Extensions of Link Bandwidth Extended Community

https://www.ietf.org/id/draft-li-idr-link-bandwidth-ext-00.html

W. Li, H. Wang, J. Dong @Huawei

IETF 112
Problems with BGP Link Bandwidth

• BGP link bandwidth is now encoded in extended community attribute using 32-bit floating point-type

• data type conversion: floating-point and unsigned integer
  – Floating-point format(IEEE 754)
    – “fraction” determines the precision, the size of a number depends on “exponent”

• When the bandwidth value exceeds $2^{24}$, it may no longer be accurate after converting to the floating-point format
Problems with BGP Link Bandwidth (Cont.)

• The implementation of floating-point conversion may cause some problem

  - RTA: Configure an export policy for BGP peer. The policy contains set link-bandwidth 65566 Kbps.
  - RTA: Converts the bandwidth to a floating-point number and advertises in Update.
    • Bandwidth value 65566 Kbps is converted to 8195750 bytes, encoded as: 4A FA 1D 4C in floating-point format
  - RTB: The expected the bandwidth value converted back from the link bandwidth extended community in the received BGP update should be 65566 Kbps.
    • However, in some interoperability test, some devices converted it back as: 65560 Kbps
Proposed Extensions to BGP Link Bandwidth

• Uses a combination of the unit and unsigned integers to accurately represent the bandwidth value
  • Link Bandwidth EC in bps unit
  • Link Bandwidth EC in Kbps unit
  • Link Bandwidth EC in Mbps unit
  • Link Bandwidth EC in Gbps unit
  • Link Bandwidth EC in Tbps unit

• Usage:
  – RTA: Configure an export policy for BGP peer. The policy contains set link-bandwidth 1500 Mbps.
  – RTB: The link bandwidth value is obtained directly, avoids the problems with the floating-point format.
Next steps

• Welcome comments and discussion

• Revise the draft accordingly
Thank you!