**IERG4831**

**Lab 3: Implementation of intra-domain routing networks**

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**Task 0: Create the Network Topology**

* Record a screen dump of the network topology

Diagram

Description automatically generated

**Task 1: VTP and VLAN configuration**

* Record the switches configuration in this task.

SW1:

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| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/2  negotiation auto  !  interface GigabitEthernet1/3  negotiation auto  !  interface GigabitEthernet2/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet2/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet2/2  negotiation auto  !  interface GigabitEthernet2/3  negotiation auto  !  interface GigabitEthernet3/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet3/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet3/2  negotiation auto  !  interface GigabitEthernet3/3  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan112  no ip address  !  interface Vlan122  no ip address  !  interface Vlan124  no ip address  !  interface Vlan134  no ip address  !  interface Vlan144  no ip address  !  interface Vlan233  no ip address  !  interface Vlan244  no ip address  !  interface Vlan312  no ip address  !  interface Vlan344  no ip address  !  SW1(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3, Gi1/2, Gi1/3  Gi2/2, Gi2/3, Gi3/2  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  SW1(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0003.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Local updater ID is 0.0.0.0 (no valid interface found)  Feature VLAN:  --------------  VTP Operating Mode : Server  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW2:

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| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/2  negotiation auto  !  interface GigabitEthernet1/3  negotiation auto  !  interface GigabitEthernet2/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet2/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet2/2  negotiation auto  !  interface GigabitEthernet2/3  negotiation auto  !  interface GigabitEthernet3/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet3/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet3/2  negotiation auto  !  interface GigabitEthernet3/3  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW2(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3, Gi1/2, Gi1/3  Gi2/2, Gi2/3, Gi3/2  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW2(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0010.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_S1:

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| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_S1(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_S1(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0013.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_S2:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_S2(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_S2(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.000d.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_S3:

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| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_S3(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_S3#  \*Mar 14 04:10:56.273: %SYS-5-CONFIG\_I: Configured from console by console  SW\_S3#conf t  Enter configuration commands, one per line. End with CNTL/Z.  SW\_S3(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.000e.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_S4:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_S4(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  SW\_S4(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0017.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_E1:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_E1(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_E1(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0017.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_E2:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_E2(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_E2(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.001f.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_E3:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_E3(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_E3(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0006.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_E4:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_E4(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_E4(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0009.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_N1:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_N1(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_N1(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.000c.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_N2:

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| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_N2(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_N2(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.001d.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_N3:

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| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_N3(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_N3(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0011.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_N4:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_N4(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_N4(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0005.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_W1:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_W1(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_W1(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0017.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_W2:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_W2(config)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_W2(config)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.001b.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_W3:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_W3(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_W3(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0009.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

SW\_W4:

|  |
| --- |
| !  interface GigabitEthernet0/0  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  SW\_W4(config-if)#do sh vlan  VLAN Name Status Ports  ---- -------------------------------- --------- -------------------------------  1 default active Gi0/0, Gi0/1, Gi0/2, Gi0/3  112 VL\_E1\_E2 active  122 VL\_E2\_S2 active  124 VL\_E2\_E4 active  134 VL\_E3\_E4 active  144 VL\_E1\_N1 active  233 VL\_S1\_W2 active  244 VL\_S1\_S2\_N1 active  312 VL\_W1\_W2 active  344 VL\_W1\_N1 active  1002 fddi-default act/unsup  1003 token-ring-default act/unsup  1004 fddinet-default act/unsup  1005 trnet-default act/unsup  SW\_W4(config-if)#do sh vtp status  VTP Version capable : 1 to 3  VTP version running : 1  VTP Domain Name : CUHK  VTP Pruning Mode : Disabled  VTP Traps Generation : Disabled  Device ID : 5254.0005.8000  Configuration last modified by 0.0.0.0 at 3-14-23 03:37:19  Feature VLAN:  --------------  VTP Operating Mode : Client  Maximum VLANs supported locally : 1005  Number of existing VLANs : 14  Configuration Revision : 10 |

**Task 2: Configure switch SVI based on the logical connection diagram**

* Verify the interconnections between devices by PING test. Record the result.

SW\_E1 ping SW\_N1 (10.11.44.1 ping 10.11.44.41, vlan 144):

|  |
| --- |
| SW\_E1(config)#do ping 10.11.44.41  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.44.41, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 7/10/16 ms |

SW\_E1 ping SW\_E2 (10.11.12.11 ping 10.11.12.12, vlan 112):

|  |
| --- |
| SW\_E1(config)#do ping 10.11.12.12  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.12.12, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/8/13 ms |

SW\_E2 ping SW\_E1 (10.11.12.12 ping 10.11.12.11, vlan 112):

|  |
| --- |
| SW\_E2(config)#do ping 10.11.12.11  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.12.11, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 5/6/8 ms |

SW\_E2 ping SW\_S2 (10.11.22.12 ping 10.11.22.22, vlan 122):

|  |
| --- |
| SW\_E2(config)#do ping 10.11.22.22  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.22.22, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/10 ms |

SW\_E2 ping SW\_E4 (10.11.24.12 ping 10.11.24.14, vlan 124):

|  |
| --- |
| SW\_E2(config)#do ping 10.11.24.14  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.24.14, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 3/8/12 ms |

SW\_E3 ping SW\_E4 (10.11.34.13 ping 10.11.34.14, vlan 134):

|  |
| --- |
| SW\_E3(config)#do ping 10.11.34.14  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.34.14, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 3/4/6 ms |

SW\_E4 ping SW\_E3 (10.11.34.14 ping 10.11.34.13, vlan 134):

|  |
| --- |
| SW\_E4(config)#do ping 10.11.34.13  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.34.13, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 8/9/11 ms |

SW\_E4 ping SW\_E2 (10.11.24.14 ping 10.11.24.12, vlan 124):

|  |
| --- |
| SW\_E4(config)#do ping 10.11.24.12  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.24.12, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/8/12 ms |

SW\_S1 ping SW\_N1 (172.22.44.21 ping 172.22.44.41, vlan 244):

|  |
| --- |
| SW\_S1(config)#do ping 172.22.44.41  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.41, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 7/8/11 ms |

SW\_S1 ping SW\_W2 (10.22.33.21 ping 10.22.33.32, vlan 233):

|  |
| --- |
| SW\_S1(config)#do ping 10.22.33.32  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.22.33.32, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 3/4/5 ms |

SW\_S2 ping SW\_N1 (172.22.44.22 ping 172.22.44.22, vlan 244):

|  |
| --- |
| SW\_S2(config)#do ping 172.22.44.22  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.22, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms |

SW\_S2 ping SW\_E2 (10.11.22.22 ping 10.11.22.12, vlan 122):

|  |
| --- |
| SW\_S2(config)#do ping 10.11.22.12  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.22.12, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/9 ms |

SW\_W1 ping SW\_N1 (10.33.44.31 ping 10.33.44.41, vlan 344):

|  |
| --- |
| SW\_W1(config)#do ping 10.33.44.41  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.33.44.41, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/10/20 ms |

SW\_W1 ping SW\_W2 (10.33.12.31 ping 10.33.12.32, vlan 312):

|  |
| --- |
| SW\_W1(config)#do ping 10.33.12.32  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.33.12.32, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 5/6/7 ms |

SW\_W2 ping SW\_S1 (10.22.33.32 ping 10.22.33.21, vlan 233):

|  |
| --- |
| SW\_W2(config)#do ping 10.22.33.21  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.22.33.21, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 7/8/12 ms |

SW\_W2 ping SW\_W1 (10.33.12.32 ping 10.33.12.31, vlan 312):

|  |
| --- |
| SW\_W2(config)#do ping 10.33.12.31  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.33.12.31, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/9 ms |

SW\_N1 ping SW\_W1 (10.33.44.41 ping 10.33.44.31, vlan 344):

|  |
| --- |
| SW\_N1(config)#do ping 10.33.44.31  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.33.44.31, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 8/9/12 ms |

SW\_N1 ping SW\_E1 (10.11.44.41 ping 10.11.44.11, vlan 144):

|  |
| --- |
| SW\_N1(config)#do ping 10.11.44.11  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 10.11.44.11, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 8/10/16 ms |

SW\_N1 ping SW\_S1 (172.22.44.41 ping 172.22.44.21, vlan 244):

|  |
| --- |
| SW\_N1(config)#do ping 172.22.44.21  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.21, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/8 ms |

SW\_N1 ping SW\_S2 (172.22.44.41 ping 172.22.44.22, vlan 244):

|  |
| --- |
| SW\_N1(config)#do ping 172.22.44.22  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.22, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/8/11 ms |

* Record the switch configurations in this task.

