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LAB 2:

11.10.1: Packet Tracer - Design and Implement a VLSM Addressing Scheme

Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
East	G0/0	10.1.1.97	255.255.255.240	N/A
	G0/1	10.1.1.65	255.255.255.224	N/A
	S0/0/0	10.1.1.121	255.255.255.252	N/A
West	G0/0	10.1.1.113	255.255.255.248	N/A
	G0/1	10.1.1.1	255.255.255.192	N/A
	S0/0/0	10.1.1.122	255.255.255.252	N/A
ES-1	VLAN 1	10.1.1.98	255.255.255.240	10.1.1.97
ES-2	VLAN 1	10.1.1.66	255.255.255.224	10.1.1.65
WS-1	VLAN 1	10.1.1.114	255.255.255.248	10.1.1.113
WS-2	VLAN 1	10.1.1.2	255.255.255.192	10.1.1.1
E1-22	NIC	10.1.1.110	255.255.255.240	10.1.1.97
E2-47	NIC	10.1.1.94	255.255.255.224	10.1.1.65
W1-201	NIC	10.1.1.118	255.255.255.248	10.1.1.113
W2-87	NIC	10.1.1.62	255.255.255.192	10.1.1.1

Objectives

In this lab you will design a VLSM addressing scheme given a network address and host requirements. You will configure addressing on routers, switches, and network hosts.

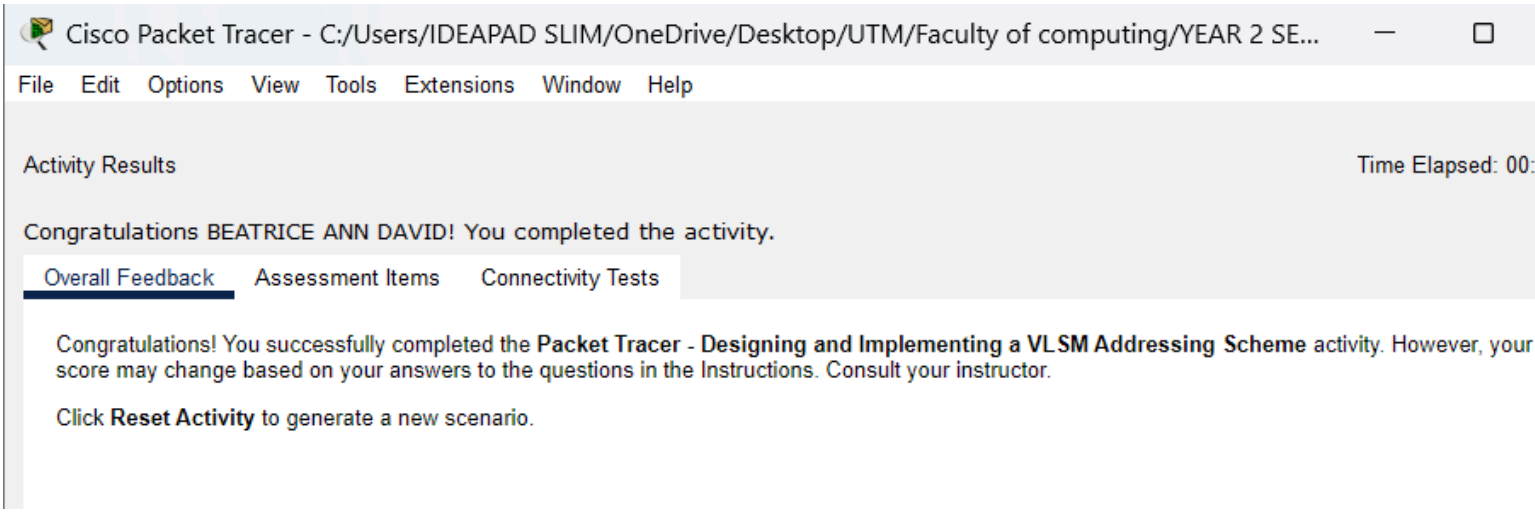
- Design a VLSM IP addressing scheme given requirements.
- Configure addressing on network devices and hosts.
- Verify IP connectivity.
- Troubleshoot connectivity issues as required.

