

Overview of 10G Ethernet Family

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ISO/IEC approved			ISO/IEC 8802-3:2000				
ANSI/IEEE approved	IEEE 802.3 Policy and Procedures Approved Nov-97	Network Systems Tutorial Published Jun-95	IEEE Std 802.3-2005 5 Books (Sections) Published 12-Dec-05				
	IEEE Std 1802.3-2001 Conformance Test 10BASE-T Published 19-Oct-01		Section 1 Clause 1 to 20 Annex A to H	Section 2 Clause 21 to 33 Annex 22A to 32A	Section 3 Clause 34 to 43 Annex 36A to 43C	Section 4 Clause 44 to 54 Annex 44A to 50A	Section 5 Clause 56 to 67 Annex 58A to 67A
			CSMA/CD Overview MAC PLS/AUI 10BASE5 MAU 10BASE2 MAU 10BROAD36 MAU 10BASE-T MAU 10BASE-F MAUs 10Mb/s Repeater 10Mb/s Topology	100Mb/s Overview MII 100BASE-T2 100BASE-T4 100BASE-TX 100BASE-FX 100Mb/s Repeater 100Mb/s Topology MAC Control Auto Negotiation Management	1000Mb/s Overview GMII 1000BASE-X AutoNeg 1000BASE-SX 1000BASE-LX 1000BASE-CX 1000BASE-T 1000Mb/s Repeater 1000Mb/s Topology Link Aggregation	10Gb/s Overview MDC/MDIO XGMII XAUI XSBI 10GBASE-SR 10GBASE-LR 10GBASE-ER 10GBASE-SW 10GBASE-LW 10GBASE-EW 10GBASE-LX4 10GBASE-CX4	Subscriber Access Overview OAM Multi-point MAC Control 100BASE-LX10 100BASE-BX10 1000BASE-LX10 1000BASE-BX10 1000BASE-PX10 1000BASE-PX20 10PASS-TS 2BASE-TL Subscriber Access Topology
	IEEE Std 802.3an-2006 10GBASE-T Approved 8-Jun-06 Publication expect August		1BASE5 DTE & MAU Mgmt Repeater Mgmt			Maintenance 7	
	IEEE Std 802.3-2005/Cor 1-2006 Corrigenda 1 Published 26-Jun-06		Maintenance 6 Maintenance 7	DTE Power Maintenance 6 Maintenance 7	Maintenance 6 Maintenance 7		

