

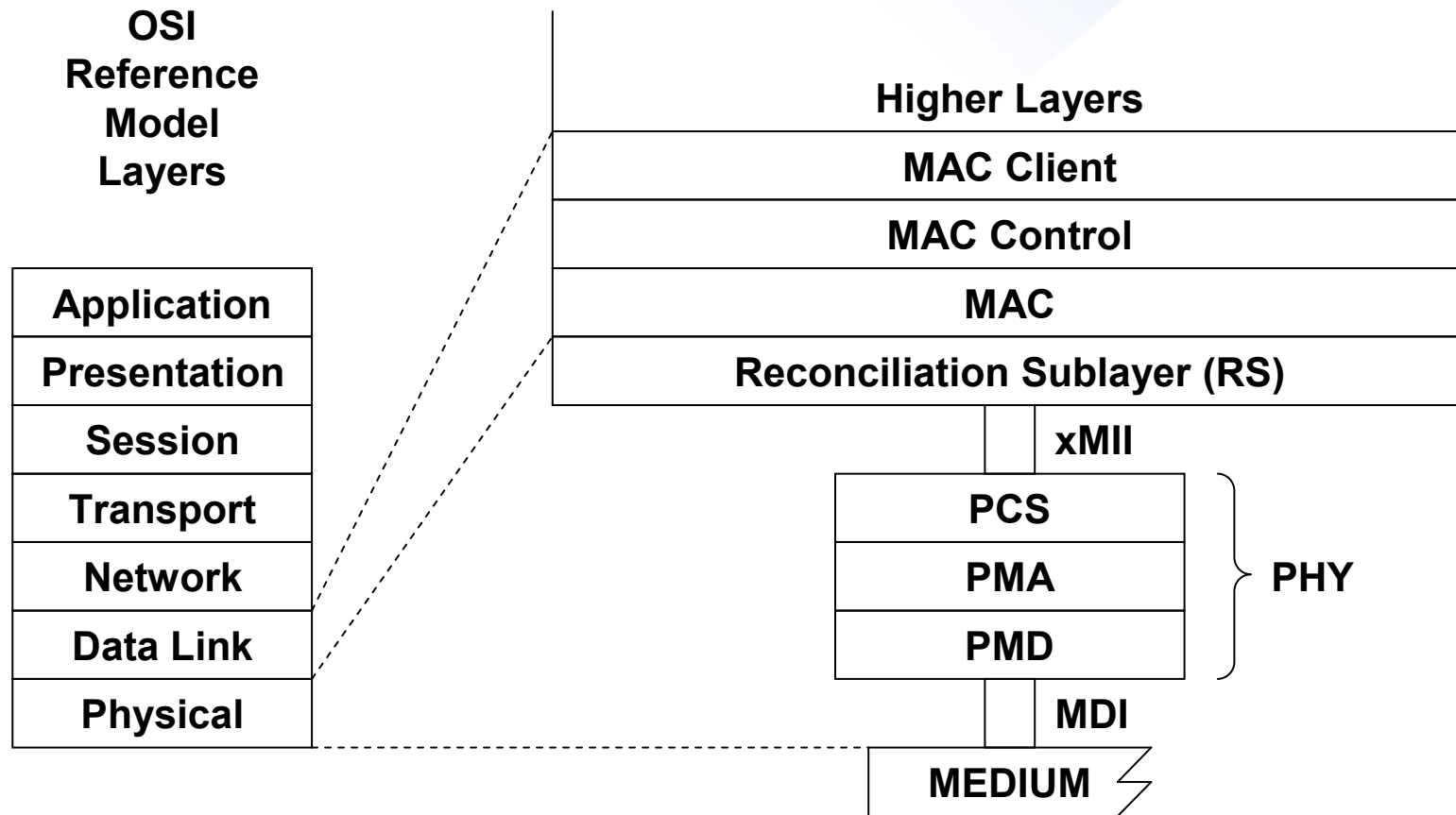
MAC Rate

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IEEE 802.3 HSSG November Plenary

MAC Rate Terminology

- Terms apply to this HSSG effort
- Static
 - Data rate of the MAC is fixed at a single speed
 - MAC-PHY interface operates at the same rate as the MAC
 - Follows what other 802.3 projects have done
- Dynamic
 - Data rate of the MAC adjusts to match the speed of the PHY
 - MAC-PHY interface rate could also adjust with the MAC data rate
 - New concept for 802.3

