

Static Routing:

- o When routers learn from a Network administrator, it is called a static routing.
- o In Static Routing administrator manually inputs all the routing table information.
- o Static route tells network devices about exact location & only work in small network.
- o In static routing, we must add all network locations manually or statically in router.
- o If any change occurs in the network, admin is responsible to update it in all routers.
- o Keep in mind, that a static route will have a default administrative distance (AD) of 1.
- o To keep route all time in Routing table, **permanent** keyword to end of route statement.
- o This keyword will keep the route in the table even if the router interface goes down.

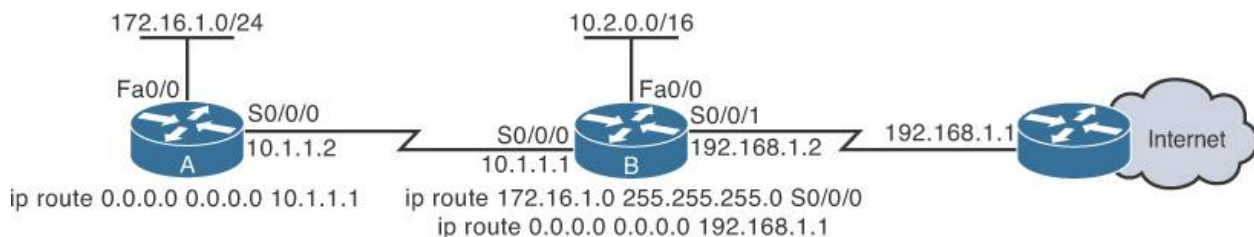


```
ip route 10.2.0.0 255.255.0.0 S0/0/0
```

```
ip route 172.16.1.0 255.255.255.0 10.1.1.2
```

Default Route:

- o A Default Route also known as the gateway of last resort is a special type of static route.
- o Default route is route that router uses to forward an incoming packet when no other route.
- o This is method where all routers are configured to send all packets towards a single router.
- o Where a static route specifies a path, a router should use to reach a specific destination.
- o Default route specifies a path router should use if it doesn't know how to reach destination.
- o Default Route is Network Route used by a router when there is no other known route exists.
- o Default Route is used by router when there is no other route for IP destination address.
- o All the Internet Protocol with unknown destination address are sent to the default route.
- o If no default route is set router will discard all packets with destination addresses not found.
- o This is very useful method for small networks or for networks with single entry & exit point.
- o All zero (0.0.0.0) in network portion and subnet mask represent all networks and all hosts.
- o A default route configured by the "IP Route" command is called the default static route.



```
ip route 0.0.0.0 0.0.0.0 10.1.1.1
```

```
ip route 172.16.1.0 255.255.255.0 S0/0/0  
ip route 0.0.0.0 0.0.0.0 192.168.1.1
```

Network Route:

- o Network Route used by a router when there is no other known route exists.
- o All the IP with unknown destination address are sent to the default route.
- o Network Route is route for a classful network most entries are network routes.

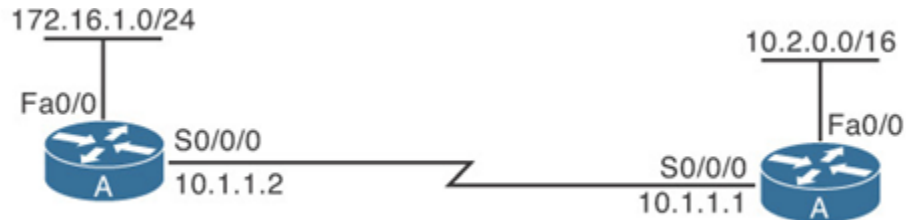


ip route 10.2.0.0 255.255.0.0 S0/0/0

ip route 172.16.1.0 255.255.255.0 10.1.1.2

Host Route:

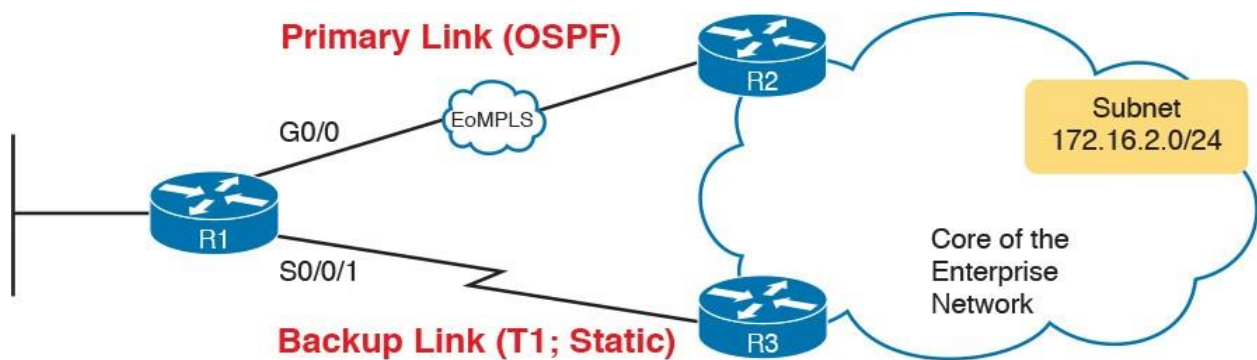
- o It is where destination address is a specific device IP with a subnet mask of /32 for IPv4.
- o It is where destination address is specific device IP with a subnet mask /128 for IPv6.
- o Also, installed Automatically when an IP address is configured on the router interface.
- o Hosts attached directly connected to routers are host routes & route for certain hosts.
- o They are advertised with a mask all 1's indicating a single destination is the Host Route.
- o An engineer might use host routes to direct packets sent to one host over one path.