SW\_E1:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.11.11 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan112  ip address 10.11.12.11 255.255.255.0  !  interface Vlan144  ip address 10.11.44.11 255.255.255.0  ! |

SW\_E2:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.12.12 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan112  ip address 10.11.12.12 255.255.255.0  !  interface Vlan122  ip address 10.11.22.12 255.255.255.0  !  interface Vlan124  ip address 10.11.24.12 255.255.255.0  ! |

SW\_E3:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.13.13 255.255.255.0  !  interface GigabitEthernet0/0  switchport access vlan 144  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan134  ip address 10.11.34.13 255.255.255.0  ! |

SW\_E4:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.14.14 255.255.255.0  !  interface GigabitEthernet0/0  switchport access vlan 134  switchport mode access  negotiation auto  !  interface GigabitEthernet0/1  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan124  ip address 10.11.24.14 255.255.255.0  !  interface Vlan134  ip address 10.11.34.14 255.255.255.0  ! |

SW\_S1:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.21.21 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan233  ip address 10.22.33.21 255.255.255.0  !  interface Vlan244  ip address 172.22.44.21 255.255.255.0  ! |

SW\_S2:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.22.22 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan122  ip address 10.11.22.22 255.255.255.0  !  interface Vlan244  ip address 172.22.44.22 255.255.255.0  ! |

SW\_W1:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.31.31 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan312  ip address 10.33.12.31 255.255.255.0  !  interface Vlan344  ip address 10.33.44.31 255.255.255.0  ! |

SW\_W2:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.32.32 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan233  ip address 10.22.33.32 255.255.255.0  !  interface Vlan312  ip address 10.33.12.32 255.255.255.0  ! |

SW\_N1:

|  |
| --- |
| !  interface Loopback0  ip address 192.168.41.41 255.255.255.0  !  interface GigabitEthernet0/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet0/2  negotiation auto  !  interface GigabitEthernet0/3  negotiation auto  !  interface GigabitEthernet1/0  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface GigabitEthernet1/1  switchport trunk encapsulation dot1q  switchport mode trunk  negotiation auto  !  interface Vlan144  ip address 10.11.44.41 255.255.255.0  !  interface Vlan244  ip address 172.22.44.41 255.255.255.0  !  interface Vlan344  ip address 10.33.44.41 255.255.255.0  ! |

**Task 3: RIP**

* Configure such that all RIP routes sent out by SW\_E4:vlan124 interface will be increased by 10 hops. Verify the result by the route table in SW\_E2. Record the result.

|  |
| --- |
| SW\_E2(config)#do sh ip ro  Codes: L - local, C - connected, S - static, 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  i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  a - application route  + - replicated route, % - next hop override, p - overrides from PfR  Gateway of last resort is not set  10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks  C 10.11.12.0/24 is directly connected, Vlan112  L 10.11.12.12/32 is directly connected, Vlan112  C 10.11.22.0/24 is directly connected, Vlan122  L 10.11.22.12/32 is directly connected, Vlan122  C 10.11.24.0/24 is directly connected, Vlan124  L 10.11.24.12/32 is directly connected, Vlan124  R 10.11.34.0/24 [120/11] via 10.11.24.14, 00:00:03, Vlan124  R 10.11.44.0/24 [120/1] via 10.11.12.11, 00:00:00, Vlan112  R 192.168.11.0/24 [120/1] via 10.11.12.11, 00:00:00, Vlan112  192.168.12.0/24 is variably subnetted, 2 subnets, 2 masks  C 192.168.12.0/24 is directly connected, Loopback0  L 192.168.12.12/32 is directly connected, Loopback0  R 192.168.13.0/24 [120/12] via 10.11.24.14, 00:00:03, Vlan124  R 192.168.14.0/24 [120/11] via 10.11.24.14, 00:00:03, Vlan124 |

* Configure PC\_E1, PC\_E2 and PC\_S2. On PC\_E1, perform PING test to all interfaces involved in RIP as well as loopback interface and the hosts. Record the result.

Vlan 134:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 10.11.34.13  PING 10.11.34.13 (10.11.34.13): 56 data bytes  64 bytes from 10.11.34.13: seq=0 ttl=252 time=26.053 ms  64 bytes from 10.11.34.13: seq=1 ttl=252 time=31.337 ms  64 bytes from 10.11.34.13: seq=2 ttl=252 time=26.859 ms  --- 10.11.34.13 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 26.053/28.083/31.337 ms  cisco@PC\_E1:~$ ping -c 3 10.11.34.14  PING 10.11.34.14 (10.11.34.14): 56 data bytes  64 bytes from 10.11.34.14: seq=0 ttl=253 time=25.832 ms  64 bytes from 10.11.34.14: seq=1 ttl=253 time=19.595 ms  64 bytes from 10.11.34.14: seq=2 ttl=253 time=20.898 ms  --- 10.11.34.14 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 19.595/22.108/25.832 ms |

Vlan 124:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 10.11.24.14  PING 10.11.24.14 (10.11.24.14): 56 data bytes  64 bytes from 10.11.24.14: seq=0 ttl=253 time=29.609 ms  64 bytes from 10.11.24.14: seq=1 ttl=253 time=33.465 ms  64 bytes from 10.11.24.14: seq=2 ttl=253 time=29.296 ms  --- 10.11.24.14 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 29.296/30.790/33.465 ms  cisco@PC\_E1:~$ ping -c 3 10.11.24.12  PING 10.11.24.12 (10.11.24.12): 56 data bytes  64 bytes from 10.11.24.12: seq=0 ttl=254 time=11.529 ms  64 bytes from 10.11.24.12: seq=1 ttl=254 time=10.046 ms  64 bytes from 10.11.24.12: seq=2 ttl=254 time=13.546 ms  --- 10.11.24.12 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 10.046/11.707/13.546 ms |

Vlan 122:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 10.11.22.12  PING 10.11.22.12 (10.11.22.12): 56 data bytes  64 bytes from 10.11.22.12: seq=0 ttl=254 time=14.076 ms  64 bytes from 10.11.22.12: seq=1 ttl=254 time=15.528 ms  64 bytes from 10.11.22.12: seq=2 ttl=254 time=8.724 ms  --- 10.11.22.12 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 8.724/12.776/15.528 ms  cisco@PC\_E1:~$ ping -c 3 10.11.22.22  PING 10.11.22.22 (10.11.22.22): 56 data bytes  64 bytes from 10.11.22.22: seq=0 ttl=253 time=23.525 ms  64 bytes from 10.11.22.22: seq=1 ttl=253 time=26.737 ms  64 bytes from 10.11.22.22: seq=2 ttl=253 time=20.008 ms  --- 10.11.22.22 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 20.008/23.423/26.737 ms |

Vlan 112:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 10.11.12.12  PING 10.11.12.12 (10.11.12.12): 56 data bytes  64 bytes from 10.11.12.12: seq=0 ttl=254 time=9.356 ms  64 bytes from 10.11.12.12: seq=1 ttl=254 time=13.801 ms  64 bytes from 10.11.12.12: seq=2 ttl=254 time=18.490 ms  --- 10.11.12.12 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 9.356/13.882/18.490 ms  cisco@PC\_E1:~$ ping -c 3 10.11.12.11  PING 10.11.12.11 (10.11.12.11): 56 data bytes  64 bytes from 10.11.12.11: seq=0 ttl=255 time=7.011 ms  64 bytes from 10.11.12.11: seq=1 ttl=255 time=5.272 ms  64 bytes from 10.11.12.11: seq=2 ttl=255 time=8.270 ms  --- 10.11.12.11 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.272/6.851/8.270 ms |

