Static Routes

A static routing table is created, maintained, and updated by a network administrator, manually. A static route to every network must be configured on every router for full connectivity. This provides a greater control for administrator over routing,but its impratical over larger networks.

Static routes provide greater security because network administrator only know the complete routes.Routers will not share static routes with each other.This reduce CPU/RAM overhead and save bandwidth.

static routing is not fault-tolerant , as any change to the routing infrastructure (such as a link going down, or a new network added) must be done manually corrected by admininstrator. Static routes have an Administrative Distance (AD) of 1, and thus are always preferred over dynamic routes, unless the default AD is changed. A static route with an adjusted AD is called a **floating static route**

Mainly Static routes are used

•where there is only a single path to a network (stub network)

•When connecting to an ISP and configuring it as a default (static) route

Advantages of Static Routing

•No bandwidth overhead (updates are not shared between routers)

•More control on how traffic is routed

Disadvantages of Static routing

•No “dynamic” fault tolerance if a link goes down ,Means Administrator need to do it

•Impractical on large network

•Infrastructure changes must be manually adjusted

To configure a static route:

R1(config)# ip route [destination_network] [subnet_mask] [next hope IP / exit interface]

R1(config)# ip route 172.16.0.0 255.255.0.0 172.18.10.2

In above example

172.16.0.0 is the destination network

255.255.0.0 is the subnet mask

172.18.10.2 is the next hop IP

R1(config)# ip route 172.16.0.0 255.255.0.0 172.18.10.2 **S0/0**

Here instead of next hop IP ,exit interface is used

•**Next hope IP** is the IP address of the neigbouring router which the packet will go,After it leaves the R1.

•**Exit interface** is the interface of R1 which the packet leaving

To remove a static route, simply type no in front of it:

R1(config)# no ip route 172.16.0.0 255.255.0.0 172.18.10.2

Default Routes

Normally, if a specific route to a particular network does not exist, a router will drop all traffic destined to that network. A default route, or gateway of last resort, allows traffic to be forwarded, even without a specific route to a particular network.

The default route is identified by all zeros in both the network and subnet mask (0.0.0.0 0.0.0.0). It is the least specific route possible, and thus will only be used if a more specific route does not exist (hence "gateway of last resort").

To configure a default route:

R1(config)# ip route 0.0.0.0 0.0.0.0 [address | interface]

R1(config)# ip route 0.0.0.0 0.0.0.0 172.18.10.2

Floating Static Routes

There are some circumstances to use a static route as a backup to a dynamic routing protocol.But we know the default administrative distance ofstatic route is less dynamic routing protocols.So inorder to use static routes as back up we need to increase the AD value of static value than dynamic routing protocol used.

To change the Administrative Distance of a static route to 200R1(config)# ip route 172.16.0.0 255.255.0.0 172.18.10.2 **200**

Static routes will only remain in the routing table as long as the interface connecting to the next-hop router is up. To ensure a static route remains permantly in the routing table, even if the next-hop interface is down:

R1(config)# ip route 172.16.0.0 255.255.0.0 172.18.10.2 **permanent**