INTERNETWORK eXpert

CCIE Routing & Switching
Advanced Troubleshooting Bootcamp

BGP Troubleshooting

http://www.INE.com

BGP Workflow

- BGP operation can be subdivided into five discrete steps…
  - Establish BGP peerings
  - Learn BGP table
  - Choose Best Path
  - Advertise Best Paths
  - Routing using BGP

Establishing BGP Peerings

- Requires TCP port 179 transport
- Troubleshooting considerations
  - IGP routing
    - Default route & initiating peering
  - Update source
  - Client/server relationship & filtering
  - TTL
    - eBGP Multihop
    - TTL Security
  - NAT & Next-Hop

Establishing BGP Peerings (cont.)

- BGP peers must agree on attributes to establish peering
  - Peer addresses
  - Unique RID
  - ASNs
    - Hide Local-AS
  - Authentication (TCP Option)
  - Capabilities (address-families)

Learning the BGP Table

- Troubleshooting considerations
  - AS-Path looping
    - Allow-AS in
    - AS-Override (MPLS VPN)
  - Inbound Filters
    - Route-map, distribute-list, AS_PATH filter etc
    - ORF
  - Max AS limit
  - Enforce First AS
    - Unlikely but possible

Choose BGP Best Path

- Valid Next Hop
- BGP Synchronization
  - Router ID Matching
- BGP Attributes
  - Weight, Local-Preference, AS_PATH, MED, etc.
  - Improper Attribute Manipulation
- BGP Dampening
- Nexthop tracking

Advertising Best Paths

- Advertisement Interval Delays
- Outbound Filters
  - Route-Map, Distribute-List, Prefix-List
- iBGP Split Horizon Rule
  - Full Mesh
  - Route Reflectors
  - Confederations
  - Synchronization

Routing using BGP

- Installing Best Paths
  - Nexthop Recursion issues
  - AD Collisions & Race Condition
  - Backdoor Networks
- eBGP Default AD 20
- BGP Blackholes
  - Redistribution
    - iBGP Redistribution
  - Tunneling

Common BGP Commands

- `show ip bgp summary`
- `show ip bgp`
- `show ip bgp neighbor [advertised-routes]`
- `debug ip tcp transaction`
- `debug ip bgp events`
- `debug ip bgp updates`

Further Reading

- Troubleshooting BGP
- Why Do BGP Neighbors Toggle Between Idle, Connect, and Active States?
- Troubleshooting When BGP Routes Are Not Advertised
- Troubleshooting Flapping BGP Routes (Recursive Routing Failure)