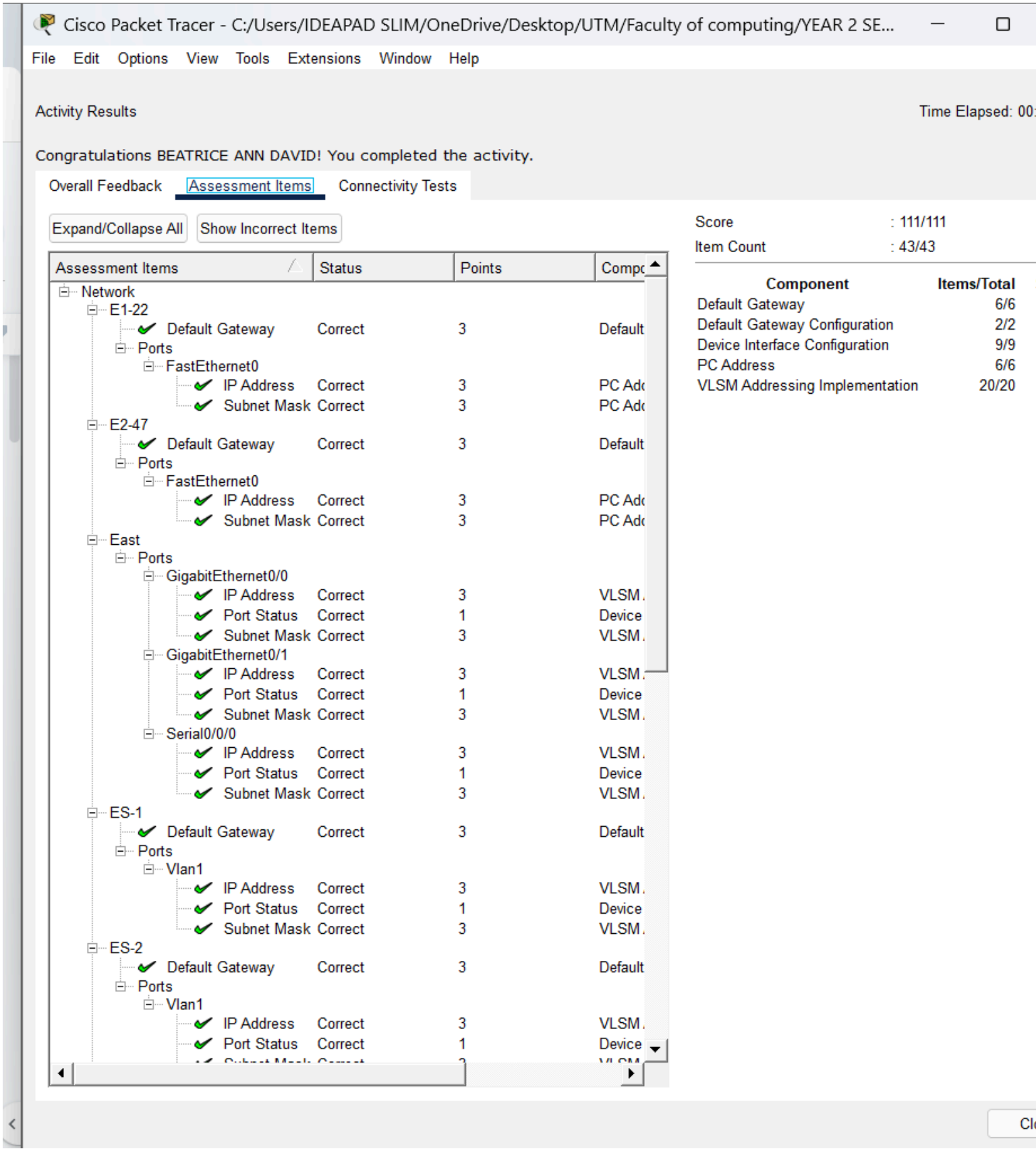
Background / Scenario

You have been asked to design, implement, and test an addressing scheme for a customer. The customer has given you the network address that is suitable for the network, the topology, and the host requirements. You will implement and test your design.

Screenshots:

A. Results





B. Working

You have been given the network address by your customer. The host address requirements are:

Requirements

Host Requirements:

LAN	Number of Addresses Required
ES-1	11
ES-2	28
WS-1	5
WS-2	47

Design Requirements

- Create the addressing design. Follow guidelines provided in the curriculum regarding the order of the subnets.
- The subnets should be contiguous. There should be no unused address space between subnets.
- Provide the most efficient subnet possible for the point-to-point link between the routers.

