UNITED STATES MILITARY ACADEMY

FINAL PROJECT

CY350: NETWORK ENGINEERING AND MANAGEMENT

SECTION N9

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**1. Project Description**

Our team was given a basic layout of an existing, disconnected network and was asked to create a comprehensive, fully functioning and efficient network. The proper VLAN’s, subnetworks, routing protocols, security measures, and device configuration must be implemented for a successful network.

**2. Results**

**2.a. Network Diagram**

**FOB HOOD**

ROUTER:

Fa0/0: 10.64.62.114/29

Fa0/1: 10.64.62.107/29

Fa1/0.100: 192.168.64.1/25

Fa1/0.200: 192.168.64.129/26

Fa1/0.300: 192.168.64.201/29

Fa1/0.500:192.168.64.193/29

Loopback: 10.64.62.142/32

Default Gateway: 10.64.62.113

Access List 10: (PAT)

access-list 10 permit 192.168.64.0 0.0.0.255

SWITCH:

VLANS: 100,200,300,500

VLAN 500 IP: 192.168.64.82 /29

Default Gateway:192.168.64.81

SERVERS:

IP1:10.64.62.98/24

IP2:10.64.62.99/24

IP3:10.64.62.100/24

Fa0/1: TRUNK

MGMT USERS: Fa0/15-20

IP:10.64.62.144/29

DATA USERS: Fa0/2-11

Private IP: 192.168.62.0/25

Public IP: 10.64.62.188/32

VoIP USERS Fa0/21-24

IP: 10.64.62.0/26

**FOB BLISS**

ROUTER:

Fa0/0: 10.64.62.106/29

Fa1/1: 192.168.64.121/30

Fa0/1: 10.64.62.115/29

Fa1/0.100: 192.168.74.1/24

Fa1/0.200: 10.64.62.65/28

Fa1/0.500: 10.64.62.89/29

Loopback: 10.64.62.141/32

Default Gateway: 10.64.62.105

Access Lists: 10 (PAT)

access-list 10 permit 192.168.74.0 0.0.0.255

SWITCH:

VLANS: 100,200,300,500

VLAN 500 IP: 192.168.64.86/29

Default Gateway: 10.64.62.91/29

Fa0/1: TRUNK

MGMT USERS: Fa0/16-20

IP: 10.64.62.152/29

DATA USERS: Fa0/2-16

IP: 10.64.62.64/26

VoIP USERS: Fa0/21-24

IP:10.64.62.128/28

**PATTON CITY**

SWITCH:

VLANS: 10 (NET)

Fa0/4-24->VLAN 10

Fa0/1-3 ->TRUNK

**METROPOLIS**

ROUTER:

Fa0/0: 10.64.0.62/24

Fa0/1: 10.64.62.105/29

Fa1/0: 10.64.62.113/29

Fa0/1.10: 10.64.62.133/30

Fa1/0.10: 10.64.62.137/30

Loopback: 10.64.62.140/32

Default Gateway: 10.64.0.64

**COP CARSON**

ROUTER:

