IP SECURITY Practical

2811
Router0

Router0

Physical   Config   CLI   Attributes

Physical Device View

| Zoom In | Original Size | Zoom Out |

MODULES

| NM-1E |
| NM-1E2W |
| NM-1FE-FX |
| NM-1FE-TX |
| NM-1FE2W |
| NM-2E2W |
| NM-2FE2W |
| NM-2W |
| NM-4A/S |
| NM-4E |
| NM-8A/S |
| NM-8AM |
| NM-Cover |
| NM-ESW-161 |
| HWIC-1GE-SFP |
| HWIC-2T |

| Customize Icon in Physical View | | Customize Icon in Logical View |

The NM-1E features a single Ethernet port that can connect a LAN backbone which can also support either six PRI connections to aggregate ISDN lines, or 24 synchronous/

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OFF

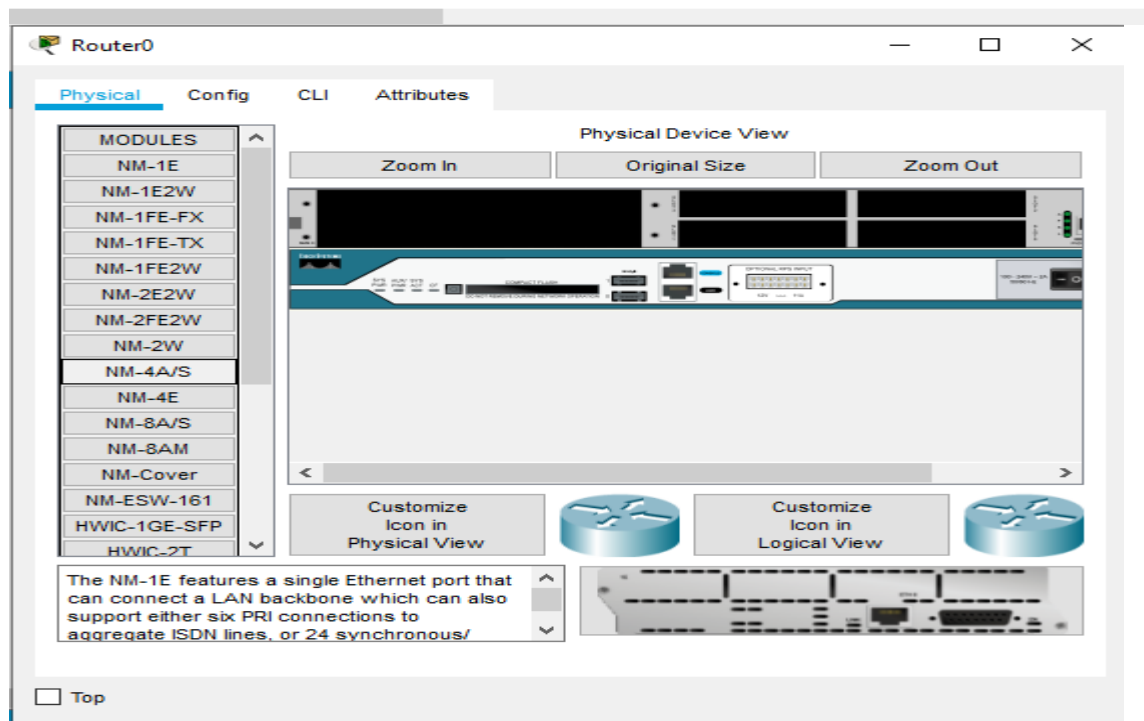**Router0**

Physical   Config   CLI   Attributes

MODULES
NM-1E
NM-1E2W
NM-1FE-FX
NM-1FE-TX
NM-1FE2W
NM-2E2W
NM-2FE2W
NM-2W
NM-4A/S
NM-4E
NM-8A/S
NM-8AM
NM-Cover
NM-ESW-161
HWIC-1GE-SFP
HWIC-2T
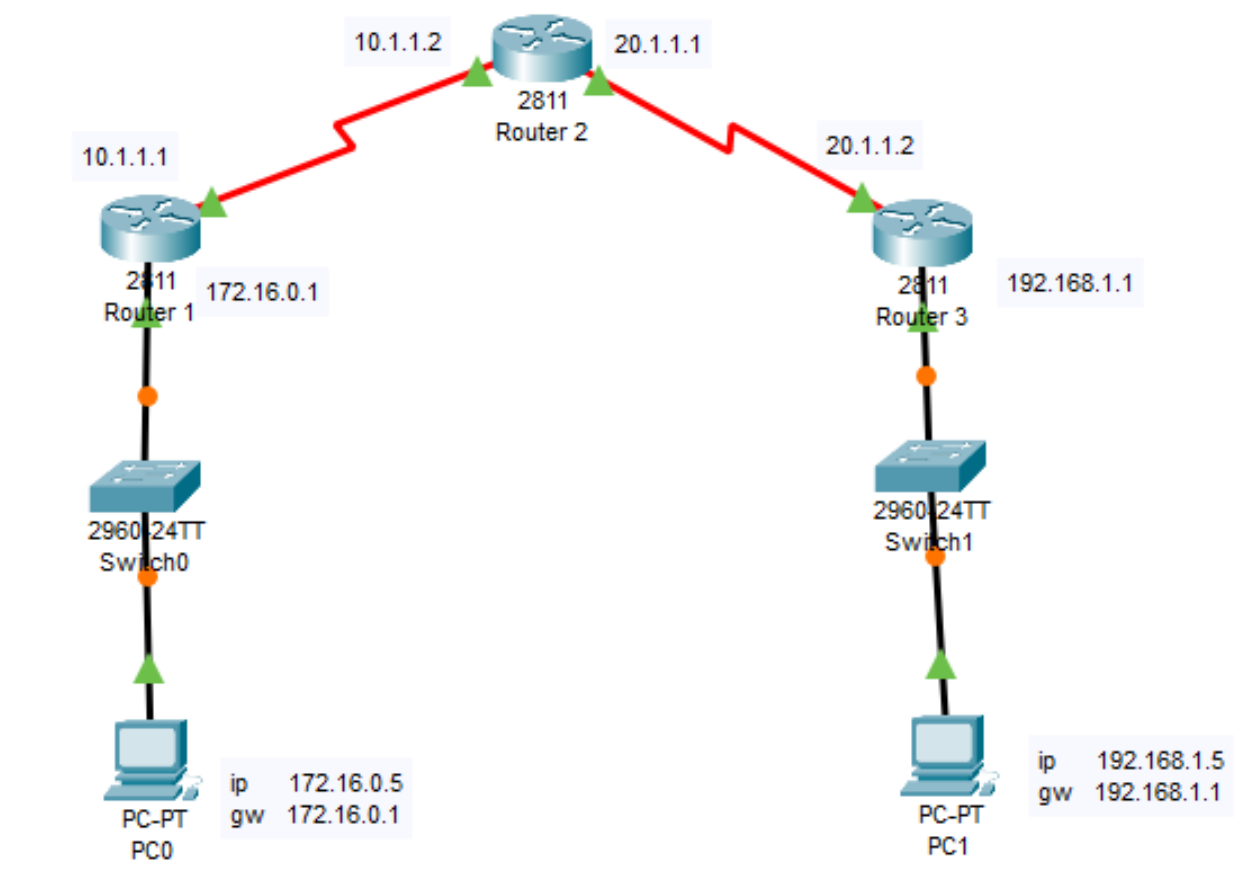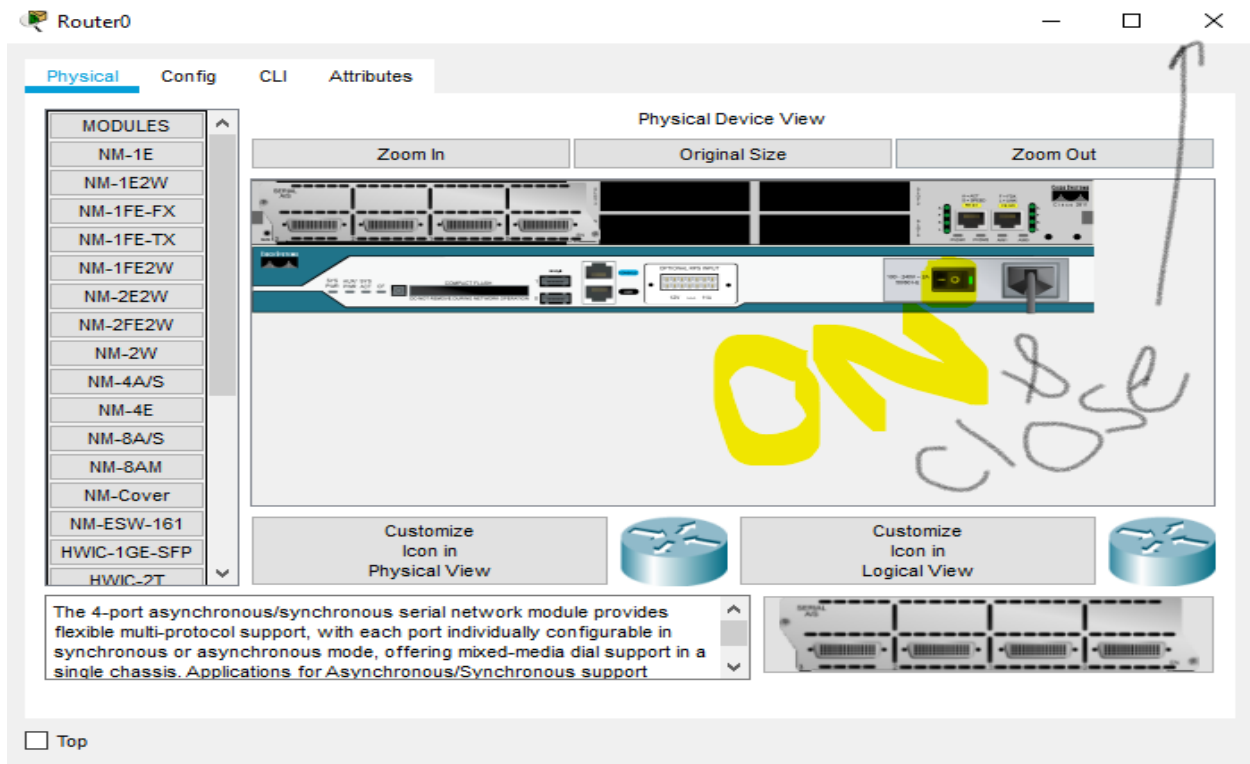
Physical Device View

