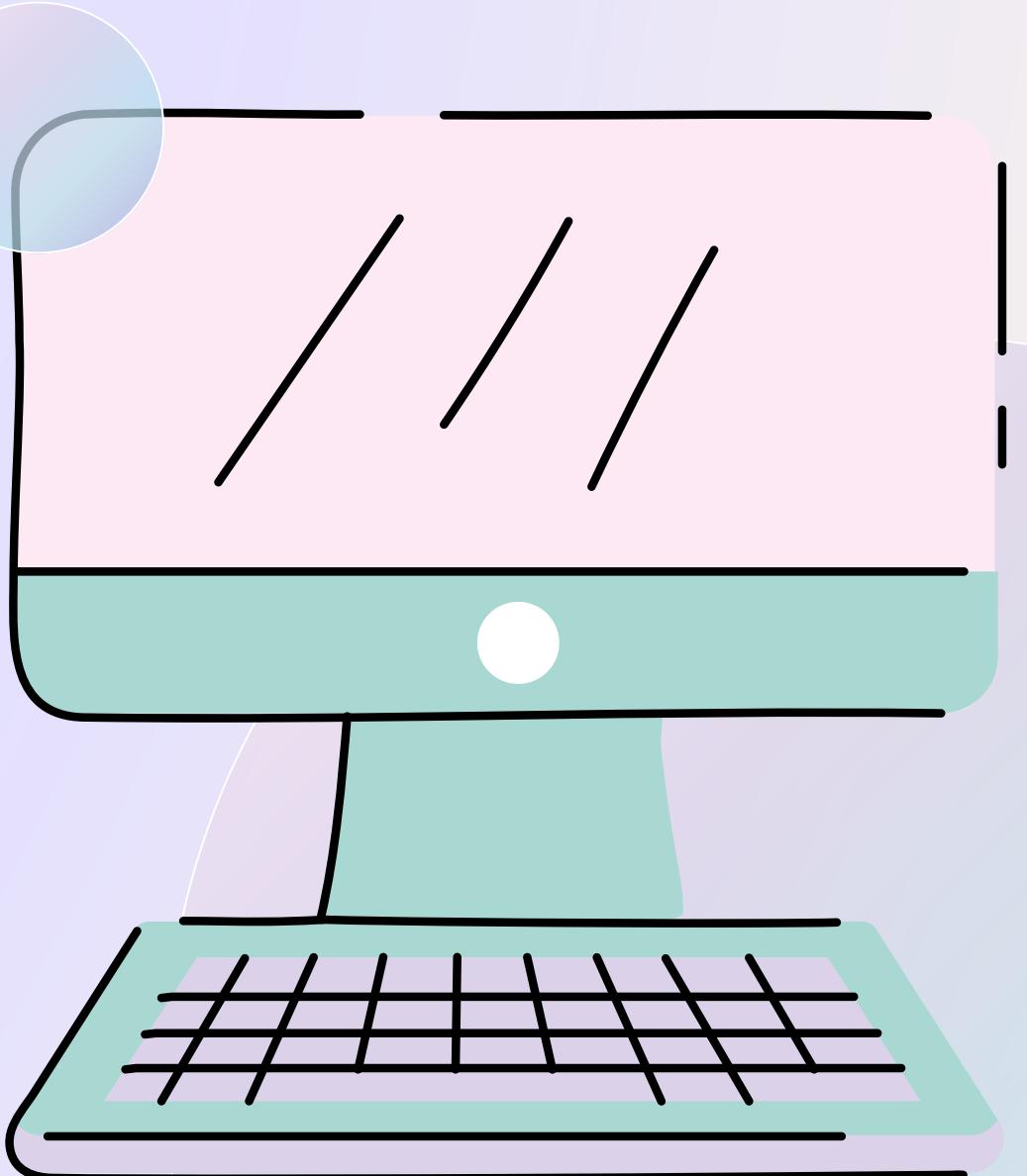




COMPUTER NETWORKS



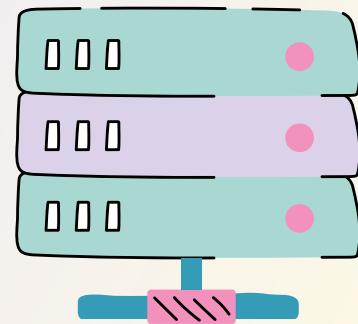
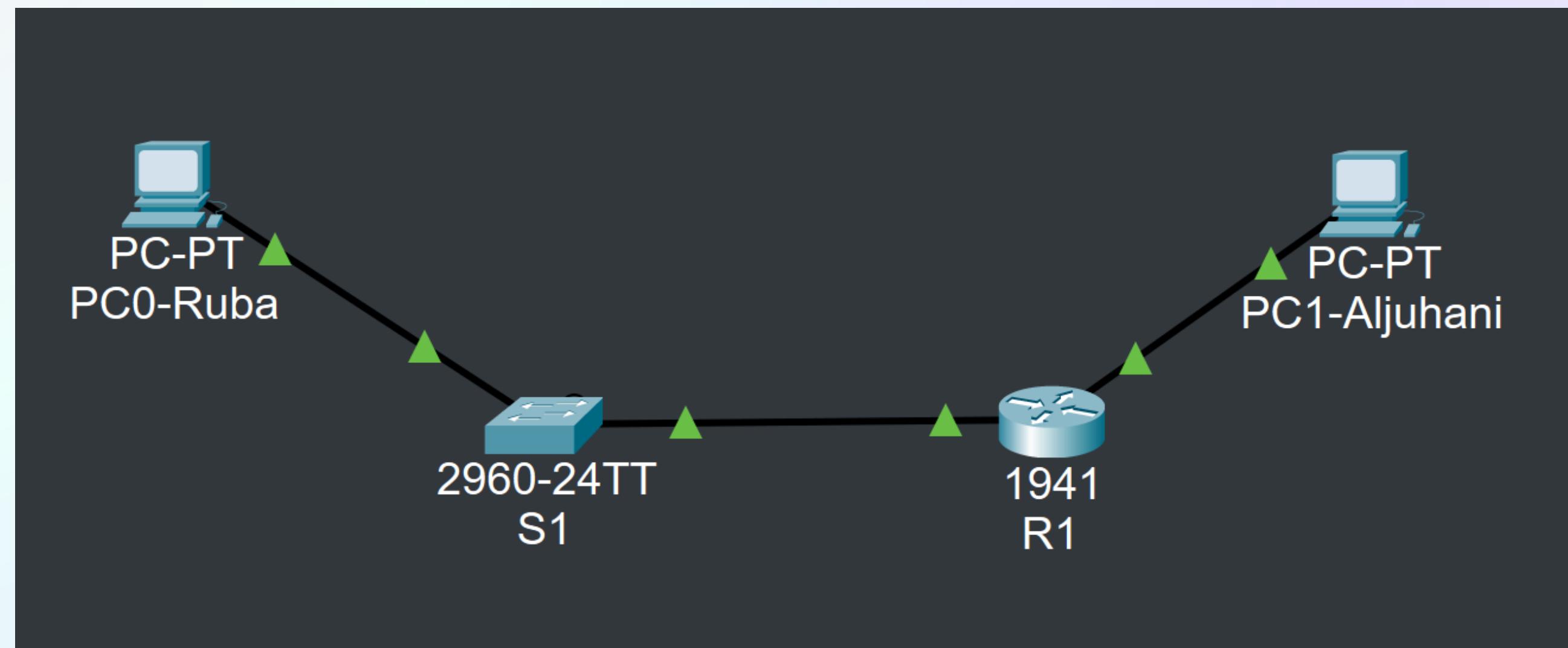
Lap 2 - Build a Switch and Router Network

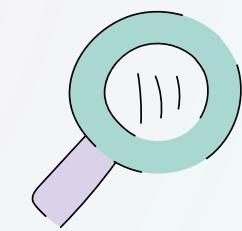
Solved by :

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				
Interface	FastEthernet0			
IP Configuration				
<input type="radio"/> DHCP	<input checked="" type="radio"/> 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				
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static			
IPv6 Address	2001:DB8:ACAD:1::3			
Link Local Address	FE80::20D:BDFF:FEBC:8DD3			
Default Gateway	FE80::1			
DNS Server				

