Deploying ALTO using BGP-LS

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Network Information -> ALTO Maps

- **Network Map**
  - Topology information
    - Inter-domain topology and intra-domain topology
    - CIDRs distribution

- **Cost Map**
  - Routing information
    - end-to-end routes
  - Performance metrics information
    - routing cost

- BGP-LS is a potential approach to collect all the information above
BGP-LS Benefits and Limitations

- BGP-LS [RFC7752] allows a BGP speaker to advertise link state database or traffic engineering database of its connected IGP areas

- Benefits
  - Could be a unified interface to advertise IGP topology, routing information and additional performance metrics
  - Reuse existing BGP sessions (no extra connection is required)

- Limitations
  - Only one-hop advertisement: Cannot be propagated to remote routing servers
ALTO Deployment Consideration

Talking to every BGP routers is inefficient

Efficiency requirements on deploying ALTO using BGP-LS:

- **Req 4**: The ALTO server SHOULD only communicate with necessary BGP speakers.
- **Req 5**: The ALTO server SHOULD only enable BGP-LS advertisement on necessary BGP sessions between BGP speakers.
IGP Topology Collection: Full-coverage Problem

- Select a minimal set of ASes as anchors
- Each AS establishes a BGP-LS session with at least one anchor
- Each anchor mirrors its received BGP-LS advertisements with the ALTO server
Routing Information Collection

- The route from a downstream AS can be inferred by the route from an upstream AS
- Select a minimal set of ASes as anchors
- Each AS is a provider or remote provider of at least one anchor
- Each anchor mirrors its BGP RIB with the ALTO server
Summary

- BGP-LS can be used to provide necessary information
- How to collect necessary information by establishing minimal BGP sessions should be considered