Fa0/0: 10.64.62.122/30

Fa0/1: 10.64.62.125/30

Loopback: 10.64.62.143/32

Default Gateway: 10.64.62.121

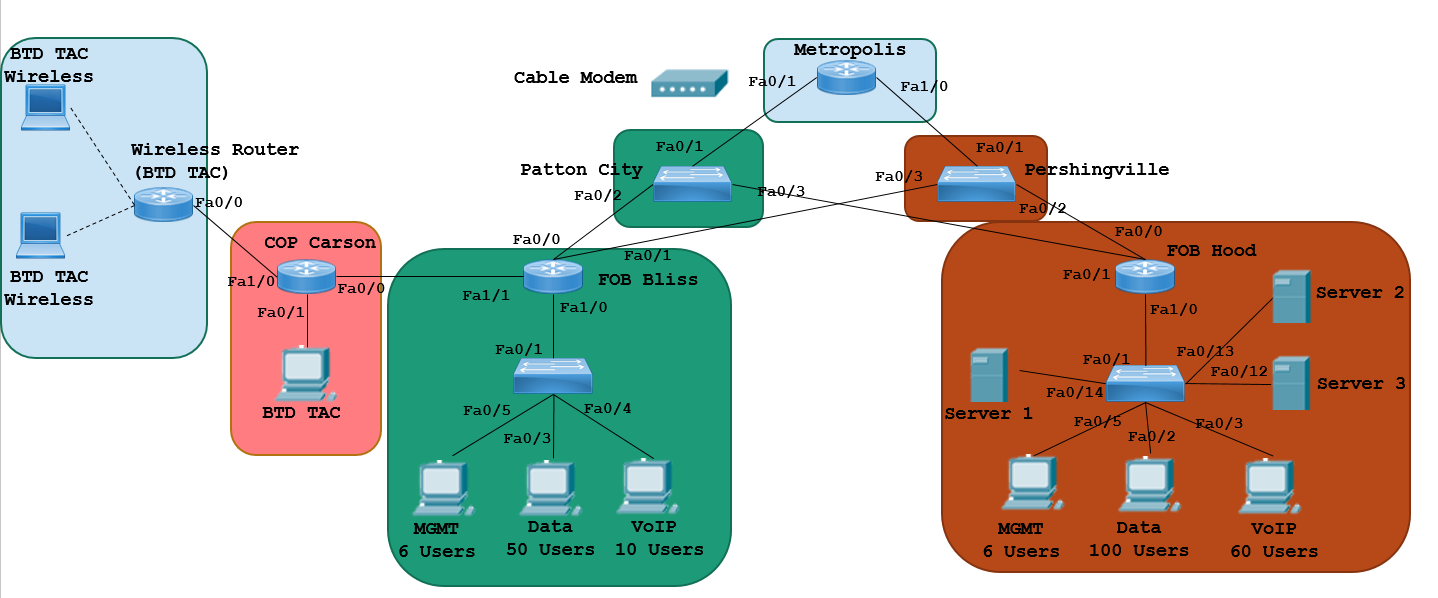
**PERSHINGVILLE**

SWITCH:

VLANS: 10 (NET)

Fa0/4-24->VLAN 10

Fa0/1-3 ->TRUNK

****

**2.b. Subnetting**

**Private**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Location** | **Network** | **Subnet Mask** | **Usable Range** | **Broadcast** |
| **FOB HOOD** | **192.168.64.0** | **255.255.255.0** | **192.168.64.1-.254** | **192.168.64.255** |
| **FOB BLISS** | **192.168.74.0** | **255.255.255.0** | **192.168.74.1-.254** | **192.168.74.255** |
| **COP CARSON** | **192.168.84.0** | **255.255.255.0** | **192.168.74.1-.254** | **192.168.74.255** |

**Public**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Need** | **Allocated** | **Network** | **Subnet** |
| VoIP(Hood) | 60 | 62 | 10.64.62.0 | 255.255.255.192 |
| VoIP(Bliss) | 10 | 14 | 10.64.62.64 | 255.255.255.240 |
| MGMT(Hood) | 6 | 6 | 10.64.62.80 | 255.255.255.248 |
| MGMT(Bliss) | 6 | 6 | 10.64.62.88 | 255.255.255.248 |
| Servers | 3 | 6 | 10.64.62.96 | 255.255.255.248 |
| Metropolis1 | 4 | 6 | 10.64.62.104 | 255.255.255.248 |
| Metropolis2 | 4 | 6 | 10.64.62.112 | 255.255.255.248 |
| Bliss-Carson | 2 | 2 | 10.64.62.120 | 255.255.255.252 |
| Carson-WAP | 2 | 2 | 10.64.62.124 | 255.255.255.252 |
| Patt. MGMT | 2 | 2 | 10.64.62.132 | 255.255.255.252 |
| Persh. MGMT | 2 | 2 | 10.64.62.136 | 255.255.255.255 |
| Loop Metro | 1 | 1 | 10/64.62.140 | 255.255.255.255 |
| Loop Bliss | 1 | 1 | 10/64.62.141 | 255.255.255.255 |
| Loop Hood | 1 | 1 | 10/64.62.142 | 255.255.255.255 |
| Loop Carson | 1 | 1 | 10/64.62.143 | 255.255.255.255 |

**2.c. Configurations**

**Metropolis Router**

METROPOLIS#show run

Building configuration...

