

COMPUTER NETWORKS

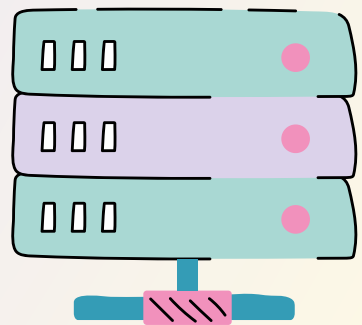
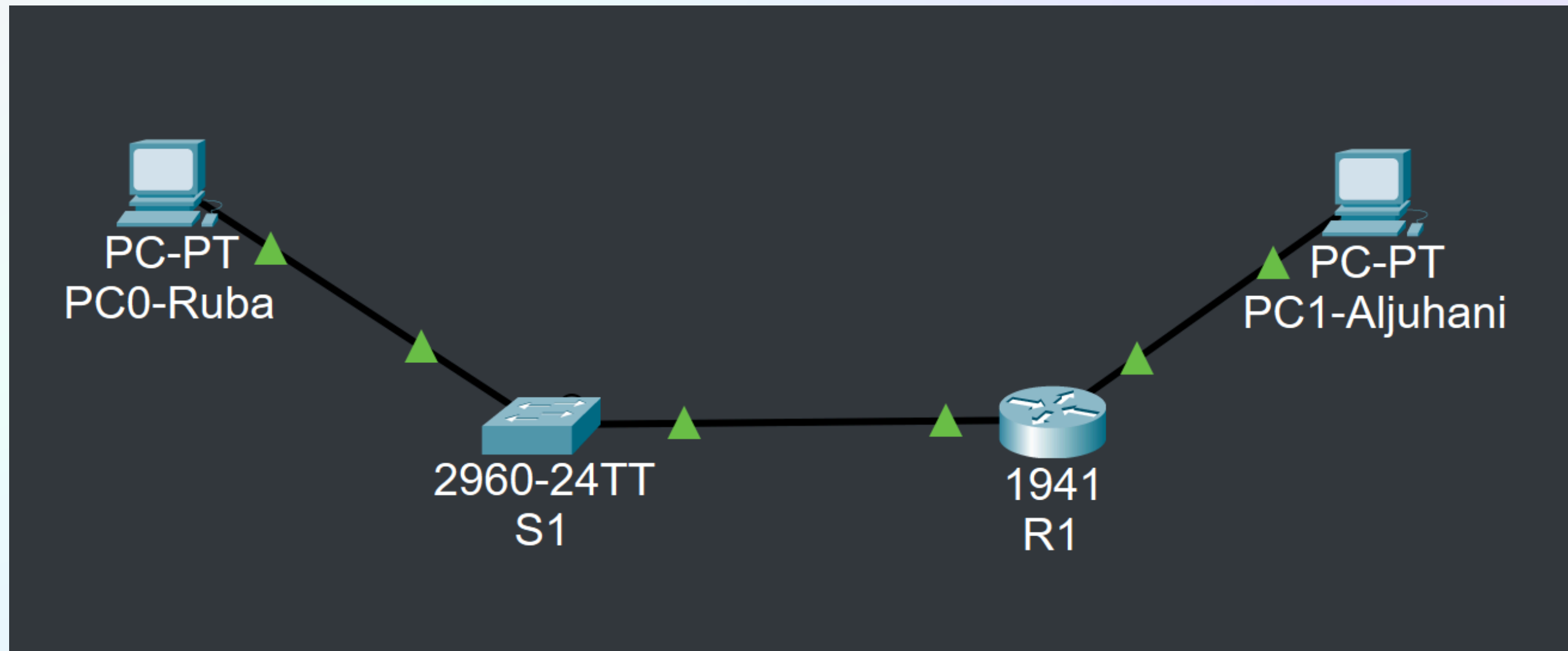
Lap 2 – Build a Switch and Router Network

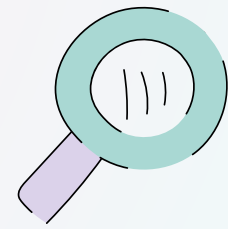


Solved by :
Ruba Aljuhani

Step 1: Topology Setup

Connected the router, switch, and PCs using the correct cables according to the lab diagram





Step 2: PC Static IPs

Assigned IPv4 and IPv6 addresses to PC-0 and PC-1 based on the addressing table.