| Zoom In | Original Size | Zoom Out |

Customize Icon in Physical View

Customize Icon in Logical View

The 4-port asynchronous/synchronous serial network module provides flexible multi-protocol support, with each port individually configurable in synchronous or asynchronous mode, offering mixed-media dial support in a single chassis. Applications for Asynchronous/Synchronous support

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Router0

Physical | Config | CLI | Attributes

Physical Device View

| Zoom In | Original Size | Zoom Out |

MODULES
- NM-1E
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- HWIC-2T

ON close

| Customize Icon in Physical View | | Customize Icon in Logical View | |

The 4-port asynchronous/synchronous serial network module provides flexible multi-protocol support, with each port individually configurable in synchronous or asynchronous mode, offering mixed-media dial support in a single chassis. Applications for Asynchronous/Synchronous support

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10.1.1.2 — 2811 Router 2 — 20.1.1.1

10.1.1.1

20.1.1.2

2811 Router 1   172.16.0.1

2811 Router 3   192.168.1.1

2960-24TT Switch0

2960-24TT Switch1

PC-PT PC0
ip   172.16.0.5
gw   172.16.0.1

PC-PT PC1
ip   192.168.1.5
gw   192.168.1.1

PC0 — ☐ ✕

| Physical | Config | Desktop | Programming | Attributes |

IP Configuration ✕

Interface: FastEthernet0 ⌄

IP Configuration

○ DHCP ● Static

IP Address: 172.16.0.5

Subnet Mask: 255.255.0.0

Default Gateway: 172.16.0.1

DNS Server: 0.0.0.0

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

IPv6 Address: _____ / _____

Link Local Address: FE80::240:BFF:FE4D:6396

IPv6 Gateway: _____

IPv6 DNS Server: _____

802.1X

☐ Use 802.1X Security

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Router 1

Router>enable
Router# configure terminal
Router(config)#hostname PUGC
PUGC(config)#interface fastEthernet 0/0
PUGC(config-if)#ip address 172.16.0.1 255.255.0.0
PUGC(config-if)#no shutdown
PUGC(config-if)#exit
PUGC(config)#interface serial 1/0
PUGC(config-if)#ip address 10.1.1.1 255.0.0.0
PUGC(config-if)#no shutdown
PUGC(config-if)#exit

