Ethernet Flow Mapping to RPR (fields and timing) Comments to 802.17 Atlanta Jan. 2003 meeting

Mr. Yu shaohua, Rapporteur of Q.7/17, WP2
Shyu@fhn.com.cn

Responsibility of SG17: Data Network and Telecom Softare

Responsibility of Q.7/17: IP related Low layer Protocols and Service Mechanisms

Major Work in Q.7/17 in the last few years

(1) ITU-T Recommendation X.85/Y.1321 on IP over SDH using LAPS

(2) ITU-T Recommendation X.86/Y.1323 on Ethernet over LAPS

developed by SG17

X.85/Y.1321 (IP over SDH using LAPS) milestone

1、Delay contribution from August 1998

2、It was acceptable by ITU-T SG7(Data network and Open System Communication) at the September meeting, 1998

3、X.85/Y.1321 on IP over SDH using LAPS was determined at the June 1999 meeting

4、Recommendation X.85/Y.1321) was approved at March 2000 meeting

Comments from:

1、IETF and ISOC

2、ITU-T SG15 (Optical and other transport networks)

3、ITU-T SG11 (Signaling requirements and protocols)

4、ITU-T SG13 (Multi-protocol and IP-based networks and their internetworking)

6、Lucent

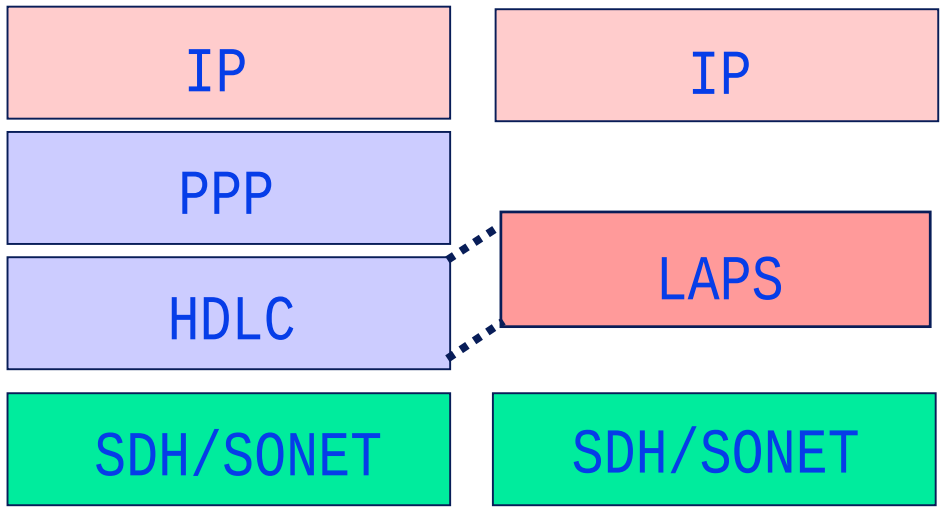
6、Nortel

7、NTT

8、Juniper

9、Swisscom

10、Lots of email from Vendors and Carriers



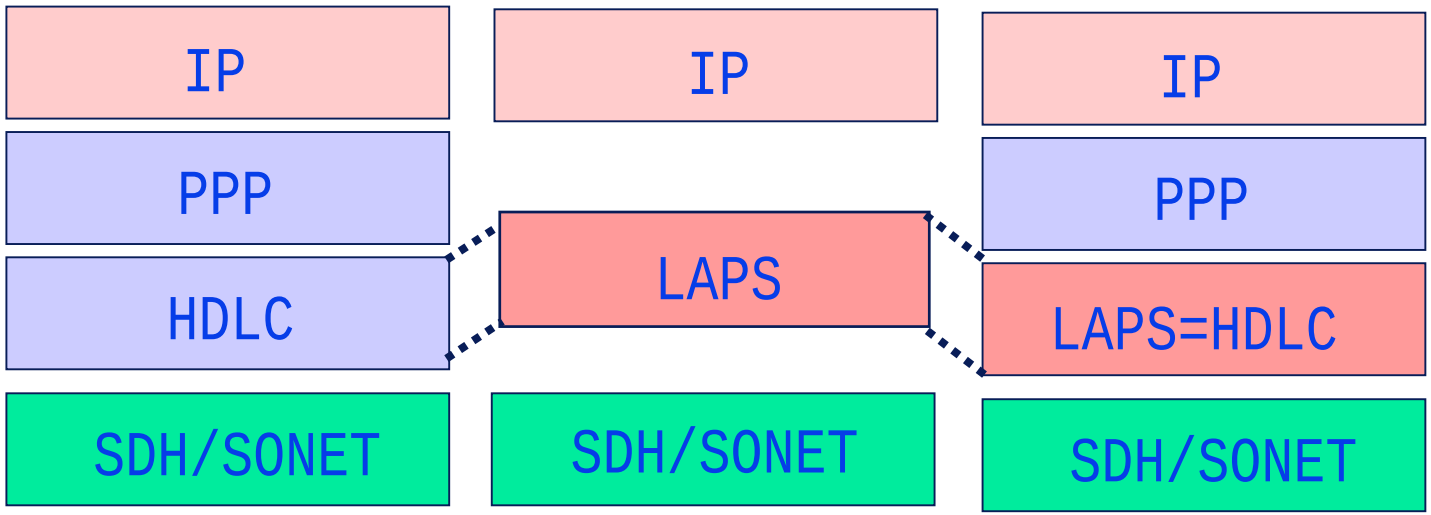
PPP over SDH/SONET

IP over SDH

Connection based protocol

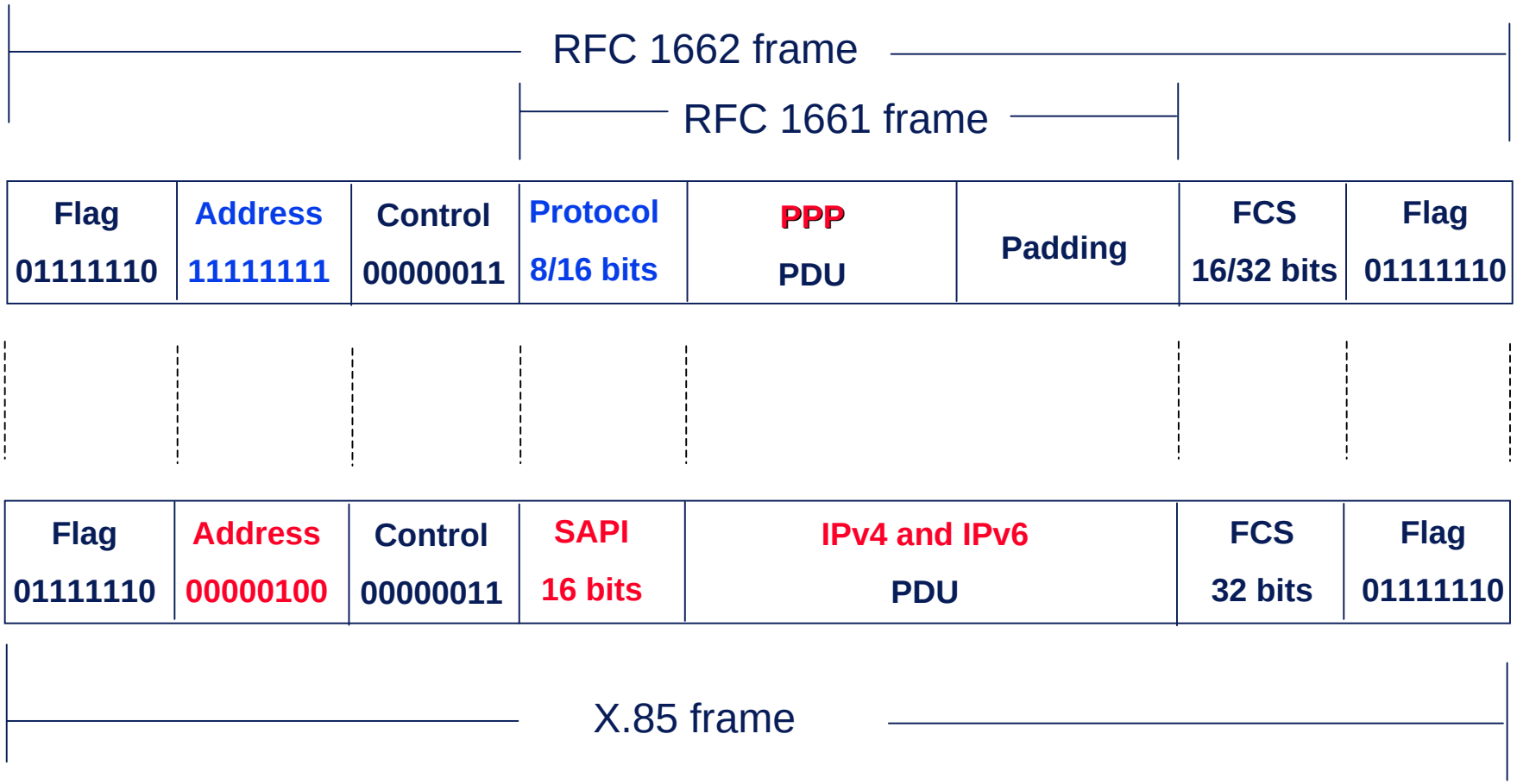
