

Base Network : 192.168.1.0

No. subnets = 4

No. Sub =  $2^n$

$n = 2$

Subnet ID	Subnet Address	Host Address Range	Broadcast Address
1	192.168.1.0	192.168.1.1 - 192.168.1.62	192.168.1.63
2	192.168.1.64	192.168.1.65 - 192.168.1.126	192.168.1.127
3	192.168.1.128	192.168.1.129 - 192.168.1.190	192.168.1.191
4	192.168.1.192	192.168.1.193 - 192.168.1.254	192.168.1.255

## Configure Vlans


```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/2-4
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if-range)#
```

Switch(config)#int range fa0/8-10: This command enters configuration mode for a range of interfaces on the switch. Specifically, it's configuring interfaces FastEthernet 0/8 to 0/10.

Switch(config-if-range)#switchport mode access: This command sets the mode of the interfaces to access mode. Access mode is typically used when the switch port is connecting to an end device rather than another switch.

Switch(config-if-range)#switchport access vlan 30: This command assigns VLAN 30 to the specified range of interfaces. VLANs are used to segment network traffic.

## Add a password to the wireless Access point



## Configure interface fa0/1 to be trunk

```
Switch(config)#int fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#do wr
Building configuration...
[OK]
Switch(config-if)#
```

Trunk mode allows the port to carry traffic for multiple VLANs, facilitating communication between different VLANs or between switches.

## Make the interface of the Router on

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int g0/0
Router(config-if)#no sh

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

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

Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#
```

## Creating a sub-interface for the router to act as the default gateway

```
Router(config)#int g0/0.20
Router(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.20, changed state to up

Router(config-subif)#encapsulation dot1Q 20
Router(config-subif)#ip address 192.168.1.65 255.255.255.192
Router(config-subif)#
```

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Router(config)#int g0/0.20: This command enters configuration mode for a subinterface on GigabitEthernet 0/0 with VLAN ID 20. Subinterfaces are virtual interfaces created on a physical interface of a router to allow it to communicate with multiple VLANs or networks.

Router(config-subif)#encapsulation dot1Q 20: This command specifies the encapsulation method for the subinterface. Here, it's using IEEE 802.1Q encapsulation with VLAN ID 20. This allows the router to distinguish between different VLAN traffic on the same physical interface.

Router(config-subif)#ip address 192.168.1.65 255.255.255.192: This command assigns an IP address and subnet mask to the subinterface. In this case, the IP address 192.168.1.65 is assigned with a subnet mask of 255.255.255.192 to the subinterface. This enables the router to communicate with devices in the corresponding network segment.

## Configure DHCP in the Router

```
Router(config)#service dhcp
Router(config)#ip dhcp pool Admin-pool
Router(dhcp-config)#network 192.168.1.0 255.255.255.192
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#dns-server 192.168.1.1
Router(dhcp-config)#domain-name Admin.com
Router(dhcp-config)#
```

---

Router(config)#service dhcp: This command enables the DHCP service on the router, allowing it to dynamically assign IP addresses and related network configuration parameters to devices on the network.

Router(config)#ip dhcp pool Admin-pool: This command creates a DHCP pool named "Admin-pool". A DHCP pool is a range of IP addresses from which DHCP can assign addresses to clients.

Router(dhcp-config)#network 192.168.1.0 255.255.255.192: This command defines the network address and subnet mask for the DHCP pool. In this case, it specifies that the DHCP pool will provide IP addresses from the range 192.168.1.0 to 192.168.1.63 with a subnet mask of 255.255.255.192.

Router(dhcp-config)#default-router 192.168.1.1: This command specifies the default gateway (router) that DHCP clients should use. In this case, it sets the default gateway to 192.168.1.1.

Router(dhcp-config)#dns-server 192.168.1.1: This command configures the DNS (Domain Name System) server address that DHCP clients should use. In this case, it sets the DNS server address to 192.168.1.1.

Router(dhcp-config)#domain-name Admin.com: This command sets the domain name that DHCP clients should use for DNS queries. In this case, it sets the domain name to "Admin.com".

## Test Connectivity

```
C:\>ping 192.168.1.132

Pinging 192.168.1.132 with 32 bytes of data:

Reply from 192.168.1.132: bytes=32 time=84ms TTL=127
Reply from 192.168.1.132: bytes=32 time=63ms TTL=127
Reply from 192.168.1.132: bytes=32 time=41ms TTL=127
Reply from 192.168.1.132: bytes=32 time=37ms TTL=127

Ping statistics for 192.168.1.132:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 37ms, Maximum = 84ms, Average = 56ms
```