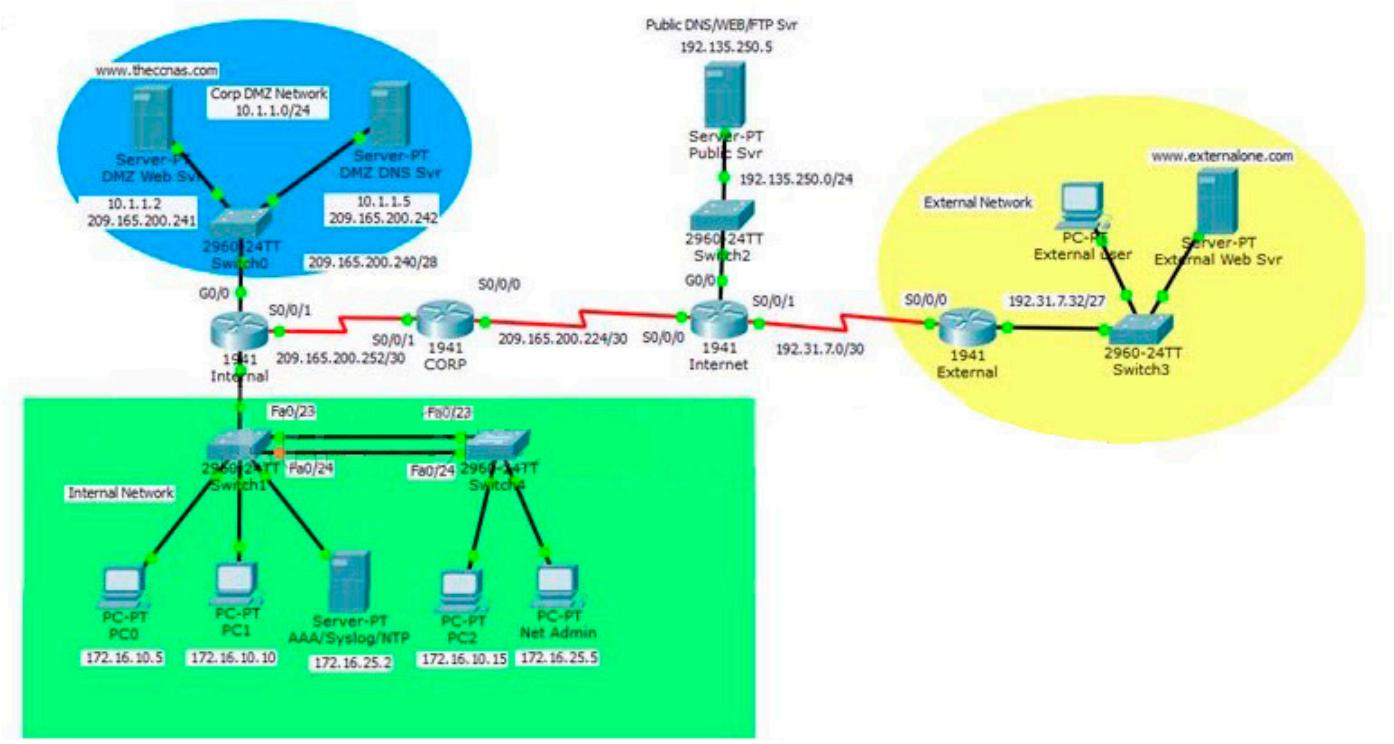
Introduction



In this practice Packet Tracer Skills Based Assessment, you will:

- configure basic device hardening and secure network management
- configure port security and disable unused switch ports
- configure an IOS IPS
- configure a Zone-based Policy Firewall (ZPF) to implement security policies

Addressing Table

Device	Interface	IP Address	Subnet Mask	Gateway	DNS server
Internet	S0/0/0	209.165.200.225	255.255.255.252	n/a	
	S0/0/1	192.31.7.1	255.255.255.252	n/a	
	G0/0	192.135.250.1	255.255.255.0	n/a	
Public Svr	NIC	192.135.250.5	255.255.255.0	192.135.250.1	
External	S0/0/0	S0/0/0	255.255.255.252	n/a	
	G0/0	192.31.7.62	255.255.255.224	n/a	
External Web Svr	NIC	192.31.7.35	255.255.255.224	192.31.7.62	192.135.250.5

