

The protection path(s) for shortest path bridging

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SPT calculating protocols

Up to now, there are three to four protocol choices to calculate SPT, among them two protocols are MSTP alike protocol and IS-IS protocol.

- ü For MSTP alike protocol, it must keep the spanning trees symmetric when rooted separately on a pair of bridges. To this end use cut-bit vector is feasible. If there are N bridges in networks, every bridge must keep N states based on the different rooted spanning trees. And for MSTP, 64 STIs are trivially supported, a limitation in the scalability. Even it can be CPU and memory intensive to support more than 64 STIs.

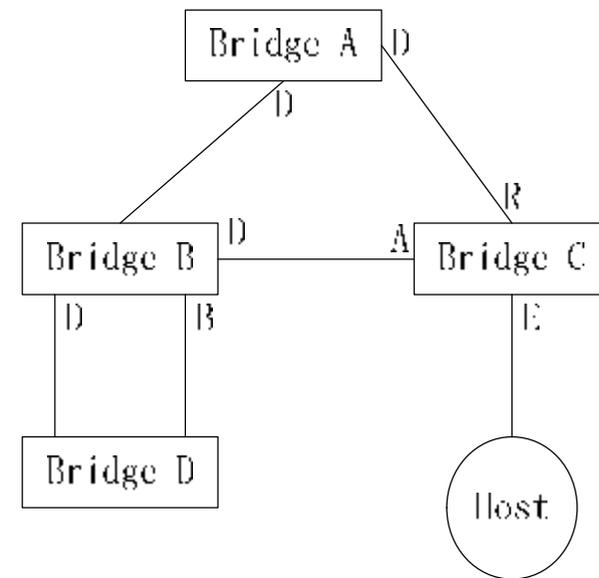
SPT calculating protocols – Cont.

- ü For IS-IS protocol, by collecting the bridge network link states, computes the optimization path between the bridge nodes. There is no need to keep complicated states on the bridge, but to facilitate the MAC learning, IS-IS protocol must also be extended to keep the route symmetric during the router computing.

Protection Path in SPT

– when using MSTP alike protocol

- When MSTP alike protocol is used to calculate SPT, there are already protection mechanisms, these are Backup Port and Alternative Port.
- In the right figure, D is for Designated Port, B for Backup Port, A for Alternative Port, R for Root Port, E for Edge Port.
- The protection path should be the same symmetrical as the primary path. So should use the alike MSTP extensions to set up the backup/alternative path when calculating the SPT.



Protection path in SPT – when using IS-IS

Use IS-IS calculating SPT,

- Ø RFC4205 extends IS-IS to support the link related attributes sub-TLVs, including link local/remote identifier, protection type, interface switching capabilities and shared risk group.
- Ø The link layer neighbor discovery can be conducted through these extension sub-TLVs.
- Ø Link State Packet (LSP) lists the node itself and the costs to neighbors.
- Ø Broadcast LSPs to all bridges
- Ø Store latest LSP from each bridge
- Ø Compute Routes, use well known shortest path algorithms.

Protection path in SPT – when using IS-IS – Cont.

- Ø Based on the above mechanisms, Protection Paths can be computed also. The protection paths can be recorded during the shortest path computation, they are not necessary the shortest path, but can spanning all the bridges in the networks.
- Ø To keep the MAC learning be functional, extension to IS-IS when computing the protection paths, in order to have the symmetric paths in the case of the multiple equal costs paths between two bridges.
- Ø To get the complete protection, the protection path shouldn't include any bridge or link which is in the primary shortest path.

Thank You!