Vlan 144:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 10.11.44.11  PING 10.11.44.11 (10.11.44.11): 56 data bytes  64 bytes from 10.11.44.11: seq=0 ttl=255 time=8.809 ms  64 bytes from 10.11.44.11: seq=1 ttl=255 time=5.614 ms  64 bytes from 10.11.44.11: seq=2 ttl=255 time=5.616 ms  --- 10.11.44.11 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.614/6.679/8.809 ms  cisco@PC\_E1:~$ ping -c 3 10.11.44.41  PING 10.11.44.41 (10.11.44.41): 56 data bytes  64 bytes from 10.11.44.41: seq=0 ttl=255 time=32.430 ms  64 bytes from 10.11.44.41: seq=1 ttl=255 time=19.827 ms  64 bytes from 10.11.44.41: seq=2 ttl=255 time=11.141 ms  --- 10.11.44.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 11.141/21.132/32.430 ms |

SW\_E1 Loopback0:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.11.11  PING 192.168.11.11 (192.168.11.11): 56 data bytes  64 bytes from 192.168.11.11: seq=0 ttl=255 time=6.952 ms  64 bytes from 192.168.11.11: seq=1 ttl=255 time=4.793 ms  64 bytes from 192.168.11.11: seq=2 ttl=255 time=4.070 ms  --- 192.168.11.11 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 4.070/5.271/6.952 ms |

SW\_E2 Loopback0:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.12.12  PING 192.168.12.12 (192.168.12.12): 56 data bytes  64 bytes from 192.168.12.12: seq=0 ttl=254 time=18.757 ms  64 bytes from 192.168.12.12: seq=1 ttl=254 time=14.001 ms  64 bytes from 192.168.12.12: seq=2 ttl=254 time=13.336 ms  --- 192.168.12.12 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 13.336/15.364/18.757 ms |

SW\_E3 Loopback0:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.13.13  PING 192.168.13.13 (192.168.13.13): 56 data bytes  64 bytes from 192.168.13.13: seq=0 ttl=252 time=31.062 ms  64 bytes from 192.168.13.13: seq=1 ttl=252 time=32.706 ms  64 bytes from 192.168.13.13: seq=2 ttl=252 time=31.292 ms  --- 192.168.13.13 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 31.062/31.686/32.706 ms |

SW\_E4 Loopback0:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.14.14  PING 192.168.14.14 (192.168.14.14): 56 data bytes  64 bytes from 192.168.14.14: seq=0 ttl=253 time=32.779 ms  64 bytes from 192.168.14.14: seq=1 ttl=253 time=17.333 ms  64 bytes from 192.168.14.14: seq=2 ttl=253 time=23.877 ms  --- 192.168.14.14 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 17.333/24.663/32.779 ms |

* Record the device configurations in this task.

SW\_E1:

|  |
| --- |
| !  router rip  version 2  network 10.0.0.0  network 192.168.11.0  no auto-summary  ! |

SW\_E2:

|  |
| --- |
| !  router rip  version 2  network 10.0.0.0  network 192.168.12.0  no auto-summary  ! |

SW\_E3:

|  |
| --- |
| !  router rip  version 2  network 10.0.0.0  network 192.168.13.0  no auto-summary  ! |

SW\_E4:

|  |
| --- |
| !  router rip  version 2  offset-list 1 out 10 Vlan124  network 10.0.0.0  network 192.168.14.0  no auto-summary  !  !  access-list 1 permit any  ! |

SW\_S2:

|  |
| --- |
| !  router rip  version 2  network 10.0.0.0  no auto-summary  ! |

SW\_N1:

|  |
| --- |
| !  router rip  version 2  network 10.0.0.0  no auto-summary  ! |

PC\_E1:

|  |
| --- |
| ifconfig eth0 10.11.44.1 netmask 255.255.255.0 broadcast 10.11.44.255 up  route add default gw 10.11.44.11  route add -net 10.11.44.0/24 dev eth0 |

PC\_E2:

|  |
| --- |
| ifconfig eth0 10.11.34.1 netmask 255.255.255.0 broadcast 10.11.34.255 up  route add default gw 10.11.34.14  route add -net 10.11.34.0/24 dev eth0 |

PC\_S2:

|  |
| --- |
| ifconfig eth0 10.11.22.1 netmask 255.255.255.0 broadcast 10.11.22.255 up  route add -net 10.11.22.0/24 dev eth0  route add default gw 10.11.22.22 |

**Task 4: OSPF**

* Configure PC\_N1. Perform PING test to all interfaces involved in OSPF. Record the result.

Vlan 244:

|  |
| --- |
| cisco@PC\_N1:~$ ping -c 3 172.22.44.41  PING 172.22.44.41 (172.22.44.41): 56 data bytes  64 bytes from 172.22.44.41: seq=0 ttl=255 time=6.899 ms  64 bytes from 172.22.44.41: seq=1 ttl=255 time=6.065 ms  64 bytes from 172.22.44.41: seq=2 ttl=255 time=5.189 ms  --- 172.22.44.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.189/6.051/6.899 ms  cisco@PC\_N1:~$ ping -c 3 172.22.44.21  PING 172.22.44.21 (172.22.44.21): 56 data bytes  64 bytes from 172.22.44.21: seq=0 ttl=255 time=28.458 ms  64 bytes from 172.22.44.21: seq=1 ttl=255 time=15.734 ms  64 bytes from 172.22.44.21: seq=2 ttl=255 time=43.726 ms  --- 172.22.44.21 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 15.734/29.306/43.726 ms  cisco@PC\_N1:~$ ping -c 3 172.22.44.22  PING 172.22.44.22 (172.22.44.22): 56 data bytes  64 bytes from 172.22.44.22: seq=0 ttl=255 time=40.108 ms  64 bytes from 172.22.44.22: seq=1 ttl=255 time=29.007 ms  64 bytes from 172.22.44.22: seq=2 ttl=255 time=14.307 ms  --- 172.22.44.22 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 14.307/27.807/40.108 ms |

SW\_N1 loopback0:

|  |
| --- |
| cisco@PC\_N1:~$ ping -c 3 192.168.41.41  PING 192.168.41.41 (192.168.41.41): 56 data bytes  64 bytes from 192.168.41.41: seq=0 ttl=255 time=6.328 ms  64 bytes from 192.168.41.41: seq=1 ttl=255 time=4.555 ms  64 bytes from 192.168.41.41: seq=2 ttl=255 time=6.732 ms  --- 192.168.41.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 4.555/5.871/6.732 ms |

SW\_S1 loopback0:

|  |
| --- |
| cisco@PC\_N1:~$ ping -c 3 192.168.21.21  PING 192.168.21.21 (192.168.21.21): 56 data bytes  64 bytes from 192.168.21.21: seq=0 ttl=255 time=14.222 ms  64 bytes from 192.168.21.21: seq=1 ttl=255 time=11.936 ms  64 bytes from 192.168.21.21: seq=2 ttl=255 time=8.574 ms  --- 192.168.21.21 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 8.574/11.577/14.222 ms |

SW\_S2 loopback0:

|  |
| --- |
| cisco@PC\_N1:~$ ping -c 3 192.168.22.22  PING 192.168.22.22 (192.168.22.22): 56 data bytes  64 bytes from 192.168.22.22: seq=0 ttl=255 time=17.683 ms  64 bytes from 192.168.22.22: seq=1 ttl=255 time=18.546 ms  64 bytes from 192.168.22.22: seq=2 ttl=255 time=39.868 ms  --- 192.168.22.22 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 17.683/25.365/39.868 ms |

* Record the configuration in this task.