Current configuration : 2258 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname METROPOLIS

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

no ip cef

no ipv6 cef

!

ip domain-name bornstallings

!

spanning-tree mode pvst

!

interface Loopback0

ip address 10.64.62.140 255.255.255.255

!

interface FastEthernet0/0

ip address 10.64.0.62 255.255.255.0

ip access-group 10 in

ip access-group 10 out

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 10.64.62.105 255.255.255.248

duplex auto

speed auto

!

interface FastEthernet0/1.10

encapsulation dot1Q 10

ip address 10.64.62.133 255.255.255.252

!

interface FastEthernet1/0

ip address 10.64.62.113 255.255.255.248

duplex auto

speed auto

!

interface FastEthernet1/0.10

encapsulation dot1Q 10

ip address 10.64.62.137 255.255.255.252

!

interface Vlan1

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 10.64.0.0 0.0.0.255 area 0

network 10.64.62.0 0.0.0.63 area 0

network 10.64.62.64 0.0.0.15 area 0

network 10.64.62.80 0.0.0.7 area 0

network 10.64.62.88 0.0.0.7 area 0

network 10.64.62.96 0.0.0.7 area 0

network 10.64.62.104 0.0.0.7 area 0

network 10.64.62.112 0.0.0.7 area 0

network 10.64.62.120 0.0.0.3 area 0

network 10.64.62.124 0.0.0.3 area 0

network 10.64.62.128 0.0.0.3 area 0

network 10.64.62.132 0.0.0.3 area 0

network 10.64.62.136 0.0.0.3 area 0

network 10.64.62.140 0.0.0.0 area 0

network 10.64.62.141 0.0.0.0 area 0

network 10.64.62.142 0.0.0.0 area 0

network 10.64.62.143 0.0.0.0 area 0

!

ip classless

ip route 0.0.0.0 0.0.0.0 10.64.0.254

!

ip flow-export version 9

!

access-list 10 permit 0.0.0.0 255.255.255.0

access-list 10 deny 0.0.0.0 255.255.0.0

access-list 10 permit any

access-list 101 permit icmp 10.64.0.0 0.0.0.255 any echo-reply

access-list 101 permit icmp 10.19.89.0 0.0.0.255 any echo-reply

access-list 101 deny icmp any any echo-reply

access-list 101 permit ip any any

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

!

line con 0

password 7 0822455D0A16

login

!

line aux 0

!

line vty 0 4

access-class 20 in

password 7 0822455D0A16

login

transport input ssh

!

end

**Pershingville Switch**

PERSHINGVILLE#show run

Building configuration...

Current configuration : 2584 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname PERSHINGVILLE

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

ip domain-name bornstallings

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport mode trunk

!

interface FastEthernet0/2

switchport mode trunk

!

interface FastEthernet0/3

switchport mode trunk

!

interface FastEthernet0/4

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/5

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/6

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/7

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/8

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/9

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/10

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/11

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/12

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/13

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/14

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/15

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/16

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/17

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/18

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/19

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/20

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/21

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/22

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/23

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/24

switchport access vlan 10

switchport mode access

!

interface GigabitEthernet0/1

!

interface GigabitEthernet0/2

!

interface Vlan1

no ip address

shutdown

!

interface Vlan10

mac-address 0007.ec6b.595a

ip address 10.64.62.138 255.255.255.252

!

ip default-gateway 10.64.62.137

!

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

line con 0

password 7 0822455D0A16

login

!

line vty 0 4

password 7 0822455D0A16

login

transport input ssh

line vty 5 15

login

!

end

**Patton City Switch**

PATTONCITY#show run

Building configuration...

Current configuration : 2581 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname PATTONCITY

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

ip domain-name bornstallings

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport mode trunk

!

interface FastEthernet0/2

switchport mode trunk

!

interface FastEthernet0/3

switchport mode trunk

!

interface FastEthernet0/4

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/5

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/6

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/7

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/8

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/9

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/10

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/11

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/12

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/13

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/14

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/15

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/16

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/17

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/18

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/19

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/20

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/21

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/22

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/23

switchport access vlan 10

switchport mode access

!

interface FastEthernet0/24

switchport access vlan 10

switchport mode access

!

interface GigabitEthernet0/1

!

interface GigabitEthernet0/2

!

interface Vlan1

no ip address

shutdown

!

interface Vlan10

mac-address 0002.16dd.ca01

ip address 10.64.62.134 255.255.255.252

!

ip default-gateway 10.64.62.133

!

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

line con 0

password 7 0822455D0A16

login

!

line vty 0 4

password 7 0822455D0A16

login

transport input ssh

line vty 5 15

login

!

end

**FOB Hood Router**

FOBHOODROUTER#show run

Building configuration...

