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:db8:123:1::2/64
```

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

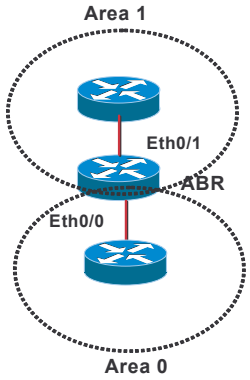
```
ipv6 unicast-routing
```

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)

```
router bgp xxxx
      no bgp default ipv4-unicast
      bgp router-id a.b.d.f
      neighbor X:X:X:X::X remote-as …
      neighbor X:X:X:X::X …
      address-family ipv6
      neighbor X:X:X:X::X activate
      neighbor X:X:X:X::X …
      network 2001:db8::/32
      no synchronization
      exit
```

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.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 {
   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 {    -> Means IPv6 unicast routing table
   static {
   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
```

Alcatel commands

Enable IPv6 on a VLAN interface

```
vlan "number"
show vlan
vlan "number" port default a/b-c
ipv6 interface "name" vlan number
ipv6 address "2001:XXXX::3/prefix" "name"
```

Tunnels configuration

```
vlan "number"
vlan "number" port default a/b
ip interface "name-v4" vlan "number"
ip interface "name-v4" address D.E.F.G mask H.I.J.K
ipv6 interface "name-v6" tunnel "number"
ipv6 interface "name-v6" tunnel source "@v4" dest. @v4"
ipb6 address "2001:XXXX::3/prefix" "name-v6"
```

Router Advertisements and auto-configuration

```
show ipv6 interface "name"
ipv6 interface "name" parameter numerical-value/yes/no
ipv6 interface name ra-send no
ipv6 interface ns-interval value
ipv6 interface ra-interval value
...
```

Starting routing

```
ipv6 route IPv6_prefix/length  IPv6_address
```

Starting and configuring RIP routing

```
ipv6 load rip
ipv6 rip status enable
ipv6 rip interface "name of the IPv6 VLAN"
show ipv6 routes

ipv6 rip  interface "name of the IPv6 VLAN" send-version\
[v1|v2|v1compatible|none]
ipv6 rip  interface "name of the IPv6 VLAN" receive-version\
[v1|v2|v1compatible|none]
ipv6 rip  interface "name of the IPv6 VLAN" metric [1-15]
```