

# ACL Route Filtering Limitations



- The operation of an ACL in a Distribute List changes depending on whether a wildcard mask is included in a standard ACL, whether it is a standard or extended ACL, and what the Distribute List is applied to (IGP, BGP, Route Map or redistribution) – this can be confusing
- If a standard or extended ACL is used in a Distribute List applied to interfaces for an IGP protocol then specific subnet mask(s) cannot be specified

# Prefix Lists



- Prefix Lists look and work similarly to Access Control Lists
- They are specifically designed for route filtering (as compared to ACLs which were originally designed to secure traffic flows)
- Prefix List configuration is simple and consistent
- Subnet masks can be specified (including ranges of subnet masks)
- Processing is more efficient than with ACLs

# Route Filter Operation



- **Routes to be filtered** can be specified with an Access Control List or Prefix List
- ACLs and Prefix Lists can optionally be nested inside a Route Map
- The filter is **applied** with a Distribute List
- (Prefix Lists can be applied directly to neighbors in BGP)

```
R1(config-router)#distribute-list ?
<1-199>          IP access list number
<1300-2699>     IP expanded access list number
WORD             Access-list name
gateway         Filter based on gateway
prefix          Filter prefixes in routing updates
route-map       Filter prefixes based on route-map
```

# Prefix List Example



```
R1(config)#ip prefix-list DEMO permit 172.16.1.0/24
```

```
R1(config)#ip prefix-list DEMO permit 192.168.1.0/24
```

```
R1(config)#router eigrp 100
```

```
R1(config-router)#distribute-list prefix DEMO in
```

# Prefix List Syntax



```
R1(config)#ip prefix-list DEMO deny 172.16.1.0/24
```

- Denies specifically 172.16.1.0/24
- Prefix Lists are always named

# Prefix List Syntax (Cont.)



```
R1(config)#ip prefix-list DEMO permit 10.0.0.0/8 le 20
```

- Permits 10.x.x.x network, with a subnet mask less than or equal to /20
- Will permit:
  - 10.0.0.0/16
  - 10.20.30.0/18
  - 10.50.10.10/20
- Will not permit:
  - 10.10.10.0/21
  - 10.70.70.0/25
  - 172.16.0.0/16

# Prefix List Syntax (Cont.)



```
R1(config)#ip prefix-list DEMO permit 10.0.0.0/8 ge 20
```

- Permits 10.x.x.x network, with a subnet mask greater than or equal to /20
- Will permit:
  - 10.0.0.0/20
  - 10.20.30.0/25
- Will not permit:
  - 10.10.10.0/19
  - 172.16.0.0/21

# Prefix List Syntax (Cont.)



```
R1(config)#ip prefix-list DEMO permit 10.0.0.0/8 le 16 ge 20
```

- Permits 10.x.x.x network, with a subnet mask from /16 to /20
- Will permit:
  - 10.0.0.0/16
  - 10.20.30.0/18
  - 10.100.100.0/20
- Will not permit:
  - 10.10.10.0/15
  - 10.50.50.0/24
  - 172.16.0.0/21

# Prefix List Syntax (Cont.)



- The Prefix List is read top down like an Access List
- There is an implicit 'Deny any' at the end of the list
- Sequence numbers can be used to inject entries
- Entries start at and increment by 5 if no sequence number is specified

```
R1(config)#ip prefix-list DEMO seq 12 permit 10.0.0.0/8 ge 20
```

```
R1(config)#ip prefix-list DEMO seq 22 permit 192.168.0.0/24
```

# Prefix List Syntax (Cont.)



```
R1(config)#ip prefix-list DEMO permit 0.0.0.0/0
```

- Permits specifically a default route to 0.0.0.0/0

```
R1(config)#ip prefix-list DEMO permit 0.0.0.0/0 le 32
```

- Permits all routes

# Prefix List Syntax (Cont.)



```
R1(config)#ip prefix-list DEMO deny 172.16.1.0/24
R1(config)#ip prefix-list DEMO deny 192.168.1.0/24
R1(config)#ip prefix-list DEMO permit 0.0.0.0/0 le 32
```

- Denies 172.16.1.0/24 and 192.168.1.0/24, allows all other networks

# Prefix List Example



```
R1(config)#ip prefix-list DEMO permit 172.16.1.0/24
```

```
R1(config)#ip prefix-list DEMO permit 192.168.1.0/24
```

```
R1(config)#router eigrp 100
```

```
R1(config-router)#distribute-list prefix DEMO in
```