SW\_S1:

|  |
| --- |
| !  router ospf 1  network 172.22.44.0 0.0.0.255 area 0  network 192.168.21.0 0.0.0.255 area 0  ! |

SW\_S2:

|  |
| --- |
| !  router ospf 1  network 172.22.44.0 0.0.0.255 area 0  network 192.168.22.0 0.0.0.255 area 0  ! |

SW\_N1:

|  |
| --- |
| !  router ospf 1  network 172.22.44.0 0.0.0.255 area 0  network 192.168.41.0 0.0.0.255 area 0  ! |

PC\_N1:

|  |
| --- |
| ifconfig eth0 172.22.44.1 netmask 255.255.255.0 broadcast 172.22.44.255 up  route add default gw 172.22.44.41  route add -net 172.22.44.0/24 dev eth0 |

**Task 5: EIGRP**

* Configure PC\_S1, PC\_W1 and PC\_W2. Perform PING test to all interfaces involved in EIGRP. Record the result.

PC\_S1:

Vlan 233:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 10.22.33.21  PING 10.22.33.21 (10.22.33.21): 56 data bytes  64 bytes from 10.22.33.21: seq=0 ttl=255 time=35.204 ms  64 bytes from 10.22.33.21: seq=1 ttl=255 time=13.974 ms  64 bytes from 10.22.33.21: seq=2 ttl=255 time=12.361 ms  --- 10.22.33.21 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 12.361/20.513/35.204 ms  cisco@PC\_S1:~$ ping -c 3 10.22.33.32  PING 10.22.33.32 (10.22.33.32): 56 data bytes  64 bytes from 10.22.33.32: seq=0 ttl=255 time=27.365 ms  64 bytes from 10.22.33.32: seq=1 ttl=255 time=14.451 ms  64 bytes from 10.22.33.32: seq=2 ttl=255 time=24.405 ms  --- 10.22.33.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 14.451/22.073/27.365 ms |

Vlan 312:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 10.33.12.32  PING 10.33.12.32 (10.33.12.32): 56 data bytes  64 bytes from 10.33.12.32: seq=0 ttl=255 time=17.949 ms  64 bytes from 10.33.12.32: seq=1 ttl=255 time=14.715 ms  64 bytes from 10.33.12.32: seq=2 ttl=255 time=13.071 ms  --- 10.33.12.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 13.071/15.245/17.949 ms  cisco@PC\_S1:~$ ping -c 3 10.33.12.31  PING 10.33.12.31 (10.33.12.31): 56 data bytes  64 bytes from 10.33.12.31: seq=0 ttl=254 time=32.179 ms  64 bytes from 10.33.12.31: seq=1 ttl=254 time=22.433 ms  64 bytes from 10.33.12.31: seq=2 ttl=254 time=22.087 ms  --- 10.33.12.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 22.087/25.566/32.179 ms |

Vlan 344:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 10.33.44.31  PING 10.33.44.31 (10.33.44.31): 56 data bytes  64 bytes from 10.33.44.31: seq=0 ttl=254 time=45.407 ms  64 bytes from 10.33.44.31: seq=1 ttl=254 time=21.111 ms  64 bytes from 10.33.44.31: seq=2 ttl=254 time=23.567 ms  --- 10.33.44.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 21.111/30.028/45.407 ms  cisco@PC\_S1:~$ ping -c 3 10.33.44.41  PING 10.33.44.41 (10.33.44.41): 56 data bytes  64 bytes from 10.33.44.41: seq=0 ttl=253 time=38.186 ms  64 bytes from 10.33.44.41: seq=1 ttl=253 time=37.990 ms  64 bytes from 10.33.44.41: seq=2 ttl=253 time=22.599 ms  --- 10.33.44.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 22.599/32.925/38.186 ms |

SW\_W1 loopback0:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 192.168.31.31  PING 192.168.31.31 (192.168.31.31): 56 data bytes  64 bytes from 192.168.31.31: seq=0 ttl=254 time=40.894 ms  64 bytes from 192.168.31.31: seq=1 ttl=254 time=22.879 ms  64 bytes from 192.168.31.31: seq=2 ttl=254 time=21.161 ms  --- 192.168.31.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 21.161/28.311/40.894 ms |

SW\_W2 loopback0:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 192.168.32.32  PING 192.168.32.32 (192.168.32.32): 56 data bytes  64 bytes from 192.168.32.32: seq=0 ttl=255 time=24.428 ms  64 bytes from 192.168.32.32: seq=1 ttl=255 time=27.478 ms  64 bytes from 192.168.32.32: seq=2 ttl=255 time=17.103 ms  --- 192.168.32.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 17.103/23.003/27.478 ms |

PC\_W1:

Vlan 233:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 10.22.33.21  PING 10.22.33.21 (10.22.33.21): 56 data bytes  64 bytes from 10.22.33.21: seq=0 ttl=253 time=37.260 ms  64 bytes from 10.22.33.21: seq=1 ttl=253 time=20.964 ms  64 bytes from 10.22.33.21: seq=2 ttl=253 time=23.110 ms  --- 10.22.33.21 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 20.964/27.111/37.260 ms  cisco@PC\_W1:~$ ping -c 3 10.22.33.32  PING 10.22.33.32 (10.22.33.32): 56 data bytes  64 bytes from 10.22.33.32: seq=0 ttl=254 time=12.936 ms  64 bytes from 10.22.33.32: seq=1 ttl=254 time=13.080 ms  64 bytes from 10.22.33.32: seq=2 ttl=254 time=13.075 ms  --- 10.22.33.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 12.936/13.030/13.080 ms |

Vlan 312:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 10.33.12.32  PING 10.33.12.32 (10.33.12.32): 56 data bytes  64 bytes from 10.33.12.32: seq=0 ttl=254 time=14.329 ms  64 bytes from 10.33.12.32: seq=1 ttl=254 time=14.407 ms  64 bytes from 10.33.12.32: seq=2 ttl=254 time=14.609 ms  --- 10.33.12.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 14.329/14.448/14.609 ms  cisco@PC\_W1:~$ ping -c 3 10.33.12.31  PING 10.33.12.31 (10.33.12.31): 56 data bytes  64 bytes from 10.33.12.31: seq=0 ttl=255 time=7.180 ms  64 bytes from 10.33.12.31: seq=1 ttl=255 time=3.732 ms  64 bytes from 10.33.12.31: seq=2 ttl=255 time=10.617 ms  --- 10.33.12.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 3.732/7.176/10.617 ms |

Vlan 344:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 10.33.44.31  PING 10.33.44.31 (10.33.44.31): 56 data bytes  64 bytes from 10.33.44.31: seq=0 ttl=255 time=11.599 ms  64 bytes from 10.33.44.31: seq=1 ttl=255 time=8.869 ms  64 bytes from 10.33.44.31: seq=2 ttl=255 time=5.243 ms  --- 10.33.44.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.243/8.570/11.599 ms  cisco@PC\_W1:~$ ping -c 3 10.33.44.41  PING 10.33.44.41 (10.33.44.41): 56 data bytes  64 bytes from 10.33.44.41: seq=0 ttl=255 time=31.463 ms  64 bytes from 10.33.44.41: seq=1 ttl=255 time=10.742 ms  64 bytes from 10.33.44.41: seq=2 ttl=255 time=21.125 ms  --- 10.33.44.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 10.742/21.110/31.463 ms |

SW\_W1 loopback0:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 192.168.31.31  PING 192.168.31.31 (192.168.31.31): 56 data bytes  64 bytes from 192.168.31.31: seq=0 ttl=255 time=7.239 ms  64 bytes from 192.168.31.31: seq=1 ttl=255 time=6.932 ms  64 bytes from 192.168.31.31: seq=2 ttl=255 time=4.835 ms  --- 192.168.31.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 4.835/6.335/7.239 ms |

SW\_W2 loopback0:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 192.168.32.32  PING 192.168.32.32 (192.168.32.32): 56 data bytes  64 bytes from 192.168.32.32: seq=0 ttl=254 time=13.734 ms  64 bytes from 192.168.32.32: seq=1 ttl=254 time=20.271 ms  64 bytes from 192.168.32.32: seq=2 ttl=254 time=19.448 ms  --- 192.168.32.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 13.734/17.817/20.271 ms |