802.3
WG
in
process

.3ap
Backplane
Ethernet
Task Force
(A. Healy)
WG recirc

.3aq
10GBASE-LRM
Task Force
(D. Cunningham)
Sponsor recirc

.3ar
Congestion
management
Task Force
(K. Daines)
Draft preview

.3as
Frame
Extension
Task Force
(K. Daines)
Sponsor recirc

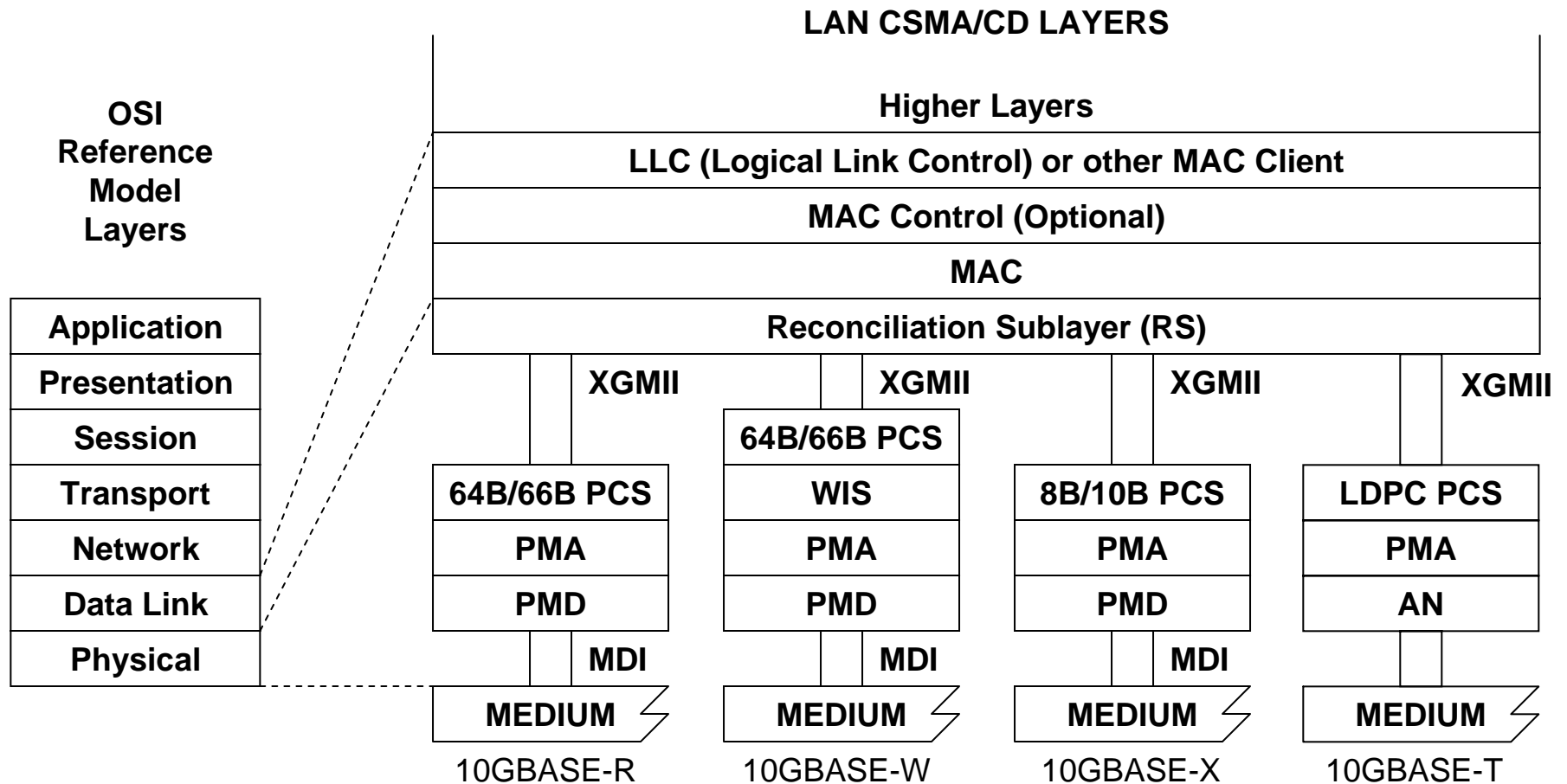
.3at
DTE Power
Enhancements
Task Force
(M. McCormack)

10Gb/s
EPON
Study Group
(G. Kramer)

HSSG
Call for
Interest
(J. D'Ambrosia)

802.3 WG
new
work items

10Gb/s Layer Model



MDI = Medium Dependent Interface

XGMII = 10 Gigabit Media Independent Interface

PCS = Physical Coding Sublayer

AN = Auto-Negotiation Sublayer

PMA = Physical Medium Attachment

PMD = Physical Medium Dependent

WIS = WAN Interface Sublayer

10Gb/s Layers and Interface(s)

