MOHAMED KHALED AHMED
Project ccna

Step 1: Project Overview

- This project is a full practical implementation of CCNA topics.
- Covers topology design, basic configuration, VLANs, routing, ACLs, and more.

Step 2: Building the Network Topology

- The network includes multiple routers and switches.
- Devices are named based on names (S1, S2, R1...).
- A consistent domain name is used across the network: ITI.com.

Step 3: Basic Device Configuration

- Assign custom hostnames to routers and switches.
- Set line passwords (Console and VTY).
- Encrypt all passwords for security.
- Enable SSH-only remote access.
- Create a local username with password for authentication.

Step 4: VLAN Configuration

- VLANs are created and assigned to specific ports:
  - SW1: VLANs 10, 20, 30
  - SW2: VLANs 40, 50, 60
- Each VLAN is mapped to a group of interfaces.
- Rapid Spanning Tree Protocol (RSTP) is enabled to prevent loops.

Step 5: DHCP Configuration

- DHCP is configured on the router to assign IPs dynamically.
- A separate DHCP pool is created for each VLAN.
- All subnets use Class C (/24) subnet masks.
- Each pool includes:
  - IP network
  - Default gateway
  - DNS server: 192.168.7.10
- An additional pool is configured for SW4 using 10.10.50.0/24.

Step 6: Routing Configuration

- A dynamic routing protocol (e.g., EIGRP) is implemented.
- Two routers are connected via a serial cable and use a default route.
- A minimum of 3 routers are part of the routing domain.

Step 7: RADIUS Server Integration

- A RADIUS server is added for centralized authentication.
- All login attempts are authenticated through the RADIUS server.

Step 8: Access Control Lists (ACLs)

- Block the host 192.168.1.2 from using DNS services.
- Deny the entire subnet 192.168.3.0/24 from accessing the web server.
- Prevent VLAN 10 users from accessing the Mail Server.

Step 9: Final Notes

- The project applies essential CCNA-level technologies.
- Provides hands-on practice using Cisco Packet Tracer.
- Suitable for training, exams, or graduation project presentations.