Connectionless based protocol

LAPS is compatible with RFC 2615



PPP over SDH/SONET IP over SDH PPP over SDH using LAPS

X.86 vs. RFC 2615



What is X.85 benefit

1、Simple implementation

2、High efficiency in the POS line card of router

3、Function equivalent to PPP/HDLC

4、Performance of Carrier concern

5、Compatibility with PPP/HDLC and SPI/POS

6、Test equipment

7、Chips available and vendors support

X.86 milestone

1、Delay contribution from May 1999

2、It was acceptable by ITU-T SG7(Data network and Open System Communication) at the June meeting, 1998

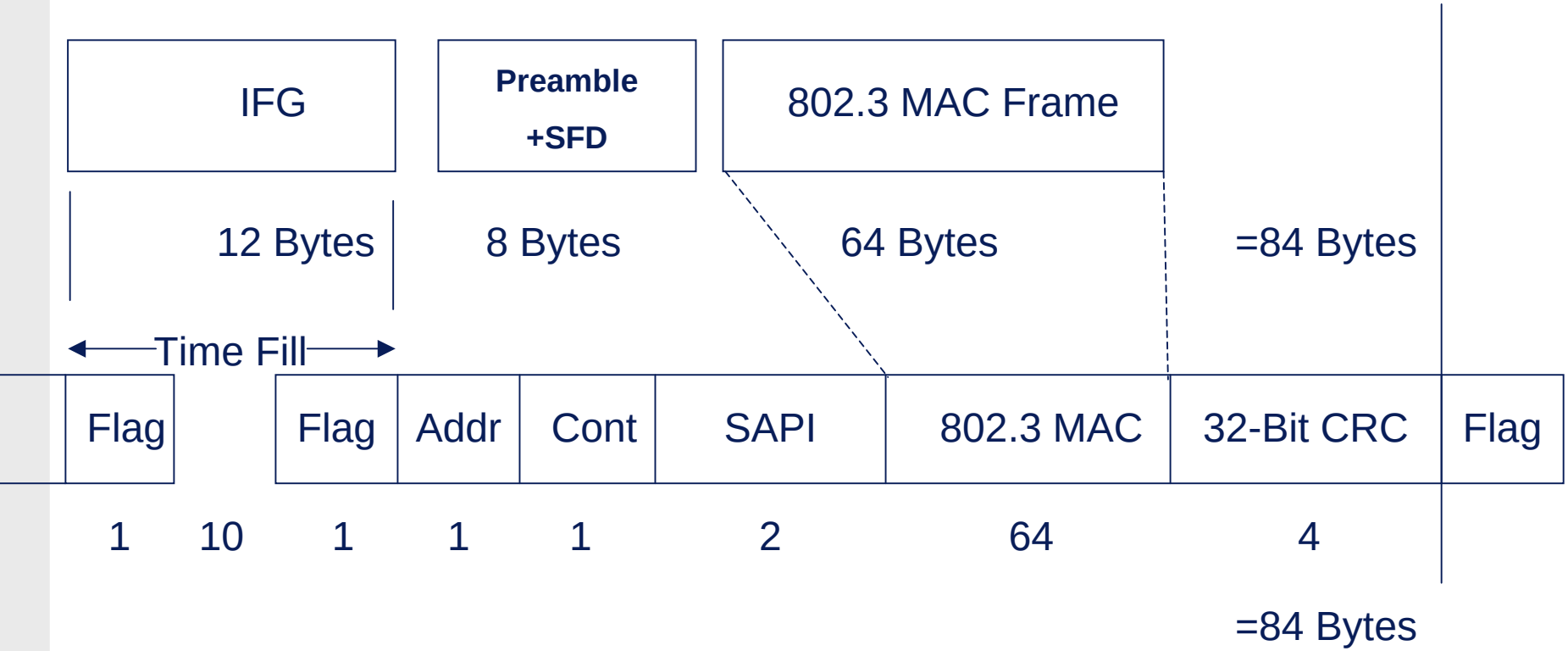
3、X.86 on Ethernet over LAPS was determined at the March 2000 meeting

