A Routing Protocol for Ethernet Transport

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Introduction

- A routing protocol propagates information about destinations in the network

- IS-IS is a mature and expandable link state routing protocol

- RE2EE includes Ethernet-based transport network and separate control and data plane

- How should the IS-IS be extended for RE2EE use?

Transport Technologies

- Two paradigms

  - Connectionless

  - Connection-oriented

- Ethernet is connectionless and very popular these days

- Ethernet has seen many extensions

- MPLS is connection-oriented

- MPLS decouples control and data plane

Routing in Datagram Networks

- Router looks up packet destination in routing table

- Two ways to populate routing tables

  – Manually (static routing)

  – Automatically (dynamic routing)

- Many ways to classify routing protocols

- Link state routing within an administration most interesting regarding RE2EE

IS-IS Routing Protocol

- Link state interior gateway protocol

- Originally developed for CLNS ("ISO IP equivalent")

- Runs directly over L2, not dependent on IP

- Uses ISO NSAP addressing

- Very generic TLV format for routing information

- Past extensions include the ones for IPv4 and IPv6

- Uses Dijkstra's SPF algorithm

Proposed Extension to IS-IS

- Two new TLVs

  - RE2EE Capability TLV

  - RE2EE Interface Parameter TLV

- 12 new sub-TLVs

  - Lots of optional information

- RE2EE protocol ID

- Multicast routing support

- Exploits IPv4 extensions of RFC 1195

Analysis

- Includes information for provisioning system

- Scalability issues
    - Deals only with RE2EE core
    - Careful with extra VLAN detail

- Efficient multicast forwarding for relatively static senders

Conclusions

- People are happy with IS-IS and its extensions

- Consensus on RE2EE IS-IS extension reached

- RE2EE data plane is in draft phase

- A prototype implementation needs to be built

- Extension may be submitted as an Internet-Draft