ip route 10.2.1.2 255.255.255.255 10.1.1.1

Floating Static Routes:

- o Floating static route is route that has higher AD than the current route in a routing table.
- o The Floating Static Route are very useful, when providing a backup to a primary link.
- o Static Floating route is static route like any other but with added AD in the configuration.
- o Static floating route is the same as normal static route except that this kind of static route.
- o That has administrative distance configured to some value higher than 1 of default value.
- o As we know, that a static route will have administrative distance (AD) of 1 by default.
- o Router ignores static route during times when the better routing protocol route is known.
- o It is used for a Backup Static Route, a second route is defined with a high Preference AD.
- o If the first Primary link fails, then this floating static route is used as a Backup link to use.

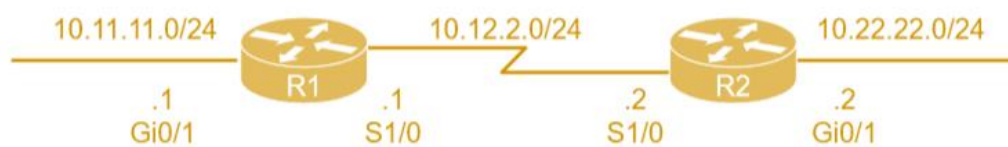


Static Route Types:

Static routes can be classified as one of these Directly Attached Static Routes, Recursive Static Routes, Fully Specified Static Routes and Static Null Routes.

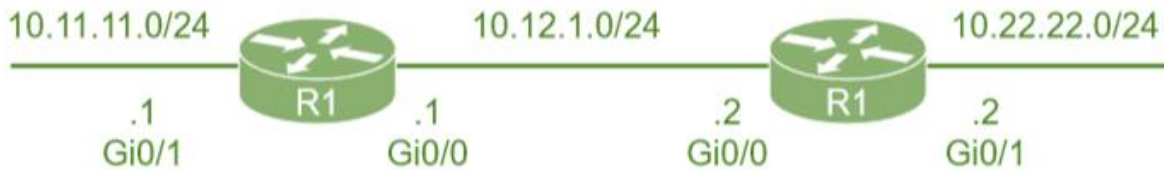
Directly Attached Static Routes:

Point-to-point serial interfaces do not need to maintain an adjacency table and do not use address resolution protocol, when used in a static route the configuration can directly reference the outbound of the router. Configuring a directly attached static route on an interface that utilizes ARP is not recommended and may cause problems. One problem being the router will need to repeat the ARP process for every destination that matches the static route. Depending on the size of the prefix, this can cause the number of lookups and entries for ARP to grow very large. `ip route 10.22.22.0 255.255.255.0 Serial1/0`



Recursive Static Routes:

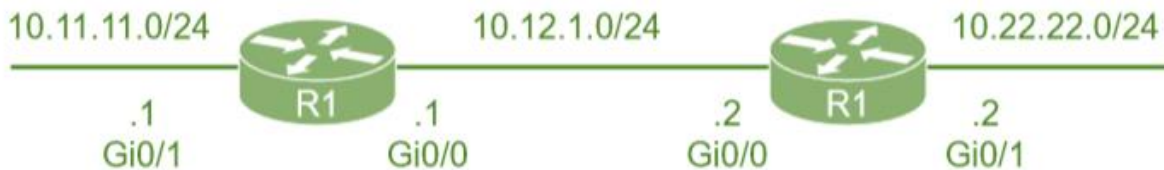
A configured recursive static route specifies the IP address rather than an interface as a next-hop destination. Recursive static routes require the next-hop IP address to exist in the routing table to install the static route. If the static route fails to meet this requirement it will not be inserted into the routing information base (RIB). `ip route 10.22.22.0 255.255.255.0 10.12.1.2`



Fully Specified Static Routes:

A configured static route can have both an outbound interface and a next-hop IP address, known as a fully specified static route. If the interface configured as part of the statement is not an up state, the route is removed from the routing information base. Specifying the IP address along with the physical address also removes the possibility of the ARP lookup problems that can be brought by only specifying the interface.

`ip route 10.22.22.0 255.255.255.0 GigabitEthernet0/0 10.12.1.2`



Static Null Routes:

The null interface is a non-physical interface that is always in an up state. Any traffic that is sent to the virtual null interface is dropped without any additional overheads added to the CPU. Configuring a static route towards a null interface provides a method of dropping network traffic without the need of an access list. `ip route 172.16.0.0 255.255.240.0 Null0`

