System and Compatibility Considerations for 50G AUIs

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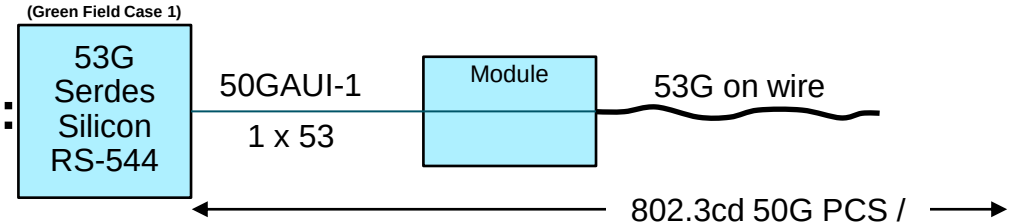
Background

- Many discussions on different architectures for 50GE:
  - *nicholl_3cd_01a_0516.pdf*, *nicholl_3cd_02_0516.pdf*, *ghiasi_3cd_01a_0516.pdf*, *wang_50GE_NGOATH_01_0316.pdf*, *stone_021716_50GE_NGOATH_adhoc-v2.pdf*
- Universal themes:
  - Determine a “best long term solution” for 50GE without detuning FEC capability due to legacy considerations
  - Avoid fragmenting the market and confusing customers with too many options
    - (note 25 / 50GE Consortium Specification is anticipated to be publicly released mid-year – referred to here as GEc)
  - Ensure existing hardware can be connected efficiently
- This presentation proposes a set of architectures which meet these requirements

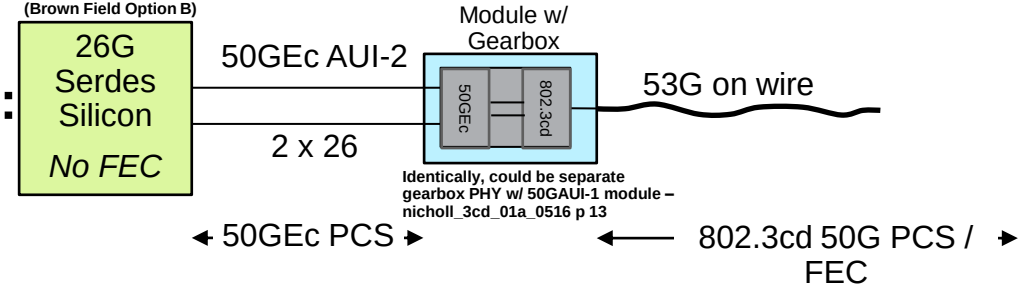
Proposed Classifications

SUPPORTED

A1: (Green Field Case 1)

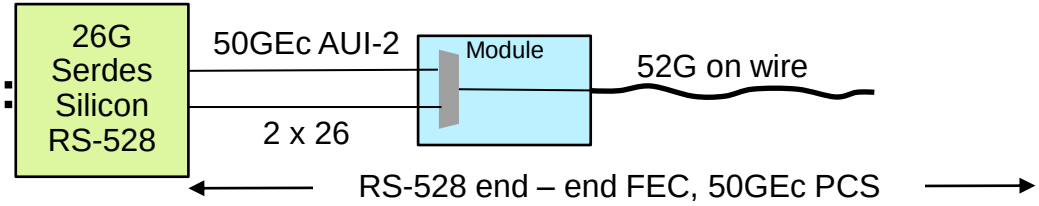


A2: (Brown Field Option B)

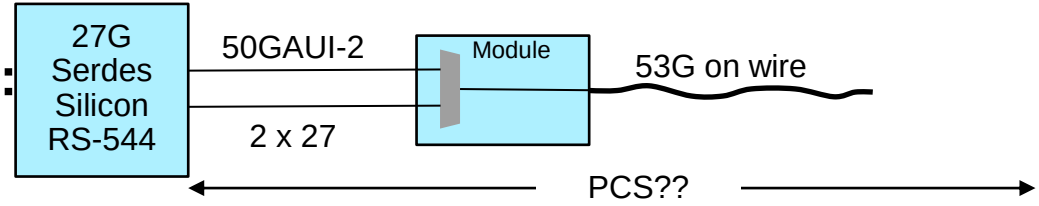


NOT SUPPORTED

B1: (Brown Field Option A):



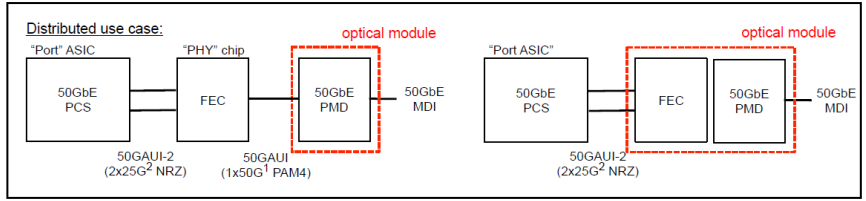
B2: (Green Field Case 2)