Router 2
Router>enable
Router#configure terminal
Router(config)#hostname ISP
ISP (config)#interface serial 1/0
ISP (config-if)#ip address 10.1.1.1 255.0.0.0
ISP (config-if)#no shutdown
ISP (config-if)#exit
ISP(config)#interface serial 1/1
ISP(config-if)#ip address 20.1.1.2 255.0.0.0
ISP(config-if)#no shutdown
ISP(config-if)#exit

Router 3

Router>enable
Router#configure terminal
Router(config)#hostname PU-LHR
PU-LHR(config)#interface fastEthernet 0/0
PU-LHR(config-if)#ip address 192.168.1.1 255.255.255.0
PU-LHR(config-if)#no shutdown
PU-LHR(config-if)#exit
PU-LHR(config)#interface serial 1/0
PU-LHR(config-if)#ip address 20.1.1.1 255.0.0.0
PU-LHR(config-if)#no shutdown
PU-LHR(config-if)#exit

Router 1
PUGC>enable
PUGC# configure terminal
PUGC(config)#ip route 0.0.0.0 0.0.0.0 10.1.1.2

Router 3
PU-LHR>enable
PU-LHR#configure terminal
PU-LHR(config)#ip route 0.0.0.0 0.0.0.0 20.1.1.2

Router 2
ISP>enable
ISP#configure terminal
ISP(config)#ip route 172.16.0.0 255.255.0.0 10.1.1.1
ISP(config)#ip route 192.168.1.0 255.255.255.0 20.1.1.1

Router 1

PUGC>enable
PUGC#configure terminal
PUGC(config)#crypto isakmp enable
PUGC(config)#crypto isakmp policy 20
PUGC(config-isakmp)#authentication pre-share
PUGC(config-isakmp)#encryption aes
PUGC(config-isakmp)#hash md5
PUGC(config-isakmp)#group 1
PUGC(config-isakmp)#lifetime 3600
PUGC(config-isakmp)#exit
PUGC(config)#crypto isakmp key bsit123 add
PUGC(config)#crypto isakmp key bsit123 address 20.1.1.1
PUGC(config)#crypto ipsec transform-set R1>R3 esp-3d
PUGC(config)#crypto esp-aes esp-md5-hmac
PUGC(config)#crypto ipsec transform-set R1>R3 esp-aes esp-md5-hmac
PUGC(config)#access-list 100 permit ip 172.16.0.0 0.0.255.255 192.168.1.0 0.0.0.255
PUGC(config)#crypto map mymap 20 ipsec-isakmp
PUGC(config-crypto-map)#set peer 20.1.1.1
PUGC(config-crypto-map)#set transform-set R1>R3
PUGC(config-crypto-map)#match address 100
PUGC(config-crypto-map)#exit

PUGC(config)#interface serial 1/0
PUGC(config-if)#crypto map mymap
PUGC(config-if)#exit
PUGC(config)#exit
PUGC#show crypto isakmp sa
PUGC#show crypto isakmp policy

Router 3

PU-LHR>enable
PU-LHR#configure terminal
PU-LHR(config)#crypto isakmp enable
PU-LHR(config)#crypto isakmp policy 20
PU-LHR(config-isakmp)#authentication pre-share
PU-LHR(config-isakmp)#encryption aes
PU-LHR(config-isakmp)#encryption aes
PU-LHR(config-isakmp)#hash md5
PU-LHR(config-isakmp)#group 1
PU-LHR(config-isakmp)#lifetime 3600
PU-LHR(config-isakmp)#exit
PU-LHR(config)#crypto isakmp key bsit123 address 10.1.1.1

PU-LHR(config)#crypto ipsec transform-set R1<R3 esp-3d
PU-LHR(config)#crypto ipsec transform-set R1<R3 esp-aes esp-md5-hmac
PU-LHR(config)#access-list 100 permit ip 192.168.1.0 0.0.0.255 172.16.0.0 0.0.255.255
PU-LHR(config)#crypto map yourmap 20
PU-LHR(config)#crypto map yourmap 20 ip
PU-LHR(config)#crypto map yourmap 20 ipsec-isakmp
PU-LHR(config-crypto-map)#set peer 10.1.1.1
PU-LHR(config-crypto-map)#set transform-set R1<R3
PU-LHR(config-crypto-map)#match address 100
PU-LHR(config-crypto-map)#exit
PU-LHR(config)#interface serial 1/0
PU-LHR(config-if)#crypto map yourmap
PU-LHR(config-if)#exit
PU-LHR(config)#exit
PU-LHR#show crypto isakmp sa
PU-LHR#show crypto isakmp policy

