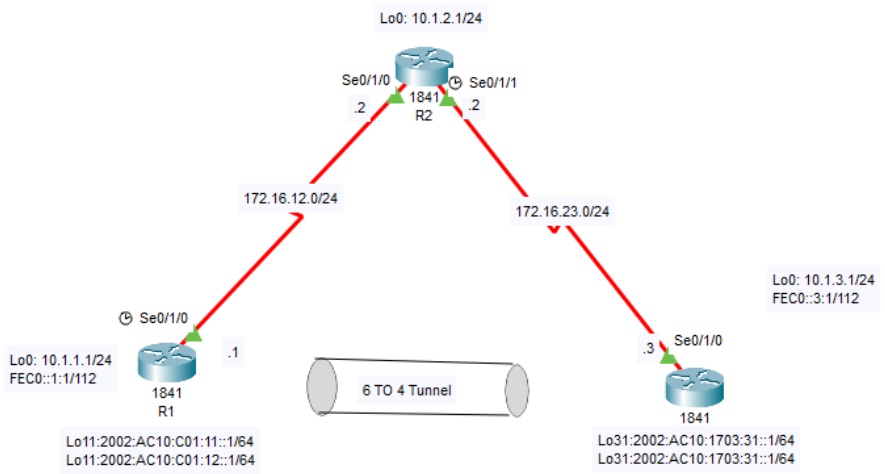
8



Step 1: Configure the loopback and physical interfaces

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int Lo0

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R1(config-if)#
R1(config-if)#ip add 10.1.1.1 255.255.255.0
R1(config-if)#ipv6 add FEC0::1:1/112
R1(config-if)#int Se0/1/0
R1(config-if)#ip add 172.16.12.1 255.255.255.0
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R1(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

```
R2(config)#int Lo0
R2(config-if)#ip add 10.1.2.1 255.255.255.0
R2(config-if)#int se0/1/0
R2(config-if)#ip add 172.16.12.2 255.255.255.0
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

R2(config-if)#int se0/1/1
R2(config-if)#ip add 172.16.23.2 255.255.255.0
R2(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up
```

-+

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#int Lo0

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R3(config-if)#ip add 10.1.3.1 255.25.255.0
Bad mask 0xFF19FF00 for address 10.1.3.1
R3(config-if)#ip add 10.1.3.1 255.255.255.0
R3(config-if)#int se0/1/0
R3(config-if)#ip add 172.16.23.3 255.255.255.0
R3(config-if)#no shut

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

Step 2: Configure EIGRP on all 3 routers

```
R1(config)#router eigrp 1
R1(config-router)#no auto-s
R1(config-router)#no auto-summary
R1(config-router)#network 10.0.0.0
R1(config-router)#network 172.16.0.0
R1(config-router)#
R1#
%SYS-5-CONFIG_I: Configured from console by console

%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 172.16.12.2 (Serial0/1/0) is up: new adjacency
```

Step 3: Add loopback interfaces for router R1 and R3

```
R1(config-if)#ipv6 add 2002:AC10:C01:11::1/64
R1(config-if)#int Lo12

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback12, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback12, changed state to up
R1(config-if)#ipv6 add 2002:AC10:C01:11::1/64
R1(config-if)#int Lo12

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback12, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback12, changed state to up
```

Step 4: Configure a manual ipv6 6 to 4 Tunnel

`

Step 5: Configure Static ipv6 route

```
R1(config)#ipv6 route FEC0::3:0/112 2002:AC10:1703:1::3
R3(config)#ipv6 route FEC0::1:0/112 2002:AC10:C01:1::1
```

Step 6

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
	Successful	R1	R3	ICMP		0.000	N	0	(edit)

```
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#ipv6 route 2002::/16 se0/1/0
R1(config)#int tunnel0
R1(config-if)#tunnel mode ipv6ip
R1(config-if)#ipv6 add 2002:AC10:0C01:1::1/64
R1(config-if)#tunnel source Se0/1/0
R1(config-if)#exit
R1(config)#ipv6 unicast-routing
R1(config)#ipv6 route 2002::/16 se0/1/0
```

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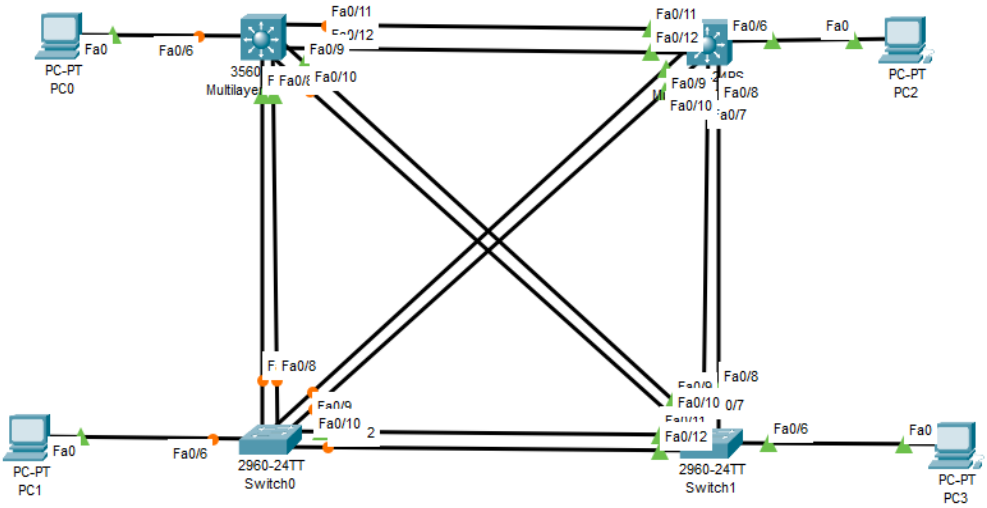