- Document your design in a table such as the one below.

Subnet Description	Number of Hosts Needed	Subnet Mask	Network Address/CIDR	First Usable Host Address	Last Usable Host Address	Broadcast Address
WS-2	47	255.255.255.192	10.1.1.0	10.1.1.1	10.1.1.62	10.1.1.63
ES-2	28	255.255.255.224	10.1.1.64	10.1.1.65	10.1.1.96	10.1.1.95
ES-1	11	255.255.255.240	10.1.1.96	10.1.1.97	10.1.1.110	10.1.1.111
WS-1	5	255.255.255.248	10.1.1.112	10.1.1.113	10.1.1.118	10.1.1.119
WAN LINK	2	255.255.255.252	10.1.1.120	10.1.1.121	10.1.1.122	10.1.1.122

Configuration Requirements

Note: You will configure addressing on **all** devices and hosts in the network.

- Assign the first usable IP addresses in the appropriate subnets to Police for the two LAN links and the WAN link.
- Assign the first usable IP addresses in the appropriate subnets to Schools for the two LANs links. Assign the last usable IP address for the WAN link.
- Assign the second usable IP addresses in the appropriate subnets to the switches.
- The switch management interface should be reachable from hosts on all of the LANs.
- Assign the last usable IP addresses in the appropriate subnets to the hosts.

If the addressing design and implementation are correct, all hosts and devices should be reachable over the network.

```
East>enable
East#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
East(config)#interface gigabitEthernet0/0
East(config-if)#ip address 10.1.1.97 255.255.255.240
East(config-if)#no shutdown

East(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

East(config-if)#exit
East(config)#interface gigabitEthernet0/1
East(config-if)#ip address 10.1.1.65 255.255.255.224
East(config-if)#no shutdown

East(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

East(config-if)#exit
East(config)#interface serial0/0/0
East(config-if)#ip address 10.1.1.121 255.255.255.252
East(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
East(config-if)#
East(config-if)#exit
East(config)#
```

