

BGP Peer Discovery Using IEEE LLDP Auto-Discovery Interim

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BGP Peer Discovery Requirement



- Support BGP peer discovery for on switch/router ports
- Minimal configuration differences between switch configurations
 - Initial Requirement for Data Center Topologies
- Support for peering on loopback addresses
- Support for discovery of authentication methods and mechanisms
- Support explicit signaling of parameter changes

BGP LLDP Peer Discovery

(1/2)



- Use LLDP (IEEE 802.1AB) for BGP Peer Discovery
- IANA already has an IEEE OUI and LLDP allows advertisement of Organizationally Specific TLVs in LLDP PDUs (Protocol Data Units).
- Add IANA Registry for IETF LLDP OS-TLVs
- First IETF LLDP OS-TLV will be BGP Config

BGP LLDP Peer Discovery

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- LLDP BGP Config OS-TLV will support Sub-TLVs
 - Peering Address (for one or more <AFI, SAFI> tuples)
 - Local AS
 - BGP Identifier
 - BGP Group ID – Category of BGP Session (e.g., spine or leaf)
 - BGP Session Capabilities – BGP Authentication support include TCP-MD5, TCP-AO, and GTSM
 - Key-Chain Name
 - Local Address for next-hops for AF other than peering AF.
 - Config State Version – Indicates a substantive change.

Miscellaneous Details



- No native authentication – relies on IEEE 802.1AE protocol, aka, MACsec.
- LLDPv2 not required but this discovery mechanism would certainly benefit from usage – requires a new draft.

Mapping to BGP Auto-Discovery Task Force Reqs



- Design team requirements are listed in expired draft - [draft-ietf-idr-bgp-autoconf-considerations-01](#)
- All requirements satisfied with exceptions as follows:
 - No native authentication – relies on IEEE 802.1AE (MACsec) or other layer-2 protocol. MACsec would be natural since LLDP and MACsec are part of the IEEE 802.x family of standards.
 - Peering on loopback addresses is supported but reachability to the loopback address is beyond the scope of the discovery protocol. This could be provided by an IGP supporting dynamic discovery (e.g., OSPF) or BGP, as a discovery protocol client, could add the route.

Next Steps



- Poll WG for opinions on adoption of draft considering of design team requirements and the myriad of proposed solutions.
- Nokia has rudimentary implementation. Also, heard about another switch vendor using LLDP for BGP peer discovery.

LLDP, IEEE 802.1AB in a Nut Shell



- Unidirectional Layer 2 discovery protocol with minimal state.
- 3 Mandatory TLVs Chassis ID, Port ID, and TTL.
 - Chassis ID and Port ID tuple defined MAC SAP with which to associate advertised information
 - TTL defines the life of the advertised information.
- Optional TLVs including TLVs defined by other organizations (Organizationally Specific TLVs or OS-TLVs).
 - All IETF needs to advertise is an IANA registry since IANA has its own OUI
- Transmission initiated based on timer expiration or LLDP PDU TLV value change.
 - Very simple but limits amount of information that can be advertised to single LLDP PDU
 - LLDP PDU information replaces the previous information