STEP 1: Configure basic switch parameters

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname DLS1
DLS1(config)#int vlan 1
DLS1(config-if)#ip add 10.1.1.101 255.255.255.0
DLS1(config-if)#no shut

DLS1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

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

Step 2: Display the switch default VLAN information(using show vlan command)

```
DLS1#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                 Gig0/1, Gig0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0
 --More--
```

Step 3:Examine VTP(Vlan Trunking Protocol) information.

```
DLS1#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0001.9716.7400
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
Local updater ID is 10.1.1.101 on interface Vl1 (lowest numbered VLAN interface found)

Feature VLAN :
--------------
VTP Operating Mode              : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 5
Configuration Revision          : 0
MD5 digest                      : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
                                  0xF0 0x58 0x10 0x6C 0x9C 0x0F 0xA0 0xF7
DLS1#
```

Step 4:Configure VTP on the switches

```
DLS1(config)#vtp version 2
DLS1(config)#vtp version 2DLS1(config)#vtp domain SWLAB
Changing VTP domain name from NULL to SWLAB
DLS1(config)#
```

```
DLS1#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 2
VTP Domain Name                 : SWLAB
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0001.9716.7400
Configuration last modified by 10.1.1.101 at 3-1-93 00:29:56
Local updater ID is 10.1.1.101 on interface Vl1 (lowest numbered VLAN interface found)

Feature VLAN :
--------------
VTP Operating Mode              : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 5
Configuration Revision          : 0
MD5 digest                      : 0x83 0x3E 0xBF 0x8A 0xAE 0x61 0xC7 0x35
                                  0x33 0xD1 0xC4 0x2E 0xC6 0x23 0xB2 0x6F
DLS1#
```

```
ALS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#vtp mode client
ALS1#sh vtp status
Setting device to VTP CLIENT mode.ALS1#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 1
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0001.424D.3A00
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00

Feature VLAN :
--------------
VTP Operating Mode              : Client
Maximum VLANs supported locally : 255
Number of existing VLANs        : 5
Configuration Revision          : 0
MD5 digest                      : 0x7D 0x5A 0xA6 0x0E 0x9A 0x72 0xA0 0x3A
                                  0xF0 0x58 0x10 0x6C 0x9C 0x0F 0xA0 0xF7
```

Step 5:Configure Trunking

```
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface range fa0/7-10
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk



DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
```

```
DLS1(config-if-range)#interface range fa0/11-12
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk


DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up


ALS1>en
ALS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#int range fa0/7-12
ALS1(config-if-range)#switchport mode trunk



ALS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
```

Step 6:Verify trunk configuration

```
DLS1#sh int trunk
Port        Mode         Encapsulation  Status        Native vlan
Fa0/7       on           802.1q         trunking      1
Fa0/8       on           802.1q         trunking      1
Fa0/9       on           802.1q         trunking      1
Fa0/10      on           802.1q         trunking      1
Fa0/11      on           802.1q         trunking      1
Fa0/12      on           802.1q         trunking      1

Port        Vlans allowed on trunk
Fa0/7       1-1005
Fa0/8       1-1005
Fa0/9       1-1005
Fa0/10      1-1005
Fa0/11      1-1005
Fa0/12      1-1005

Port        Vlans allowed and active in management domain
Fa0/7       1
Fa0/8       1
Fa0/9       1
Fa0/10      1
Fa0/11      1
 --More-- |
```

Step 7:Configure access port

```
DLS1#en
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#int fa0/6
DLS1(config-if)#switchport mode ?
  access   Set trunking mode to ACCESS unconditionally
  dynamic  Set trunking mode to dynamically negotiate access or trunk mode
  trunk    Set trunking mode to TRUNK unconditionally
DLS1(config-if)#switchport mode
% Incomplete command.
DLS1(config-if)#int fa0/6
DLS1(config-if)#switchport mode access
DLS1(config-if)#
```

```
DLS2#
DLS2#
DLS2#sh int fa0/6 switchport
Name: Fa0/6
Switchport: Enabled
Administrative Mode: dynamic auto
Operational Mode: static access
Administrative Trunking Encapsulation: negotiated
Operational Trunking Encapsulation: native
Negotiation of Trunking: On
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: All
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
 --More--
```

```
DLS1#sh int fa0/6 switchport
Name: Fa0/6
Switchport: Enabled
Administrative Mode: static access
Operational Mode: static access
Administrative Trunking Encapsulation: negotiated
Operational Trunking Encapsulation: native
Negotiation of Trunking: Off
Access Mode VLAN: 1 (default)
Trunking Native Mode VLAN: 1 (default)
Voice VLAN: none
Administrative private-vlan host-association: none
Administrative private-vlan mapping: none
Administrative private-vlan trunk native VLAN: none
Administrative private-vlan trunk encapsulation: dot1q
Administrative private-vlan trunk normal VLANs: none
Administrative private-vlan trunk private VLANs: none
Operational private-vlan: none
Trunking VLANs Enabled: All
Pruning VLANs Enabled: 2-1001
Capture Mode Disabled
Capture VLANs Allowed: ALL
Protected: false
 --More--
```