RADIUS/AAA Practical
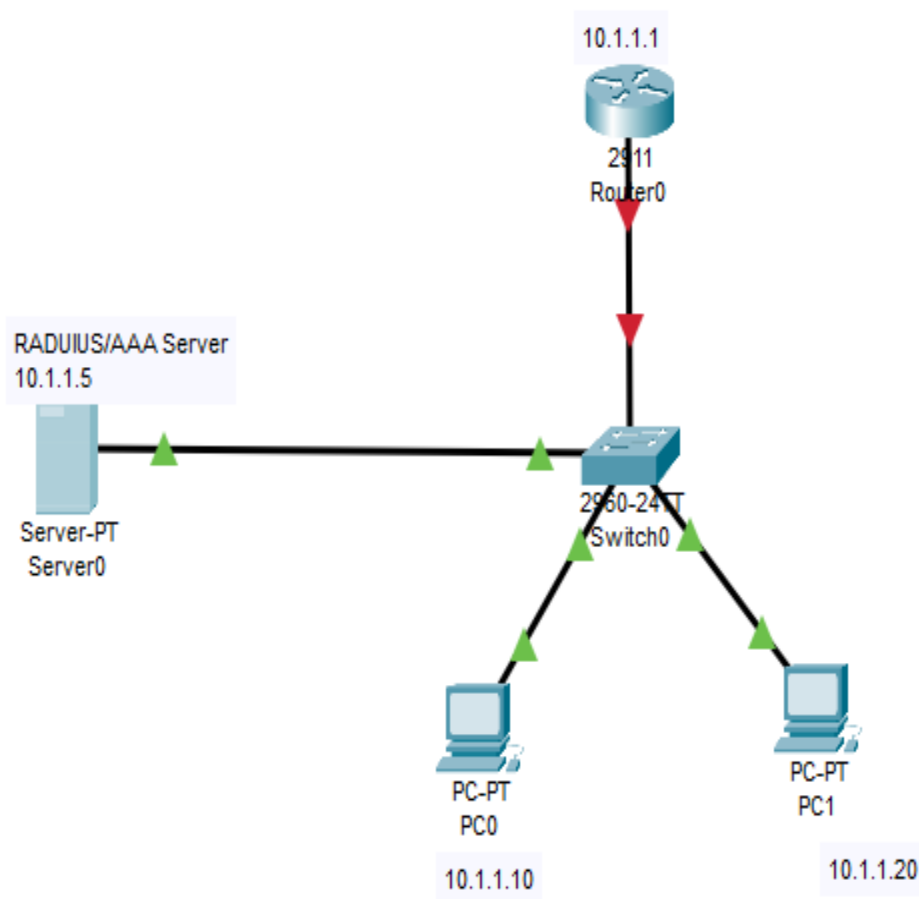
Server0

Physical | **Config** | **Services** | **Desktop** | **Programming** | **Attributes**

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- 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]

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Server0

Physical | **Config** | **Services** | **Desktop** | **Programming** | **Attributes**

SERVICES
- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

AAA

Service   ◉ On   ○ Off   **Radius Port** 1645

Network Configuration

Client Name	pugc	Client IP	10.1.1.1
Secret	cisco	ServerType	Radius

Client Name	Client IP	Server Type	Key	
				[Add]
				[Save]
				[Remove]

