# Multicast Peering

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# What is IP Multicast?

- Single packet is replicated by network infrastructure to all receivers instead of server sending packet N times to N receivers.
- TV Station Model: Single Source to Multiple Receivers
- Party Line Model: Multiple Sources to Multiple Receivers

# Protocol Independent Multicast (Sparse Mode)

- It was designed for “single ASN” operation, and operates that way without some help
- Packets flow from Source to Receiver via the Rendezvous Point (RP).
- Trees are built “backwards” from receiver to source using information learned from the routing protocols
- (S,G) Pairs
  - Single source in a group: (69.36.237.132,224.2.127.254)
  - All possible sources for a group: (*,224.2.127.254)

# MBGP

- Multiprotocol BGP Extensions in RFC2858
- It’s just BGP
- Separate RIB for Multicast paths
- If you are already doing dual-stack IPv4/IPv6, congratulations, you are already doing this
- You will not see multicast groups in MBGP

# Multicast Source Distribution Protocol (MSDP)

- RFC3618
- The glue that makes PIM work between domains
- Communicates (S,G) state between peers
- Is a temporary solution :-)

# Global Configuration

- ip pim rp-address 192.168.1.1
- ip multicast-routing [distributed]
- ip msdp cache-sa-state

- ! Loopback Interface must have PIM Enabled
- int loopback0
- ip address 192.168.1.1 255.255.255.255
- ip pim sparse-mode

- int GigabitEthernet1/1
- description Backbone interface
- ip pim sparse-mode

- int GigabitEthernet1/2
- description Exchange Point
- ip address 192.168.5.2 255.255.255.0
- ip pim sparse-mode
- ip pim bsr-border
- ip multicast ttl-threshold 32
- ip multicast boundary bogon

- ip access-list standard bogon
- ! This should be considered the bare minimum
- deny 239.0.0.0 0.255.255.255
- deny 224.0.1.39
- deny 224.0.1.40
- permit any

# Per-Peer Configuration

- ip msdp peer 192.168.5.1 remote-as 65002
- ip msdp sa-filter in 192.168.5.1 list bogon
- ip msdp sa-filter out 192.168.5.1 list bogon

- ! You can use your normal peer route-maps
- ! Peer templates or peer groups recommended
- router bgp 65001
- neighbor 192.168.5.1 peer-out remote-as 65002
- address-family ipv4 unicast
- no neighbor 192.168.5.1 activate
- address-family ipv4 multicast
- neighbor 192.168.5.1 activate
- neighbor 192.168.5.1 route-map peer-in in
- neighbor 192.168.5.1 route-map peer-out out

# Verify

```
Router>show ip pim neighbor
PIM Neighbor Table
Neighbor          Interface              Uptime/Expires    Ver   DR
Address                                                    Prio/Mode
192.168.5.1       GigabitEthernet1/2     12w6d/00:01:27    v2    1 / S

Router>show ip msdp summary
MSDP Peer Status Summary
Peer Address     AS    State    Uptime/    Reset SA       Peer Name
                                Downtime   Count Count
192.168.5.1      65002 Up       5w3d       46    30       somepeer

Router>show ip msdp peer 192.168.5.1 accepted-SAs
MSDP SA accepted from peer 192.168.5.1 (somepeer.foo.net)
224.3.4.5      131.225.235.129 (lead.fnal.gov) RP: 198.49.208.2
224.2.209.35   140.221.34.2 (ws-display.mcs.anl.gov) RP: 192.5.170.10
[...]

Router>show ip bgp ipv4 multicast summary
[...]
192.168.5.1 4   1234 1513623 1452785  2889456    0    0 34w5d          24
```

# More information

- RFC4601 - PIM Sparse Mode
- RFC3618 - Multicast Source Discovery Protocol
- RFC2858 - Multiprotocol BGP
- http://andrew.triumf.ca/AG/multicast/
- http://aharp.ittns.northwestern.edu/papers/mcast-template.html
- Google/Wikipedia?