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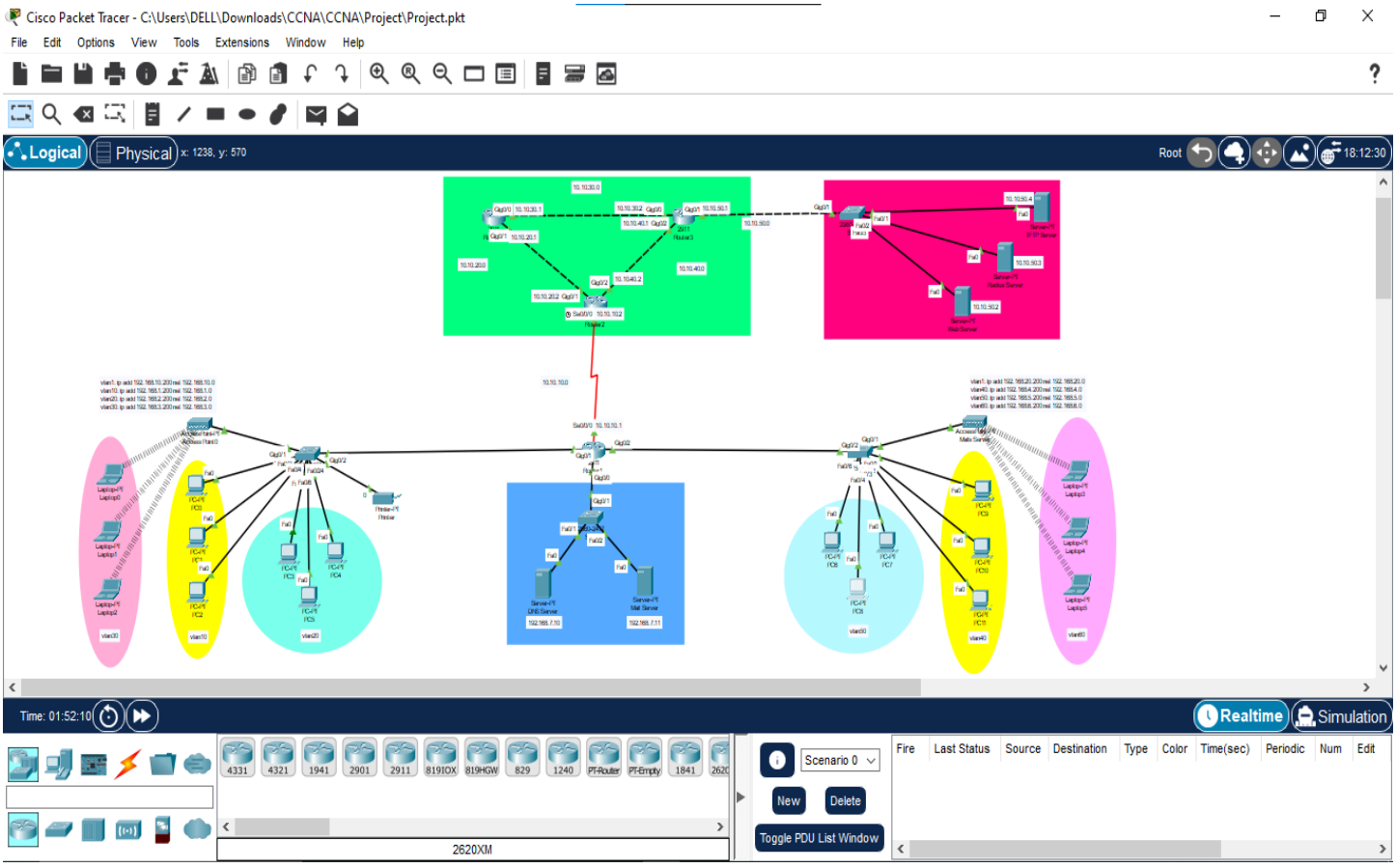
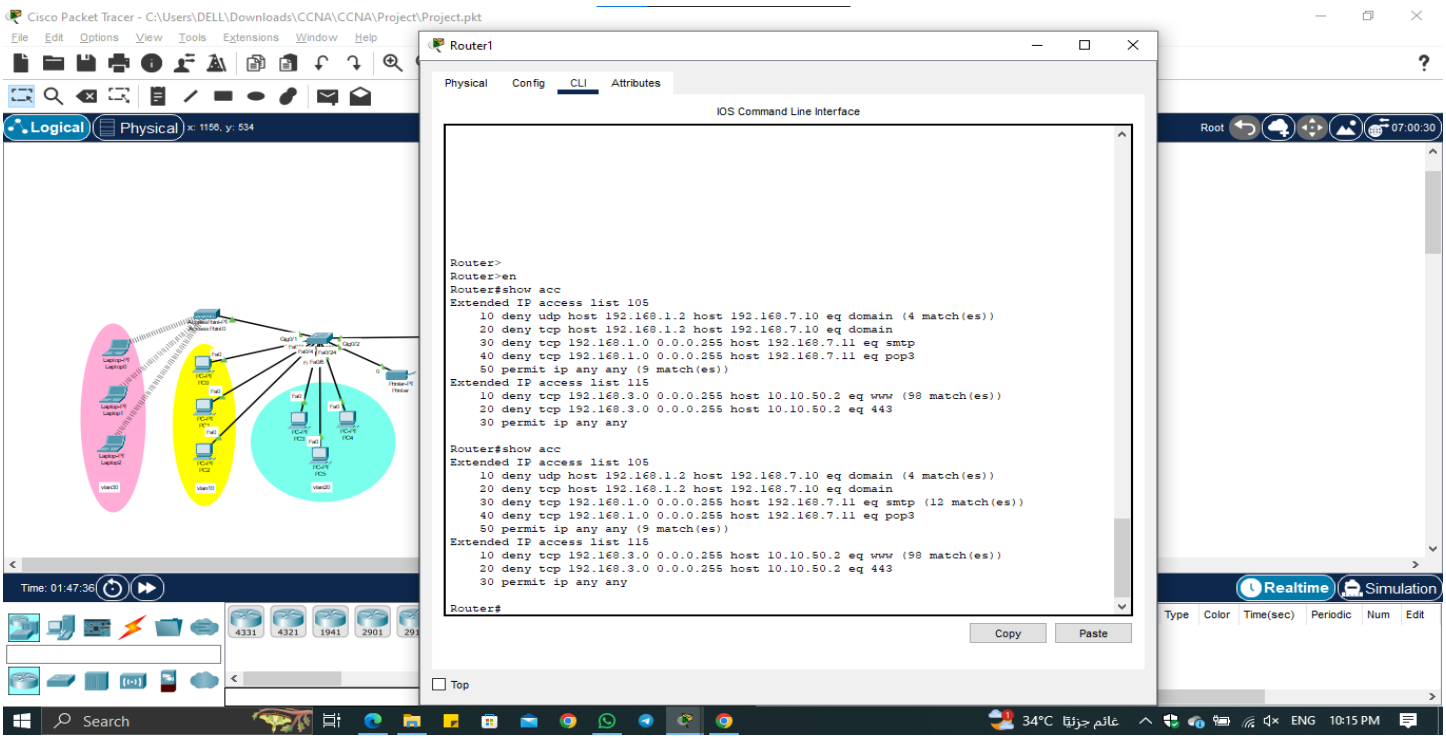
Topology



ACL



Pool

```
ip dhcp pool vlan10
 network 192.168.1.0 255.255.255.0
 default-router 192.168.1.1
 dns-server 192.168.7.10
ip dhcp pool vlan20
 network 192.168.2.0 255.255.255.0
 default-router 192.168.2.1
 dns-server 192.168.7.10
ip dhcp pool vlan30
 network 192.168.3.0 255.255.255.0
 default-router 192.168.3.1
 dns-server 192.168.7.10
ip dhcp pool vlan40
 network 192.168.4.0 255.255.255.0
 default-router 192.168.4.1
 dns-server 192.168.7.10
ip dhcp pool vlan50
 network 192.168.5.0 255.255.255.0
 default-router 192.168.5.1
 dns-server 192.168.7.10
ip dhcp pool vlan60
 network 192.168.6.0 255.255.255.0
 default-router 192.168.6.1
 dns-server 192.168.7.10
ip dhcp pool sw1
 network 192.168.10.0 255.255.255.0
 default-router 192.168.10.1
 dns-server 192.168.7.10
ip dhcp pool sw2
 network 192.168.20.0 255.255.255.0
 default-router 192.168.20.1
 dns-server 192.168.7.10
ip dhcp pool sw3
 network 192.168.7.0 255.255.255.0
 default-router 192.168.7.1
 dns-server 192.168.7.10
```

```
ip dhcp pool sw4
 network 10.10.50.0 255.255.255.0
 default-router 10.10.50.1
 dns-server 192.168.7.10
```

