FINAL TASK

Computer Networks

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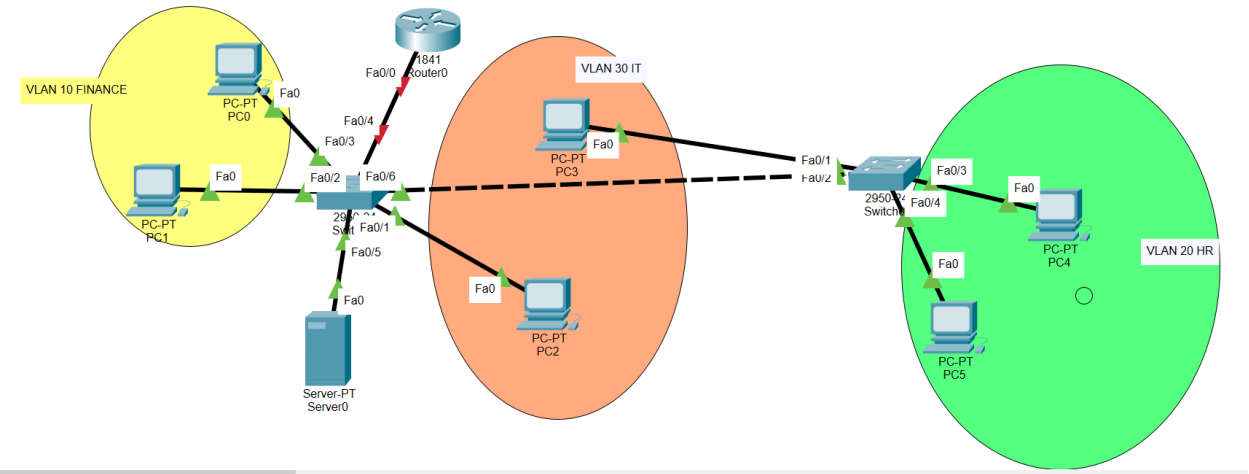
Question 01: pkt file is attached

Question 02: A text file with all configuration commands used.

PART 1: Network Topology



PART 2: VLANs & Trunking

Switch 0

```
Switch>en
Switch#CONFIG T
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#^Z
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name finance
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name HR
Switch(config-vlan)#vlan 30
Switch(config-vlan)#name IT
Switch(config-vlan)#exit
Switch(config)#
```

```
Switch>en
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#interface fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#interface fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#interface fa0/4
Switch(config-if)#switchport mode trunk
Switch(config-if)#interface fa0/6
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
```

```
Switch(config-if)#interface fa0/5
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#
```

```
Switch#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/4, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/10, Fa0/11, Fa0/12, Fa0/13
                                                Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24
10   finance                          active    Fa0/2, Fa0/3
20   HR                               active
30   IT                               active    Fa0/1, Fa0/5
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/6       on           802.1q         trunking      1

Port        Vlans allowed on trunk
Fa0/6       1-1005

Port        Vlans allowed and active in management domain
Fa0/6       1,10,20,30

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/6       1,10,20,30
```

Switch 1

```
Switch#en
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name finance
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name HR
Switch(config-vlan)#vlan 30
Switch(config-vlan)#name IT
Switch(config-vlan)#exit
```

```
Switch(config)#interface fa0/3
Switch(config-if)#switchport access mode
                                  ^
% Invalid input detected at '^' marker.

Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#interface fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
```

```
Switch(config-if)#interface fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#interface fa0/1
Switch(config-if)#switchport mode trunk
```

```
Switch#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/6, Fa0/7, Fa0/8, Fa0/9
                                                Fa0/10, Fa0/11, Fa0/12, Fa0/13
                                                Fa0/14, Fa0/15, Fa0/16, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24
10   finance                          active
20   HR                               active    Fa0/3, Fa0/4
30   IT                               active    Fa0/2, Fa0/5
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/1       on           802.1q         trunking      1

Port        Vlans allowed on trunk
Fa0/1       1-1005

Port        Vlans allowed and active in management domain
Fa0/1       1,10,20,30

Port        Vlans in spanning tree forwarding state and not pruned
Fa0/1       1,10,20,30
```

