Progress of BGP Autoconf
Design Team

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(on behalf of the design team members)

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Purpose of Design Team

• The team is initially chartered to consider requirements and review the solution space (notably including existing proposals).
  • What we would like from the design team is proposed requirements and solution space outline to guide our discussion as a WG in producing a solution (which will likely include one or more interim meetings).
  • The design team isn’t forbidden from suggesting a solution, but it’s not one of our specific requests to them.
Design Team Members

- Acee Lindem
- Jeff Haas
- Jeff Tantsura
- Jie Dong (Lead)
- Mankamana Mishra
- Randy Bush
- Robert Raszuk
- Warren Kumari
- Xiaohu Xu
How We Work

• Discussion mostly happens on the design team mail list: https://mailarchive.ietf.org/arch/browse/bgp-autoconf/

• Held one conference call to speed up the discussion
  • Minutes: https://etherpad.ietf.org:9009/p/bgp-autoconf-feb-25
  • Some difficulty in finding appropriate time slot for all members
The Scope

• The design team has agreed to work on the DC case first
  • More precisely, when BGP is used as the underlay routing protocol in data center

• Will also keep an eye on the difference in other cases
  • WAN
  • IXP
  • ...
Requirements Collected (1): Common Ones

• Support IPv4 and IPv6 address family

• Support to use either interface or loopback address for BGP session

• Support to discover the peering IP address

• Support to discover the peering ASN

• Support authentication of control message

• Enable Layer 3 link liveness detection, such as BFD
Requirements Collected (2): Under Discussion

• The capability of communicating arbitrary attributes to peers according to operators’ need
  • The information should be only sent to peers, and not propagate further

• While it is considered useful, there is ongoing discussion about:
  • Whether it should be part of BGP autoconf, or it can be done in BGP itself (i.e. after the session is established)
  • Whether it should be a generic capability for operator's customization, or some guidance or structure needs be specified as part of the design?
List of Other Suggested Features (1)

• These features are NOT adopted yet but may be considered
  • Discover mutually supported encapsulation
  • Provide Layer 2 keep-alive messages for session continuity
  • Discover the role of the connected nodes
  • Automatic setup of reachability to peer's loopback over one or more connected links
  • Provide resolution for the BGP next-hop address (i.e. the loopback address) for the BGP routes exchanged over these sessions between the loopback addresses.
  • Enable exchange of IP addresses and link attributes between the directly connected BGP routers. should be extensible to include other information in future.
List of Other Suggested Features (2)

- These features are NOT adopted yet but may be considered
  - Discover neighbor's BGP ID for consistency check or avoid connection collision
  - Discovery parameters relating to the BGP peer session (e.g., the local address)
  - Mechanism should be limited to link scope for security and use link-local addressing only
  - Support optional validation of parameters to detect misconfiguration (e.g. link address subnet mismatch, peering between incorrect AS, etc.) in an extensible manner
Design Principles: Needs Further Discussion

• Independent from BGP session establishment
• Not affect or change BGP session establishment and routing exchange, other than the interactions for triggering the setup/removal of peer session based on discovery mechanism
• Generic for any link-layer protocol
• Make use of a currently implemented and deployed DC switch protocol to reduce the cost and complexity
• Make use of existing BGP protocol for automating the BGP session bring-up
• Widely applicable to a range of routing and similar protocols which need layer 3 discovery and characterization
• Length of the message size supported
Existing Proposals

• draft-acee-idr-lldp-peer-discovery-06
• draft-xu-idr-neighbor-autodiscovery-12
• draft-ymbk-lsvr-l3dl-ulpc-02
• draft-raszuk-idr-bgp-auto-session-setup-01
• draft-raszuk-idr-bgp-auto-discovery-06
  • Merged draft-raszuk-idr-ibgp-auto-mesh-00 and draft-wkumari-idr-socialite-02
  • Applicable to BGP auto discovery in WAN & IXP
  • Not included in the analysis on next page
# A Brief Analysis to Existing Proposals

<table>
<thead>
<tr>
<th>Draft Name</th>
<th>Design Principle</th>
<th>Basic Functions</th>
<th>Extensibility</th>
<th>Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>draft-acee-lldp-peer-discovery-06</td>
<td>Extensions to LLDP (layer 2)</td>
<td>Discover peering address, ASN, BGP ID, <strong>Group ID</strong>, capabilities, key-chain, local address; Support BGP session on direct / loopback*</td>
<td>Easily extensible with additional TLVs</td>
<td>LLDP message length limitation; Progress of LLDPv2</td>
</tr>
<tr>
<td>draft-ymbk-lsvr-l3dl-ulpc-02</td>
<td>Extensions to L3DL (layer 2)</td>
<td>Discover peering address, ASN, authentication data; Support BGP session on direct/loopback*</td>
<td>Easily extensible with additional TLVs</td>
<td>Rely on the support of L3DL, session based</td>
</tr>
<tr>
<td>draft-xu-neighbor-autodiscovery-12</td>
<td>New BGP message based on UDP</td>
<td>Discover peering address, accepted ASN list, <strong>Local prefix, Link attribute</strong>, authentication; Support BGP session on direct/loopback IF, support ECMP;</td>
<td>Easily extensible with additional TLVs</td>
<td>Change to BGP, additional FSM</td>
</tr>
<tr>
<td>draft-raszuk-idr-bgp-auto-session-setup-01</td>
<td>Reuse BGP OPEN message with new UDP port</td>
<td>Discover peering IP address, ASN, BGP ID; Support BGP session on direct/loopback</td>
<td>Constrained with BGP OPEN optional parameters*</td>
<td>Solution not quite complete</td>
</tr>
</tbody>
</table>

* Not fully specified in current draft
Next Steps

• Confirm the minimal set of common requirements
• Reach consensus on the design principles
• Probably put them into a requirement document
• Hand the solution discussion to the WG
Thank You