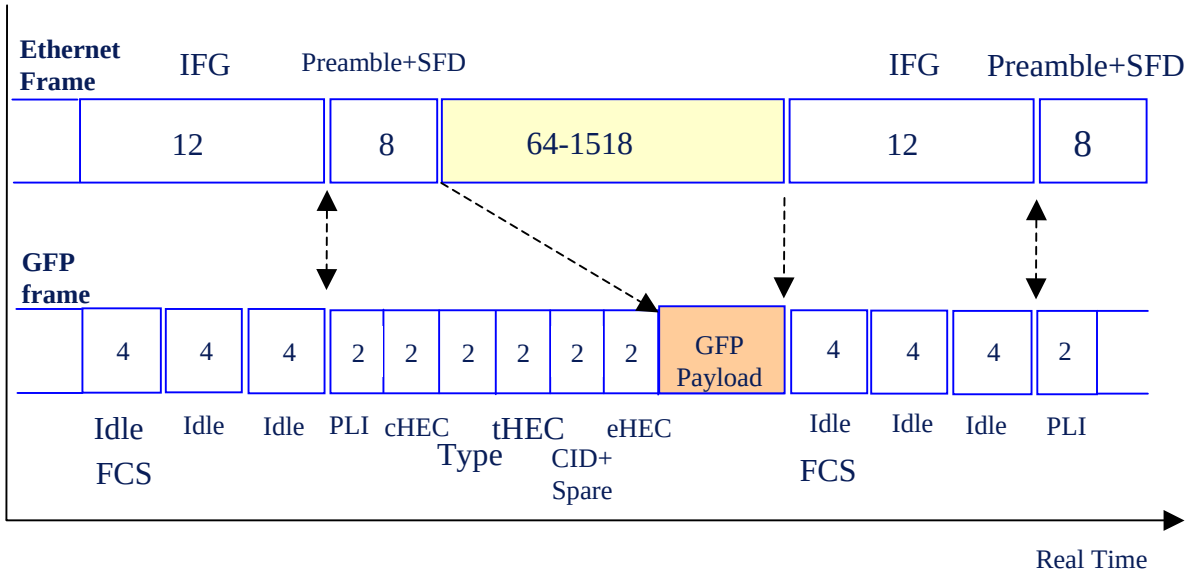
4、Recommendation X.86 on Ethernet over LAPS (TD 2046/Rev.1) was approved at Feb. 2001 meeting

