mERr$H/qMkjAOjHCgDeGyyMp2c.
enable password 12345
!
!
!
```

# LAP

- Using Console cable in Switch
  - change hostname switch to (SW1)
  - Create password Console(12345)
  - Create password Enable(2468)
  - Show All Configuration in Switch





# VLAN

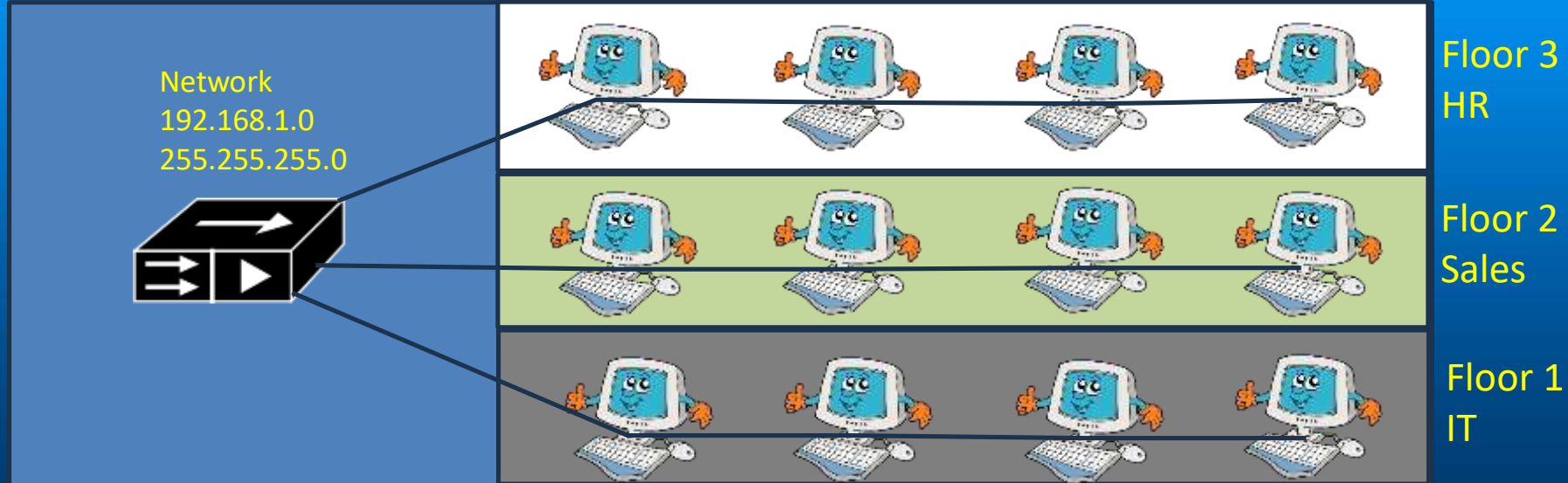
- A virtual local area network (VLAN) is a way of dividing a network so that the number of broadcasts, as well as the level of access users have, is limited .

- هي عبارته عن شبكة وهمية تقوم فكرتها على تجزئة الشبكة المحلية الى شبكات فرعية لا تستطيع الاتصال فيما بينهما حتى لو كانت متصلة في نفس الشبكة.



# VLAN

- فكرة انشاء VLAN في السويتش .



# VLAN