XGMII

10 Gigabit Media Independent Interface
32 data (4 'lanes' of 8 bits),
4 control and 1 DDR clock

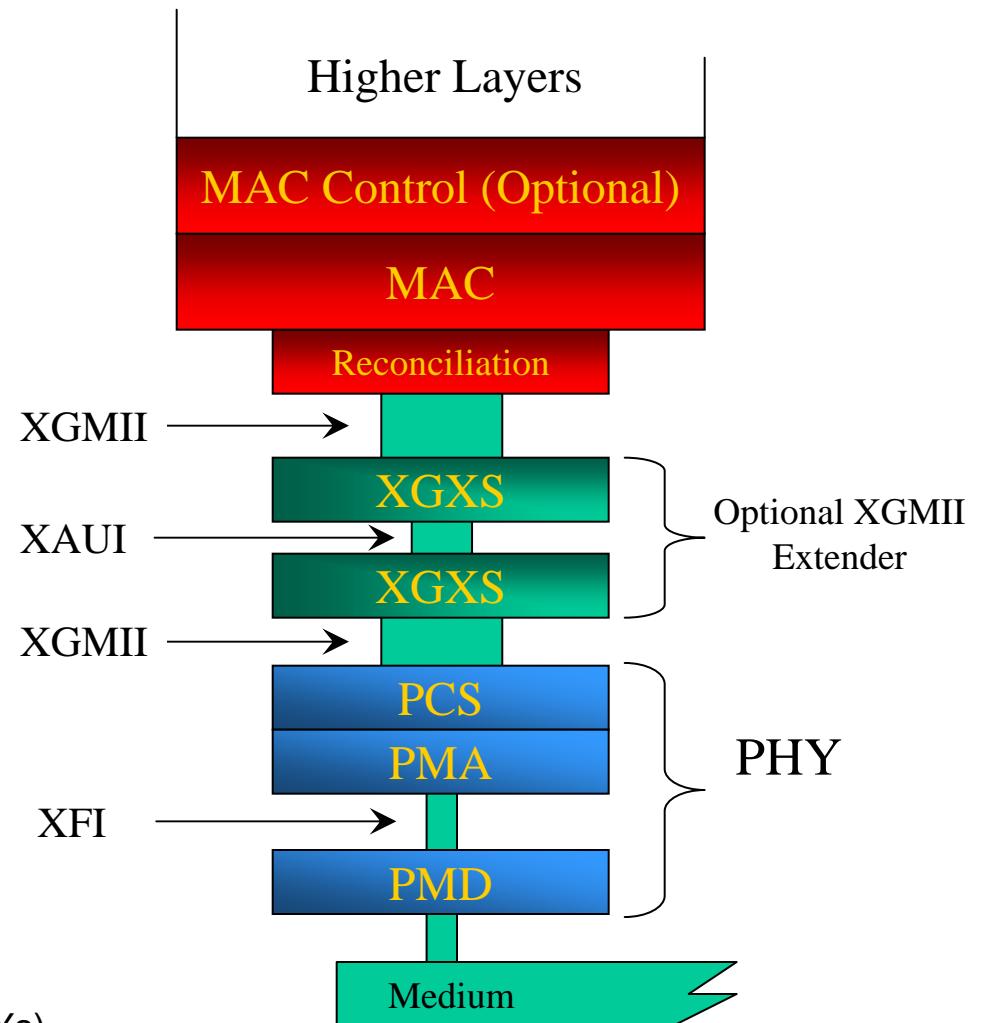
XAUI