Current configuration : 2683 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname FOBHOODROUTER

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

no ip cef

no ipv6 cef

!

ip domain-name bornstallings

!

spanning-tree mode pvst

!

interface Loopback0

ip address 10.64.62.142 255.255.255.255

!

interface FastEthernet0/0

ip address 10.64.62.114 255.255.255.248

ip nat outside

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 10.64.62.107 255.255.255.248

ip nat outside

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

ip nat inside

duplex auto

speed auto

!

interface FastEthernet1/0.100

encapsulation dot1Q 100

ip address 192.168.64.1 255.255.255.0

ip nat inside

!

interface FastEthernet1/0.200

encapsulation dot1Q 200

ip address 10.64.62.1 255.255.255.192

ip nat inside

!

interface FastEthernet1/0.300

encapsulation dot1Q 300

ip address 10.64.62.97 255.255.255.248

ip nat inside

!

interface FastEthernet1/0.500

encapsulation dot1Q 500

ip address 10.64.62.81 255.255.255.248

ip access-group 101 in

ip nat inside

!

interface Vlan1

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 10.64.0.0 0.0.0.255 area 0

network 10.64.62.0 0.0.0.63 area 0

network 10.64.62.64 0.0.0.15 area 0

network 10.64.62.80 0.0.0.7 area 0

network 10.64.62.88 0.0.0.7 area 0

network 10.64.62.96 0.0.0.7 area 0

network 10.64.62.104 0.0.0.7 area 0

network 10.64.62.112 0.0.0.7 area 0

network 10.64.62.120 0.0.0.3 area 0

network 10.64.62.124 0.0.0.3 area 0

network 10.64.62.128 0.0.0.3 area 0

network 10.64.62.132 0.0.0.3 area 0

network 10.64.62.136 0.0.0.3 area 0

network 10.64.62.140 0.0.0.0 area 0

network 10.64.62.141 0.0.0.0 area 0

network 10.64.62.142 0.0.0.0 area 0

network 10.64.62.143 0.0.0.0 area 0

network 192.168.64.0 0.0.0.255 area 0

!

ip nat pool NETWORK 10.64.62.142 10.64.62.142 netmask 255.255.255.255

ip nat inside source list 10 pool NETWORK overload

ip classless

ip route 0.0.0.0 0.0.0.0 10.64.62.105

ip route 0.0.0.0 0.0.0.0 10.64.62.113

!

ip flow-export version 9

!

!

access-list 10 permit 192.168.64.0 0.0.0.255

access-list 101 permit icmp 10.64.62.88 0.0.0.7 10.64.62.80 0.0.0.7 echo-reply

access-list 101 permit icmp 10.64.62.80 0.0.0.7 10.64.62.88 0.0.0.7 echo-reply

access-list 101 deny icmp any any echo-reply

access-list 101 permit ip any any

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

!

line con 0

password 7 0822455D0A16

login

!

line aux 0

!

line vty 0 4

access-class 20 in

password 7 0822455D0A16

login

transport input ssh

!

!

!

end

**FOB Hood Switch**

FOBHOODSWITCH#show run

Building configuration...

Current configuration : 2662 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname FOBHOODSWITCH

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

ip domain-name bornstallings

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport mode trunk

!

interface FastEthernet0/2

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/3

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/4

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/5

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/6

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/7

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/8

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/9

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/10

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/11

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/12

switchport access vlan 300

switchport mode access

!

interface FastEthernet0/13

switchport access vlan 300

switchport mode access

!

interface FastEthernet0/14

switchport access vlan 300

switchport mode access

!

interface FastEthernet0/15

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/16

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/17

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/18

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/19

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/20

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/21

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/22

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/23

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/24

switchport access vlan 200

switchport mode access

!

interface GigabitEthernet0/1

!

interface GigabitEthernet0/2

!

interface Vlan1

no ip address

shutdown

!

interface Vlan500

mac-address 000c.85d4.c68b

ip address 10.64.62.82 255.255.255.248

!

ip default-gateway 10.64.62.81

!

