Directions for Gigabit Token Ring

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Introduction

- Gigabit Objectives
- Gigabit TR standardisation proposal

Gigabit Objectives

- Full protection of current Token Ring features
- Operability at speeds higher than 1Gbit/s
- Cost of gigabit ports no more than Gigabit Ethernet

Protection of Token Ring features

- Large Frames
- Multiple Access Priorities
  - No head-of-line blocking
- Source Routing
  - Load sharing
  - Resilience through redundant links
  - Can be enhanced to provide future features
- Manageability
  - Can use existing management applications

No more costly than Gigabit Ethernet

- Ethernet has a MAC layer for Pause frames
  - Requires data multiplexing path like Token Ring
- DTR MAC can be simplified (MAC Light)
  - Remove need for a local microprocessor
  - Remove redundant features
  - Retain useful features

Source Routing support requirements

- Standards compliant
  - RIF must be signalled at the bridge interface
- Ability to source-route through the gigabit cloud
  - RIF must be near the start of the frame

Gigabit TR standardisation proposal

- Native Token Ring frame format
- MAC Light for reduced cost
- Use Gigabit Ethernet PHY
- Multiple priorities
- Manageability
  - Supports Token Ring features required for compatibility with existing management applications
- Resilience through SR enhancements

Token Ring is the superset network

- Ethernet frame format lacks features required by Token Ring users
  - Source Routing field absent
  - Priority field absent (or provided late with 802.1p)
  - Frame size too small
- Token Ring frame format provides all that Ethernet users want
  - And value-adding features

Support for future speeds

- Standards-based aggregation of 1Gbit/s links
  - Based on 802.3 link aggregation
- 10Gbit/s optical PHY in future

Enhanced Resilience

- Ethernet is deficient in this area
  - Token Ring users are used to superior resilience
- Switches take over packet routing
- Hijack route discovery frames
- Route frames to destination ring number
  - Shortest path algorithm?
  - Topology change detection allows fast failover

Superior flow control

- Link-based flow control
- Better granularity than simple X-on/X-off
- Includes Flow Identifier in control messages
  - Flow identifier must be simple
  - Suggest Priority or VLAN-id or a combination

Gigabit Token Ring

- Provide interswitch links for HSTR switches
- Provide server attachments in the backbone
- Support the growing HSTR market
- Continue to provide a technology direction for token ring customers