Management & control of the sublayers

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What's all this about?

Can't we just move the data?

Things to do

- Start up
- Data transport <-normal operation
- Shut down
- Testing
  - In the factory
  - In the field
  - Use of loopback
- Fault reporting

Things to do

Action	*Suitable for standard*
Start up	Yes, need, could be trivial
• Data transport	Yes, need
• Shut down	Yes, need, could be trivial
• Testing	
– In the factory/test house	
• at qualification	only for proving compliance
• in production	only for proving compliance
– In the field	
• Installation	Want not need
• Diagnostics	Not part of the standard
– Use of loopback	Only for cause
• Fault reporting	Want not need

Possible reasons for standardising something 1

- Interworking
  - Horizontal *across the medium*
  - Vertical *up/down the stack*
- Fault handling
  - Detection
  - Location
- Protection
  - of network
  - of people
- Parameter testing

Possible reasons for standardising something 2

• Interworking	
– Horizontal	Need
– Vertical	Want
• Fault handling	
– Detection	Strong want
– Location	Weaker want
• Protection	
– of network	want
– of people	need but not our standard
• Parameter testing	Need, only for proving compliance

Ways to manage something

Physical *"Harder"*
- – e.g. pulling out a card
- Visible
  - – e.g. panel lights
- Optical intervention
  - – e.g. patchcord for loopback
- Electrical intervention
  - – Pins or wires
  - – Through data path
- MDIO
  - – registers, software *"Softer"*

Candidate managed objects

		Signal detect		Check signal code		Disable o/p		Loopback (divert o/p)		Modify data output		Raise or respond to auxiliary signal		Transport auxiliary signal		Communicate with MDIO	
	Serial or WWDM	Tx side	Rx side	Tx side	Rx side	Tx side	Rx side	Tx side -> Rx side	Rx side -> Tx side	Tx side	Rx side	Tx side	Rx side	Tx side	Rx side	Tx side	Rx side
Higher layer(s)									Y								
RS																	
XGMII														(Y)	(Y)		
XGXS																	
XAUI		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
XGXS																	
XGMII														(Y)	(Y)		
PCS	S			Z	Y	Z	Z	Z	Z							O	O
PCS	W				Y	Z	Z	Z	Z							O	O
WIS																	
PMA	S	X	O	X	X	X	X	X	X	X	X	Z	O	(Y)	(Y)	X	X
PMA	W	X	O	X	X	X	X	X	X	X	X	Z	O	(Y)	(Y)	X	X
PMD	S	X	O, Z	X	X	O	Z	X	X	X	X	O	O, Z	X	X	X	X
PMD	W	X	O(1),Z	X	X	O(1)	Z	X	X	X	X	O	O(1),Z	X	X	X	X
Medium		X	X	X	X	Y	Y	Y	Y,Z	X	X	X	X	X	X	X	X

	Y	Probably a good idea or easy to do
	X	Impossible, expensive, impractical or similar
	O	Should be optional
	(1)	One signal not four
	Z	No convincing reason yet proposed
	(Y)	e.g. sig. det. doesn't pass through SERDES or XGMII but can bypass it. Issues with pin count
	(blank)	(No comment)

Summary: not all nice ideas are practical

Work to do!

- Feature creep is bad news
- Each feature needs:
  - Good justification
  - Precise description of effect
  - Precise description of use
- PMD and PMA are analog
- Include features only when justified, which hasn't happened yet