Network

SW1:

vlan1: IP add 192.168.10.200 net 192.168.10.0

vlan10: IP add 192.168.1.200 net 192.168.1.0

vlan20: IP add 192.168.2.200 net 192.168.2.0

vlan30: IP add 192.168.3.200 net 192.168.3.0

SW2:

vlan1: IP add 192.168.20.200 net 192.168.20.0

vlan40: IP add 192.168.4.200 net 192.168.4.0

vlan50: IP add 192.168.5.200 net 192.168.5.0

vlan60: IP add 192.168.6.200 net 192.168.6.0

SW3:

vlan1: IP add 192.168.7.200 net 192.168.7.0

DNS Server: IP add 192.168.7.10 Static

Mail Server: IP add 192.168.7.11 Static

SW4:

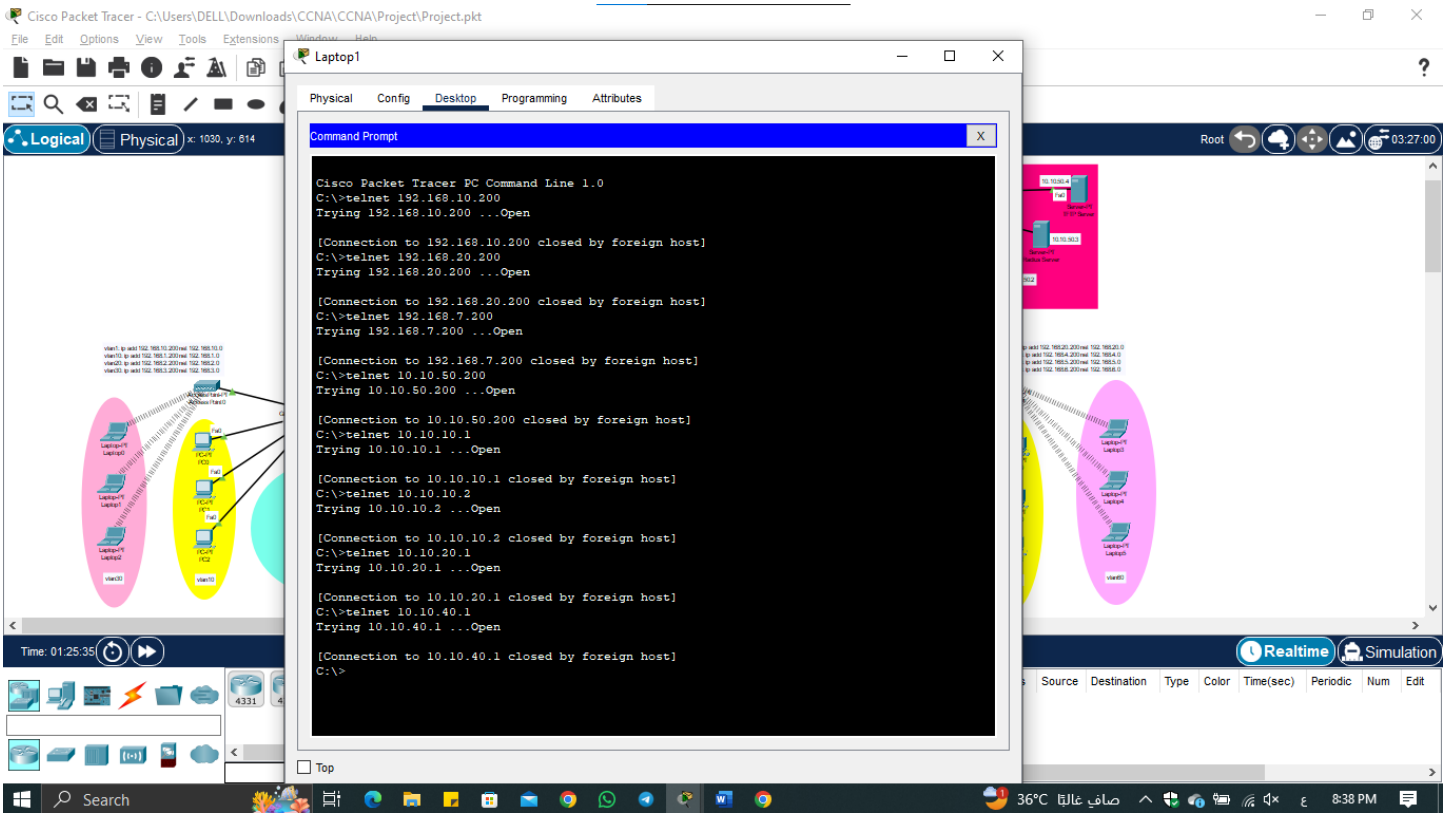
vlan1: IP add 10.10.50.200 net 10.10.50.0