PC\_W2:

Vlan 233:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 10.22.33.21  PING 10.22.33.21 (10.22.33.21): 56 data bytes  64 bytes from 10.22.33.21: seq=0 ttl=254 time=44.435 ms  64 bytes from 10.22.33.21: seq=1 ttl=254 time=21.932 ms  64 bytes from 10.22.33.21: seq=2 ttl=254 time=18.263 ms  --- 10.22.33.21 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 18.263/28.210/44.435 ms  cisco@PC\_W2:~$ ping -c 3 10.22.33.32  PING 10.22.33.32 (10.22.33.32): 56 data bytes  64 bytes from 10.22.33.32: seq=0 ttl=255 time=14.217 ms  64 bytes from 10.22.33.32: seq=1 ttl=255 time=17.815 ms  64 bytes from 10.22.33.32: seq=2 ttl=255 time=10.831 ms  --- 10.22.33.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 10.831/14.287/17.815 ms |

Vlan 312:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 10.33.12.32  PING 10.33.12.32 (10.33.12.32): 56 data bytes  64 bytes from 10.33.12.32: seq=0 ttl=255 time=14.024 ms  64 bytes from 10.33.12.32: seq=1 ttl=255 time=13.232 ms  64 bytes from 10.33.12.32: seq=2 ttl=255 time=29.529 ms  --- 10.33.12.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 13.232/18.928/29.529 ms  cisco@PC\_W2:~$ ping -c 3 10.33.12.31  PING 10.33.12.31 (10.33.12.31): 56 data bytes  64 bytes from 10.33.12.31: seq=0 ttl=255 time=15.974 ms  64 bytes from 10.33.12.31: seq=1 ttl=255 time=5.995 ms  64 bytes from 10.33.12.31: seq=2 ttl=255 time=10.396 ms  --- 10.33.12.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.995/10.788/15.974 ms |

Vlan 344:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 10.33.44.31  PING 10.33.44.31 (10.33.44.31): 56 data bytes  64 bytes from 10.33.44.31: seq=0 ttl=255 time=13.756 ms  64 bytes from 10.33.44.31: seq=1 ttl=255 time=5.742 ms  64 bytes from 10.33.44.31: seq=2 ttl=255 time=6.982 ms  --- 10.33.44.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.742/8.826/13.756 ms  cisco@PC\_W2:~$ ping -c 3 10.33.44.41  PING 10.33.44.41 (10.33.44.41): 56 data bytes  64 bytes from 10.33.44.41: seq=0 ttl=254 time=27.779 ms  64 bytes from 10.33.44.41: seq=1 ttl=254 time=12.631 ms  64 bytes from 10.33.44.41: seq=2 ttl=254 time=16.335 ms  --- 10.33.44.41 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 12.631/18.915/27.779 ms |

SW\_W1 loopback0:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 192.168.31.31  PING 192.168.31.31 (192.168.31.31): 56 data bytes  64 bytes from 192.168.31.31: seq=0 ttl=255 time=41.486 ms  64 bytes from 192.168.31.31: seq=1 ttl=255 time=5.540 ms  64 bytes from 192.168.31.31: seq=2 ttl=255 time=8.543 ms  --- 192.168.31.31 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 5.540/18.523/41.486 ms |

SW\_W2 loopback0:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 192.168.32.32  PING 192.168.32.32 (192.168.32.32): 56 data bytes  64 bytes from 192.168.32.32: seq=0 ttl=255 time=9.743 ms  64 bytes from 192.168.32.32: seq=1 ttl=255 time=10.456 ms  64 bytes from 192.168.32.32: seq=2 ttl=255 time=12.521 ms  --- 192.168.32.32 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 9.743/10.906/12.521 ms |

* Record the configuration in this task.

SW\_S1:

|  |
| --- |
| !  router eigrp 10  network 10.22.33.0 0.0.0.255  ! |

SW\_W1:

|  |
| --- |
| !  router eigrp 10  network 10.33.12.0 0.0.0.255  network 10.33.44.0 0.0.0.255  network 192.168.31.0  ! |

SW\_W2:

|  |
| --- |
| !  router eigrp 10  network 10.22.33.0 0.0.0.255  network 10.33.12.0 0.0.0.255  network 192.168.32.0  ! |

SW\_N1:

|  |
| --- |
| !  router eigrp 10  network 10.33.44.0 0.0.0.255  ! |

PC\_S1:

|  |
| --- |
| ifconfig eth0 10.22.33.1 netmask 255.255.255.0 broadcast 10.22.33.255 up  route add -net 10.22.33.0/24 dev eth0  route add default gw 10.22.33.21 |

PC\_W1:

|  |
| --- |
| ifconfig eth0 10.22.33.1 netmask 255.255.255.0 broadcast 10.22.33.255 up  route add -net 10.22.33.0/24 dev eth0  route add default gw 10.22.33.21 |

PC\_W2:

|  |
| --- |
| ifconfig eth0 10.33.12.1 netmask 255.255.255.0 broadcast 10.33.12.255 up  route add -net 10.33.12.0/24 dev eth0  route add default gw 10.33.12.32 |

**Task 6: Mutual redistribution between OSPF and RIP**

* At SW\_S1, show the redistributed routes by “show ip ospf database”. Record the result.

|  |
| --- |
| SW\_S1(config)#do sh ip ospf database  OSPF Router with ID (192.168.21.21) (Process ID 1)  Router Link States (Area 0)  Link ID ADV Router Age Seq# Checksum Link count  192.168.21.21 192.168.21.21 1956 0x80000061 0x00FAEF 2  192.168.22.22 192.168.22.22 903 0x80000069 0x00FBDD 2  192.168.41.41 192.168.41.41 1130 0x8000006F 0x00C18C 2  Net Link States (Area 0)  Link ID ADV Router Age Seq# Checksum  172.22.44.41 192.168.41.41 885 0x80000062 0x004FCC  Type-5 AS External Link States  Link ID ADV Router Age Seq# Checksum Tag  10.11.12.0 192.168.41.41 1130 0x8000000F 0x0047DD 144  10.11.22.0 192.168.22.22 903 0x8000000F 0x004314 122  10.11.24.0 192.168.41.41 1130 0x8000000F 0x00C256 144  10.11.34.0 192.168.41.41 1130 0x8000000F 0x0054BA 144  10.11.44.0 192.168.41.41 1130 0x8000000F 0x00E51F 144  10.33.44.0 192.168.41.41 1130 0x8000000F 0x00DC12 144  192.168.11.0 192.168.41.41 1130 0x8000000F 0x00A72A 144  192.168.12.0 192.168.41.41 1130 0x8000000F 0x009C34 144  192.168.13.0 192.168.41.41 1130 0x8000000F 0x00913E 144  192.168.14.0 192.168.41.41 1130 0x8000000F 0x008648 144  192.168.22.0 192.168.41.41 1130 0x8000000F 0x002E98 144  192.168.41.0 192.168.22.22 903 0x8000000F 0x00C629 122 |

* Record the configurations in this task.

SW\_N1:

|  |
| --- |
| router ospf 1  redistribute rip subnets tag 144  network 172.22.44.0 0.0.0.255 area 0  network 192.168.41.0 0.0.0.255 area 0  !  router rip  version 2  redistribute ospf 1 metric 1  network 10.0.0.0  no auto-summary  ! |

SW\_S2:

|  |
| --- |
| !  router ospf 1  redistribute rip subnets tag 122  network 172.22.44.0 0.0.0.255 area 0  network 192.168.22.0 0.0.0.255 area 0  !  router rip  version 2  redistribute ospf 1 metric 1  network 10.0.0.0  no auto-summary  ! |

**Task 7: Routing loop due to redistribution between OSPF and RIP**

* Refer to the logical connection diagram, on SW\_E2, what should be the next hop to SW\_E3:lo0?