Architecture Overview



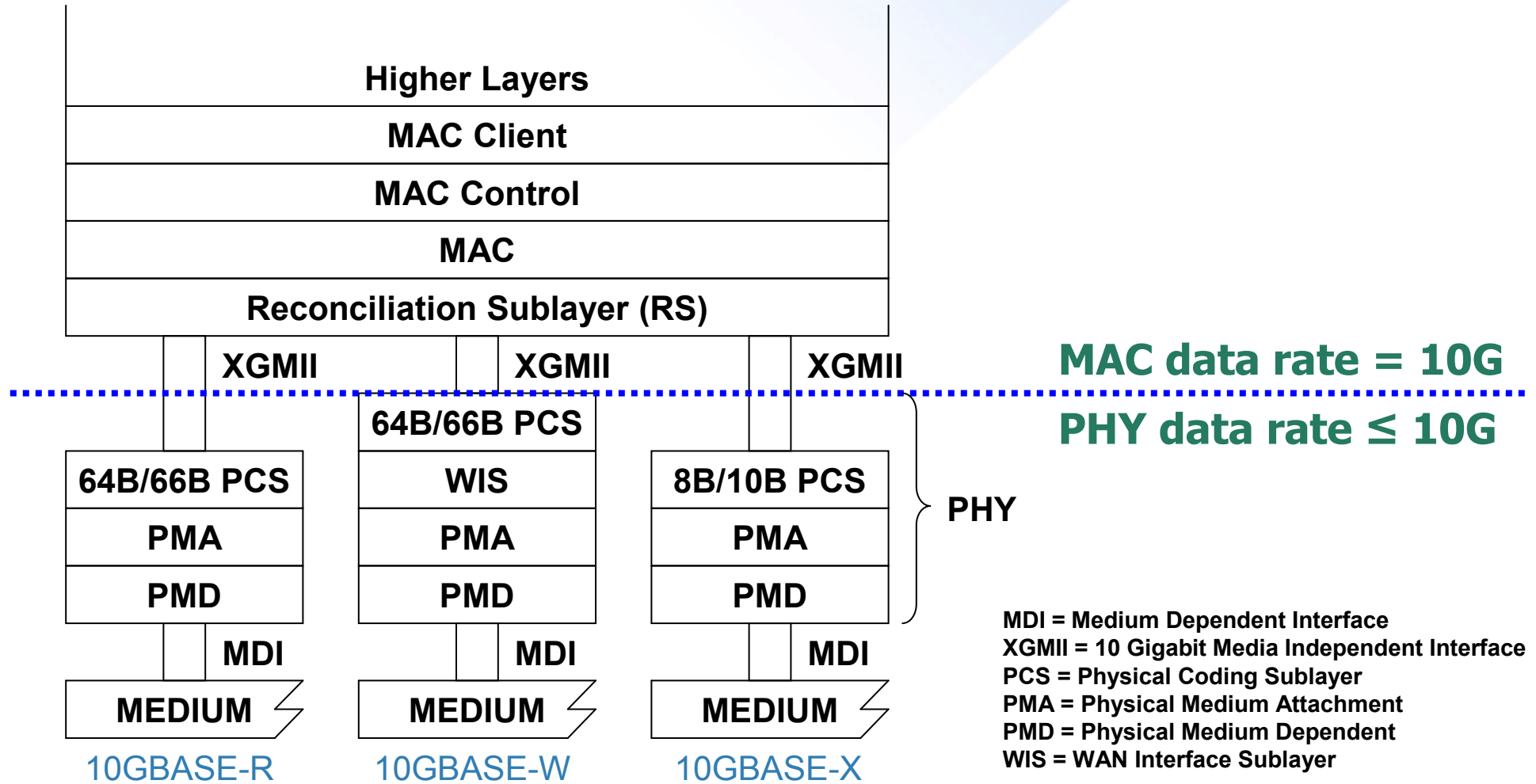
MDI = Medium Dependent Interface
xMII = Media Independent Interface
PCS = Physical Coding Sublayer