Web Server: IP add 10.10.50.2 Static

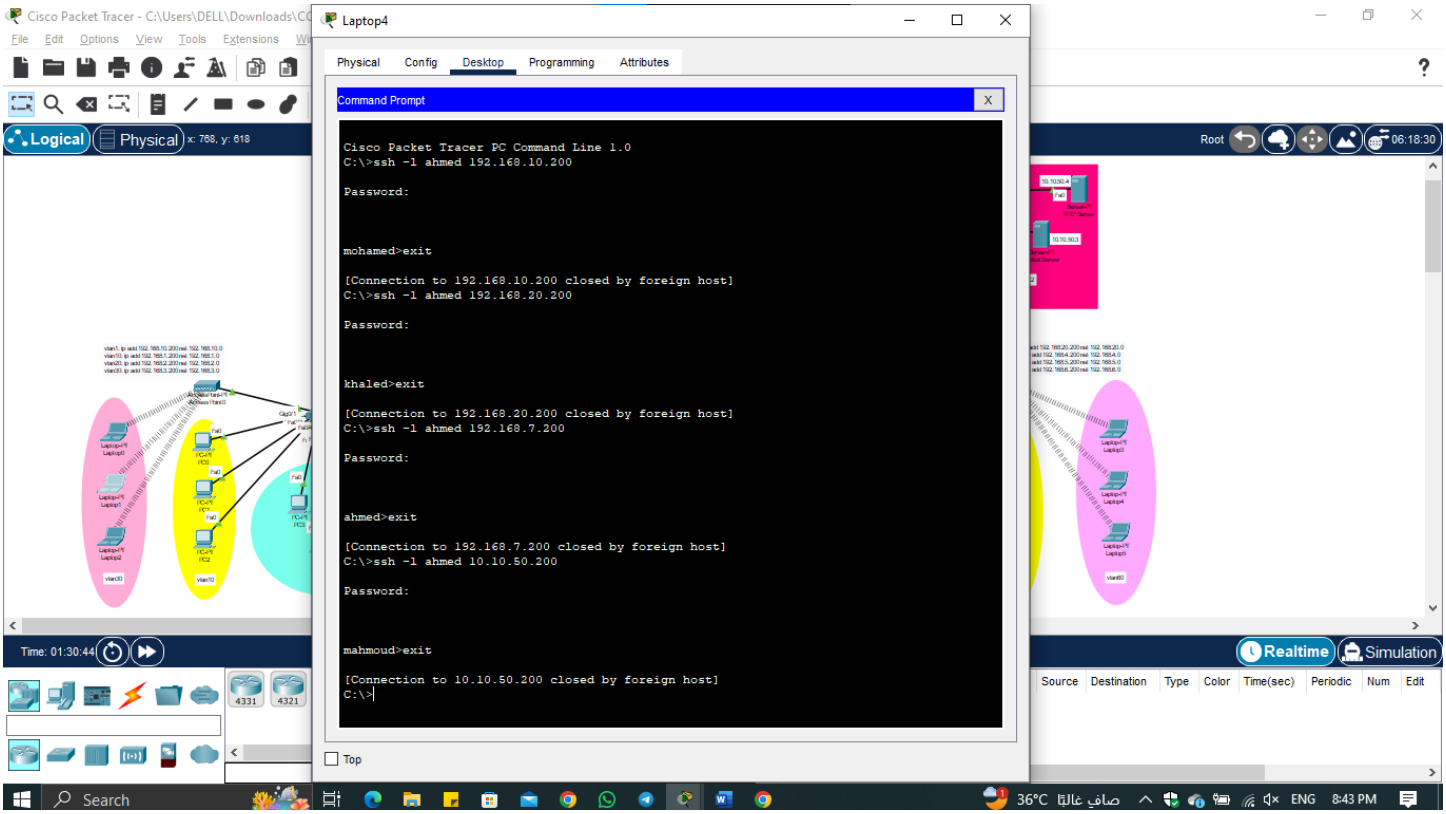
Radius Server: IP add 10.10.50.3 Static

TFTP Server: IP add 10.10.50.4 Static

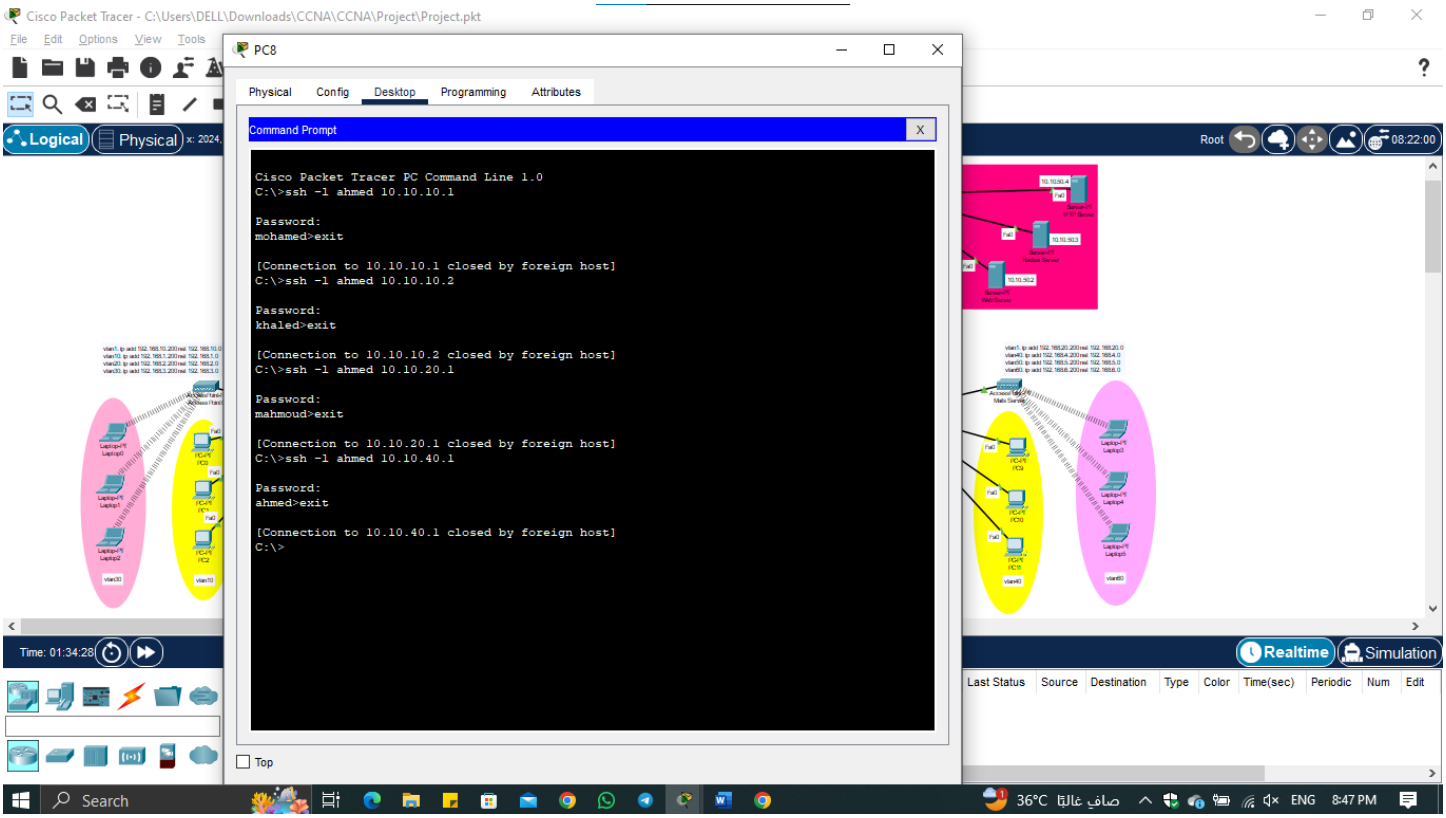
Telnet not enabled in Switch and Router



