# Layered Network Design Simulation (Instructor Version)

**Instructor Note**: Red font color or Gray highlights indicate text that appears in the instructor copy only.

## Objective

Explain the need to design a hierarchical network that is scalable.

Instructor Note: This activity can be completed by individual students or groups of two students. It can then be shared with another individual, group, class, or the instructor.

## Scenario

As the network administrator for a very small network, you want to prepare a simulated-network presentation for your branch manager to explain how the network currently operates.

The small network includes the following equipment:

- One Cisco 2911 series router
- One Cisco 3560 switch
- One Cisco 2960 switch
- Four user workstations (PCs or laptops)
- One printer

## Resources

- Packet Tracer software

## Directions

### Step 1: Create a simple network topology using Packet Tracer software. Place the devices at the appropriate levels of the Cisco three-layer hierarchical model design, including:

a. One Cisco 2911 series router

b. One Cisco 3560 switch

c. One Cisco 2960 switch

d. Four user workstations (PCs or laptops)

e. One printer

### Step 2: Using Packet Tracer's drawing tool and indicate the hierarchical layers with different color coding and labels:

a. Access layer

b. Distribution layer

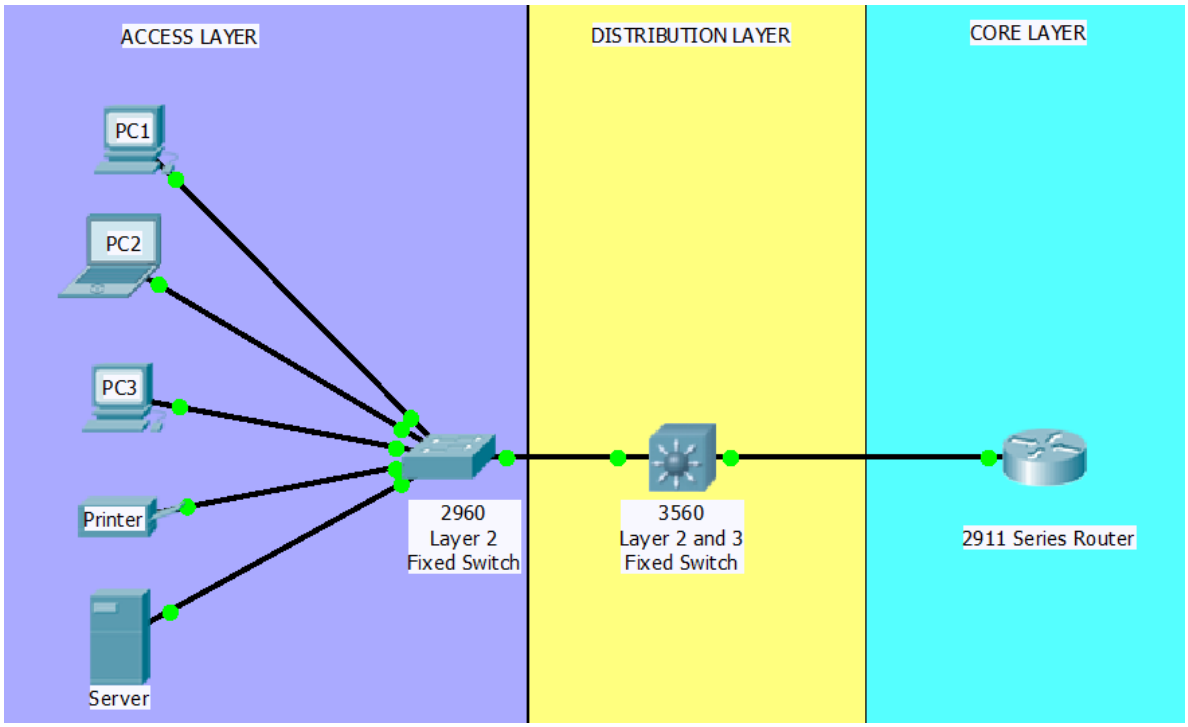
c. Core layer

**Step 3: Configure the network and user devices. Check for end-to-end connectivity.**

**Step 4: Share your configuration and hierarchical network design Packet Tracer file with another student, group, the class, or the instructor.**

## Suggested Activity Example Solution:

Instructor Note: In the Packet Tracer simulation, a Cisco 2911 series router is used in the core layer of the network. Normally, a higher-capacity router, such as the Cisco 3800 series routers, would be used at the core layer. **Please make students aware of this fact as they work through the activity**.




### Cisco 2960 Fixed-Switch Configuration:

```
Cisco_2960_Switch# show running-configuration
      version 12.2
      no service timestamps log datetime msec
      no service timestamps debug datetime msec
      no service password-encryption
      !
      hostname "Cisco 2960 Switch"
      !
      spanning-tree mode pvst
      !
      interface FastEthernet0/1
      !
      <output omitted>
      !
```

```
interface GigabitEthernet1/1
!
interface GigabitEthernet1/2
!
interface Vlan1
 ip address 192.168.10.2 255.255.255.0
!
ip default-gateway 192.168.10.1
!
!
line con 0
!
line vty 0 4
 no login
line vty 5 15
 no login!
end
```

## Cisco 3560 Switch Configuration

```
Cisco_3560_Switch# show running-configuration
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname "Cisco 3560 Switch"
!
ip routing
!
spanning-tree mode pvst
!
interface FastEthernet0/1
 no switchport
 ip address 10.11.48.2 255.255.255.252
 duplex auto
 speed auto
!
interface FastEthernet0/2
!
<output omitted>
!
interface GigabitEthernet0/1
 no switchport
 ip address 192.168.10.1 255.255.255.0
 duplex auto
 speed auto
!
```

```
interface GigabitEthernet0/2
 no switchport
 duplex auto
 speed auto
!
interface Vlan1
 no ip address
 shutdown
!
router eigrp 1
 network 10.11.48.0.0
 network 192.168.10.0
 network 192.168.11.0
 no auto-summary
!
ip classless
!
line con 0
!
line aux 0
!
line vty 0 4
 login
line vty 5 15
 no login
!
end
```

## Cisco 2911 Router Configuration

```
2911_Series_Router# show running-configuration
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname "2911 Series Router"
!
license udi pid CISCO2911/K9 sn FTX15248II7
!
spanning-tree mode pvst
!
interface Loopback0
 ip address 1.1.1.1 255.255.255.255
!
interface GigabitEthernet0/0
 ip address 10.11.48.1 255.255.255.252
 duplex auto
 speed auto
```

```
!
<output omitted>
!
router eigrp 1
 network 10.0.0.0
 network 1.1.1.1
 no auto-summary
!
ip classless
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
end
```

Identify elements of the model that map to IT-related content:

- Network design
- Cisco three-layer hierarchical model
- Access layer
- Distribution layer
- Core layer
- Network configuration
- Network device **show running-configuration** command