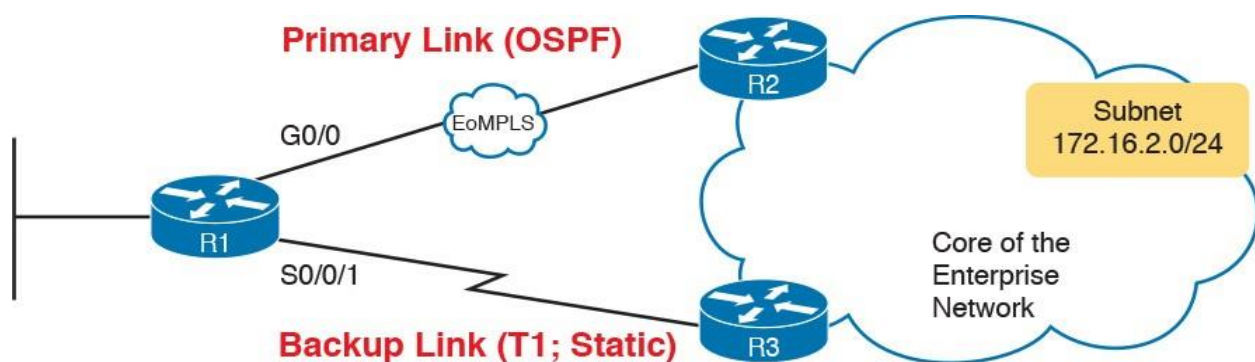


Floating Static Routes:

- o Floating static route is route that has higher AD then 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.



By default, we have created multiple static routing records for multiple Internet connections. We have multiple paths for the same destination, which use a different interface and different gateway. FortiGate must decide which Next Hop to use when routing. When it creates a routing table, and there are multiple records for the same destination, it compares the Administrative Distance (AD) value and selects the value with the lowest distance to insert into the table. If they have the same AD, both records are inserted into the table.

If there are multiple routes for the same destination and they have the same Distance and metric, then we are talking about Equal Cost Multi Path (ECMP) routes. In this case, Router automatically uses ECMP Load Balancing.

Equal Cost Multi-Path ECMP:

ECMP stands for **Equal Cost Multiple Path**. ECMP is a mechanism that allows multiple routes to the same destination with different next-hops and load-balances routed traffic over those multiple next-hops. Equal Cost Multi-Path (ECMP) is a mechanism that allows a Router to load-balance routed traffic over multiple gateways. Routes must have the same destination and costs. Equal Cost Multi-Path (ECMP) Load Balancing and Failover are methods that extend static routing. They are used to distribute traffic to the same destination across multiple routes.

ECMP Load Balancing Methods:

Per-Destination Load Balancing:

Packets for a given source and destination host pairs are guaranteed to take the same path, even if multiple ECMP paths are available it means Per-flow load balancing. Per Destination which means for a specific destination all traffic is sent over the same link. By default, it's set as Per-Destination Load Balancing.

Per-Packet Load Balancing:

per packet which means each packet is sent over one of the links and then the next packet is sent over another of the links etc. Using per packet load balancing can result in packets being delivered to the destination out of order because each packet is using a different link and this can have performance implications for the receiving application. It uses the round-robin method to determine which path each packet takes to the destination IP. This is inappropriate for certain types of traffic, such as Voice over IP (VoIP), which depends on the packets arriving at the destination in sequence.

```
R1#show ip cef 8.8.8.8 detail
0.0.0.0/0, epoch 0, flags [default route], per-destination sharing
  recursive via 192.168.12.2
    attached to GigabitEthernet0/0
  recursive via 192.168.13.3
    attached to GigabitEthernet0/1
```

Backup Interface:

A backup interface is an interface that stays idle until certain circumstances occur; then it is activated. The backup interface is usually used in a situation where you don't want to use your secondary link unless absolutely necessary. The backup interface is activated when the primary interface goes down or reaches the load specified by the backup load command. The backup delay command specifies how long the router should wait before activating (enable-time) or deactivating (disable-time) the backup interface. The backup interface command is placed under the primary link. This is the link that needs to be backed up in case of failure.

Testing the backup interface is a little more difficult. A simple shutdown of the interface will not cause the IOS software to see this as a link failure. To test the backup interface, you must physically remove the cable from the interface.