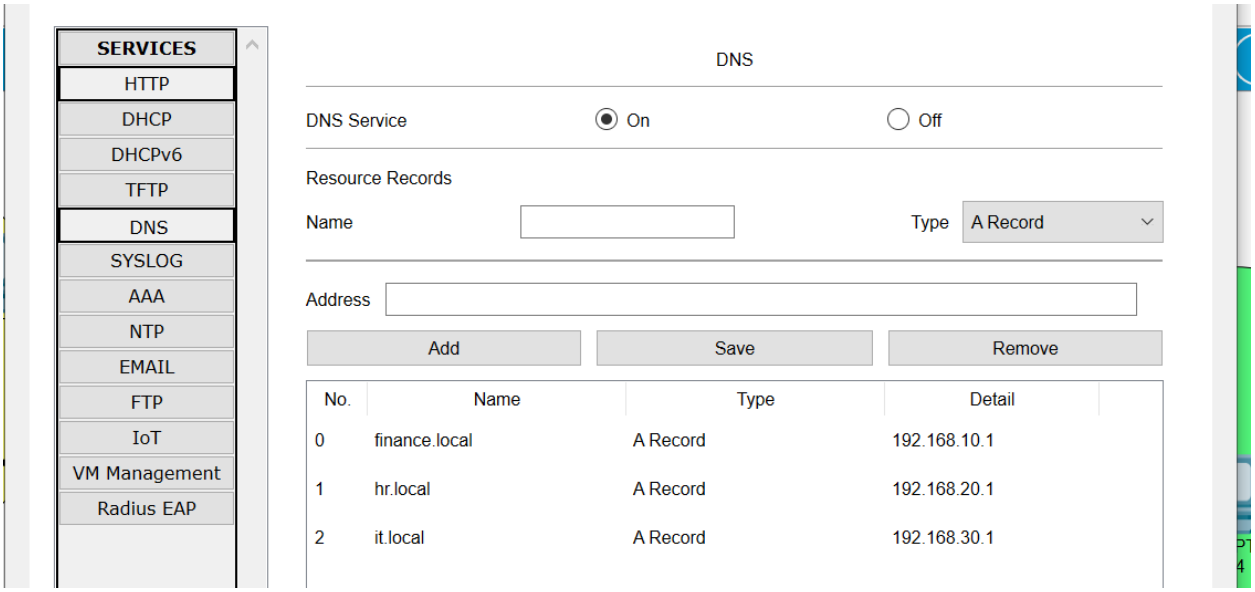
PART 3: Inter-VLAN Routing (Router-on-a-Stick)

```
Router0#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router0(config)#! vlan 10-finance DHCP relay
Router0(config)#interface fa0/0.10
Router0(config-subif)#ip helper-address 192.168.30.10
Router0(config-subif)#! vlan 20-HR DHCP relay
Router0(config-subif)#interface fa0/0.20
Router0(config-subif)#ip helper-address 192.168.30.10
```

```
Router0>en
Router0#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router0(config)#!vlan 10 - finance
Router0(config)#interface fa0/0.10
Router0(config-subif)#encapsulation dot1Q 10
Router0(config-subif)#ip address 192.168.10.1 255.255.255.0
Router0(config-subif)#no shutdown
Router0(config-subif)#exit
Router0(config)#!vlan 20-HR
Router0(config)#interface fa0/0.20
Router0(config-subif)#encapsulation dot1Q 20
Router0(config-subif)#ip address 192.168.20.1 255.255.255.0
Router0(config-subif)#no shutdown
Router0(config-subif)#exit
Router0(config)#
Router0(config)#!vlan 30-IT
Router0(config)#interface fa0/0.30
Router0(config-subif)#ip address 192.168.30.1 255.255.255.0
Router0(config-subif)#no shutdown
Router0(config-subif)#encapsulation dot1Q 30
Router0(config-subif)#ip address 192.168.30.1 255.255.255.0
Router0(config-subif)#no shutdown
Router0(config-subif)#exit
Router0(config)#
```

Part 4: DHCP & DNS Server

```
Router0>en
Router0#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router0(config)#ip dhcp excluded-address 192.168.10.1
Router0(config)#ip dhcp excluded-address 192.168.20.1
Router0(config)#ip dhcp excluded-address 192.168.30.1
Router0(config)#
Router0(config)#ip dhcp pool vlan10
Router0(dhcp-config)#network 192.168.10.0 255.255.255.0
Router0(dhcp-config)#default-router 192.168.10.1
Router0(dhcp-config)#exit
Router0(config)#
Router0(config)#ip dhcp pool vlan20
Router0(dhcp-config)#network 192.168.20.0 255.255.255.0
Router0(dhcp-config)#default-router 192.168.20.1
Router0(dhcp-config)#exit
Router0(config)#
Router0(config)#ip dhcp pool vlan30
Router0(dhcp-config)#network 192.168.30.0 255.255.255.0
Router0(dhcp-config)#default-router 192.168.30.1
Router0(dhcp-config)#exit
Router0(config)#exit
```



