711 Networking Practical test

Basic Settings for Router

```
router(config)# hostname R1
R1(config)# no ip domain lookup
R1(config)# enable secret class
R1(config)# line console 0
R1(config-line)# password cisco
R1(config-line)# login
R1(config)# login synchronous
R1(config)# line vty 0 4
R1(config-line)# password cisco
R1(config-line)# login
R1(config)# service password-encryption
R1(config)# banner motd $ Authorized Users Only! $
R1# copy running-config startup-config
```

Basic Settings for Switch

```
switch(config)# hostname S1
S1(config)# no ip domain lookup
S1(config)# enable secret class
S1(config)# line console 0
S1(config-line)# password cisco
S1(config-line)# login
S1(config)# line vty 0 15
S1(config-line)# password cisco
S1(config-line)# login
S1(config)# service password-encryption
S1(config)# banner motd $ Authorized Users Only! $
S1# copy running-config startup-config
```

VLAN

Creating vlan

```
S2(config)#vlan 10
S2(config-vlan)#name Faculty/Staff
```

Assigning vlan to int

```
S2(config)# interface f0/11
S2(config-if)# switchport mode access
S2(config-if)# switchport access vlan 10
```

Assinging voice vlan to int

```
S3(config)# interface f0/11
S3(config-if)# mls qos trust cos
S3(config-if)# switchport voice vlan 150
```

Show commands

```
S2# show vlan brief
```

Router on stick

on router

```
R1(config)#interface g0/0
R1(config-if)#no shutdown
R1(config)# int g0/0.10
R1(config-subif)# encapsulation dot1Q 10
R1(config-subif)# ip address 172.17.10.1 255.255.255.0
R(config)# [no] ip classless
```

on switch

```
S1(config)#int g0/1
S1(config-if)#switchport mode trunk
```

on trunk port in switch

```
S1(config)#int g0/1
S1(config-if)#switchport mode trunk
```

to change **native vlan**

```
Switch(config-if)# switchport trunk native vlan 10
```

to specify what **vlans allowed**

```
Switch(config-if)# switchport trunk allowed vlan 10,20,30
```

OSPFv2

Configuring **OSPF**

```
R1(config)# router ospf 56
R1(config-router)# router-id 1.1.1.1
R1(config-router)# network 10.53.0.0 0.0.0.3 area 0
```

Configure the interface G0/0/1 OSPF **priority to 50 to ensure R1 is the *Designated Router*.**

```
R1(config)# interface g0/0/1
R1(config-if)# ip ospf priority 50
```

Configure the **OSPF timers** on the G0/0/1 of each router for a ***hello timer of 30 seconds***

```
R1(config)# interface g0/0/1
R1(config-if)# ip ospf hello-interval 30
```

OSPF to treat R2 Loopback 1 like a **point-to-point** network

```
R2(config)# interface loopback 1
R2(config-if)# ip ospf network point-to-point
```

Configure **passive interface** on OSPF.

```
R2(config)# router ospf 56
R2(config-router)# passive-interface loopback 1
```

Configure OSPF to **propagate the default route** in OSPF routing updates.

```
R2(config)# router ospf 1
R2(config-router)# default-information originate
```

Change the **reference *bandwidth* on each router to 1Gbs** (1Gbs = 1000Mbs) & Have to change on both routers to be *consistant*

```
R1(config)# router ospf 56
R1(config-router)# auto-cost reference-bandwidth 1000
```

Following commands help **verifying** OSPF configurations

```
show ip interface brief
show ip route
show ip route ospf
show ip ospf neighbor
show ip protocols
show ip ospf
show ip ospf interface g0/0/1
```

EIGRP

EIGRP for IPv4

Configuring *EIGRP on routers*

> **NOTE** Need to be configured on all routers

```
R1(config)# router eigrp 1
R1(config-router)# eigrp router-id 1.1.1.1
R1(config-router)# network 172.16.1.0 0.0.0.3
```

Configuring *passive interfaces*

```
R1(config)# router eigrp 1
R1(config-router)# passive-interface g0/0
```

Disabling *auto summary*

```
R1(config)# router eigrp 1
R1(config-router)# no auto-summary
```

Configuring *bandwidth*

> **NOTE** need to be configured both ends of the connection.

```
R2(config)# interface s0/0/0
R2(config-if)# bandwidth 2000
```

