PCE Traffic Engineering Database Requirements

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Motivations

- PCE architecture and path computation need Network Information

    - The Traffic Engineering Database (TED) contains these pertinent and suitable information regarding the underlying networks

- However:

    - No RFC specifies the detailed contents of the PCE TED
        - Only TED MIB specification are ongoing (CCAMP)
    - A PCE TED is not limited to the information disseminated by the IGP
    - The fulfillement method of PCE TED is not specified

- Multi-Domain path computation suffer from a lack of information in the TED

    - Lead to a non optimal result or to some difficulties to deploy them
    - Collaborative PCEs would benefit from neighbouring context

- Goal: Identify some TED requirements for the PCE:

    - identification of the specific information to be stored in the TED
    - and how it may be populated

Inventory of TED elements

- First inventory has been split between Intra (MPLS & GMPLS) and Inter domain

- Intra-domain

  – Standard TE information exchange by the IGP-TE

- Inter-domain

  – ASBR of the foreign domains

  – Inter-domain Links TE

  – Traffic Engineering performance between Border Nodes (n)

    – To give performance indication on foreign domain n

    – But only as an abstract view (to not divulgate details of the network)

  – PCE (i) peer address associated with the AS number of the domain (i)

TED Population

- Some mechanisms and protocols have been identified for Intra-domain population

  – Some efforts are necessary for the Inter-domain section

- Intra-domain

  – IGP-TE (IS-IS-TE or OSPF-TE) are commonly used
  – RFC 5088 and RFC 5089 help to auto discover PCE

- Inter-domain

  – RFC 5316 and RFC 5392 provide TE information on inter-domain links
  – BGP just provides reachability

Inter-domain status for TED Population

- But Inter-domain needs more effort to correctly populate the PCE TED

- Ongoing identified solutions
  - Management plane
  - North bound distribution of Link-State and TE Information using BGP [I-D.gredler-idr-ls-distribution]
  - PCNtf message to convey, inside vendor attribute (but in a non standardized way), TE information of foreign domains
  - ➔ All are non standard

- Candidate standardisation efforts
  - A hierarchical TE protocol to advertise abstract TE information at the AS level
  - A PCEP extension to convey such TE information (e.g. through standard PCNtf message)

Next Steps

- Get feedback from PCE WG

  – We are here for that

- Release a 02 version that:

  – Take into account GMPLS stuff
  – Improve Inter-domain definition
    – Consider multi-area / multi-region / multi-layer as inter-domain and not only inter AS
  – Add analysis and best-current practice for Intra-domain solutions
  – Add analysis of Inter-domain solutions