The competitive advantages of X.86

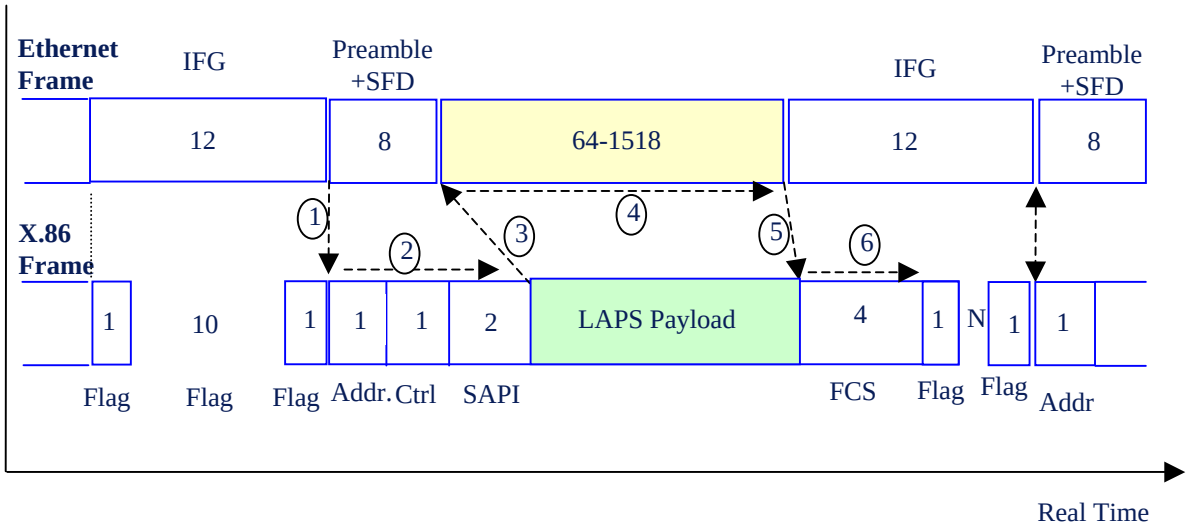
- Solutions to both byte and bit oriented, it is very useful to RPR PHY options for SONET and Ethernet MAC PHY
- Remote Trail Performance Monitoring
- Remote Fault Indication
- IEEE802.3x – Active Flow Control in Burst Traffic Condition
- Low Price and Ease of Use (Compared to LANE)
- Low Latency and Low Latency Variance
- 1+1 redundancy based Ethernet and Gigabit Ethernet service (SONET provide)
- Target at existing telecom transport resources