External User	NIC	192.31.7.33	255.255.255.224	192.31.7.62	192.135.250.5
CORP	S0/0/0	209.165.200.226	255.255.255.252	n/a	
	S0/0/1	209.165.200.254	255.255.255.252	n/a	
Internal	S0/0/1	209.165.200.253	255.255.255.252	n/a	
	G0/0	10.1.1.254	255.255.255.0	n/a	
	G0/1.10	172.16.10.254	255.255.255.0	n/a	
	G0/1.25	172.16.25.254	255.255.255.0	n/a	
	G0/1.99	172.16.99.1	255.255.255.0	n/a	
DMZ DNS Svr	NIC	10.1.1.5	255.255.255.0	10.1.1.254	192.135.250.5
DMZ Web Svr	NIC	10.1.1.2	255.255.255.0	10.1.1.254	10.1.1.5
PC0	NIC	172.16.10.5	255.255.255.0	172.16.10.254	10.1.1.5
PC1	NIC	172.16.10.10	255.255.255.0	172.16.10.254	10.1.1.5
AAA/NTP/ Syslog Svr	NIC	172.16.25.2	255.255.255.0	172.16.25.254	10.1.1.5
PC2	NIC	172.16.10.15	255.255.255.0	172.16.10.254	10.1.1.5
Net Admin	NIC	172.16.25.5	255.255.255.0	172.16.25.254	10.1.1.5

Note: Appropriate verification procedures should be taken after each configuration task to ensure that it has been properly implemented.

Step 1: Configure Basic Device Hardening for the CORP and the Internal Routers.

1. Configure the CORP and the Internal routers to only accept passwords with a minimum length of 10 characters.
2. Configure an encrypted privileged level password of **ciscoclass**.
3. Enable password encryption for all clear text passwords in the configuration file.
4. Configure the console port and all vty lines with the following requirements:**Note:** Both the CORP and the Internal routers are already configured with the username **CORPADMIN** and password **Ciscoccnas**.

– Use the local database for login.
– Disconnect after being idle for 20 minutes.

5. Disable the CDP protocol on the CORP router on the link to the Internet router.

Step 2: Configure Secure Network Management for the CORP Router.

Configure the IOS login enhancement for all vty lines with the following requirements:

– Disable logins for 30 seconds after 3 failed login attempts within 60 seconds.

Step 3: Configure Secure Network Management for the Internal Router.

1. Configure the Internal router:
– as an NTP client to the AAA/NTP/Syslog server
– to update the router calendar (hardware clock) from the NTP time source
– to timestamp log messages
– to send logging messages to the AAA/NTP/Syslog server

2. Configure the IOS login enhancement for all vty lines with the following requirements:
– Disable logins for 30 seconds after 3 failed login attempts within 60 seconds.
– Log any failed or successful login to the syslog server.

3. Configure the Internal router to accept SSH connections. Use the following guidelines:Note: Internal is already configured with the username **SSHAccess** and the secret password ciscosshaccess.
– The domain name is theccnas.com.
– RSA encryption key pair using a modulus of 1024
– SSH version 2, timeout of 90 seconds, and 2 authentication retries
– All vty lines accept only SSH connections.

4. Configure the Internal router with server-based AAA authentication and verify its functionality:Note: The AAA server is already configured with RADIUS service, a username **CORPSYS**, and the password **LetSysIn**.
– The key to connect to the RADIUS server is **corpradius**.
– AAA authentication uses the RADIUS server as the default for console line and vty lines access.
– The local database is used as the backup if the RADIUS server connection cannot be established.

Step 4: Configure ACLs on the Internal Router to Implement Secure Management Access.

Create ACL 12 to implement the security policy regarding the access to the vty lines:
– Only users logged on to the Net Admin PC are allowed access to the vty lines.

Step 5: Configure Device Hardening for Switch1 and Switch4

1. Access Switch1 and Switch4 with username **CORPADMIN**, password **Ciscoccnas**, and the enable secret password of **ciscoclass**.

2. Configure Switch1 to protect against STP attacks.
– Configure PortFast on FastEthernet ports 0/1 to 0/22.
– Enable BPDU guard on FastEthernet ports 0/1 to 0/22.

3. Configure Switch1 port security and disable unused ports.
– Set the maximum number of learned MAC addresses to 2 on FastEthernet ports 0/1 to 0/22. Allow the MAC address to be learned dynamically and to be retained in the running-config. Shutdown the port if a violation occurs.
– Disable unused ports (Fa0/2-4, Fa0/6-10, Fa0/13-22).

4. Configure the trunk link on Fa0/23 and Fa0/24 on both Switch1 and Switch4
– Disable DTP negotiation on the trunking ports.
– Set the native VLAN as VLAN 50 for the trunk links.

Step 6: Configure an IOS IPS on the Internal Router.