User Setup

Username		Password	

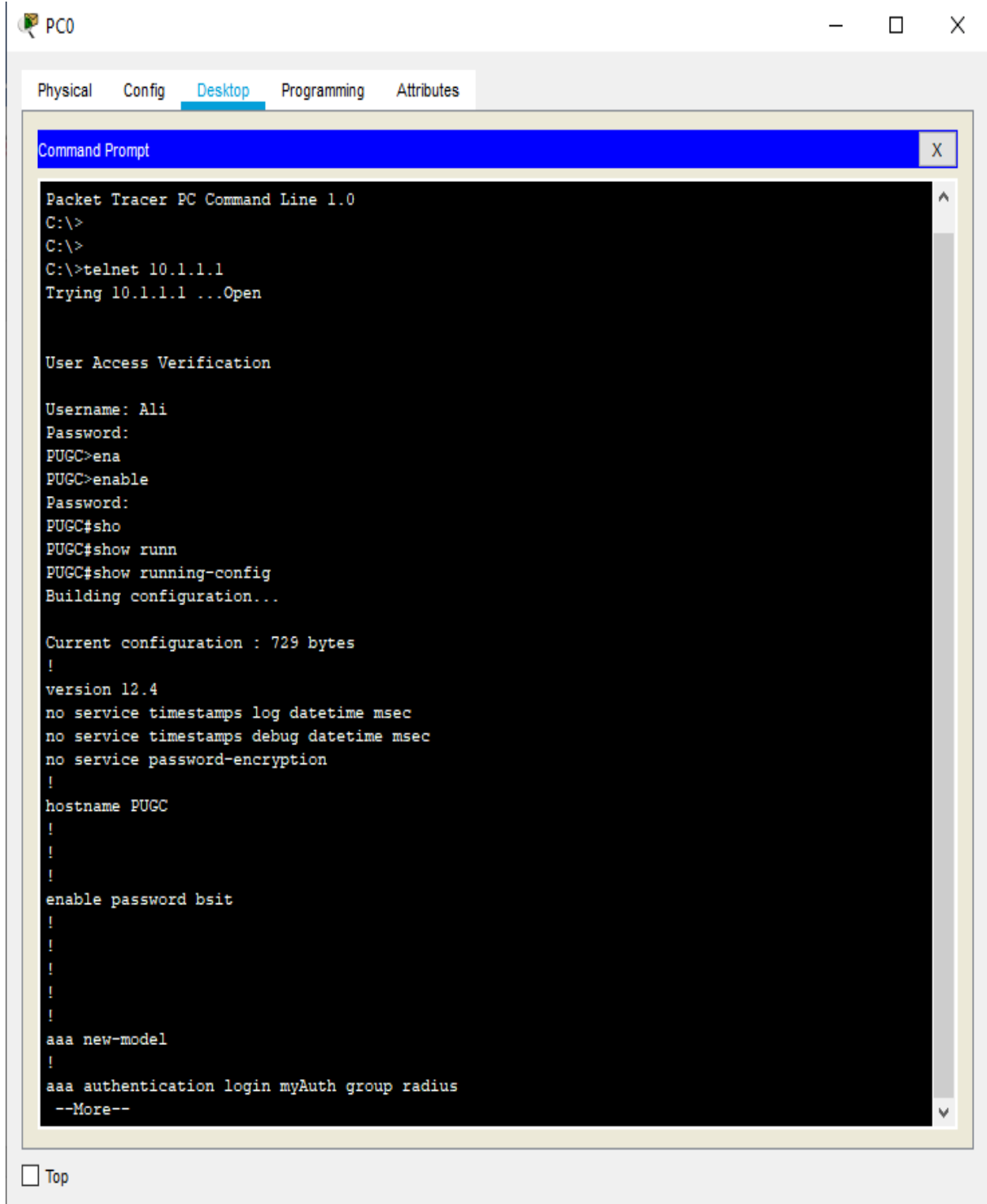| Username	Password	
		[Add]
		[Save]
		[Remove]

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Router
Router#enable
Router#configure terminal
Router(config)#hostname PUGC
PUGC (config)#interface fastEthernet 0/0
PUGC (config-if)#ip address 10.1.1.1 255.0.0.0
PUGC (config-if)#no shutdown
PUGC (config-if)#exit
PUGC(config)#enable password bsit
PUGC(config)#aaa new-model
PUGC(config)#radius-server host 10.1.1.5 key cisco
PUGC(config)#aaa authentication login myAuth group radius
PUGC(config)#line vty 0 4
PUGC(config-line)#login authentication myAuth
PUGC(config-line)#exit

Go to PC0


```
Packet Tracer PC Command Line 1.0
C:\>
C:\>
C:\>telnet 10.1.1.1
Trying 10.1.1.1 ...Open


User Access Verification

Username: Ali
Password:
PUGC>ena
PUGC>enable
Password:
PUGC#sho
PUGC#show runn
PUGC#show running-config
Building configuration...

Current configuration : 729 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname PUGC
!
!
!
enable password bsit
!
!
!
!
!
aaa new-model
!
aaa authentication login myAuth group radius
 --More--
```

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Go to PC1