PC1-Aljuhani

Physical	Config	Desktop	Programming	Attributes
IP Configuration				
Interface	FastEthernet0			
IP Configuration				
<input type="radio"/> DHCP	<input checked="" type="radio"/> 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				
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static			
IPv6 Address	2001:DB8:ACAD::3			
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 configuration 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"...
#####
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

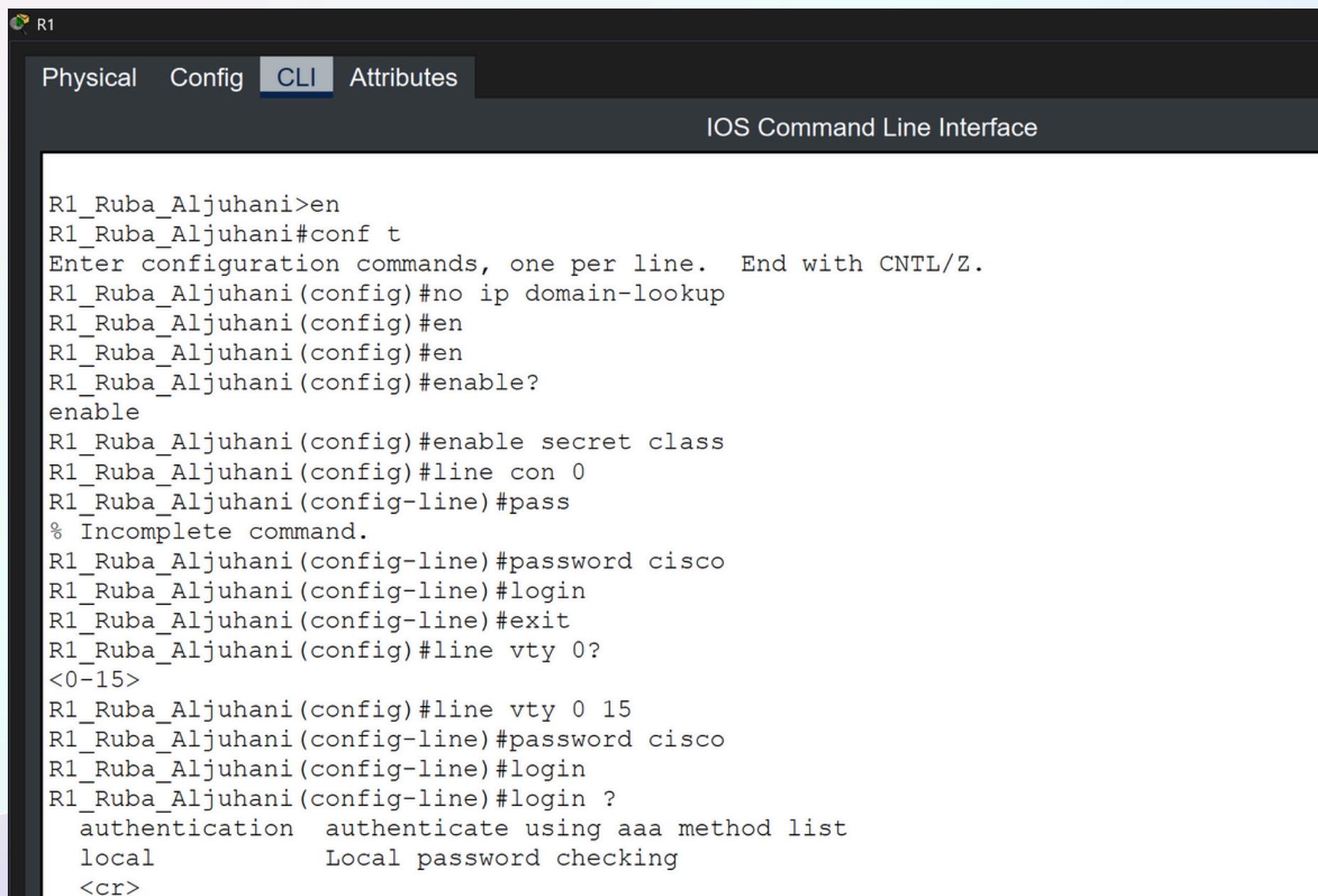
IOS Command Line Interface

```
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