It will be SW\_E4: vlan124.

* On SW\_E2, record the next hop to SW\_E3:lo0 by command “show ip route 192.168.13.13”. Does it match with the logical connection diagram?

It does not match with the logical connection diagram because the next hop becomes vlan 122 instead of vlan 124.

|  |
| --- |
| SW\_E2(config)#do show ip route 192.168.13.13  Routing entry for 192.168.13.0/24  Known via "rip", distance 120, metric 1  Redistributing via rip  Last update from 10.11.22.22 on Vlan122, 00:00:19 ago  Routing Descriptor Blocks:  \* 10.11.22.22, from 10.11.22.22, 00:00:19 ago, via Vlan122  Route metric is 1, traffic share count is 1 |

* On PC\_E1, perform PING test to SW\_E3:lo0. Does it success? Record the result.

Note: Refer to task 3, does the ping to SW\_E3:lo0 successfully?

In task 3, it can ping SW\_E3:lo0, but now it fails to ping.

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.13.13  PING 192.168.13.13 (192.168.13.13): 56 data bytes  --- 192.168.13.13 ping statistics ---  3 packets transmitted, 0 packets received, 100% packet loss |

* On PC\_E2, perform PING test to SW\_E3:lo0. Does it success? Record the result.

It can still ping the SW\_E3:lo0.

|  |
| --- |
| cisco@PC\_E2:~$ ping -c 3 192.168.13.13  PING 192.168.13.13 (192.168.13.13): 56 data bytes  64 bytes from 192.168.13.13: seq=0 ttl=255 time=42.059 ms  64 bytes from 192.168.13.13: seq=1 ttl=255 time=12.382 ms  64 bytes from 192.168.13.13: seq=2 ttl=255 time=8.674 ms  --- 192.168.13.13 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 8.674/21.038/42.059 ms |

* On SW\_E2, use traceroute to find out the path towards SW\_E3:lo0 by “traceroute 192.168.13.13”. Record, observe and explain what is happening. Then, explain the PING result difference by PC\_E1 and PC\_E2.

Redistributed routes are advertised back into the originating routing protocol. When a router redistributes routes from one routing protocol into another, it can advertise those routes back into the original protocol which causes a loop. Since PC\_E2 does not connect with the OSPF area, it does not cause a loop. However, PC\_E1 is connected to the OSPF area in vlan 144, it will cause a routing loop.

|  |
| --- |
| SW\_E2(config)#do traceroute 192.168.13.13  Type escape sequence to abort.  Tracing the route to 192.168.13.13  VRF info: (vrf in name/id, vrf out name/id)  1 10.11.22.22 9 msec 4 msec 9 msec  2 172.22.44.41 17 msec 16 msec 20 msec  3 10.11.44.11 15 msec 22 msec 23 msec  4 10.11.12.12 11 msec 19 msec 17 msec  5 10.11.22.22 21 msec 38 msec 40 msec  6 172.22.44.41 29 msec 32 msec 27 msec  7 10.11.44.11 28 msec 34 msec 31 msec  8 10.11.12.12 27 msec 29 msec 30 msec  9 10.11.22.22 26 msec 37 msec 27 msec  10 172.22.44.41 36 msec 34 msec 30 msec  11 10.11.44.11 46 msec 40 msec 43 msec  12 10.11.12.12 29 msec 49 msec 46 msec  13 10.11.22.22 49 msec 41 msec 49 msec  14 172.22.44.41 66 msec 47 msec 51 msec  15 10.11.44.11 57 msec 48 msec 52 msec  16 10.11.12.12 47 msec 53 msec 56 msec  17 10.11.22.22 48 msec 62 msec 51 msec  18 172.22.44.41 54 msec 51 msec 55 msec  19 10.11.44.11 54 msec 73 msec 77 msec  20 10.11.12.12 69 msec 64 msec 56 msec  21 10.11.22.22 68 msec 66 msec 72 msec  22 172.22.44.41 65 msec 73 msec 69 msec  23 10.11.44.11 122 msec 77 msec 78 msec  24 10.11.12.12 73 msec 87 msec 77 msec  25 10.11.22.22 77 msec 99 msec 77 msec  26 172.22.44.41 103 msec 83 msec 109 msec  27 10.11.44.11 105 msec 101 msec 109 msec  28 10.11.12.12 90 msec 75 msec 84 msec  29 10.11.22.22 86 msec 102 msec 90 msec  30 172.22.44.41 90 msec 142 msec 135 msec |

**Task 8: Fix the routing loop due to mutual redistribution between OSPF and RIP**

* At PC\_E1, perform PING test to SW\_E3:lo0. Does it success? Record the result.

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 192.168.13.13  PING 192.168.13.13 (192.168.13.13): 56 data bytes  64 bytes from 192.168.13.13: seq=0 ttl=252 time=31.050 ms  64 bytes from 192.168.13.13: seq=1 ttl=252 time=60.337 ms  64 bytes from 192.168.13.13: seq=2 ttl=252 time=30.542 ms  --- 192.168.13.13 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 30.542/40.643/60.337 ms |

* At SW\_S1, record the output by command “show ip ospf database”.

Use the tag column under “Type-5 AS External Link States” to identify the source of external OSPF routes.

With such information, explain why the issue is fixed.

The external routes are filtered based on the tags. With reference to the ospf database, the duplicated routes are removed.

|  |
| --- |
| SW\_S1(config)#do sh ip ospf database  OSPF Router with ID (192.168.21.21) (Process ID 1)  Router Link States (Area 0)  Link ID ADV Router Age Seq# Checksum Link count  192.168.21.21 192.168.21.21 547 0x80000067 0x00EEF5 2  192.168.22.22 192.168.22.22 560 0x8000006D 0x00F3E1 2  192.168.41.41 192.168.41.41 549 0x80000075 0x00B592 2  Net Link States (Area 0)  Link ID ADV Router Age Seq# Checksum  172.22.44.41 192.168.41.41 457 0x80000065 0x0049CF  Type-5 AS External Link States  Link ID ADV Router Age Seq# Checksum Tag  10.11.12.0 192.168.22.22 554 0x80000002 0x00CBA2 122  10.11.12.0 192.168.41.41 708 0x80000012 0x0041E0 144  10.11.22.0 192.168.22.22 554 0x80000013 0x003B18 122  10.11.22.0 192.168.41.41 629 0x80000001 0x00F434 144  10.11.24.0 192.168.22.22 554 0x80000002 0x00471B 122  10.11.24.0 192.168.41.41 708 0x80000012 0x00BC59 144  10.11.34.0 192.168.22.22 554 0x80000002 0x00D87F 122  10.11.34.0 192.168.41.41 591 0x80000001 0x0070AC 144  10.11.44.0 192.168.22.22 554 0x80000002 0x006AE3 122  10.11.44.0 192.168.41.41 708 0x80000012 0x00DF22 144  10.33.44.0 192.168.22.22 554 0x80000002 0x0061D6 122  10.33.44.0 192.168.41.41 708 0x80000012 0x00D615 144  192.168.11.0 192.168.22.22 554 0x80000002 0x002CEE 122  192.168.11.0 192.168.41.41 708 0x80000012 0x00A12D 144  192.168.12.0 192.168.22.22 554 0x80000002 0x0021F8 122  192.168.12.0 192.168.41.41 708 0x80000012 0x009637 144  192.168.13.0 192.168.22.22 554 0x80000002 0x001603 122  192.168.13.0 192.168.41.41 591 0x80000001 0x00AD30 144  192.168.14.0 192.168.22.22 554 0x80000002 0x000B0D 122  192.168.14.0 192.168.41.41 591 0x80000001 0x00A23A 144  192.168.22.0 192.168.41.41 708 0x80000012 0x00289B 144  192.168.41.0 192.168.22.22 554 0x80000013 0x00BE2D 122 |

* Record the configurations in this task.