EIGRP for IPv6

Enable *ipv6* routing

```
R1(config)# ipv6 unicast-routing
```

Configuring *ipv6 addresses* on each interfaces in router

> Normally link local address automatically configured unless changed. Clock rate command is optional

```
int g0/0/0
ipv6 add 2001:sd8:sgfsfs:1::1/64
```

```
ipv6 add fe80::1 link-local
clock rate 64000
```

Enable *EIGRP for IPv6* routing

```
R1(config)# ipv6 router eigrp 1
R1(config-rtr)# no shutdown
R1(config-rtr)# eigrp router-id 1.1.1.1
```

Configuring EIGRP in each *interface*

```
R1(config)# int g0/0
R1(config-if)# ipv6 eigrp
```

Configuring passive interfaces

```
R1(config)# ipv6 router eigrp 1
R1(config-rtr)# passive-interface g0/
```

ACL

Standard ACL

Standard numbered Access-List

Creating standard Access List

```
R3(config)# access-list 1 remark Allow R1 LANs Access
R3(config)# access-list 1 permit 192.168.10.0 0.0.0.255
R3(config)# access-list 1 permit 192.168.20.0 0.0.0.255
R3(config)# access-list 1 deny an
```

Assigning access list to interfaces

```
R3(config)# interface g0/0/0
R3(config-if)# ip access-group 1 out
```

Named Access-List

Creating *named* access list

```
R1(config)# ip access-list standard BRANCH-OFFICE-POLICY
R1(config-std-nacl)# permit host 192.168.30.3
R1(config-std-nacl)# permit 192.168.40.0 0.0.0.255
R1(config-std-nacl)# end
```

Assigning named access list to interfaces

```
R1(config)# interface g0/0/0
R1(config-if)# ip access-group BRANCH-OFFICE-POLICY ou
```

show commands for ACL

To verify configurations

```
R3# show access-lists 1
R3# show access-lists
R3# show ip access-lists
R3# show ip interface g0/0/0
R3# show ip interface
```

Extended ACL

Creating Extended ACL

> Have to input `permit ip any any` at the end if want to permit other becasue in default there is `deny any` on ACL

```
RT1(config)# ip access-list extended acl-name
RT1(config-ext-nacl)# deny tcp host 172.31.1.101 host 64.101.255.254 eq 80
RT1(config-ext-nacl)# deny icmp host 172.31.1.103 host 64.103.255.254
RT1(config-ext-nacl)# permit ip any any
RT1(config)# interface g0/0
RT1(config-f)# ip access-group ACL in
```

NAT

Configuring static NAT

```
R(config)# ip nat inside source static 192.168.1.10 209.73.69.10
```

Configuring dynamic NAT

```
R(config)# ip nat pool NAT-POOL 209.73.69.0 209.73.69.9 netmask 255.255.255.0
R(config)# ip access-list standard NAT-ACL
R(config-std-nacl)# permit 192.168.1.0 255.255.255.0
R(config-std-nacl)# deny any
R(config)# ip nat inside source list NAT-ACL pool NAT-POOL overload
```

Static/Default route

assigning **default route**

> Can also use the ip address of the interface

```
R2(config)# ip route 0.0.0.0 0.0.0.0 Serial0/1/0

R(config)# ip route 192.168.20.0 255.255.255.0 serial0/1
```

SSH Config

Description

```
R(config)# hostname {hostname}
R(config)# username {username} password {password}
R(config)# ip domain-name {domain-name}
R(config)# crypto key generate rsa
R(config)# ip ssh version 2
R(config)# line vty 0 15
R(config-line)# login local
R(config-line)# transport input ssh
```

Actual configuration

```
R(config)# hostname R1
R(config)# username Cisco password Password-123
R(config)# ip domain-name anything.com
R(config)# crypto key generate rsa
R(config)# ip ssh version 2
R(config)# line vty 0 15
R(config-line)# login local
R(config-line)# transport input ssh
```

Port Security Config

Description

```
S(config)# interface {interface | range {interface}{interface-start}-{interface-
end}}
S(config-if)# switchport mode access
S(config-if)# switchport port-security
S(config-if)# switchport port-security maximum {number}
S(config-if)# switchport port-security mac-address sticky
S(config-if)# switchport port-security violation {restrict | protect | shutdown}
S(config-if)# switchport protected
S(config-if)# spanning-tree bpduguard enable
S(config-if)# shutdown
S(config-if)# no shutdown
S# show port-security interface {interface}
```