Step 8: Configure VLANS by assigning port membership

```
DLS1#en
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#int fa0/6
DLS1(config-if)#switchport access vlan 100
% Access VLAN does not exist. Creating vlan 100
DLS1(config-if)#
```

verify

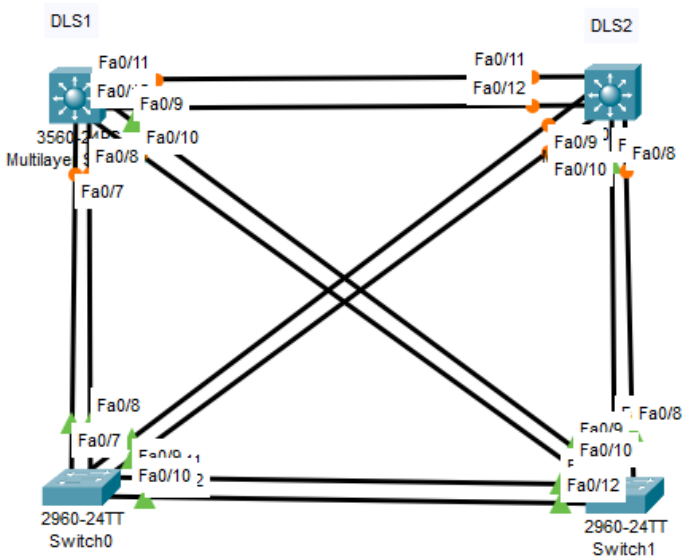
```
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#vlan 120
DLS1(config-vlan)#^Z
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#sh vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/13, Fa0/14, Fa0/15
                                                 Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                 Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                 Fa0/24, Gig0/1, Gig0/2
100  VLAN0100                          active    Fa0/6
110  VLAN0110                          active
120  VLAN0120                          active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
100  enet  100100     1500  -      -      -        -    -        0      0
110  enet  100110     1500  -      -      -        -    -        0      0
120  enet  100120     1500  -      -      -        -    -        0      0
 --More--
```

10



Step 1→

```
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#int range fa0/7-12
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#
```

```
DLS2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#int range fa0/7-12
DLS2(config-if-range)#switch
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#sw
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#
```

```
ALS1(config)#int range fa0/7-12
ALS1(config-if-range)#switchport mode trunk
```

```
ALS2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#int range fa0/7-12
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#
```

Step 2→ Configure an ether channel with cisco PAgP (Port Aggregation Protocol)

```
ALS1#
ALS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#int range fa0/11-12
ALS1(config-if-range)#channel-group 1 mode desirable
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
```

```
ALS1(config-if-range)#int port-channel 1
ALS1(config-if)#switchport mode trunk
```

```
ALS2(config-if-range)#int range fa0/11-12
ALS2(config-if-range)#channel-group 1 mode desirable
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

%LINK-5-CHANGED: Interface Port-channel1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up

ALS2(config-if-range)#int port-channel 1
ALS2(config-if)#switchport mode trunk
```

```
ALS1#sh etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

1      Po1(SU)           PAgP    Fa0/11(P) Fa0/12(P)
```

Step 3→ Configure an LACP (Link Aggregation Control Protocol) EtherChannel

\

```
ALS1(config-if-range)#channel-group 2 mode  active
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 2

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up

ALS1(config-if-range)#int port-channel 2
ALS1(config-if)#switchport mode trunk
```

```
ALS1#sh etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 2
Number of aggregators:           2

Group  Port-channel  Protocol    Ports
------+-------------+-----------+--------------------------------

1      Po1(SU)           PAgP    Fa0/11(P) Fa0/12(P)
2      Po2(SD)           LACP    Fa0/7(I)  Fa0/8(I)
```

Step 4→ Configure a layer 3 EtherChannel

```
DLS1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#int range fa0/11-12
DLS1(config-if-range)#no switchport
DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

DLS1(config-if-range)#channel-group 3 mode desirable
DLS1(config-if-range)#
Creating a port-channel interface Port-channel 3

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up

DLS1(config-if-range)#int port-channel 3
DLS1(config-if)#ip add 10.0.0.1 255.255.255.0
DLS1(config-if)#
```

```
DLS1>en
DLS1#sh etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

3      Po3(RU)           PAgP   Fa0/11(P) Fa0/12(P)
```