PC0-Ruba

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.1.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address 2001:DB8:ACAD:1::3 / 64

Link Local Address FE80::20D:BDFF:FEBC:8DD3

Default Gateway FE80::1

DNS Server

PC1-Aljuhani

Physical Config **Desktop** Programming Attributes

IP Configuration [X]

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 192.168.0.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address 2001:DB8:ACAD::3 / 64

Link Local Address FE80::20B:BEFF:FE11:BA2

Default Gateway FE80::1

DNS Server

Step 3: Router Basic Configuration

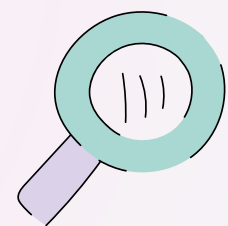
Set hostname R1_Ruba, configured IPv4/IPv6 addresses on interfaces G0/0/0 and G0/0/1, and enabled interfaces (no shutdown)

```
R1_Ruba_Aljuhani(config-if)#exit
R1_Ruba_Aljuhani(config)#int g0/1
R1_Ruba_Aljuhani(config-if)#ip ad
% Incomplete command.
R1_Ruba_Aljuhani(config-if)#ip address 192.168.1.1 255.255.255.0
R1_Ruba_Aljuhani(config-if)#ipv6 ad
% Incomplete command.
R1_Ruba_Aljuhani(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1_Ruba_Aljuhani(config-if)#description Link to PC0-Ruba Network
R1_Ruba_Aljuhani(config-if)#no sh

R1_Ruba_Aljuhani(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
|
```

```
R1_Ruba_Aljuhani(config)#int GigabitEthernet ?
<0-9> GigabitEthernet interface number
R1_Ruba_Aljuhani(config)#int GigabitEthernet 0/?
<0-28> GigabitEthernet interface number
R1_Ruba_Aljuhani(config)#int GigabitEthernet 0/0
R1_Ruba_Aljuhani(config-if)#ip address 192.168.0.1?
A.B.C.D
R1_Ruba_Aljuhani(config-if)#ip address 192.168.0.1 255.255.255.0
R1_Ruba_Aljuhani(config-if)#ipv6 address 2001:db8:acad::1?
WORD X:X:X:X::X X:X:X:X::X/<0-128>
R1_Ruba_Aljuhani(config-if)#ipv6 address 2001:db8:acad::1/64
R1_Ruba_Aljuhani(config-if)#desc
% Incomplete command.
R1_Ruba_Aljuhani(config-if)#description Link to PC1-Aljuhani
R1_Ruba_Aljuhani(config-if)#no sh
```

Step 4: Switch Configuration

Set hostname S1_Ruba, configured VLAN 1 IP, default gateway, enabled password encryption, created SSH user, and generated RSA keys,Vlan1

```
Physical Config CLI Attributes
IOS Command Line Interface

S1_Ruba_Aljuhani#en
S1_Ruba_Aljuhani#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1_Ruba_Aljuhani(config)#sdm
% Incomplete command.
S1_Ruba_Aljuhani(config)# sdm prefer ?
  default          Default bias
  dual-ipv4-and-ipv6 Support both IPv4 and IPv6
  lanbase-routing  Lanbase routing
  qos              Qos bias
S1_Ruba_Aljuhani(config)# sdm prefer
% Incomplete command.
S1_Ruba_Aljuhani(config)#?
Configure commands:
  aaa              Authentication, Authorization and Accounting.
  access-list      Add an access list entry
  banner           Define a login banner
  boot             Boot Commands
  cdp              Global CDP configuration subcommands
  clock            Configure time-of-day clock
  crypto           Encryption module
  default          Set a command to its defaults
  do-exec          To run exec commands in config mode
  dot1x            IEEE 802.1X Global Configuration Commands
  enable           Modify enable password parameters
  end              Exit from configure mode
  exit             Exit from configure mode
```

```
Physical Config CLI Attributes
IOS Command Line Interface

hostname          Set system's network name
interface         Select an interface to configure
ip                Global IP configuration subcommands
line              Configure a terminal line
lldp              Global LLDP configuration subcommands
logging           Modify message logging facilities
mac               MAC configuration
mls               mls global commands
monitor           SPAN information and configuration

S1_Ruba_Aljuhani(config)#sdm prefer du
% Incomplete command.
S1_Ruba_Aljuhani(config)#sdm prefer dual-ipv4-and-ipv6 default
Changes to the running SDM preferences have been stored, but cannot take effect until the next reload.
Use 'show sdm prefer' to see what SDM preference is currently active.
S1_Ruba_Aljuhani(config)#exit
S1_Ruba_Aljuhani#
%SYS-5-CONFIG_I: Configured from console by console

S1_Ruba_Aljuhani#reload
System configuration has been modified. Save? [yes/no]:yes
Building configuration...
[OK]
Proceed with reload? [confirm]
C2960 Boot Loader (C2960-HBOOT-M) Version 12.2(25r)FX, RELEASE SOFTWARE (fc4)
Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.
2960-24TT starting...
```

```
Physical Config CLI Attributes
IOS Command Line Interface

Cisco WS-C2960-24TT (RC32300) processor (revision C0) with 21039K bytes of memory.
2960-24TT starting...
Base ethernet MAC Address: 0009.7C18.2E53
Xmodem file system is available.
Initializing Flash...
flashfs[0]: 2 files, 0 directories
flashfs[0]: 0 orphaned files, 0 orphaned directories
flashfs[0]: Total bytes: 64016384
flashfs[0]: Bytes used: 4671545
flashfs[0]: Bytes available: 59344839
flashfs[0]: flashfs fsck took 1 seconds.
...done Initializing Flash.

Boot Sector Filesystem (bs:) installed, fsid: 3
Parameter Block Filesystem (pb:) installed, fsid: 4

Loading "flash:/2960-lanbasek9-mz.150-2.SE4.bin"...
##### [OK]
Restricted Rights Legend
Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.
cisco Systems, Inc.
```

```
Physical Config CLI Attributes
IOS Command Line Interface

S1_Ruba_Aljuhani#
%SYS-5-CONFIG_I: Configured from console by
console

S1_Ruba_Aljuhani#conf t
Enter configuration commands, one per line. End
with CNTL/Z.
S1_Ruba_Aljuhani(config)#interface vlan1
S1_Ruba_Aljuhani(config-if)#ip add
% Incomplete command.
S1_Ruba_Aljuhani(config-if)#ip address
192.168.1.2 255.255.255.0
S1_Ruba_Aljuhani(config-if)#
S1_Ruba_Aljuhani(config-if)#
S1_Ruba_Aljuhani(config-if)#exit
S1_Ruba_Aljuhani(config)#ip default-gateway
192.168.1.1
S1_Ruba_Aljuhani(config)#interface vlan1
S1_Ruba_Aljuhani(config-if)#ip?
```