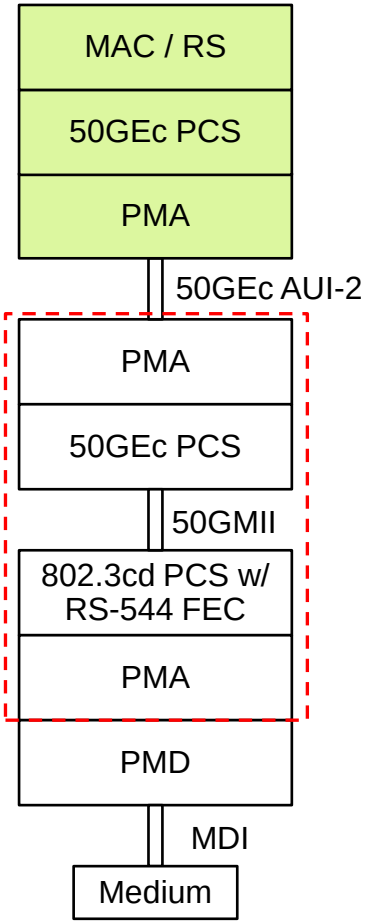
Classification Rationale

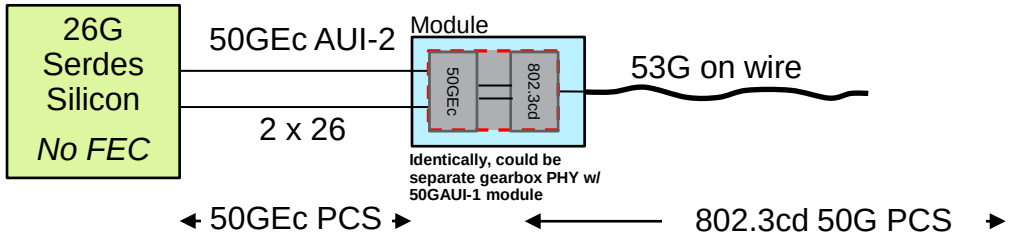
- Best end – end architecture for all new designs, maximum FEC leverage by PMDs
- Backwards compatibility with existing 25G silicon
- Uses identical PMD specifications to A1
- Feedback from PMD vendors that RS-528 is insufficient for end to end link budgets, especially with a bit mux
- Do not want to specify two link budgets (**A1** & **B1**) per PMD for an interim solution
- Requires new silicon, does not increase ASIC port density vs 50GEc
- Requires module symbol mux for max FEC protection

Associated Layer Diagram – Case A2



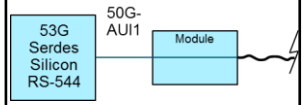
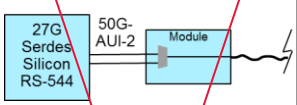
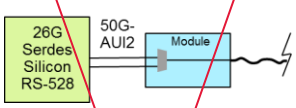
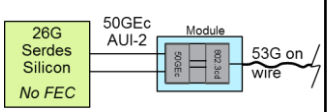
from nicholl_3cd_01a_0516.pdf





- Terminate 50GEc PCS in gearbox
- Initiate 802.3cd 50G PCS and FEC to cover 50G serial PMD
- A straightforward clean way to provide backwards compatibility to the existing widely deployed PCS specification (50GEc)
- Enables a single set of 50G PMDs (A1 & A2 use same PCS / FEC so identical)
- Could also be instantiated as a stand alone board PHY

Summary

	A1 (50G AUI-1 hosts, RS-544 end – end) 	**B2** (50G AUI-2 Host to AUI-1 Host RS-544 end – end) 	**B1** (2 x 25G AUI Host, RS-528 end – end) 	**A2** (2 x 25G AUI Host, RS-544 in module, over PMD and 50G AUI) 
compatible with existing silicon / standards*	No	No	Yes	Yes
Can use existing host management software	No (new hardware)	No (new hardware)	Yes	Maybe (due to extender sublayer)
maximizes PMD reach / FEC leverage	Yes	Yes, if symbol mux	No	Yes
Provides backwards compatibility to existing technology	N/A	No	Yes	Yes
Maximizes new host IO density	Yes	No	Yes	Yes
		Not supported	Not supported	

**With appropriate adapter module if needed*

Summary

- Propose to define only a single 50G PCS within 802.3cd to support serial AUI / PMDs (**A1**)
- Backwards compatibility to existing 50GEc devices can be achieved with a gearbox PHY at relatively low cost and low system complexity (**A2**)
- This approach minimizes market fragmentation and end user confusion

Thanks!