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

line con 0

password 7 0822455D0A16

login

!

line vty 0 4

password 7 0822455D0A16

login

transport input ssh

line vty 5 15

login

!

end

**FOB Bliss Router**

Current configuration : 2422 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname FOBBLISSROUTER

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

no ip cef

no ipv6 cef

!

ip domain-name bornstallings

!

spanning-tree mode pvst

!

interface Loopback0

ip address 10.64.62.141 255.255.255.255

!

interface FastEthernet0/0

ip address 10.64.62.106 255.255.255.248

ip nat outside

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 10.64.62.115 255.255.255.248

ip nat outside

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

ip nat inside

duplex auto

speed auto

!

interface FastEthernet1/0.100

encapsulation dot1Q 100

ip address 192.168.74.1 255.255.255.0

ip nat inside

!

interface FastEthernet1/0.200

encapsulation dot1Q 200

ip address 10.64.62.65 255.255.255.240

ip nat inside

!

interface FastEthernet1/0.500

encapsulation dot1Q 500

ip address 10.64.62.89 255.255.255.248

ip nat inside

!

interface FastEthernet1/1

ip address 10.64.62.121 255.255.255.252

ip nat outside

duplex auto

speed auto

!

interface Vlan1

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 10.64.0.0 0.0.0.255 area 0

network 10.64.62.0 0.0.0.63 area 0

network 10.64.62.64 0.0.0.15 area 0

network 10.64.62.80 0.0.0.7 area 0

network 10.64.62.88 0.0.0.7 area 0

network 10.64.62.96 0.0.0.7 area 0

network 10.64.62.104 0.0.0.7 area 0

network 10.64.62.112 0.0.0.7 area 0

network 10.64.62.120 0.0.0.3 area 0

network 10.64.62.124 0.0.0.3 area 0

network 10.64.62.128 0.0.0.3 area 0

network 10.64.62.132 0.0.0.3 area 0

network 10.64.62.136 0.0.0.3 area 0

network 10.64.62.140 0.0.0.0 area 0

network 10.64.62.141 0.0.0.0 area 0

network 10.64.62.142 0.0.0.0 area 0

network 10.64.62.143 0.0.0.0 area 0

network 192.168.74.0 0.0.0.255 area 0

!

ip nat pool NETWORK 10.64.62.141 10.64.62.141 netmask 255.255.255.255

ip nat inside source list 10 pool NETWORK overload

ip classless

ip route 0.0.0.0 0.0.0.0 10.64.62.105

ip route 0.0.0.0 0.0.0.0 10.64.62.113

!

ip flow-export version 9

!

!

access-list 10 permit 192.168.74.0 0.0.0.255

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

!

line con 0

password 7 0822455D0A16

login

!

line aux 0

!

line vty 0 4

access-class 20 in

password 7 0822455D0A16

login

transport input ssh

!

end

**FOB Bliss Switch**

Current configuration : 2579 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname FOBBLISSSWITCH

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

ip domain-name bornstallings

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport mode trunk

!

interface FastEthernet0/2

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/3

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/4

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/5

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/6

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/7

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/8

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/9

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/10

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/11

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/12

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/13

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/14

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/15

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/16

switchport access vlan 100

switchport mode access

!

interface FastEthernet0/17

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/18

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/19

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/20

switchport access vlan 500

switchport mode access

!

interface FastEthernet0/21

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/22

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/23

switchport access vlan 200

switchport mode access

!

interface FastEthernet0/24

switchport access vlan 200

switchport mode access

!

interface GigabitEthernet0/1

!

interface GigabitEthernet0/2

!

interface Vlan1

no ip address

shutdown

!

interface Vlan500

mac-address 0030.f204.a79c

ip address 10.64.62.90 255.255.255.248

!

ip default-gateway 10.64.62.89

!

line con 0

password 7 0822455D0A16

login

!

line vty 0 4

password 7 0822455D0A16

login

transport input ssh

line vty 5 15

login

!

End

**COP Carson Router**

COPCARSONROUTER#show run

Building configuration...

Current configuration : 1619 bytes

!

version 12.4

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname COPCARSONROUTER

!

enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0

!

no ip cef

no ipv6 cef

!

ip domain-name bornstallings

!

spanning-tree mode pvst

!

interface Loopback0

ip address 10.64.62.143 255.255.255.255

!

interface FastEthernet0/0

ip address 10.64.62.122 255.255.255.252

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 10.64.62.125 255.255.255.252

duplex auto

speed auto

!

