

# Hands-on

## Routing configuration / commands glossary

### Cisco commands

*To enter in configuration mode:*

```
#conf t
(config)#
```

#### 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
ipv6 cef (activate IPv6 Cisco Express forwarding)
```

### Configure static routes

```
ipv6 route prefix/prefixlen next_hop
ipv6 route ::/0 2001:db8:10a:1001::1
```



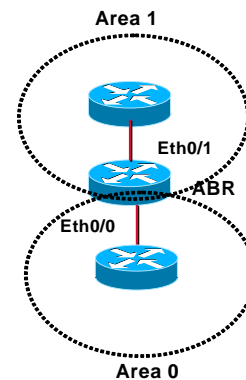
## Routing (OSPFv3)

```

ipv6 router ospf 1 # "1" is the process ID
  router-id 2.2.2.2 # loopback interface

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
  !

```



## Routing (BGP)

```

router bgp xxxx (AS number)
  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

IPv6 interfaces:

```
show ipv6 interface
```

IPv6 static routes:

```
show ipv6 route
```

IPv6 OSPF commands:

```
show ipv6 ospf
```

```
show ipv6 ospf neighbor
```

IPv6 BGP commands:

```
show bgp
```

```
show bgp ipv6 unicast/multicast/all summary
```

```
show bgp ipv6 neigh <addr> routes
```