SW\_N1:

|  |
| --- |
| !  router ospf 1  redistribute rip subnets tag 144  network 172.22.44.0 0.0.0.255 area 0  network 192.168.41.0 0.0.0.255 area 0  distribute-list route-map tag-filter in  !  router rip  version 2  redistribute ospf 1 metric 1  network 10.0.0.0  no auto-summary  !  ip forward-protocol nd  !  ip http server  ip http secure-server  !  ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr  ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr  !  !  !  !  route-map tag-filter deny 10  match tag 122  !  route-map tag-filter permit 20 |

SW\_S2:

|  |
| --- |
| !  router ospf 1  redistribute rip subnets tag 122  network 172.22.44.0 0.0.0.255 area 0  network 192.168.22.0 0.0.0.255 area 0  distribute-list route-map tag-filter in  !  router rip  version 2  redistribute ospf 1 metric 1  network 10.0.0.0  no auto-summary  !  ip forward-protocol nd  !  ip http server  ip http secure-server  !  ip ssh server algorithm encryption aes128-ctr aes192-ctr aes256-ctr  ip ssh client algorithm encryption aes128-ctr aes192-ctr aes256-ctr  !  !  !  !  route-map tag-filter deny 10  match tag 144  !  route-map tag-filter permit 20  ! |

**Task 9: Behavior on redistribution of connected network**

* At SW\_S1, identify the source of OSPF route SW\_N1:lo1 via the route tag.

|  |
| --- |
| 11.44.41.0 192.168.22.22 45 0x80000001 0x00F23D 122  11.44.41.0 192.168.41.41 50 0x80000001 0x00886B 144 |

* At SW\_S1, identify the source of OSPF route SW\_N1:lo2 via the route tag.

|  |
| --- |
| 12.44.41.0 192.168.22.22 258 0x80000001 0x00E549 122 |

* Identify the source of OSPF route SW\_N1:lo1 again via the route tag.

Observe the change of the source of OSPF route SW\_N1:lo1.

Explain the change.

The SW\_N1: lo1 changed to tag 1241.

When OSPF receives a redistributed route with a tag, it will use the external protocol’s tag as the OSPF tag for the route. If there are multiple tags associated with the same route, OSPF will select the highest value. In this case, if lo2 interface being redistributed into OSPF with an assigned route tag, OSPF will use that tag as the OSPF tag for that route.

|  |
| --- |
| 11.44.41.0 192.168.41.41 446 0x80000003 0x00EFB4 1241 |

* Record the configurations in this task.

SW\_N1:

|  |
| --- |
| !  interface Loopback1  ip address 11.44.41.41 255.255.255.0  !  interface Loopback2  ip address 12.44.41.41 255.255.255.0  !  !  router ospf 1  redistribute connected subnets route-map lo2-to-ospf  redistribute rip subnets tag 144  network 12.44.41.0 0.0.0.255 area 0  network 172.22.44.0 0.0.0.255 area 0  network 192.168.41.0 0.0.0.255 area 0  distribute-list route-map tag-filter in  !  router rip  version 2  redistribute ospf 1 metric 1  network 10.0.0.0  network 11.0.0.0  no auto-summary  !  !  ip prefix-list lo2 seq 5 permit 12.44.41.0/24  !  !  route-map lo2-to-ospf permit 10  match ip address perfix-list lo2  set tag 1241 |

Task 10: Configure mutual redistribution between OSPF and EIGRP

* Do routing loops occur for EIGRP 🡪 OSPF 🡪 EIGRP ? Explain.

With reference to routing table in SW\_N1:

|  |
| --- |
| D EX 192.168.21.0/24 [170/28928] via 10.33.44.31, 00:00:10, Vlan344  O 192.168.21.21/32 [110/2] via 172.22.44.21, 1d19h, Vlan244 |

There is no routing loop because in SW\_N1 routing table, the external EIGRP route is redistributed to OSPF.

* Do routing loops occur for OSPF 🡪 EIGRP 🡪 OSPF ? Explain.

By using traceroute to EOGRP area, no loop is formed.

|  |
| --- |
| SW\_S1(config)#do traceroute 192.168.22.22  Type escape sequence to abort.  Tracing the route to 192.168.22.22  VRF info: (vrf in name/id, vrf out name/id)  1 172.22.44.22 5 msec 8 msec \* |

* Record the traceroute below.

SW\_E1 🡪 SW\_W1:vlan344

|  |
| --- |
| SW\_E1(config)#do traceroute 10.33.44.31  Type escape sequence to abort.  Tracing the route to 10.33.44.31  VRF info: (vrf in name/id, vrf out name/id)  1 10.11.44.41 6 msec 7 msec 8 msec  2 10.33.44.31 22 msec 20 msec \* |

SW\_E2 🡪 SW\_W2:vlan233

|  |
| --- |
| SW\_E2(config)#do traceroute 10.22.33.32  Type escape sequence to abort.  Tracing the route to 10.22.33.32  VRF info: (vrf in name/id, vrf out name/id)  1 10.11.22.22 8 msec 10 msec 7 msec  2 172.22.44.21 28 msec 11 msec 16 msec  3 10.22.33.32 22 msec 29 msec \* |

SW\_E3 🡪 SW\_W2:vlan312

|  |
| --- |
| SW\_E3(config)#do traceroute 10.33.12.32  Type escape sequence to abort.  Tracing the route to 10.33.12.32  VRF info: (vrf in name/id, vrf out name/id)  1 10.11.34.14 3 msec 5 msec 7 msec  2 10.11.24.12 15 msec 22 msec 17 msec  3 10.11.22.22 26 msec 20 msec 19 msec  4 172.22.44.41 24 msec 24 msec 31 msec  5 10.33.44.31 53 msec 67 msec 51 msec  6 10.33.12.32 49 msec 43 msec \* |

* Record the configurations in this task.

SW\_N1:

|  |
| --- |
| !  router eigrp 10  network 10.33.44.0 0.0.0.255  redistribute ospf 1 metric 100000 10 255 1 1500  !  router ospf 1  redistribute connected subnets route-map lo2-to-ospf  redistribute eigrp 10 subnets tag 344  redistribute rip subnets tag 144  network 12.44.41.0 0.0.0.255 area 0  network 172.22.44.0 0.0.0.255 area 0  network 192.168.41.0 0.0.0.255 area 0  distribute-list route-map tag-filter in  ! |

SW\_S1:

|  |
| --- |
| !  router eigrp 10  network 10.22.33.0 0.0.0.255  redistribute ospf 1 metric 100000 10 255 1 1500  !  router ospf 1  redistribute eigrp 10 subnets tag 233  network 172.22.44.0 0.0.0.255 area 0  network 192.168.21.0 0.0.0.255 area 0  ! |

**Task 11: Internet Access**

* Configure the IP address on R:G0/1 to be 172.22.44.44/24 and let it be able to access VLAN244. Record the ping test to the interface vlan244 of SW\_N1, SW\_S1 and SW\_S2.