X.86 does match Ethernet and Gigabit Ethernet very well

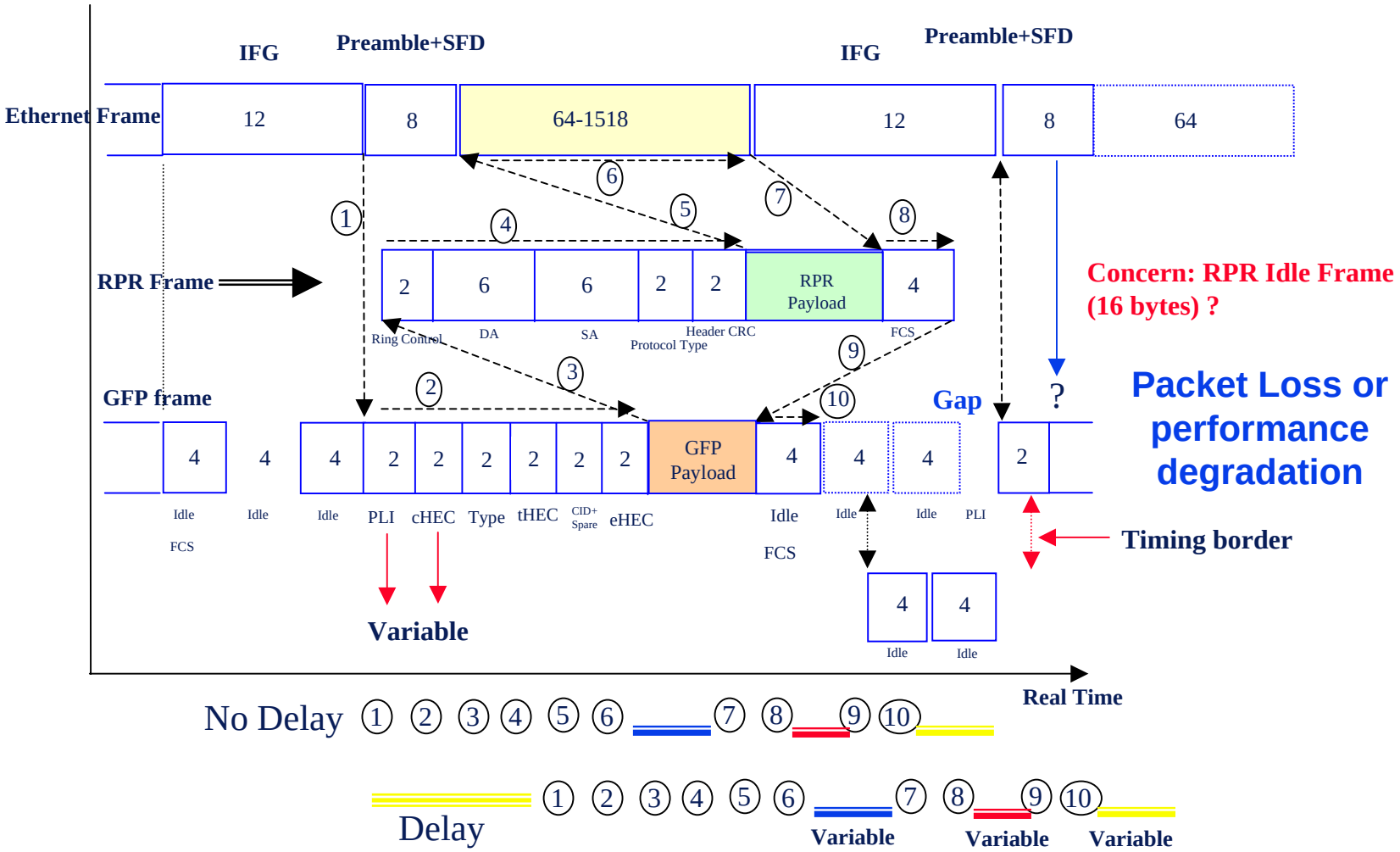




Bytes Mapping of Ethernet/GFP



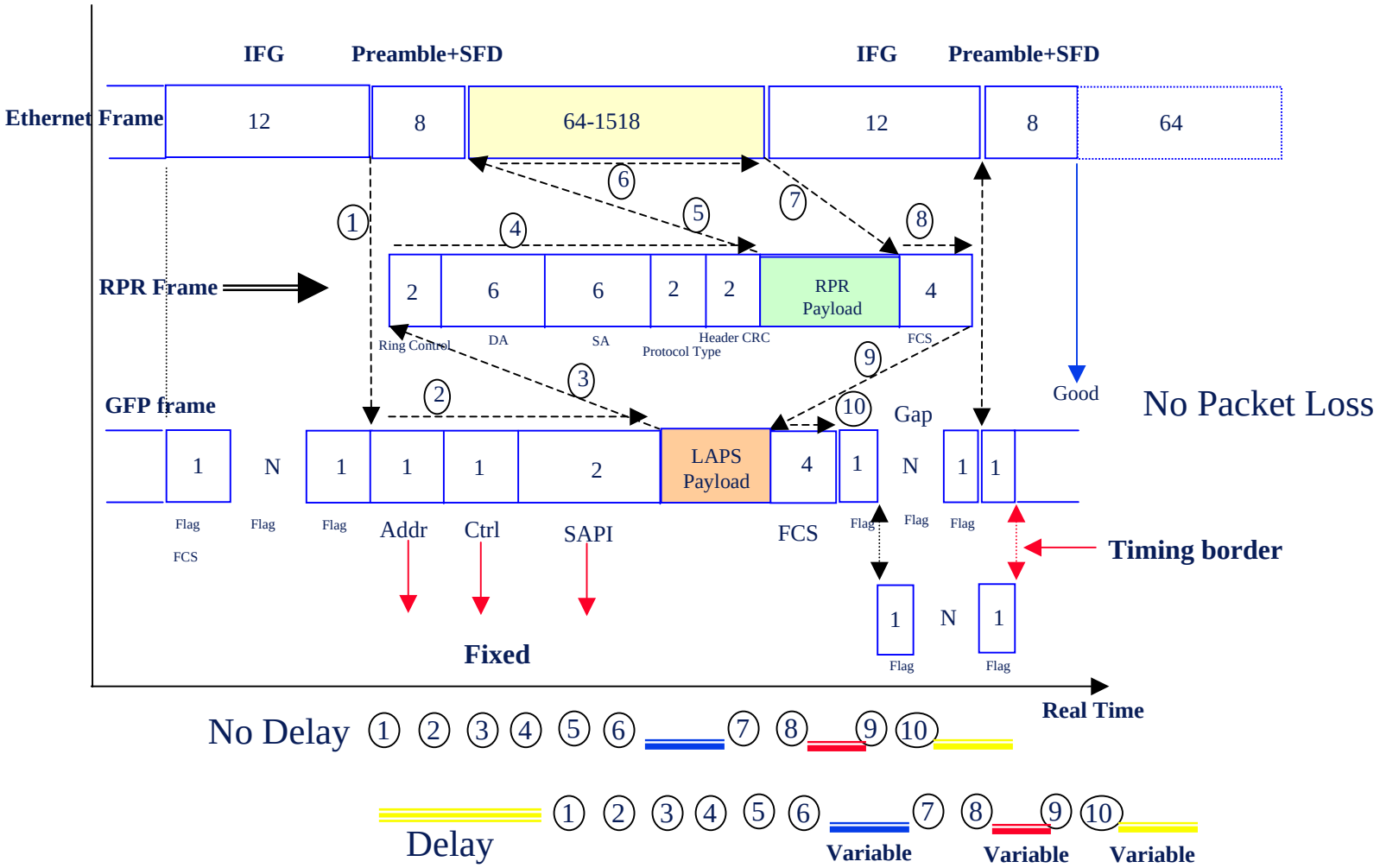
Bytes Mapping of Ethernet/X.86



Bytes Mapping of Ethernet/RPR/GFP

Comments to RPR idle

- Gap of data frames from client is random, including Ethernet and TDM, granularity of 4-byte or 16-byte idle is much great for the real-time services
- Some performance degradation will occur, due to atomic operation between RPR data frames: insertion/extraction of 4-byte idle (GFP) and 16-byte idle (RPR)



Bytes Mapping of Ethernet/RPR/LAPS

Comparison of Measurement, X.86 vs GFP

	GFP	LAPS/X.86	Percentage
64bytes	10.520 μs	9.658 μs	8.9% higher
1518bytes	203.620 μs	133.967 μs	51.9% higher
9.6Kbytes	Not supported	769.567 μs	

Note: Data comes from HDMP-3001, Agilent and WRI joint development
X.86 system devices has been deployed more than 12 provinces in China

Proposal:

(1) Use ITU-T LAPS in sub-clause 7.4.2.2 – Byte synchronous HDLC-like framing adaptation

(2) Use LAPS flag (0x7E) and cancel 16 bytes idle in order to support those services with low delay and latency

Thank you