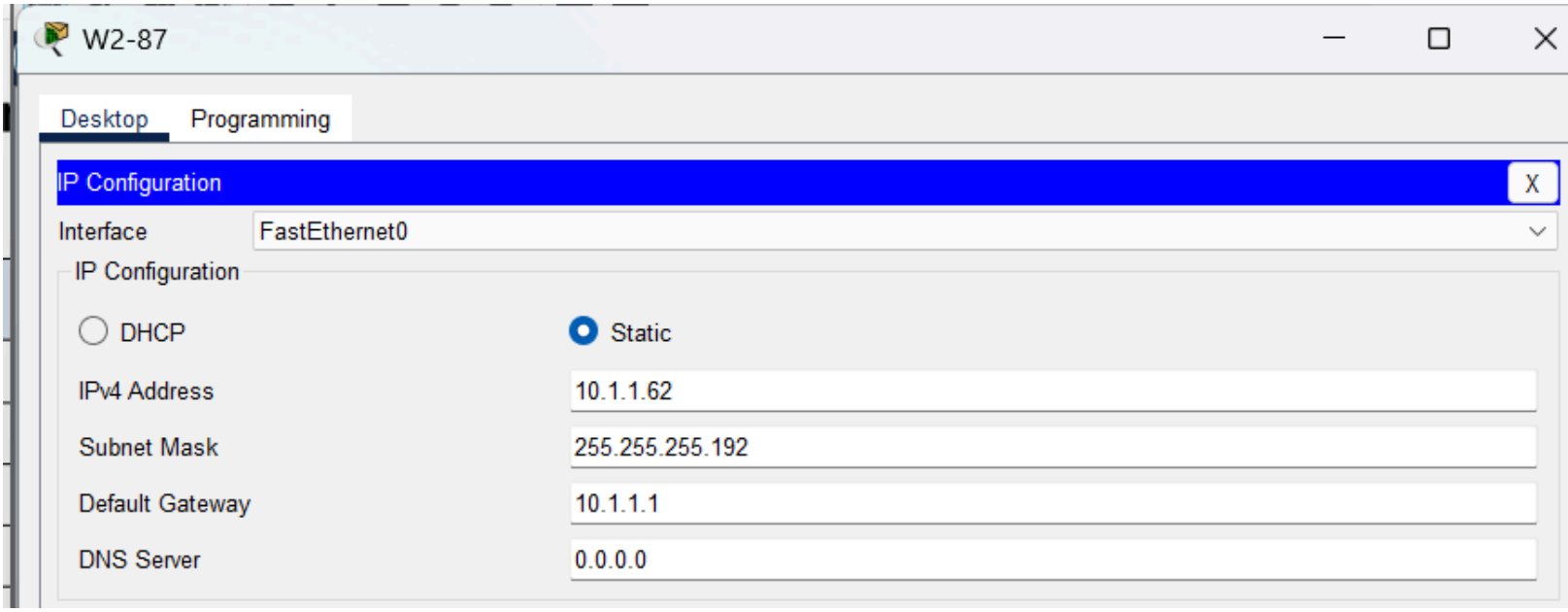
```
West>enable
West#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
West(config)#interface gigabitEthernet0/0
West(config-if)#ip address 10.1.1.113 255.255.255.248
West(config-if)#no shutdown

West(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

West(config-if)#exit
West(config)#interface gigabitEthernet0/1
West(config-if)#ip address 10.1.1.1 255.255.255.192
West(config-if)#no shutdown

West(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

West(config-if)#exit
West(config)#interface serial0/0/0
West(config-if)#ip address 10.1.1.122 255.255.255.252
West(config-if)#no shutdown

West(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

West(config-if)#exit
West(config)#
```

```
ES-1>enable
ES-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ES-1(config)#interface vlan 1
ES-1(config-if)# ip address 10.1.1.98 255.255.255.240
ES-1(config-if)#no shutdown

ES-1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

ES-1(config-if)#exit
ES-1(config)#ip default-gateway 10.1.1.97
ES-1(config)#
```

```
ES-2>enable
ES-2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ES-2(config)#interface vlan 1
ES-2(config-if)#ip address 10.1.1.66 255.255.255.224
ES-2(config-if)#no shutdown

ES-2(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

ES-2(config-if)#exit
ES-2(config)#ip default-gateway 10.1.1.65
ES-2(config)#
```

```
WS-1>enable
WS-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
WS-1(config)#interface vlan 1
WS-1(config-if)#ip address 10.1.1.114 255.255.255.248
WS-1(config-if)#no shutdown

WS-1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

WS-1(config-if)#exit
WS-1(config)#ip default-gateway 10.1.1.113
WS-1(config)#
```

```
WS-2>enable
WS-2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
WS-2(config)#interface vlan 1
WS-2(config-if)#ip address 10.1.1.2 255.255.255.192
WS-2(config-if)#no shutdown

WS-2(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

WS-2(config-if)#exit
WS-2(config)#ip default-gateway 10.1.1.1
WS-2(config)#
```




```
C:\>ping 10.1.1.94

Pinging 10.1.1.94 with 32 bytes of data:

Reply from 10.1.1.94: bytes=32 time<1ms TTL=127
Reply from 10.1.1.94: bytes=32 time<1ms TTL=127
Reply from 10.1.1.94: bytes=32 time<1ms TTL=127
Reply from 10.1.1.94: bytes=32 time<1ms TTL=127

Ping statistics for 10.1.1.94:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.1.1.118

Pinging 10.1.1.118 with 32 bytes of data:

Request timed out.
Reply from 10.1.1.118: bytes=32 time=7ms TTL=126
Reply from 10.1.1.118: bytes=32 time=1ms TTL=126
Reply from 10.1.1.118: bytes=32 time=1ms TTL=126

Ping statistics for 10.1.1.118:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 7ms, Average = 3ms

C:\>ping 10.1.1.118

Pinging 10.1.1.118 with 32 bytes of data:

Reply from 10.1.1.118: bytes=32 time=14ms TTL=126
Reply from 10.1.1.118: bytes=32 time=1ms TTL=126
Reply from 10.1.1.118: bytes=32 time=6ms TTL=126
Reply from 10.1.1.118: bytes=32 time=10ms TTL=126

Ping statistics for 10.1.1.118:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 14ms, Average = 7ms

C:\>
```