Step 5: Router Security & Encryption

Enabled service password-encryption, set enable secret, created a local user, generated RSA keys, and activated SSH version 2

```
R1
Physical Config CLI Attributes
IOS Command Line Interface

R1_Ruba_Aljuhani>en
R1_Ruba_Aljuhani#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1_Ruba_Aljuhani(config)#no ip domain-lookup
R1_Ruba_Aljuhani(config)#en
R1_Ruba_Aljuhani(config)#en
R1_Ruba_Aljuhani(config)#enable?
enable
R1_Ruba_Aljuhani(config)#enable secret class
R1_Ruba_Aljuhani(config)#line con 0
R1_Ruba_Aljuhani(config-line)#pass
% Incomplete command.
R1_Ruba_Aljuhani(config-line)#password cisco
R1_Ruba_Aljuhani(config-line)#login
R1_Ruba_Aljuhani(config-line)#exit
R1_Ruba_Aljuhani(config)#line vty 0?
<0-15>
R1_Ruba_Aljuhani(config)#line vty 0 15
R1_Ruba_Aljuhani(config-line)#password cisco
R1_Ruba_Aljuhani(config-line)#login
R1_Ruba_Aljuhani(config-line)#login ?
authentication authenticate using aaa method list
local Local password checking
<cr>
```

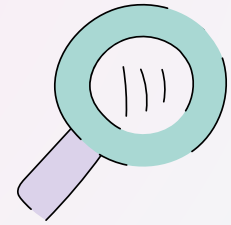
```
R1
Physical Config CLI Attributes
IOS Command Line Interface

R1_Ruba_Aljuhani(config-line)#exit
R1_Ruba_Aljuhani(config)#service password-encryption
R1_Ruba_Aljuhani(config)#banner motd?
motd
R1_Ruba_Aljuhani(config)#banner motd ?
LINE c banner-text c, where 'c' is a delimiting character
R1_Ruba_Aljuhani(config)#banner motd #*****
Enter TEXT message. End with the character '#'.
*****
****GO AWAY!****
*****
#

R1_Ruba_Aljuhani(config)#exit
R1_Ruba_Aljuhani#
%SYS-5-CONFIG_I: Configured from console by console

R1_Ruba_Aljuhani#copy running-confih startup-config
^
% Invalid input detected at '^' marker.

R1_Ruba_Aljuhani#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1_Ruba_Aljuhani#
```



Step 6: Connectivity Test

Ping between PC-A and PC-B succeeded, confirming full network connectivity

PC0-Ruba

Physical Config Desktop Programming Attributes

Command Prompt

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.

Request timed out.

Request timed out.

Request timed out.

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Request timed out.

Reply from 192.168.1.2: bytes=32 time<1ms TTL=255

Reply from 192.168.1.2: bytes=32 time=3ms TTL=255

Reply from 192.168.1.2: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.2:

Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>S

Top

PC1-Aljuhani

Physical Config Desktop Programming Attributes

Command Prompt

C:\>

C:\>ping 2001:db8:acad:1::3

Pinging 2001:db8:acad:1::3 with 32 bytes of data:

Request timed out.

Request timed out.

Request timed out.

Request timed out.

Ping statistics for 2001:DB8:ACAD:1::3:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>

C:\>ping 2001:db8:acad:1::3

Pinging 2001:db8:acad:1::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD:1::3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms

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