Border Gateway Protocol (BGP)

Module 10: IBGP Scaling

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AS Confederation

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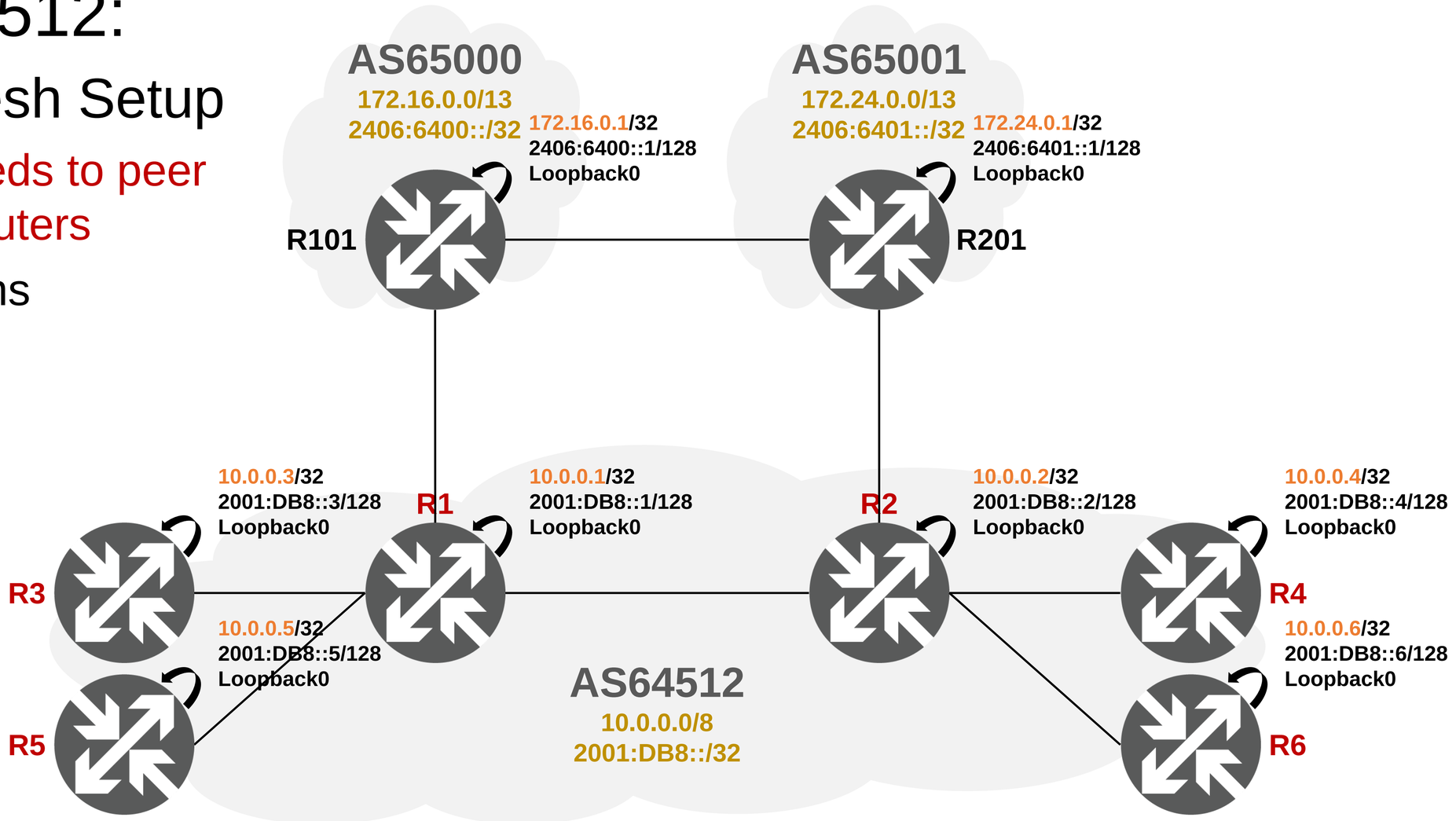
- An alternative to Route Reflection for addressing full mesh IBGP issues.
- Described in RFC1965, RFC3065, RFC5065.
- Divides AS into multiple sub-ASes.
  - Each sub-AS has own ASN
  - Appear as a single Confederation AS to outside world
- Supports individual IGP for each sub-AS.

AS Confederation

- IBGP peering between routers within the same sub-AS.
  - Reduced number of routers results in fewer full mesh IBGP sessions
  - Can implement Route Reflection to eliminate full mesh
- EBGP peering between routers from different sub-ASes
  - Intra-Confederation ASNs are prepended to AS_PATH
    - To be removed when prefixes are advertised to external peers
  - Loop prevention by AS_PATH
  - NEXT_HOP is unchanged by default

Example: AS Confederation (Cisco IOS)

- IBGP in AS64512:
  - Typical Full Mesh Setup
    - Each router needs to peer with all other routers
    - 15 BGP sessions
      - 6 * (6 - 1) / 2



Example: AS Confederation (Cisco IOS)

- IBGP in AS64512:
  - AS Confederation Setup
    - Sub-AS 64601
      - R1, R3, R5
      - Full mesh IBGP
      - R1-R2 EBGP
    - Sub-AS 64602
      - R2, R4, R6
      - Full mesh IBGP
      - R1-R2 EBGP
    - 7 BGP sessions
      - Sub-AS 64601: 3
      - Sub-AS 64602: 3
      - R1-R2 EBGP: 1