1. On the Internal router, if asked to login, then login as **CORPSYS** with password **LetSysIn**. The enable secret password is **ciscoclass**.
2. Use the IPS signature storage location at flash:.
3. Create an IPS rule named corpips.
4. Configure the IOS IPS to use the signature categories. Retire the all signature category and unretire the **ios_ips basic** category.
5. Apply the IPS rule to the Gi0/0 interface in the out direction.
6. Modify the **ios_ips basic** category. Unretire the **echo request** signature (signature 2004, subsig 0); enable the signature; modify the signature **event-action** to produce an alert and deny packets that match the signature.
7. Verify that IPS is working properly. Net Admin in the internal network cannot ping DMZ Web Svr. DMZ Web Svr, however, can ping Net Admin.

Step 7: Configure ZPF on the CORP Router.

1. Access the CORP router with username **CORPADMIN**, password **Ciscoccnas**, and the enable secret password of **ciscoclass**.
2. Create the firewall zones.
– Create an internal zone named CORP-INSIDE.
– Create an external zone named INTERNET.

3. Define a traffic class to allow traffic from the Internal network to access services in the Internet.
– Create a class map using the option of **class map type inspect** with the match-any keyword. Name the class map **INSIDE_PROTOCOLS**.
– Match the protocols, http, tcp, udp, icmp, dns (Please note, the order of match statements is significant only because of the scoring need in Packet Tracer.)

4. Specify firewall policies to allow internal hosts to access Internet.
– Create a policy map named **INSIDE_TO_INTERNET**.
– Use the **INSIDE_PROTOCOLS** class map.
– Specify the action of inspect for this policy map.

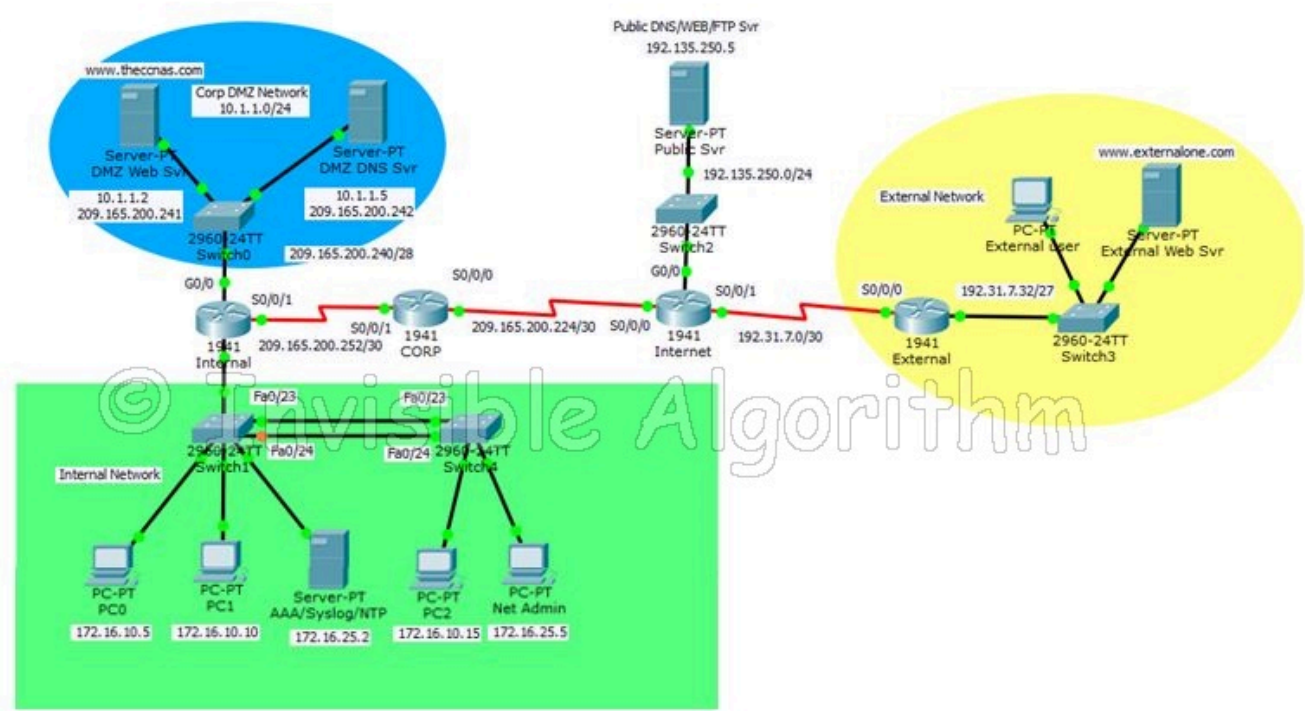
5. Define a traffic class to allow traffic from the Internet to access services in the DMZ network.
– Create a class map using the option of **class map type inspect** with the match-any keyword. Name the class map DMZ_WEB.
– Match the protocols, http and dns (Please note, the order of match statements is significant only because of the scoring need in Packet Tracer.)