PMA = Physical Medium Attachment
PMD = Physical Medium Dependent

Previous Projects

- Minimize the effort related due the MAC
 - Focused on a single speed MAC
 - 802.3ae had one MAC speed, but IPG stretch to operate at WIS PHY rate
 - 802.3ah used one MAC speed with CRS for the DSL derivatives
- Benefits
 - MAC specification is easy
 - Easier specification of the MAC-PHY interface
- Order of magnitude
 - Have set a precedence in the market
 - Industry is expecting an order of magnitude

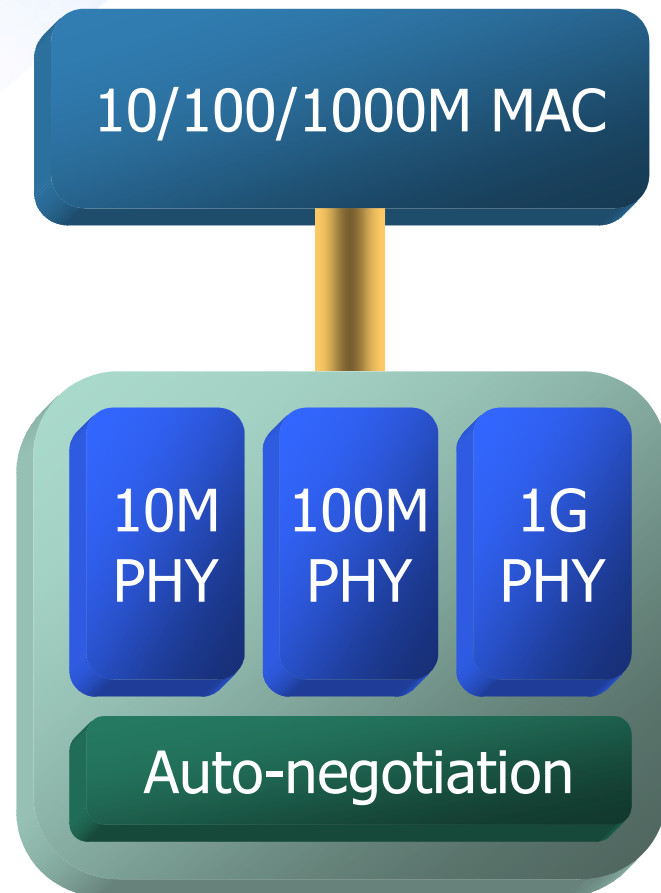
802.3ae Example



Static Rate MAC does not imply Static Rate PHY

10/100/1000M Ethernet Implementation Example

- Example: three static rate standards projects
- 802.3 has specified multiple MAC and PHY speeds
 - Each MAC-PHY speed (i.e. 10M, 100M, 1G) were separate projects
 - MAC management can obtain that information via MDIO
- Implementations may be conceptually “dynamic”
 - Each standard (or speed) was not a dynamic rate MAC



Static vs. Dynamic MAC Rate

Static

- Pros

- Simpler management interaction
- Easier and faster specification
- Interoperability and testing requirements less complicated
- MAC-PHY interface can be static

- Cons

- Reduced granularity
- Reduced scalability

Dynamic

- Pros

- Unlimited granularity
- More scalable solution

- Cons

- More management interaction with PHY and MAC Client
- Increased specification complexity
- More interoperability and testing configurations to verify
- Dynamic MAC-PHY interface?

MAC Rate vs. PHY Rate

- Rates are dependent, but do not have to be equal
- MAC Rate
 - Must be \geq the PHY rate
 - IPG stretching can be used to slow down the effective data rate
 - One MAC rate simplifies MAC-PHY interaction
- PHY Rate
 - Conversely, must be \leq MAC rate
 - Multiple, selectable PHY rates requires either:
 - User intervention
 - MAC-PHY signaling (i.e. CRS)
 - Auto-negotiation
 - Decision can be separate from the MAC Rate decision

- MAC rate and PHY rate do not have to be equal
 - PHY rate can be less than or equal to MAC rate
- Dynamic MAC rate is more complicated
 - Requires agreement between local and link partner MACs, MAC & MAC client, and MAC & PHY
- Recommendation:
 - Select a single, static MAC rate
 - Make that rate 100G

Supporters

- Frank Chang, Vitesse
- Chris Cole, Finisar
- Joel Goergen, Force10 Networks
- Carrie Higbie, Siemon Company
- Paul Kolesar, Commscope
- Gary Nicholl, Cisco
- Bill Ryan, Foundry
- Schelto van Doorn, Intel