Hands-on
Routing configuration / commands glossary

Cisco commands

1. **Enable IPv6 on an interface**
   ```
   interface xxxxx
   ipv6 enable
   ```

2. **Configure an address**
   ```
   interface xxxxx
   ipv6 address X:X:X:X::X/<0-128> (general address)
   ipv6 address X:X:X:X::X (link-local address)
   ipv6 address autoconfig (auto-configuration)
   ```

   **Example (LAN interface)**
   ```
   interface Ethernet0/0
   ip address 192.168.1.254 255.255.255.0
   ipv6 address 2001:db8:10a:1001::1/64
   ```

**Configure a tunnel**

- **Configure an IPv6 in IPv4 tunnel**
  ```
  interface tunnel x
  tunnel source interface
  tunnel destination X.X.X.X
  ipv6 address X:X:X:X::X/<0-128>
  tunnel mode ipv6ip (for direct tunneling)
  tunnel mode gre ip (for gre encapsulation)
  ```

- **Configure an IPv6 in IPv6 tunnel**
  ```
  interface tunnel x
  tunnel source interface
  tunnel destination X.X.X.X
  ipv6 address X:X:X:X::X/<0-128>
  tunnel mode ipv6 (for direct tunneling)
  tunnel mode gre ipv6 (for gre encapsulation)
  ```

**Enable IPv6 routing**
```ipv6 unicast-routing```

**Configure static routes**
```ipv6 route prefix/prefixlen next_hop
ipv6 route ::/0 2001:db8:10a:1001::1```
Routing (OSPFv3)

interface Ethernet0/0
  ipv6 address 2001:db8:1:1::1/64
  ipv6 ospf 1 area 0

! interface Ethernet0/1
  ipv6 address 2001:db8:1:2::2/64
  ipv6 ospf 1 area 1

! ipv6 router ospf 1
  router-id 2.2.2.2

Routing (BGP)

no bgp4 default unicast
bgp router-id a.b.d.f
router bgp xxxx
  neighbor X:X:X::X remote-as ...
network 2001:db8::/32
  no synchronization
exit address-family

Routing policy filtering

ipv6 prefix-list bgp-in-6net seq 5 deny ::/0
  Means filter ::/0 exactly
ipv6 prefix-list bgp-in-6net seq 10 deny 3FFE:300::/24 le 28
ipv6 prefix-list bgp-in-6net seq 15 deny 2001:db8::/35 le 41
ipv6 prefix-list bgp-in-6net seq 20 permit 2002::/16
ipv6 prefix-list bgp-in-6net seq 25 permit 3FFE::/17 ge 24 le 24
ipv6 prefix-list bgp-in-6net seq 30 permit 3FFE:8000::/17 ge 28 le 28
  Means every prefix matching 3FFE:8000::/17 with length 28
ipv6 prefix-list bgp-in-6net seq 35 permit 3FFE:4000::/18 ge 32 le 32
ipv6 prefix-list bgp-in-6net seq 40 permit 2001::/16 ge 32 le 35
  Means every 2001::/16 derived prefix, with length between 32 and 35

Access Control Lists

ipv6 access-list vty-ipv6
  permit tcp 2001:db8:0:401::/64 any eq telnet
  deny ipv6 any any log-input
Applying an ACL to an interface
ipv6 traffic-filter <acl_name> in | out

Restricting access to the router
ipv6 access-class <acl_name> in | out

Applying an ACL to filter debug traffic
debug ipv6 packet [access-list <acl_name>] [detail]

Show commands
show bgp
show bgp ipv6 unicast/multicast/all summary
show bgp ipv6 neigh <addr> routes
show bgp ipv6 neigh <addr> advertised-routes
show bgp ipv6 neigh <addr> received-routes
show ipv6 route
show ipv6 interface
show ipv6 neighbors
Juniper commands

Interface configuration

    interfaces {
        name of interface {
            unit x {
                family inet {
                    address X.X.X.X/prefixlength;
                }
                family iso {
                    address Y.Y.Y.Y.Y;
                }
                family inet6 {
                    address Z.Z.Z.Z::Z/prefixlength;
                }
            }
        }
    }

Router advertisements (stateless autoconfiguration)

    protocols {
        router advertisement {
            interface interface name {
                prefix IPv6_prefix::/prefixlength;
            }
        }
    }

Configure tunnel (with Tunnel PIC)

    interface {
        ip-x/x/x/x {
            tunnel {
                source ipv4_source_address;
                destination ipv4_destination_address;
            }
            family inet6 {
                address ipv6_address_in_tunnel/prefixlength;
                gr-x/x/y/z {
                    unit 0 {...}
                }
            }
        }
    }

Static routes

    Routing options {
        rib inet6.0 {
            route IPv6_prefix next-hop IPv6_address;
        }
    }

    Routing options {
        rib inet6.0 {
            static {
                
                
            }
        }
    }
route IPv6_prefix discard; -> Useful to originate a network
}

Routing (OSPFv3)
protocols {
    ospf3 {
        preference 20;
        area 0.0.0.0 {
            interface ge-0/3/0.808 {
                metric 100;
            }
            interface lo0.0 {
                passive;
            }
        }
    }
}

Routing (BGP)
protocols {
    bgp {
        local-as local_AS_number;
        group EBGP_peers {
            type external;
            family inet6 {
                (any | multicast | unicast) }
            neighbor neighbor_IPv6_address;
            peer-as distant_AS_number;
            import in-PS;
            export out-PS; }
    }
}

Policy routing
policy statement in PS {
    term from_outside_accept {
        from {
            route-filter 2002::/16 exact;
            route-filter 3FFE::/17 prefix-length-range /24-/24;
            route-filter 3FFE:8000::/17 prefix-length-range /28-/28;
            route-filter 3FFE:4000::/18 prefix-length-range /32-/32;
            route-filter 2000::/3 prefix-length-range /16-/16;
            route-filter 2001::/16 prefix-length-range /29-/35; }
        then {
            accept; }
        then reject; }
}

Show commands
show bgp summary
show route advert bgp <addr>
show route rece bgp <addr>
show route table inet6.0 (terse)
show interfaces
show ipv6 neighbors