SSH enabled in Switch

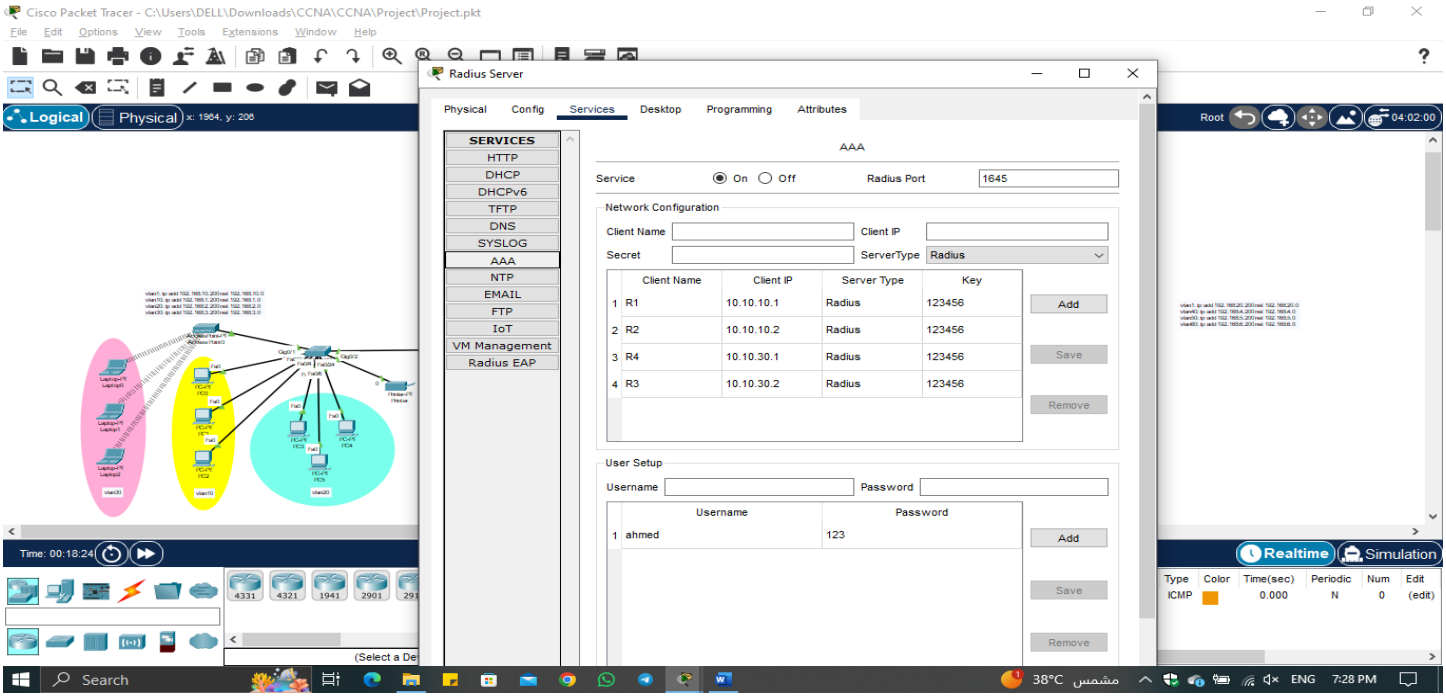


SSH enabled in Router

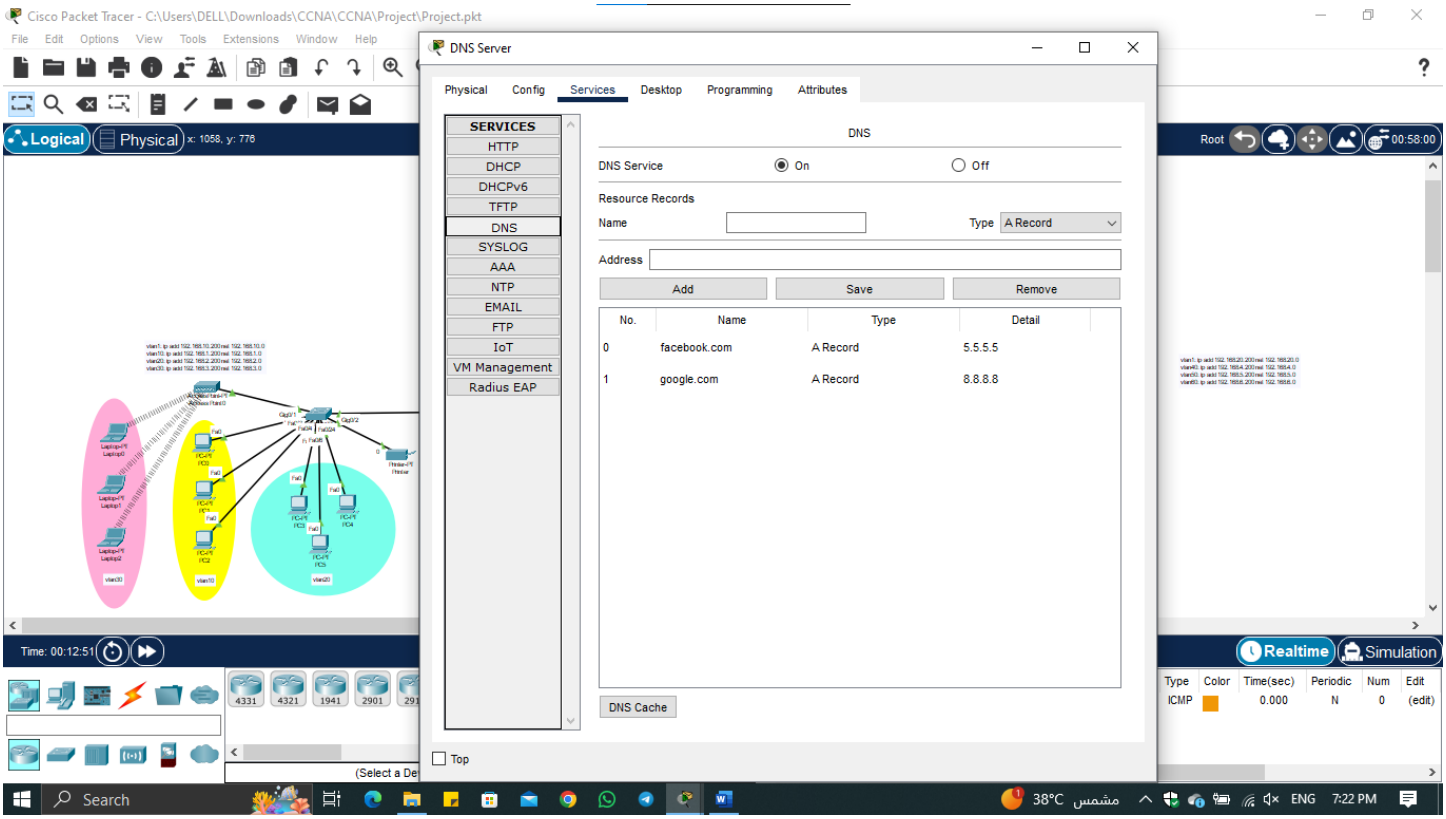


Radius enabled (AAA)

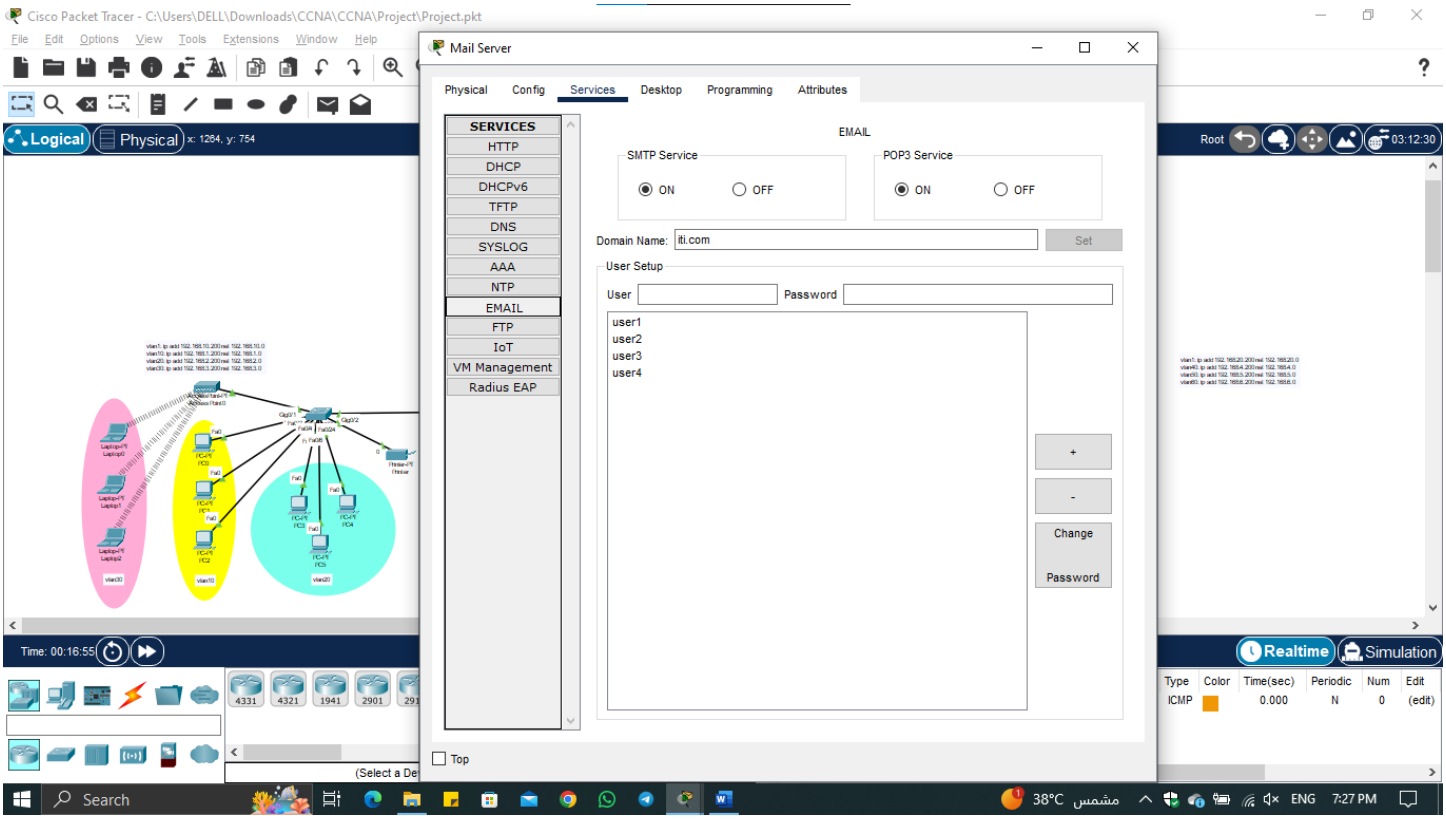
```
mohamed(config)#ser password-encryption
mohamed(config)#line v 0 15
mohamed(config-line)#t
mohamed(config-line)#transport i
mohamed(config-line)#transport input s
mohamed(config-line)#transport input ssh
mohamed(config-line)#login local
AAA is enabled. Command not supported. Use an aaa authentication methodlist
```