6. Specify firewall policy to allow Internet traffic to access DMZ services.
– Create a policy map named **INTERNET_TO_DMZWEB**.
– Use the DMZ_WEB class map.
– Specify the action of pass for this policy map.

7. Apply the firewall.
– Create a pair of zones named IN_TO_OUT_ZONE with the source as CORP-INSIDE and destination as INTERNET.
– Specify the policy map **INSIDE_TO_INTERNET** for handling the traffic between the two zones.
– Create a pair of zones named **INTERNET_TO_DMZ_ZONE** with the source as INTERNET and destination as CORP-INSIDE.
– Assign interfaces to the appropriate security zones.

8. Verify the ZPF configuration.
– The External user can access the URLs http://www.theccnas.com and http://www.externalone.com.
– The External user cannot ping the DMZ Web Svr.
– The PCs in the internal network can ping and access the External Web Svr URL.

**** End Of Question ****



ROUTER CORP

```
enable
configure terminal
```

```
security passwords min-length 10
enable secret ciscoclass
service password-encryption
line console 0
login local
exec-timeout 20 0
line vty 0 15
login local
exec-timeout 20 0
exit
interface serial0/0/0
no cdp enable
login block-for 30 attempts 3 within 60
zone security CORP-INSIDE
exit
zone security INTERNET
exit
class-map type inspect match-any INSIDE_PROTOCOLS
match protocol http
match protocol tcp
match protocol udp
match protocol icmp
match protocol dns
exit
policy-map type inspect INSIDE_TO_INTERNET
class type inspect INSIDE_PROTOCOLS
inspect
exit
exit
class-map type inspect match-any DMZ_WEB
match protocol http
match protocol dns
exit
policy-map type inspect INTERNET_TO_DMZWEB
class type inspect DMZ_WEB
pass
exit
exit
zone-pair security IN_TO_OUT_ZONE source CORP-INSIDE destination INTERNET
service-policy type inspect INSIDE_TO_INTERNET
exit
zone-pair security INTERNET_TO_DMZ_ZONE source INTERNET destination CORP-INSI
service-policy type inspect INTERNET_TO_DMZWEB
exit
interface serial0/0/0
zone-member security INTERNET
exit
interface serial0/0/1
zone-member security CORP-INSIDE
exit
```

Router INTERNAL

```
enable
configure terminal
security passwords min-length 10
enable secret ciscoclass
service password-encryption
login on-failure log
login on-success log
line console 0
login local
exec-timeout 20 0
line vty 0 15
login local
exec-timeout 20 0
exit
interface serial0/0/0
no cdp enable
login block-for 30 attempts 3 within 60
ntp server 172.16.25.2 key 0
ntp update-calendar
service timestamps log datetime msec
logging host 172.16.25.2
ip domain-name theccnas.com
crypto key generate rsa
1024

ip ssh version 2
ip ssh time-out 90
ip ssh authentication-retries 2
line vty 0 4
transport input ssh
exit
line vty 5 15
transport input ssh
exit
aaa new-model
Radius-server host 172.16.25.2 key corpradius
aaa authentication login default group radius local
aaa authorization exec default local
line vty 0 4
login authentication default
line vty 5 15
login authentication default
line con 0
login authentication default
exit
access-list 12 permit host 172.16.25.5
line vty 0 15
access-class 12 in
exit
```

```
ip ips config location flash:
ip ips name corpips
ip ips signature-category
category all
retired true
exit
category ios_ips basic
retired false
exit
exit

interface Gi0/0
ip ips corpips out
exit
ip ips signature-definition
signature 2004 0
status
retired false
enable true
exit
engine
event-action produce-alert
event-action deny-packet-inline
exit
exit
exit

exit
```

Switch1 Config

```
configure terminal
interface range fastEthernet0/1-22
spanning-tree portfast
spanning-tree bpduguard enable
switchport port-security
switchport port-security violation shutdown
switchport port-security mac-address sticky
switchport port-security maximum 2
exit
interface range fastethernet 0/2-4
shutdown
interface range fastethernet 0/6-10
shutdown
interface range fastethernet 0/13-22
shutdown
exit
interface range fa0/23-24
switchport nonegotiate
switchport trunk native vlan 50
```

Switch 4

```
configure terminal
interface range fa0/23-24
switchport mode trunk
switchport nonegotiate
switchport trunk native vlan 50
```