SW\_N1:vlan244

|  |
| --- |
| R(config-if)#do ping 172.22.44.41  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.41, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/10 ms |

SW\_S1:vlan244

|  |
| --- |
| R(config-if)#do ping 172.22.44.21  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.21, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 13/13/14 ms |

SW\_S2:vlan244

|  |
| --- |
| R(config-if)#do ping 172.22.44.22  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 172.22.44.22, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 11/13/17 ms |

* Configure R:G0/0 such that it can get IP address from the ISP via DHCP. Record the ping test to 8.8.4.4

|  |
| --- |
| R(config-if)#do ping 8.8.4.4  Type escape sequence to abort.  Sending 5, 100-byte ICMP Echos to 8.8.4.4, timeout is 2 seconds:  !!!!!  Success rate is 100 percent (5/5), round-trip min/avg/max = 3/3/4 ms |

* Configure OSPF area 0 for R:G0/1. Record the route table.

|  |
| --- |
| R(config-if)#do sh ip ro  Codes: L - local, C - connected, S - static, 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  i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  a - application route  + - replicated route, % - next hop override, p - overrides from PfR  Gateway of last resort is 192.168.255.1 to network 0.0.0.0  S\* 0.0.0.0/0 [254/0] via 192.168.255.1  10.0.0.0/24 is subnetted, 8 subnets  O E2 10.11.12.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 10.11.22.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 10.11.24.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 10.11.34.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 10.11.44.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  O E2 10.22.33.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  O E2 10.33.12.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  O E2 10.33.44.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  11.0.0.0/24 is subnetted, 1 subnets  O E2 11.44.41.0 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks  O E2 12.44.41.0/24 [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O 12.44.41.41/32 [110/2] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  172.22.0.0/16 is variably subnetted, 2 subnets, 2 masks  C 172.22.44.0/24 is directly connected, GigabitEthernet0/1  L 172.22.44.44/32 is directly connected, GigabitEthernet0/1  O E2 192.168.11.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 192.168.12.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 192.168.13.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 192.168.14.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  192.168.21.0/32 is subnetted, 1 subnets  O 192.168.21.21 [110/2] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  192.168.22.0/24 is variably subnetted, 2 subnets, 2 masks  O E2 192.168.22.0/24  [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  O 192.168.22.22/32  [110/2] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O E2 192.168.31.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  O E2 192.168.32.0/24 [110/20] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  [110/20] via 172.22.44.21, 00:00:12, GigabitEthernet0/1  192.168.41.0/24 is variably subnetted, 2 subnets, 2 masks  O E2 192.168.41.0/24  [110/20] via 172.22.44.22, 00:00:12, GigabitEthernet0/1  O 192.168.41.41/32  [110/2] via 172.22.44.41, 00:00:12, GigabitEthernet0/1  192.168.255.0/24 is variably subnetted, 2 subnets, 2 masks  C 192.168.255.0/24 is directly connected, GigabitEthernet0/0  L 192.168.255.50/32 is directly connected, GigabitEthernet0/0 |

* Configure R such that the default route 0.0.0.0/0 will be advertised to OSPF. After the configuration, all devices in the logical diagram will have a default route on the route table. Record the route table of SW\_E3.

|  |
| --- |
| SW\_E3(config)#do sh ip ro  Codes: L - local, C - connected, S - static, 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  i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  a - application route  + - replicated route, % - next hop override, p - overrides from PfR  Gateway of last resort is 10.11.34.14 to network 0.0.0.0  R\* 0.0.0.0/0 [120/3] via 10.11.34.14, 00:00:12, Vlan134  10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks  R 10.11.12.0/24 [120/2] via 10.11.34.14, 00:00:14, Vlan134  R 10.11.22.0/24 [120/2] via 10.11.34.14, 00:00:14, Vlan134  R 10.11.24.0/24 [120/1] via 10.11.34.14, 00:00:14, Vlan134  C 10.11.34.0/24 is directly connected, Vlan134  L 10.11.34.13/32 is directly connected, Vlan134  R 10.11.44.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 10.22.33.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 10.33.12.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 10.33.44.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  11.0.0.0/24 is subnetted, 1 subnets  R 11.44.41.0 [120/3] via 10.11.34.14, 00:00:14, Vlan134  12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks  R 12.44.41.0/24 [120/4] via 10.11.34.14, 00:00:14, Vlan134  R 12.44.41.41/32 [120/3] via 10.11.34.14, 00:00:14, Vlan134  172.22.0.0/24 is subnetted, 1 subnets  R 172.22.44.0 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.11.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.12.0/24 [120/2] via 10.11.34.14, 00:00:14, Vlan134  192.168.13.0/24 is variably subnetted, 2 subnets, 2 masks  C 192.168.13.0/24 is directly connected, Loopback0  L 192.168.13.13/32 is directly connected, Loopback0  R 192.168.14.0/24 [120/1] via 10.11.34.14, 00:00:14, Vlan134  192.168.21.0/32 is subnetted, 1 subnets  R 192.168.21.21 [120/3] via 10.11.34.14, 00:00:14, Vlan134  192.168.22.0/24 is variably subnetted, 2 subnets, 2 masks  R 192.168.22.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.22.22/32 [120/4] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.31.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.32.0/24 [120/3] via 10.11.34.14, 00:00:14, Vlan134  192.168.41.0/24 is variably subnetted, 2 subnets, 2 masks  R 192.168.41.0/24 [120/4] via 10.11.34.14, 00:00:14, Vlan134  R 192.168.41.41/32 [120/3] via 10.11.34.14, 00:00:14, Vlan134 |

* Configure R such that all devices in the logical diagram can access the Internet. Record the ping test to 8.8.4.4 on all PC.

PC\_E1:

|  |
| --- |
| cisco@PC\_E1:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=116 time=27.179 ms  64 bytes from 8.8.4.4: seq=1 ttl=116 time=23.449 ms  64 bytes from 8.8.4.4: seq=2 ttl=116 time=22.758 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 22.758/24.462/27.179 ms |

PC\_E2:

|  |
| --- |
| cisco@PC\_E2:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=113 time=37.264 ms  64 bytes from 8.8.4.4: seq=1 ttl=113 time=41.223 ms  64 bytes from 8.8.4.4: seq=2 ttl=113 time=34.899 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 34.899/37.795/41.223 ms |

PC\_S1:

|  |
| --- |
| cisco@PC\_S1:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=116 time=30.731 ms  64 bytes from 8.8.4.4: seq=1 ttl=116 time=24.682 ms  64 bytes from 8.8.4.4: seq=2 ttl=116 time=64.058 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 24.682/39.823/64.058 ms |

PC\_S2:

|  |
| --- |
| cisco@PC\_S2:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=116 time=35.592 ms  64 bytes from 8.8.4.4: seq=1 ttl=116 time=17.423 ms  64 bytes from 8.8.4.4: seq=2 ttl=116 time=21.210 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 17.423/24.741/35.592 ms |

PC\_W1:

|  |
| --- |
| cisco@PC\_W1:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=116 time=36.815 ms  64 bytes from 8.8.4.4: seq=1 ttl=116 time=21.364 ms  64 bytes from 8.8.4.4: seq=2 ttl=116 time=28.368 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 21.364/28.849/36.815 ms |

PC\_W2:

|  |
| --- |
| cisco@PC\_W2:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=115 time=29.289 ms  64 bytes from 8.8.4.4: seq=1 ttl=115 time=24.396 ms  64 bytes from 8.8.4.4: seq=2 ttl=115 time=28.589 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 24.396/27.424/29.289 ms |

PC\_N1:

|  |
| --- |
| cisco@PC\_N1:~$ ping -c 3 8.8.4.4  PING 8.8.4.4 (8.8.4.4): 56 data bytes  64 bytes from 8.8.4.4: seq=0 ttl=117 time=13.898 ms  64 bytes from 8.8.4.4: seq=1 ttl=117 time=15.337 ms  64 bytes from 8.8.4.4: seq=2 ttl=117 time=16.958 ms  --- 8.8.4.4 ping statistics ---  3 packets transmitted, 3 packets received, 0% packet loss  round-trip min/avg/max = 13.898/15.397/16.958 ms |

* Record the configurations in this task.

R:

|  |
| --- |
| !  interface GigabitEthernet0/0  ip address dhcp  ip nat outside  ip virtual-reassembly in  duplex auto  speed auto  media-type rj45  !  interface GigabitEthernet0/1  ip address 172.22.44.44 255.255.255.0  ip nat inside  ip virtual-reassembly in  ip ospf 1 area 0  duplex auto  speed auto  media-type rj45  !  interface GigabitEthernet0/2  no ip address  shutdown  duplex auto  speed auto  media-type rj45  !  interface GigabitEthernet0/3  no ip address  shutdown  duplex auto  speed auto  media-type rj45  !  router ospf 1  default-information originate  !  ip forward-protocol nd  !  !  no ip http server  no ip http secure-server  ip nat inside source list 1 interface GigabitEthernet0/0 overload  !  ipv6 ioam timestamp  !  !  access-list 1 permit any |

-- END OF LAB –