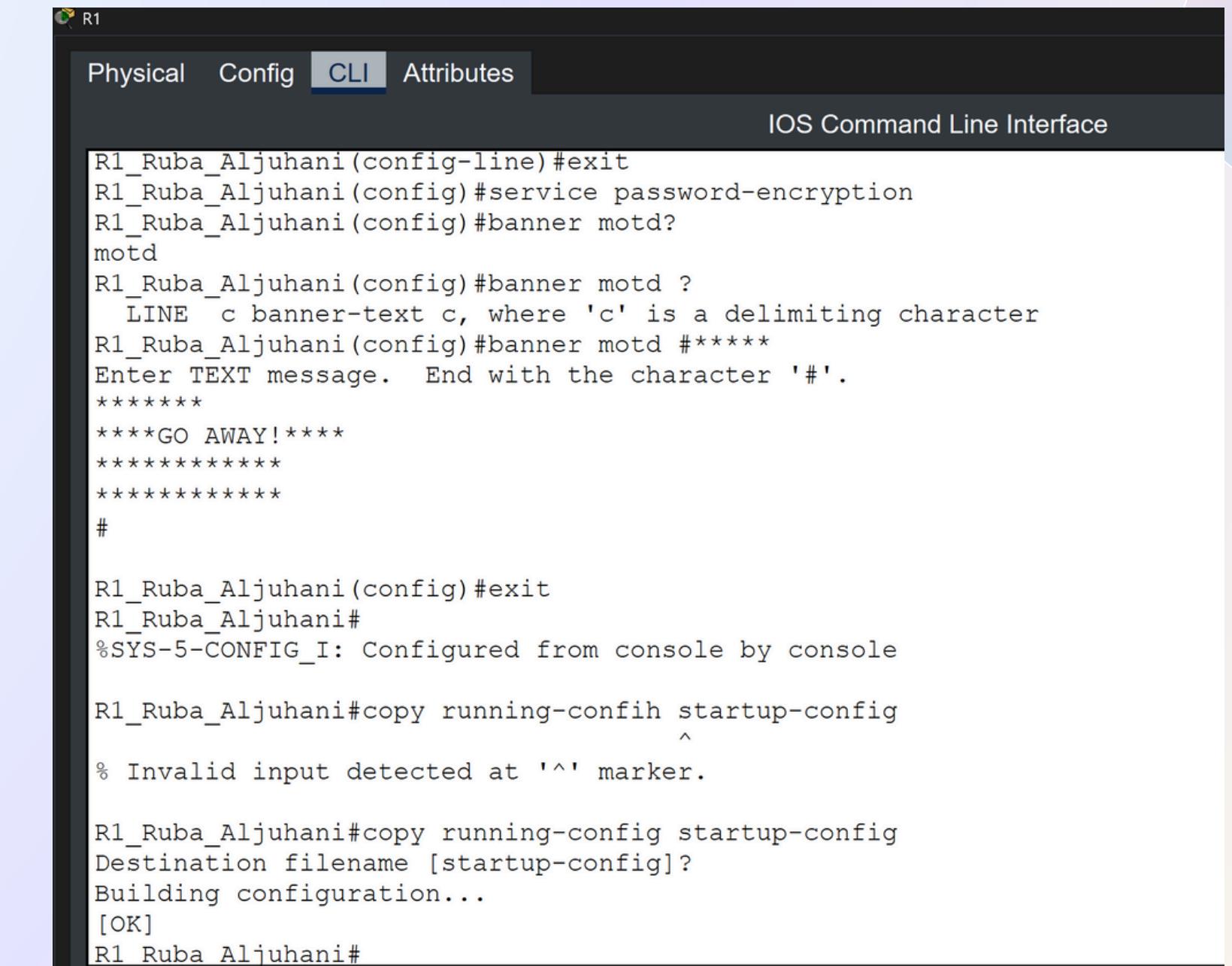


R1

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-config 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

The image shows two computer interfaces side-by-side, both titled "Command Prompt". The left interface is for "PC0-Ruba" and the right is for "PC1-Aljuhani". Both interfaces have tabs for Physical, Config, Desktop (which is selected), Programming, and Attributes.

PC0-Ruba Command Prompt Output:

```
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
```

PC1-Aljuhani Command Prompt Output:

```
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

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
C:\>
```