High Speed Token Ring Tutorial

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Tutorial Outline

- Three Approaches to HSTR
- PARs
- Five Criteria
- Technology Concerns
- Questions/Discussion

Three Approaches to HSTR

- 100 Mbit/s Copper PHY
- 100 Mbit/s Fibre PHY
- Gigabit Operation

100 Mbit/s Copper PHY

- 100 Mbit/s Dedicated Token Ring Operation over 2-Pair Cabling
  - 2 pair Category 5 UTP (100 ohm)
  - 2 pair STP (150 ohm)
  - Specified in IS-11801 and EIA/TIA 568A
  - Connector pin configuration same as present-day Token Ring
- Station and Port specifications will be developed

Why A 100Mbit/s Copper PHY?

- Provide a cost-effective high-speed solution for current IEEE 802.5 LANs
- Only solution based on present IEEE 802.5 MAC
- Incorporate into present Token Ring environments
- Minimal increase in LAN complexity
- Support emerging bandwidth-intensive applications

100 Mbit/s Fibre PHY

- 100 Mbit/s Dedicated Token Ring Operation over Optical Fibre Cabling
  - Specified in IS-11801 and EIA/TIA 568A
- Station and Port specifications will be developed
- Using 100BASE-FX PHY

Why A 100Mbit/s Fibre PHY?

- Provide a cost-effective high-speed fibre solution for current IEEE 802.5 LANs
- Only fibre solution based on present IEEE 802.5 MAC
- Incorporate into present Token Ring environments
- Minimal increase in LAN complexity
- Support emerging bandwidth-intensive applications

Gigabit Operation

- Media Access Control parameters, Physical Layers and Management Parameters for Gigabit Token Ring Operation or above
  - MAC and Management parameters
  - Gigabit PHY layer characteristics
- Station and Port specifications will be developed

Why A Gigabit HSTR?

- Provide Gigabit operating speed or Greater
- Extend the present IEEE 802.5 protocol
- Incorporate into present Token Ring environments
- Support emerging bandwidth-intensive applications

Project Authorization Request

- 100 Mbit/s Copper PHY -- IEEE 802.5t
  - Expected Completion Date: November, 1998
- 100 Mbit/s Fibre PHY -- IEEE 802.5u
  - Expected Completion Date: July, 1999
- Gigabit Operation -- IEEE 802.5v
  - Expected Completion Date: November, 1999

Five Criteria

- Broad Market Potential
- Compatibility
- Distinct Identity
- Technical Feasibility
- Economic Feasibility

Broad Market Potential

- Current Applications:
  - High-Speed Transfer of traditional data
    - » 2-pair Copper 100Mbit/s
    - » Fibre 100Mbit/s
    - » Gigabit Speeds
  - Client/Server Computing
  - Database
  - Imaging
  - Computer Aided Design and Modeling
- Emerging Applications:
  - Video and Teleconferencing
  - Interactive Video Training
  - Real-Time Control

Broad Market Potential

- Multiple Vendors, Numerous Users
  - Supports $2 billion/year market needs
  - Participation in standardization:

2-pair Copper:	26 people / 16 companies
Fibre:	22 people / 13 companies
Gigabit Speed:	24 people / 16 companies

  - Surveys show strong support among users
- Balanced Costs
  - Most of the same MAC code
  - Available high speed PMD hardware

Compatibility

- HSTR based on IEEE 802.5 MAC frame format
- Compatible with the LLC/MAC Boundary
- Consistent with IEEE 802.1 Management
- Single MAC supporting multiple PHY layers

Distinct Identity

- HSTR is different from:
  - FDDI
  - IEEE 802.12
  - IEEE 802.3
- Eight Native MAC Priority Levels
- Frame Sizes ranging from 22 octets to 18200 octets
- Token Ring cable and pin usage
- Native TR frames at 100 and Gig

Technical Feasibility

- MAC technology for TR is the same
- PMD hardware for copper and fibre are the same as that of Fast Ethernet
- No significant technical obstacles to combining MAC and PHY for HSTR
- Existing TR products are reliable

Economic Feasibility

- Low cost PHYs and Token Ring MACs will provide costs in line with present Token Ring technology
- Considerably better cost/performance than existing 16/4 Mbit/s Token Ring technology
- Migration changes targeted to backbone, wiring center, servers and end stations requiring HSTR

Technology Concerns

- Auto-negotiation for 100Mbit/s Copper PHYs (fibre PHYs?)
- Ability to capitalize on RMII

Questions/Discussion

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