DNS


Cisco Packet Tracer - C:\Users\DELL\Downloads\CCNA\CCNA\Project\Project.pkt
DNS Server
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DNS
DNS Service
On
Off
Resource Records
Name
Type
A Record
Address
Add
Save
Remove
No.
Name
Type
Detail
0
facebook.com
A Record
5.5.5.5
1
google.com
A Record
8.8.8.8
DNS Cache
Top
Logical
Physical
Realtime
Simulation
Time: 00:12:51
Search
ENG
7:22 PM

Email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Mail Server
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SERVICES
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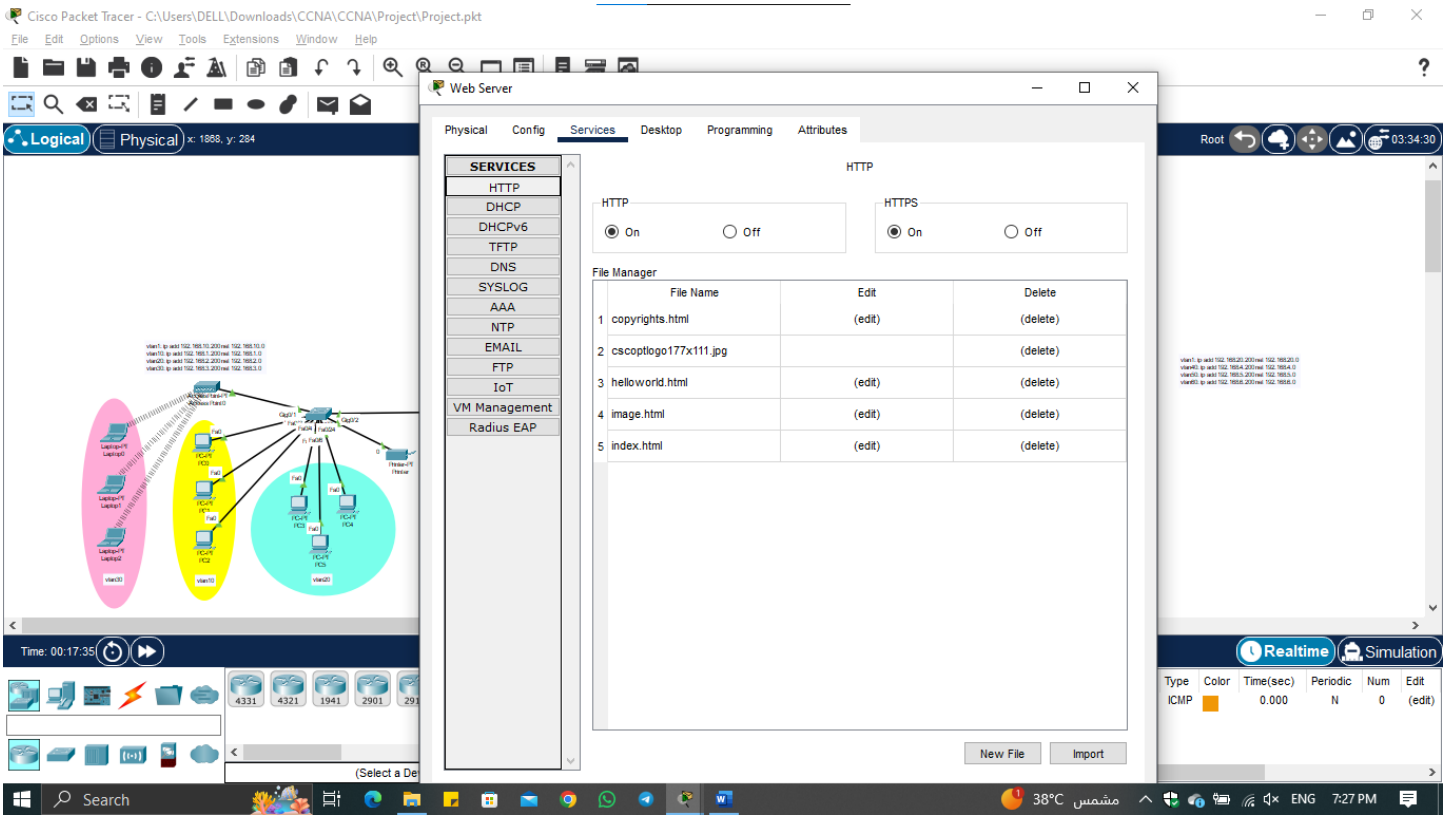
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
EMAIL
SMTP Service
ON
OFF
POP3 Service
ON
OFF
Domain Name:
iti.com
Set
User Setup
User
Password
user1
user2
user3
user4
+
-
Change
Password
Top
Logical
Physical
Realtime
Simulation
Time: 00:16:55
Search
ENG
7:27 PM