10 Gb/s Attachment Unit Interface
4 Bit serial @ 2.5Gb/s
8B/10B encoded - 3.125GBaud/s

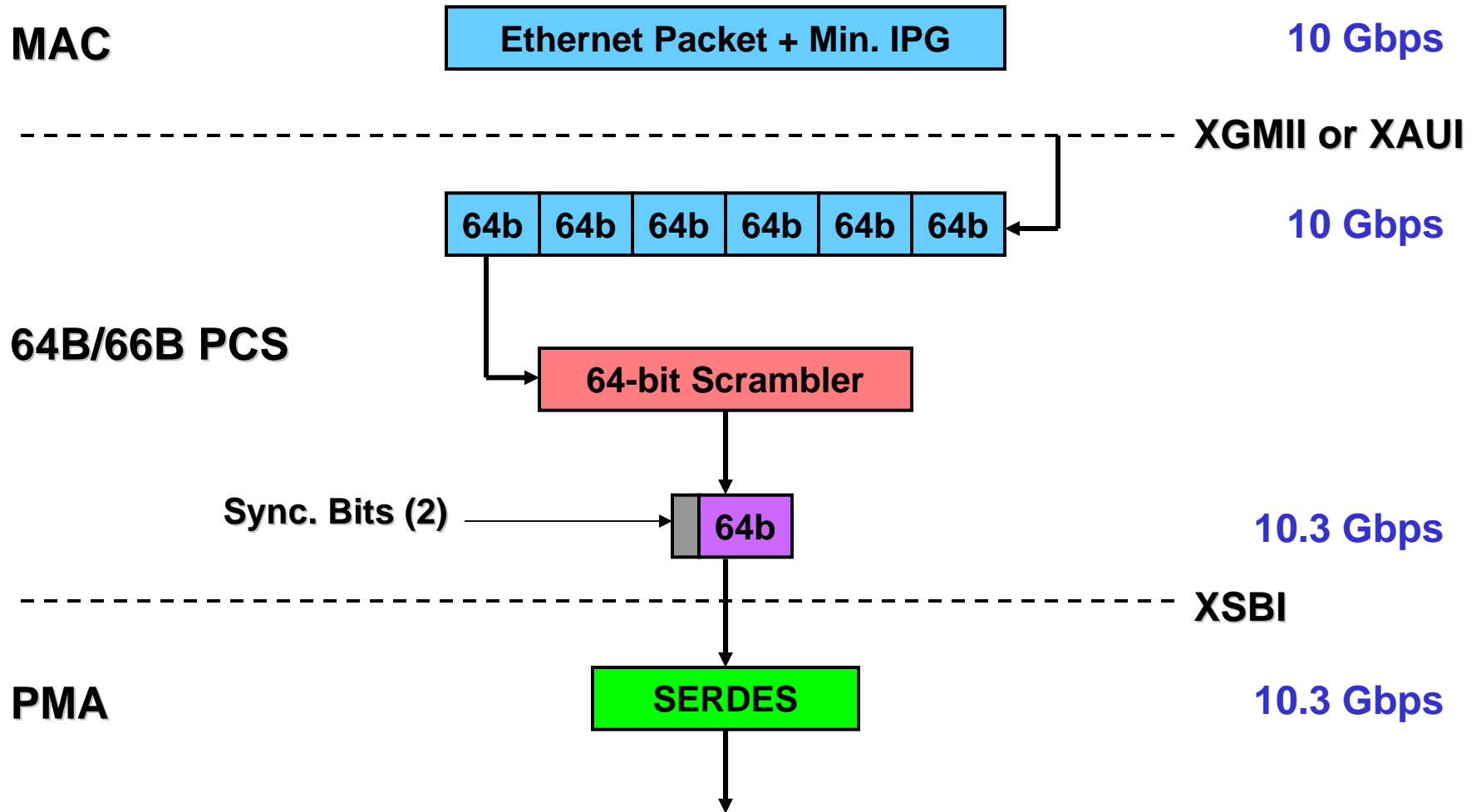
XFI (Not specified in IEEE Std 802.3)

