



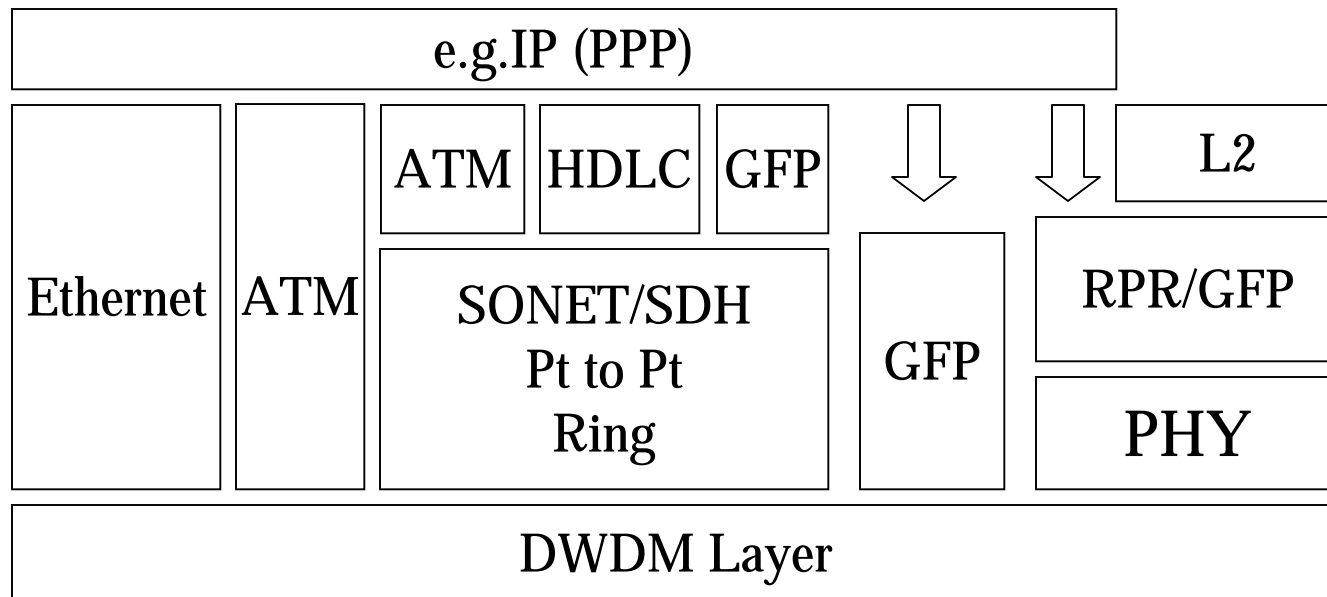
Truth of GFP

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Agenda

- **What is GFP**
- **Truth and Facts**
- **T1X1.5/ITU Contributions**
- **GFP Header**
- **GFP delineation Benefits**
- **Going Forward**

GFP stands for Generic Framing Procedure



- **Robust and efficient packet transport**
 - Better performance than POS, and agnostic to L2 and higher
- **Direct application to Dark Fiber**
- **T1X1 and ITU standard in October 2001**

Generic Framing Procedure: Truth and Myths

Truth

- GFP was conceived in T1X1
- GFP supports Linear and can support ring_configurations
- GFP is more efficient and robust than HDLC
- No inflation factor
- GFP is low overhead
- GFP is rate matched to ethernet
- Frame-mapped GFP
- Transparent GFP

Facts

- GFP is NOT for SONET/SDH only
- GFP is NOT L1 specific
- GFP is NOT for linear network

GFP Directions

- **Semiconductor devices on the Market**
 - multi PHY and MAC
 - Integration of MAC and PHY
 - GFP support: robust and deterministic overhead
- **Alignment of Standards: 802 and ANSI/ITU**
 - Accelerates the acceptance of RPR
 - No translation needed
 - More cost effective

Advantage of GFP

- 1. The mapping is uniform across all Path types. The mapping is also uniform across all Ethernet types. This minimizes cost by maximizing equipment commonality.
- 2. All of the relevant MAC layer information, from Destination address through Frame Check Sequence (FCS) inclusive, is preserved intact by the mapping. This maintains a clear distinction between layers and avoids setting a precedent for partial termination of payloads in SONET/SDH mappings.
- 3. Since the FCS is preserved, the native Ethernet error detection capability is protected. Consequently, the error detection capability is not degraded.
- 4. Because the mapping doesn't inflate the frame length in a non-deterministic way, the throughput capacity is predictable. This eases network planning and ensures that the throughput is independent of data content. In particular, there is no vulnerability to flag/'escape' emulation attacks.
- 5. The throughput is maintained at a high rate by use of a robust delineation mechanism and by the deterministic, non-inflationary encapsulation.

Where is T1X1/ITU Heading

- **Standard in T1X1 and ITU for packet transport**
 - SONET/SDH
 - OTN
- **Support Point to point and Ring**
- **Consider GFP for RPR PHY:**
 - L1 affects L2 MAC design: reconciliation layer
 - Robust Framing

Summary

- **GFP is here and expected to replace POS**
 - GFP can share the L2 protection, Fairness, Topology discovery
 - Advantage of an unified approach
 - One less layer of translation
 - Easier to integrate
 - Easier to use
 - Easier to debug
 - Facilitate wide acceptance in the market
 - GFP has a length requirement for L2
- **Important for T1X1/ITU to work with 802.17**
 - Need Liaison to T1X1
 - Responsible to update T1X1



Questions and Answers

GFP References

- [1] T1X1.5/99-267, *Concerns with HDLC Encapsulation for Ethernet MAC Mapping into SONET/SDH*, Tim Armstrong (Nortel Networks), October 1999
- [2] T1X1.5/99-204, *T1 105.02 draft text for Mapping IEEE 802.3 Ethernet MAC frames to SONET payload*, C and Steven Gorshe, July 1999
- [3] T1X1.5/2001-039, *GFP Breakout Group report and GFP Revision 1*, John Chen, January 2001



Back up

RPR header Poll

Common Fields:

1. TTL: No homeless packets, or black hole effect
2. Priority: Some flag for differential treatment
3. Type/version: identify content. E.g. control
4. DA: Destination removal
5. SA: Source removal
6. Header checking: early removal of unroutable packets

Other Header Specifics:

1. Virtual ports
2. Header extension
3. Customer separation
4. Vendor specifics
5. Address mode
6. Tag mode

RPR/GFP header

Core Header for delineation

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Ring:

1. TTL Time to Live Type
2. COS Class of service
3. TYPE
4. DA
5. SA
6. eHEC
 - Spare fields can support header extension
 - DP/SP Aggregation