Web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AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
HTTP
HTTP
On
Off
HTTPS
On
Off
File Manager
File Name
Edit
Delete
1 copyrights.html (edit) (delete)
2 cscoptlogo177x111.jpg (delete)
3 helloworld.html (edit) (delete)
4 image.html (edit) (delete)
5 index.html (edit) (delete)
New File
Import
Logical
Physical
Root
Realtime
Simulation
Type
Color
Time(sec)
Periodic
Num
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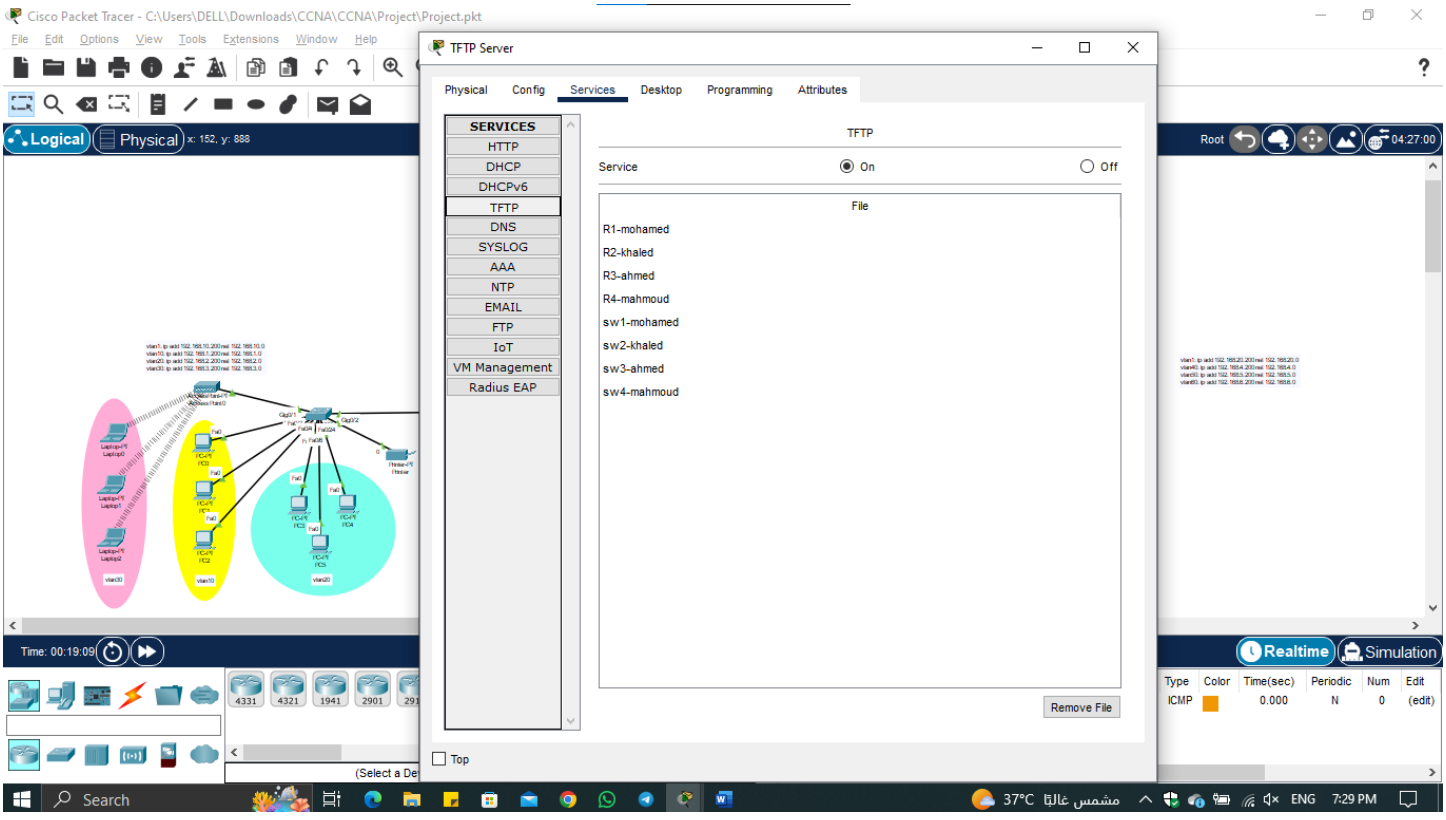
(edit)
Search
ENG
7:27 PM

TFTP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TFTP Server
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EMAIL
FTP
IoT
VM Management
Radius EAP
TFTP
Service
On
Off
File
R1-mohamed
R2-khaled
R3-ahmed
R4-mahmoud
sw1-mohamed
sw2-khaled
sw3-ahmed
sw4-mahmoud
Remove File
Top
Logical
Physical
Root
Realtime
Simulation
Type
Color
Time(sec)
Periodic
Num
Edit
ICMP
0.000
N
0
(edit)
Search
ENG
7:29 PM

PASSWORD

SW1 and R1 hostname is mohamed
SW2 and R2 hostname is khaled
SW3 and R3 hostname is ahmed
SW4 and R4 hostname is mahmoud

Enable password: mohkhaahm

RADIUS
username: ahmed
password: 123

Line vty 0 15 / Line vty 0 4 (SSH)
username: ahmed
password: 123

Line Console 0
password: mohkhaahm