10 Gb/s Serial Electrical Interface
Bit serial @ 10Gb/s
64B/66B encoded - 10.312GBaud/s

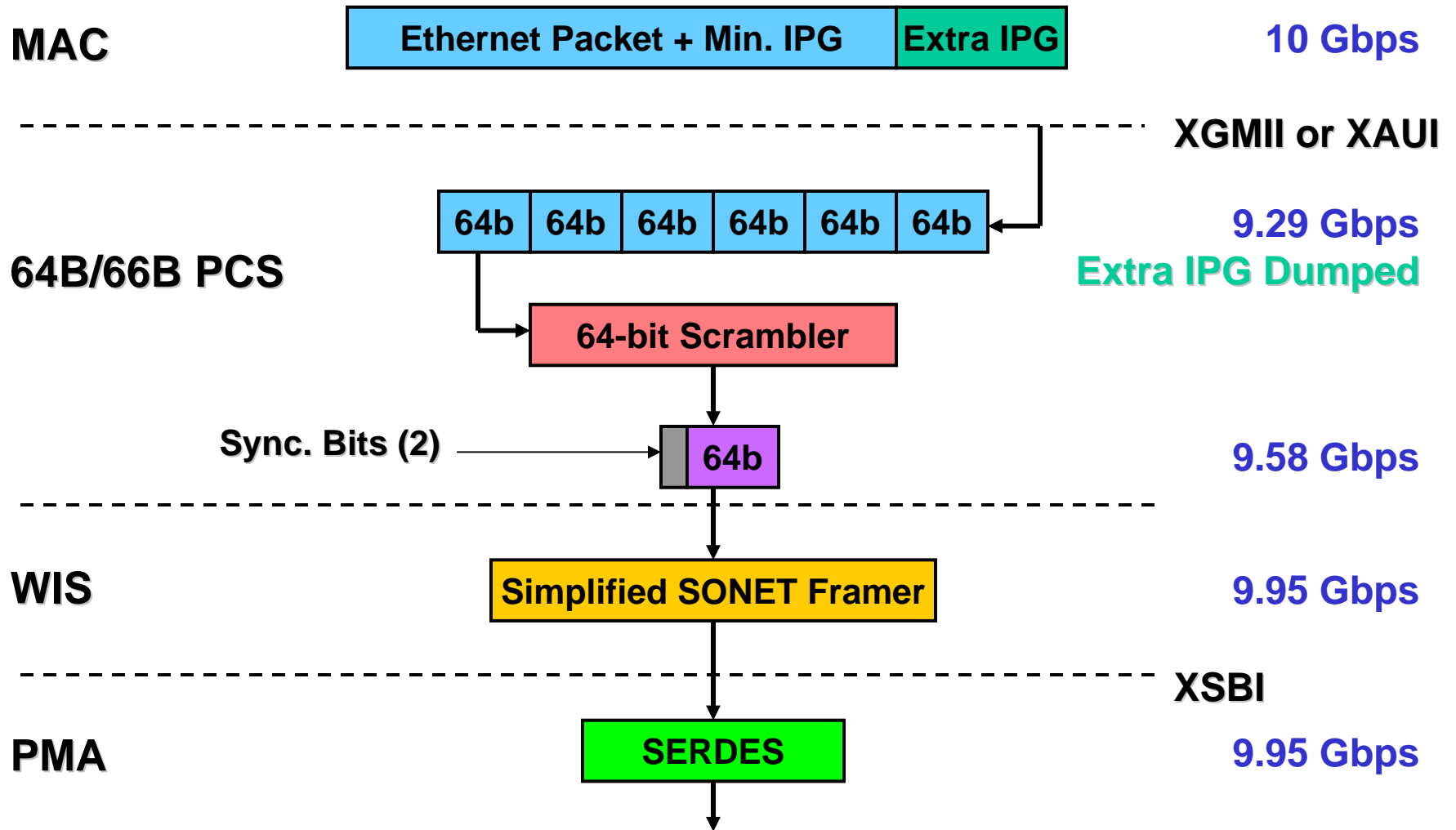
PCS = Physical Coding Sublayer
PMA = Physical Medium Attachment
PMD = Physical Medium Dependent (not for all PHYs)



10GBASE-R



10GBASE-W Serial



Overview of PMD Types

Optical	10GBASE-SR / W	850 nm	Serial	300 / 33 m	50 um / 62.5 um MMF
	10GBASE-LRM	1310 nm	Serial	220 m	50 um / 62.5 um MMF
	10GBASE-LX4	1310 nm	WDM	300 m 10 km	50 um / 62.5 um MMF Single Mode Fiber
	10GBASE-LR / W	1310 nm	Serial	10 km	Single Mode Fiber
	10GBASE-ER / W	1550 nm	Serial	40 km	Single Mode Fiber
Copper	10GBASE-CX4		4 Lanes	15 m	Twinaxial
	10GBASE-T		4 Pairs	100 m	UTP
Backplane	10GBASE-KX4		4 Lanes	1 m	Improved FR-4
	10GBASE-KR		Serial	1 m	Improved FR-4

Link Aggregation

OSI
Reference
Model
Layers

LAN CSMA / CD Layers