Actual configuration

```
S(config)# interface interface range f0/1-24,g0/1-2
S(config-if)# switchport mode access
S(config-if)# switchport port-security
S(config-if)# switchport port-security maximum 25
S(config-if)# switchport port-security mac-address sticky
S(config-if)# switchport port-security violation shutdown
S(config-if)# switchport protected
S(config-if)# spanning-tree bpduguard enable
S(config-if)# shutdown
S(config-if)# no shutdown
S# show port-security interface f0/1
```

PPP Auth

Desription

```
R(config)# username {pap-neighbor-username | chap-neighbor-hostname} password
{neighbor-password}
R(config)# interface {interface-to-neighbor}
R(config-if)# encapsulation ppp
R(config-if)# ppp authentication {pap | chap | pap chap | chap pap}
R(config-if (pap))# ppp pap sent-username {your-username} password {your-password}
```

Actual configuration

```
R(config)# username R2 password R2Password
R(config)# interface S0/0/0
R(config-if)# encapsulation ppp
R(config-if)# ppp authentication pap
R(config-if)# ppp pap sent-username R1 password R1Password
```

BGP

Desription

```
R(config)# router bgp {autonomous-system-number}
R(config-router)# neighbor {neighbor-ip-address} remote-as {neighbor-autonomous-
system-number}
R(config-router)# network {internal-network} [mask {subnet-mask}]
```

Actual configuration

```
R(config)# router bgp 65000
R(config-router)# neighbor 209.165.201.1 remote-as 65001
R(config-router)# network 198.133.219.0 mask 255.255.255.0
```

DHCP Config

IPv4 DHCP Config

Desription

```
R1(config)# ip dhcp excluded {excluded-start-ip} {excluded-end-ip}
R1(config)# ip dhcp pool {pool-name}
R1(dhcp-config)# network {allowed-network-address} {subnet-mask}
R1(dhcp-config)# default-router {default-gateway}
R1(dhcp-config)# dns-server {dns-server-address (up to 4)}
R1(dhcp-config)# domain-name {domain-name}
R1(dhcp-config)# lease-time {days}

R3(config)# interface {interface}
R3(config-if)# ip helper-address {dhcp-server-address}
```

Actual configuration

```
R1# show ip dhcp binding

R1(config)# ip dhcp excluded 172.16.2.1 172.16.2.6
R1(config)# ip dhcp pool R1-DHCP
R1(dhcp-config)# network 172.16.2.0 255.255.255.128
R1(dhcp-config)# default-router 172.16.2.1
R1(dhcp-config)# dns-server 140.198.8.14
R1(dhcp-config)# domain-name anything.com
R1(dhcp-config)# lease-time 5

R3(config)# interface fastethernet 0/1
R3(config-if)# ip helper-address 192.168.15.2
```

IPv6 DHCP Config

Desription

Stateless Address Auto Config (SLAAC)

```
R(config)# ipv6 unicast routing
R(config)# ipv6 dhcp pool {pool-name}
R(dhcpv6-config)# dns-server {ipv6-dns-server-address}
R(dhcpv6-config)# domain-name {domain-name}
R(config)# interface {interface}
R(config-if)# ipv6 address {ip-address}{prefix-length}
R(config-if)# ipv6 dhcp server {pool-name}
R(config-if)# ipv6 nd other-config-flag
```

Stateful Address Auto Config

```
R1(config)# ipv6 unicast routing
R1(config)# ipv6 dhcp pool {pool-name}
R1(dhcpv6-config)# address prefix {ipv6-prefix} [lifetime {preferred-lifetime}
{valid-lifetime}]
R1(dhcpv6-config)# dns-server {ipv6-dns-server-address}
R1(dhcpv6-config)# domain-name {domain-name}
R1(config)# interface {interface}
R1(config-if)# ipv6 address {ipv6-address}
R1(config-if)# ipv6 dhcp server {pool-name}
R1(config-if)# ipv6 nd managed-config-flag
```

Actual configuration

```
R3(config)# interface fastethernet 0/1
R3(config-if)# ip dhcp relay destination 2001:A123:7CA1::15

R# show ipv6 dhcp pool
R# show ipv6 dhcp binding

R(config)# ipv6 unicast routing
R(config)# ipv6 dhcp pool LAN-10-STATELESS
R(dhcpv6-config)# dns-server 2001:345:ACAD:F::5
R(dhcpv6-config)# domain-name cisco.com

R(config)# interface g1/1
R(config-if)# ipv6 address 2001:A1B5:C13:10::1/64
R(config-if)# ipv6 dhcp server LAN-10-STATELESS
R(config-if)# ipv6 nd other-config-flag
```