interface Vlan1

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 10.64.0.0 0.0.0.255 area 0

network 10.64.62.0 0.0.0.63 area 0

network 10.64.62.64 0.0.0.15 area 0

network 10.64.62.80 0.0.0.7 area 0

network 10.64.62.88 0.0.0.7 area 0

network 10.64.62.96 0.0.0.7 area 0

network 10.64.62.104 0.0.0.7 area 0

network 10.64.62.112 0.0.0.7 area 0

network 10.64.62.120 0.0.0.3 area 0

network 10.64.62.124 0.0.0.3 area 0

network 10.64.62.128 0.0.0.3 area 0

network 10.64.62.132 0.0.0.3 area 0

network 10.64.62.136 0.0.0.3 area 0

network 10.64.62.140 0.0.0.0 area 0

network 10.64.62.141 0.0.0.0 area 0

network 10.64.62.142 0.0.0.0 area 0

network 10.64.62.143 0.0.0.0 area 0

!

ip classless

ip route 0.0.0.0 0.0.0.0 10.64.62.141

!

ip flow-export version 9

!

access-list 20 permit 10.64.62.80 0.0.0.7

access-list 20 permit 10.64.62.88 0.0.0.7

!

line con 0

password 7 0822455D0A16

login

!

line aux 0

!

line vty 0 4

access-class 20 in

password 7 0822455D0A16

login

transport input ssh

!

end

**VLAN Database from switches show vlan**

**FOB Hood Switch**

FOBHOODSWITCH#show vlan brief

VLAN Name Status Ports

---- -------------------------------- --------- -------------------------------

1 default active Gig0/1, Gig0/2

100 DATA active Fa0/2, Fa0/3, Fa0/4, Fa0/5

Fa0/6, Fa0/7, Fa0/8, Fa0/9

Fa0/10, Fa0/11

200 VOIP active Fa0/21, Fa0/22, Fa0/23, Fa0/24

300 SERVERS active Fa0/12, Fa0/13, Fa0/14

500 MANAGEMENT active Fa0/15, Fa0/16, Fa0/17, Fa0/18

Fa0/19, Fa0/20

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

**FOB Bliss Switch**

FOBBLISSSWITCH#show vlan brief

VLAN Name Status Ports

---- -------------------------------- --------- -------------------------------

1 default active Gig0/1, Gig0/2

100 DATA active Fa0/2, Fa0/3, Fa0/4, Fa0/5

Fa0/6, Fa0/7, Fa0/8, Fa0/9

Fa0/10, Fa0/11, Fa0/12, Fa0/13

Fa0/14, Fa0/15, Fa0/16

200 VOIP active Fa0/21, Fa0/22, Fa0/23, Fa0/24

300 SERVERS active

500 MANAGEMENT active Fa0/17, Fa0/18, Fa0/19, Fa0/20

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

**2.d Routing Tables show ip route**

**Metropolis Router**

METROPOLIS#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 10.64.0.254 to network 0.0.0.0

10.0.0.0/8 is variably subnetted, 16 subnets, 6 masks

C 10.64.0.0/24 is directly connected, FastEthernet0/0

O 10.64.62.0/26 [110/2] via 10.64.62.107, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.114, 01:45:38, FastEthernet1/0

O 10.64.62.64/28 [110/2] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.115, 01:45:38, FastEthernet1/0

O 10.64.62.80/29 [110/2] via 10.64.62.107, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.114, 01:45:38, FastEthernet1/0

O 10.64.62.88/29 [110/2] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.115, 01:45:38, FastEthernet1/0

O 10.64.62.96/29 [110/2] via 10.64.62.107, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.114, 01:45:38, FastEthernet1/0

C 10.64.62.104/29 is directly connected, FastEthernet0/1

C 10.64.62.112/29 is directly connected, FastEthernet1/0

O 10.64.62.120/30 [110/2] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.115, 01:45:38, FastEthernet1/0

O 10.64.62.124/30 [110/3] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/3] via 10.64.62.115, 01:45:38, FastEthernet1/0

C 10.64.62.132/30 is directly connected, FastEthernet0/1.10

C 10.64.62.136/30 is directly connected, FastEthernet1/0.10

C 10.64.62.140/32 is directly connected, Loopback0

O 10.64.62.141/32 [110/2] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.115, 01:45:38, FastEthernet1/0

O 10.64.62.142/32 [110/2] via 10.64.62.107, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.114, 01:45:38, FastEthernet1/0

O 10.64.62.143/32 [110/3] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/3] via 10.64.62.115, 01:45:38, FastEthernet1/0

O 192.168.64.0/24 [110/2] via 10.64.62.107, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.114, 01:45:38, FastEthernet1/0

