

# LAN Simulation Project Implementation Guide

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## Phase 1: Topology Physical Construction

### 1. Connections

#### 1.1 SW1 connections with Router, DNS, Switch

R1 G0/0 then with SW1 G0/1

SW2 G0/1 then with SW1 G0/2

DNS1 Fa0/24 then with SW1 fa0

#### 1.2 SW1 connections with PC1

CS1 fa0 then with SW1 fa0/3

ENG1 fa0 then with SW1 fa0/4

BUS1 fa0 then with SW1 fa0/5

BIO1 fa0 then with SW1 fa0/6

DNS1 fa0 then with SW1 fa0/7

#### 1.3 SW2 connections PCs2

CS2 fa0 then with SW2 fa0/2

ENG2 fa0 then with SW2 fa0/3

BUS2 fa0 then with SW2 fa0/4

BIO2 fa0 then with SW2 fa0/5

## Phase 2: Configurations SW, Access ports, trunk ports

### 2 Configuration SW1; Access ports assign, Trunk Ports

#### 2.1 Configure SW1 First

```
Switch> enable
Switch# configure terminal

Switch(config)# vlan 10
Switch(config-vlan)# name CS_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 20
Switch(config-vlan)# name ENG_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 30
Switch(config-vlan)# name BUS_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 40
Switch(config-vlan)# name BIO_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 99
Switch(config-vlan)# name SERVERS
Switch(config-vlan)# exit
```

#### 2.2 Access Port Assignments on SW1

```
! CS1 to VLAN 10 (Fa0/3)
Switch(config)# interface FastEthernet0/3
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 10
Switch(config-if)# exit

! ENG1 to VLAN 20 (Fa0/4)
Switch(config)# interface FastEthernet0/4
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 20
Switch(config-if)# exit

! BUS1 to VLAN 30 (Fa0/5)
Switch(config)# interface FastEthernet0/5
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 30
```

```

Switch(config-if)# exit

! BIO1 to VLAN 40 (Fa0/6)
Switch(config)# interface FastEthernet0/6
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 40
Switch(config-if)# exit

! DNS1 to VLAN 99 (Fa0/7)
Switch(config)# interface FastEthernet0/7
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 99
Switch(config-if)# exit

```

## 2.3 Trunk ports on SW1

```

! Gi0/1 to Router as TRUNK
Switch(config)# interface GigabitEthernet0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# exit

! Gi0/2 to SW2 as TRUNK
Switch(config)# interface GigabitEthernet0/2
Switch(config-if)# switchport mode trunk
Switch(config-if)# end

```

## 3 Configuration SW2; Access ports assign, Trunk Ports

### 3.1 configure SW2

```

! Access SW2 CLI tab
Switch> enable
Switch# configure terminal

! Create VLANs (same as SW1)
Switch(config)# vlan 10
Switch(config-vlan)# name CS_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 20
Switch(config-vlan)# name ENG_Dept
Switch(config-vlan)# exit

Switch(config)# vlan 30
Switch(config-vlan)# name BUS_Dept
Switch(config-vlan)# exit

```

```
Switch(config)# vlan 40
Switch(config-vlan)# name BIO_Dept
Switch(config-vlan)# exit
```

### 3.2 Access Port Assignments on SW2

```
! CS2 (Fa0/2)      VLAN 10
Switch(config)# interface FastEthernet0/2
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 10
Switch(config-if)# exit

! ENG2 (Fa0/3)      VLAN 20
Switch(config)# interface FastEthernet0/3
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 20
Switch(config-if)# exit

! BUS2 (Fa0/4)      VLAN 30
Switch(config)# interface FastEthernet0/4
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 30
Switch(config-if)# exit

! BIO2 (Fa0/5)      VLAN 40
Switch(config)# interface FastEthernet0/5
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 40
Switch(config-if)# exit
```

### 3.3 Trunk ports on SW2

```
! Configure Gi0/1 as TRUNK (to SW1)
Switch(config)# interface GigabitEthernet0/1
Switch(config-if)# switchport mode trunk
Switch(config-if)# end

! Verify configuration
Switch# show vlan brief
```

## Phase 3: Router Configuration (Inter-VLAN Routing)

```
! Enter privileged mode
Router> enable
Router# configure terminal

! Configure main interface (no IP address here)
Router(config)# interface GigabitEthernet0/0
Router(config-if)# no shutdown
Router(config-if)# no ip address
Router(config-if)# exit

! Create subinterface for VLAN 10 (CS_Dept)
Router(config)# interface GigabitEthernet0/0.10
Router(config-subif)# description Gateway for CS_Dept VLAN
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.10.1 255.255.255.0
Router(config-subif)# exit

! Create subinterface for VLAN 20 (ENG_Dept)
Router(config)# interface GigabitEthernet0/0.20
Router(config-subif)# description Gateway for ENG_Dept VLAN
Router(config-subif)# encapsulation dot1Q 20
Router(config-subif)# ip address 192.168.20.1 255.255.255.0
Router(config-subif)# exit

! Create subinterface for VLAN 30 (BUS_Dept)
Router(config)# interface GigabitEthernet0/0.30
Router(config-subif)# description Gateway for BUS_Dept VLAN
Router(config-subif)# encapsulation dot1Q 30
Router(config-subif)# ip address 192.168.30.1 255.255.255.0
Router(config-subif)# exit

! Create subinterface for VLAN 40 (BIO_Dept)
Router(config)# interface GigabitEthernet0/0.40
Router(config-subif)# description Gateway for BIO_Dept VLAN
Router(config-subif)# encapsulation dot1Q 40
Router(config-subif)# ip address 192.168.40.1 255.255.255.0
Router(config-subif)# exit

! Create subinterface for VLAN 99 (SERVERS)
Router(config)# interface GigabitEthernet0/0.99
Router(config-subif)# description Gateway for SERVERS VLAN
Router(config-subif)# encapsulation dot1Q 99
Router(config-subif)# ip address 192.168.99.1 255.255.255.0
Router(config-subif)# exit

! Return to privileged mode
Router(config-subif)# end
```

## Phase 4: Set IP & DNS addresses (End Device IP & DNS Configuration)

### 4.1 Configure DNS Server

IP Address: 192.168.99.10

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.99.1

DNS Server: 192.168.99.10 (itself)

### 4.2 Configure DNS Service

go to Services tab → DNS

Click DNS Service: ON

Name: cs1.lan	Address: 192.168.10.10	(Click Add after each entry)
Name: cs2.lan	Address: 192.168.10.20	
Name: eng1.lan	Address: 192.168.20.10	
Name: eng2.lan	Address: 192.168.20.20	
Name: bus1.lan	Address: 192.168.30.10	
Name: bus2.lan	Address: 192.168.30.20	
Name: bio1.lan	Address: 192.168.40.10	
Name: bio2.lan	Address: 192.168.40.20	
Name: dns1.lan	Address: 192.168.99.10	