Default Routing

Default Route on Cisco Router.Before configuring default routes you must know why we need to configure it and where we use it.The reason behind configuring default routes is that it has capacity to direct packets destined to networks not found in the routing table.Default Routes are configured mainly in STUB NETWORK.

STUB NETWORK:A network having only one exit interface or only one route to reach the destination.

When we configure default routes,it directs these packets to another router that has the route to destination.

When a packet arrives on an interface of a router, the router checks the destination network address of the arrived-packet and finds that destination address in the routing table. If the router finds an entry for the destination network, the router forwards the incoming packet from the interface that is specified in the entry.

If the router does not find an entry for the destination network, the router checks the default route. If the default route is available, the router forwards the incoming packet from the interface that is specified in the default route.

If the default route is not available, the router drops the incoming packet. A router uses a default route to forward all incoming packets; those destination addresses are not available in the routing table.

Usually, a default route is used in the following situations.

- To forward all packets to a single destination.
- To forward all unknown packets (whose destination network addresses are not available in the routing table) to a server or a device for logging and troubleshooting purposes.
- To forward all packets to a device or a router that knows how to reach remote networks or has a routing table that has entries for all remote networks.

In the below section, we will understand how to configure a default route to forward all packets to a single destination through a practical example.
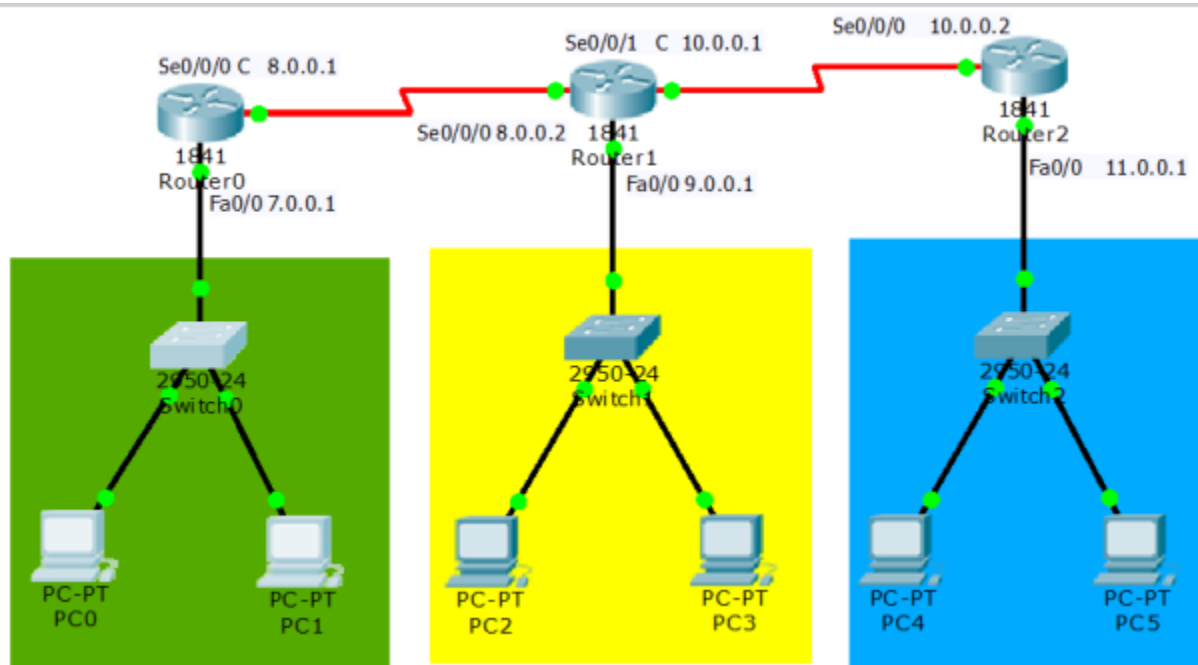
First Configure IP Addresses on Routers:

CONFIGURATION ON ROUTER R 0:
Router>enable

Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R0
R0(config)#int fa0/0
R0(config-if)#ip address 7.0.0.1 255.0.0.0
R0(config-if)#no shut

R0(config-if)#exit
R0(config)#int se0/0/0
R0(config-if)#ip address 8.0.0.1 255.0.0.0
R0(config-if)#clock rate 64000
R0(config-if)#no shut
R0(config-if)#

CONFIGURATION ON ROUTER R1:
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#int fa0/0

```
R1(config-if)#ip address 9.0.0.1 255.0.0.0
R1(config-if)#no shut




R1(config-if)#exit
R1(config)#int se0/0/0
R1(config-if)#ip address 8.0.0.2 255.0.0.0
R1(config-if)#no shut


R1(config-if)#exit




R1(config)#int se0/0/1
R1(config-if)#ip address 10.0.0.1 255.0.0.0
R1(config-if)#clock rate 64000
R1(config-if)#no shut
```

CONFIGURATION ON ROUTER R2:
```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#int fa0/0
R2(config-if)#ip address 11.0.0.1 255.0.0.0
R2(config-if)#no shut




R2(config-if)#exit
R2(config)#int se0/0/0
R2(config-if)#ip address 10.0.0.2 255.0.0.0
R2(config-if)#no shut
```

NOW DEFAULT ROUTE CONFIGURATION :

Configure Default Route on Router R0:

```
R0(config)#ip route 0.0.0.0 0.0.0.0 8.0.0.2
```

Configure Default Route on Router R1:

```
R1(config)#ip route 0.0.0.0 0.0.0.0 8.0.0.1
```

R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.2

Configure Default Route on Router R2:

R2(config)#ip route 0.0.0.0 0.0.0.0 10.0.0.1

CHECK DEFAULT ROUTE on router :

R0#show ip route
Codes: C – connected, S – static, I – IGRP, 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, E – EGP
i – IS-IS, 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

Gateway of last resort is 8.0.0.2 to network 0.0.0.0

C 7.0.0.0/8 is directly connected, FastEthernet0/0
C 8.0.0.0/8 is directly connected, Serial0/0/0
S* 0.0.0.0/0 [1/0] via 8.0.0.2

Check for Routing Table and routing protocol on router:

R1#show ip route
Codes: C – connected, S – static, I – IGRP, 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, E – EGP
i – IS-IS, 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

Gateway of last resort is 10.0.0.2 to network 0.0.0.0

C 8.0.0.0/8 is directly connected, Serial0/0/0
C 9.0.0.0/8 is directly connected, FastEthernet0/0
C 10.0.0.0/8 is directly connected, Serial0/0/1
S* 0.0.0.0/0 [1/0] via 10.0.0.2
[1/0] via 8.0.0.1

R2#show ip route
Codes: C – connected, S – static, I – IGRP, 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, E – EGP
i – IS-IS, 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


Gateway of last resort is 10.0.0.1 to network 0.0.0.0


C 10.0.0.0/8 is directly connected, Serial0/0/0
C 11.0.0.0/8 is directly connected, FastEthernet0/0
S* 0.0.0.0/0 [1/0] via 10.0.0.1
```

Note: S* shows route is default Route.