O 192.168.74.0/24 [110/2] via 10.64.62.106, 01:45:38, FastEthernet0/1

[110/2] via 10.64.62.115, 01:45:38, FastEthernet1/0

S\* 0.0.0.0/0 [1/0] via 10.64.0.254

**FOB Hood Router**

FOBHOODROUTER#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 10.64.62.105 to network 0.0.0.0

10.0.0.0/8 is variably subnetted, 16 subnets, 6 masks

O 10.64.0.0/24 [110/2] via 10.64.62.105, 01:44:24, FastEthernet0/1

[110/2] via 10.64.62.113, 01:44:24, FastEthernet0/0

C 10.64.62.0/26 is directly connected, FastEthernet1/0.200

O 10.64.62.64/28 [110/2] via 10.64.62.106, 01:53:17, FastEthernet0/1

[110/2] via 10.64.62.115, 01:53:17, FastEthernet0/0

C 10.64.62.80/29 is directly connected, FastEthernet1/0.500

O 10.64.62.88/29 [110/2] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/2] via 10.64.62.115, 02:19:49, FastEthernet0/0

C 10.64.62.96/29 is directly connected, FastEthernet1/0.300

C 10.64.62.104/29 is directly connected, FastEthernet0/1

C 10.64.62.112/29 is directly connected, FastEthernet0/0

O 10.64.62.120/30 [110/2] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/2] via 10.64.62.115, 02:19:49, FastEthernet0/0

O 10.64.62.124/30 [110/3] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/3] via 10.64.62.115, 02:19:49, FastEthernet0/0

O 10.64.62.132/30 [110/2] via 10.64.62.105, 01:44:24, FastEthernet0/1

[110/2] via 10.64.62.113, 01:44:24, FastEthernet0/0

O 10.64.62.136/30 [110/2] via 10.64.62.105, 01:44:24, FastEthernet0/1

[110/2] via 10.64.62.113, 01:44:24, FastEthernet0/0

O 10.64.62.140/32 [110/2] via 10.64.62.105, 01:44:24, FastEthernet0/1

[110/2] via 10.64.62.113, 01:44:24, FastEthernet0/0

O 10.64.62.141/32 [110/2] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/2] via 10.64.62.115, 02:19:49, FastEthernet0/0

C 10.64.62.142/32 is directly connected, Loopback0

O 10.64.62.143/32 [110/3] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/3] via 10.64.62.115, 02:19:49, FastEthernet0/0

C 192.168.64.0/24 is directly connected, FastEthernet1/0.100

O 192.168.74.0/24 [110/2] via 10.64.62.106, 02:19:49, FastEthernet0/1

[110/2] via 10.64.62.115, 02:19:49, FastEthernet0/0

S\* 0.0.0.0/0 [1/0] via 10.64.62.105

[1/0] via 10.64.62.113

**FOB Bliss Router**

FOBBLISSROUTER#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 10.64.62.105 to network 0.0.0.0