PART 05: ACL Security

```
Router0#
Router0#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router0(config)#ip access-list extended BLOCK_FIN_HR
Router0(config-ext-nacl)#deny ip 192.168.10.0 0.0.0.255 192.168.20.0 0.0.0.255
Router0(config-ext-nacl)#deny ip 192.168.20.0 0.0.0.255 192.168.10.0 0.0.0.255
Router0(config-ext-nacl)#permit ip any any
Router0(config-ext-nacl)#! Apply on vlan10 & vlan 20 sub-interfaces
Router0(config-ext-nacl)#interface fa0/0.10
Router0(config-subif)#ip access-group BLOCK_FIN_HR in
Router0(config-subif)#exit
Router0(config)#interface fa0/0.20
Router0(config-subif)#ip access-group BLOCK_FIN_HR in
Router0(config-subif)#exit
Router0(config)#ip access-list extended DNS_ONLY_IT
Router0(config-ext-nacl)#permit tcp 192.168.30.0 0.0.0.255 host 192.168.30.10 eq 53
Router0(config-ext-nacl)#permit udp 192.168.30.0 0.0.0.255 host 192.168.30.10 eq 53
Router0(config-ext-nacl)#deny tcp any host 192.168.30.10 eq 53
Router0(config-ext-nacl)#deny udp any host 192.168.30.10 eq 53
Router0(config-ext-nacl)#permit ip any any
Router0(config-ext-nacl)#! Apply on vlan30
Router0(config-ext-nacl)#interface fa0/0.30
Router0(config-subif)#ip access-group DNS-ONLY-IT in
Router0(config-subif)#exit
Router0(config)#ip access-list extended HR_NO_PING_FIN
Router0(config-ext-nacl)#deny icmp 192.168.20.0 0.0.0.255 192.168.10.0 0.0.0.255
Router0(config-ext-nacl)#permit ip any any
Router0(config-ext-nacl)#! Apply on vlan20
Router0(config-ext-nacl)#interface fa0/0.20
Router0(config-subif)#ip access-group HR_NO_PING_FIN out
Router0(config-subif)#exit
Router0(config)#end
Router0#
%SYS-5-CONFIG_I: Configured from console by console
```

3: SCREEN SHOOTS SHOWING PING TESTS.

From Finance PC

```
C:\>nslookup finance.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out

C:\>nslookup hr.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out

C:\>nslookup it.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out
```

```
C:\>ping 192.168.30.4

Pinging 192.168.30.4 with 32 bytes of data:

Request timed out.
Reply from 192.168.30.4: bytes=32 time=1ms TTL=127
Reply from 192.168.30.4: bytes=32 time=1ms TTL=127
Reply from 192.168.30.4: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.
Reply from 192.168.10.1: Destination host unreachable.

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

From HR PC

```
C:\>nslookup finance.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out

C:\>nslookup hr.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out

C:\>nslookup it.local

Server: [255.255.255.255]
Address:   255.255.255.255
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
DNS request timed out.
                timeout was 15000 milli seconds.
*** Request to 0.0.0.0 timed-out
```

```
Packet Tracer PC Command Line 1.0
C:\>192.168.10.2
Invalid Command.

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.20.1: Destination host unreachable.
Reply from 192.168.20.1: Destination host unreachable.
Reply from 192.168.20.1: Destination host unreachable.
Reply from 192.168.20.1: Destination host unreachable.

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.30.4

Pinging 192.168.30.4 with 32 bytes of data:

Reply from 192.168.30.4: bytes=32 time=1ms TTL=127
Reply from 192.168.30.4: bytes=32 time=10ms TTL=127
Reply from 192.168.30.4: bytes=32 time=11ms TTL=127
Reply from 192.168.30.4: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.30.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 5ms

C:\>
```

From IT Pc

```
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.2: bytes=32 time=2ms TTL=127
Reply from 192.168.20.2: bytes=32 time=3ms TTL=127
Reply from 192.168.20.2: bytes=32 time=19ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 19ms, Average = 8ms

C:\>ping 192.168.30.4

Pinging 192.168.30.4 with 32 bytes of data:

Reply from 192.168.30.4: bytes=32 time=2ms TTL=128
Reply from 192.168.30.4: bytes=32 time<1ms TTL=128
Reply from 192.168.30.4: bytes=32 time=2ms TTL=128
Reply from 192.168.30.4: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.30.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

```
C:\>nslookup finance.local

Server: [255.255.255.255]
Address:   255.255.255.255

Non-authoritative answer:
Name:   finance.local
Address:   192.168.10.1

C:\>nslookup hr.local

Server: [255.255.255.255]
Address:   255.255.255.255

Non-authoritative answer:
Name:   hr.local
Address:   192.168.20.1

C:\>nslookup it.local

Server: [255.255.255.255]
Address:   255.255.255.255

Non-authoritative answer:
Name:   it.local
Address:   192.168.30.1

C:\>
```