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CS332 Section 2
Report on the static routing concept

1. Static Routes

a. Types of Static routes

- Static routes are commonly implemented on a network. Static routes can be configured for IPv4 and IPv6. There are
 - Standard Static Route: This is the workhorse of static routes. It defines a path to a specific network destination (identified by a network address and subnet mask) through a next-hop IP address, which is typically the interface of another router on the network. Standard static routes are manually configured and offer granular control over traffic direction.
 - Default Static Route: Sometimes you need a catch-all for traffic not explicitly directed elsewhere. A default route specifies the next-hop IP for any destination not found in the routing table. This is typically used to reach the internet or another large network. Remember, a router can only have one default route active at a time.
 - Floating Static Route: These routes act as backups, providing an alternative path to a network if the primary route (usually a dynamic route learned from a routing protocol) becomes unavailable. They are configured with a higher administrative distance (a value indicating preference) than the primary route. This ensures the router only uses the floating route when the primary route fails.
 - Summary Static Route: This type of route allows you to define a route for a larger network block by specifying a network address with a more concise subnet mask. Imagine you have multiple subnets within a larger network class. A summary route can efficiently represent all those subnets with a single entry, reducing the routing table size.

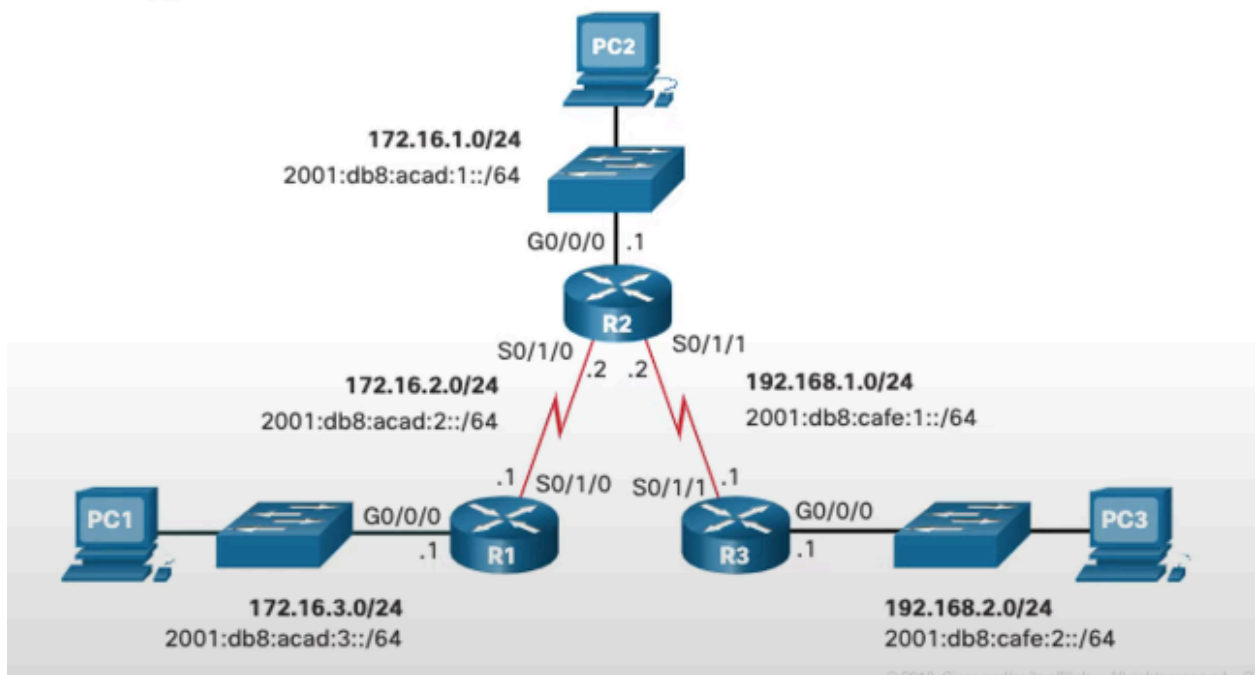
b. IPv4 Static Route Command

- `ip route (network-address) (subnet-mask) {ip-address | exit-intf [ip-address]} [distance]`

c. IPv6 Static Route Command

- `ipv6 route ipv6-prefix/prefix-length {ipv6-address | exit-intf [ipv6-address]} [distance]`

d. Dual-stack



- The key aspect of a dual-stack network is that each device can utilize both IPv4 and IPv6 addressing. In summary, this dual-stack network topology allows devices to communicate using either IPv4 or IPv6 protocols. This provides a smooth transition path as the internet migrates from IPv4 to IPv6.