10.0.0.0/8 is variably subnetted, 16 subnets, 6 masks

O 10.64.0.0/24 [110/2] via 10.64.62.105, 01:46:31, FastEthernet0/0

[110/2] via 10.64.62.113, 01:46:31, FastEthernet0/1

O 10.64.62.0/26 [110/2] via 10.64.62.107, 02:21:55, FastEthernet0/0

[110/2] via 10.64.62.114, 02:21:55, FastEthernet0/1

C 10.64.62.64/28 is directly connected, FastEthernet1/0.200

O 10.64.62.80/29 [110/2] via 10.64.62.107, 02:21:55, FastEthernet0/0

[110/2] via 10.64.62.114, 02:21:55, FastEthernet0/1

C 10.64.62.88/29 is directly connected, FastEthernet1/0.500

O 10.64.62.96/29 [110/2] via 10.64.62.107, 02:21:55, FastEthernet0/0

[110/2] via 10.64.62.114, 02:21:55, FastEthernet0/1

C 10.64.62.104/29 is directly connected, FastEthernet0/0

C 10.64.62.112/29 is directly connected, FastEthernet0/1

C 10.64.62.120/30 is directly connected, FastEthernet1/1

O 10.64.62.124/30 [110/2] via 10.64.62.122, 05:32:48, FastEthernet1/1

O 10.64.62.132/30 [110/2] via 10.64.62.105, 01:46:31, FastEthernet0/0

[110/2] via 10.64.62.113, 01:46:31, FastEthernet0/1

O 10.64.62.136/30 [110/2] via 10.64.62.105, 01:46:31, FastEthernet0/0

[110/2] via 10.64.62.113, 01:46:31, FastEthernet0/1

O 10.64.62.140/32 [110/2] via 10.64.62.105, 01:46:31, FastEthernet0/0

[110/2] via 10.64.62.113, 01:46:31, FastEthernet0/1

C 10.64.62.141/32 is directly connected, Loopback0

O 10.64.62.142/32 [110/2] via 10.64.62.107, 02:21:55, FastEthernet0/0

[110/2] via 10.64.62.114, 02:21:55, FastEthernet0/1

O 10.64.62.143/32 [110/2] via 10.64.62.122, 04:25:58, FastEthernet1/1

O 192.168.64.0/24 [110/2] via 10.64.62.107, 02:21:55, FastEthernet0/0

[110/2] via 10.64.62.114, 02:21:55, FastEthernet0/1

C 192.168.74.0/24 is directly connected, FastEthernet1/0.100

S\* 0.0.0.0/0 [1/0] via 10.64.62.105

[1/0] via 10.64.62.113

**COP Carson Router**

COPCARSONROUTER#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is 10.64.62.141 to network 0.0.0.0

10.0.0.0/8 is variably subnetted, 16 subnets, 6 masks

O 10.64.0.0/24 [110/3] via 10.64.62.121, 01:46:56, FastEthernet0/0

O 10.64.62.0/26 [110/3] via 10.64.62.121, 02:22:21, FastEthernet0/0

O 10.64.62.64/28 [110/2] via 10.64.62.121, 01:55:49, FastEthernet0/0

O 10.64.62.80/29 [110/3] via 10.64.62.121, 02:22:21, FastEthernet0/0

O 10.64.62.88/29 [110/2] via 10.64.62.121, 05:33:19, FastEthernet0/0

O 10.64.62.96/29 [110/3] via 10.64.62.121, 02:22:21, FastEthernet0/0

O 10.64.62.104/29 [110/2] via 10.64.62.121, 04:56:23, FastEthernet0/0

O 10.64.62.112/29 [110/2] via 10.64.62.121, 02:43:43, FastEthernet0/0

C 10.64.62.120/30 is directly connected, FastEthernet0/0

C 10.64.62.124/30 is directly connected, FastEthernet0/1

O 10.64.62.132/30 [110/3] via 10.64.62.121, 01:46:56, FastEthernet0/0

O 10.64.62.136/30 [110/3] via 10.64.62.121, 01:46:56, FastEthernet0/0

O 10.64.62.140/32 [110/3] via 10.64.62.121, 01:46:56, FastEthernet0/0

O 10.64.62.141/32 [110/2] via 10.64.62.121, 05:33:19, FastEthernet0/0

O 10.64.62.142/32 [110/3] via 10.64.62.121, 02:22:21, FastEthernet0/0

C 10.64.62.143/32 is directly connected, Loopback0

O 192.168.64.0/24 [110/3] via 10.64.62.121, 02:22:21, FastEthernet0/0

O 192.168.74.0/24 [110/2] via 10.64.62.121, 05:33:19, FastEthernet0/0

S\* 0.0.0.0/0 [1/0] via 10.64.62.141

**3. Lessons Learned**

This project reinforced everything we learned throughout the course. We had to not only configure all deceives, but create an entire network. It was interesting to play with different configurations while attempting to optimize the functionality of the network. We learned that there are many right answers to solve this problem, but not all answers that work are optimal. This was a great final project that accumulated everything we learned this semester into one final submission.

**4. Difficulties**

Our original difficulty was attempting to simultaneously work on packet tracer and update all devices while working on different PC’s. We solved this by using GitHub, and coordinating who was going to do what, and when the updated packet tracer was uploaded to the server. With the network, our biggest difficulty was trying to get around the packet tracer set up of the wireless routers not passing ICMP packets through to the connected devices. However, with the help of our instructor we were able to work around this issue.

**5. Recommendations for Improvement**

One recommendation we had to improve the effectiveness of the project would be in the initial IPR/Final brief, either require an IPR and not a brief, or just require the brief. As shown in our class, the IPR opportunity was not utilized and many people did not learn what they should have out of just the presentation. The network problem itself was very well set up, easy to understand and difficult enough to solve.

**6. Conclusion**

In conclusion, we both learned a lot about networks, the big army as a cyber system, and intermediate technology (GitHub) that will be useful throughout our army and (probably) civilian careers. We both really enjoyed this class and Major Yim as an instructor.

**7. Resources**

None.