



Thoughts on AUI BER budgeting when considering electrical and optical interfaces

Gary Nicholl, Cisco

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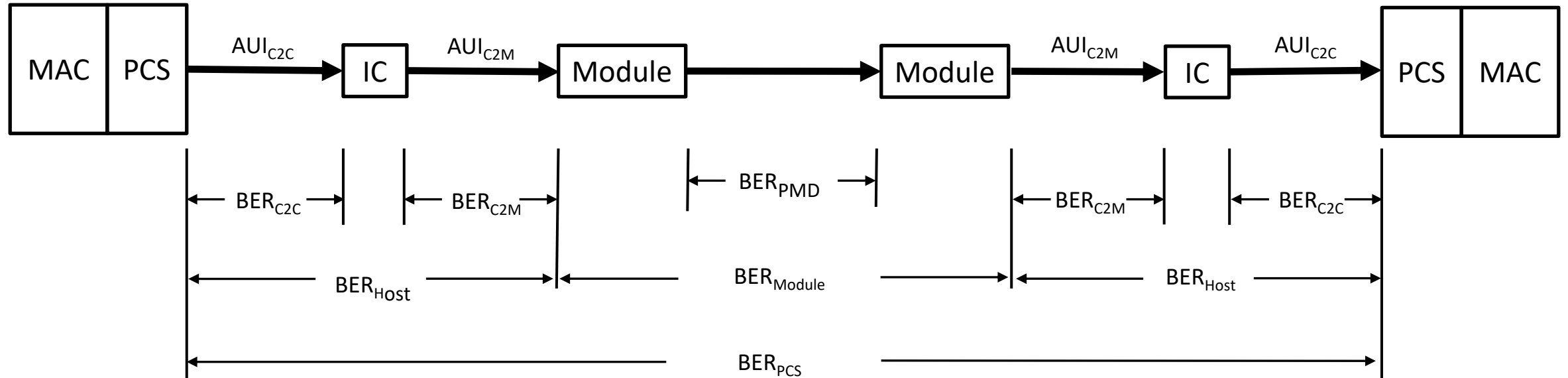
Background

- This contribution will provide some thoughts around the BER budgeting between 200G/lane host electrical and optical interfaces , and in the context of inter-generational interop and migration.
- To maximize broad market potential, we want to be able to mix and interoperate:
 - 800GbE hosts based on 100G/lane AUIs with new 200G/lane PMDs
 - 800GbE hosts based on 200G/lane AUIs with “legacy” 100G/lane PMDs
- This was the case for 200 GbE and 400 GbE , with the transition from 50G/lane technology to 100G/lane technology

Interoperability Examples

- The following slides will review four separate 800GbE inter-generational interoperability examples, and consider the implications on BER budgeting for 200G/lane host and optical interfaces:
 - 100G/lane host and 100G/lane PMD (all 100G/lane, i.e. 802.3df)
 - 100G/lane host and new 200G/lane PMD (inter-generational #1)
 - New 200G/lane host and 100G/lane PMD (inter-generational #2)
 - New 200G/lane host and New 200G/lane PMD (all 200G/lane)
- Additional examples are provided in the backup, but were removed from the main presentation to simplify the messaging

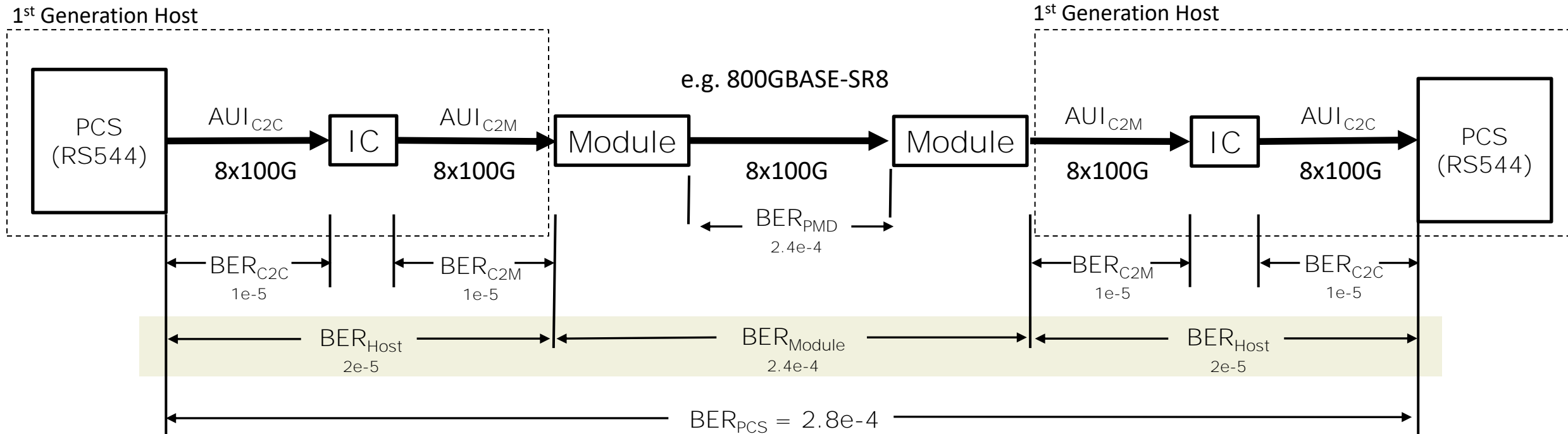
Link Reference Diagram



The model above is provided for illustrative purposes to enable discussion. No formal budget has been adopted.

Note, Random “BER” is used here as an indication of performance for the various sub-links to simplify the analysis (recognize there is much discussion on that topic, and that FLR is the ultimate goal)

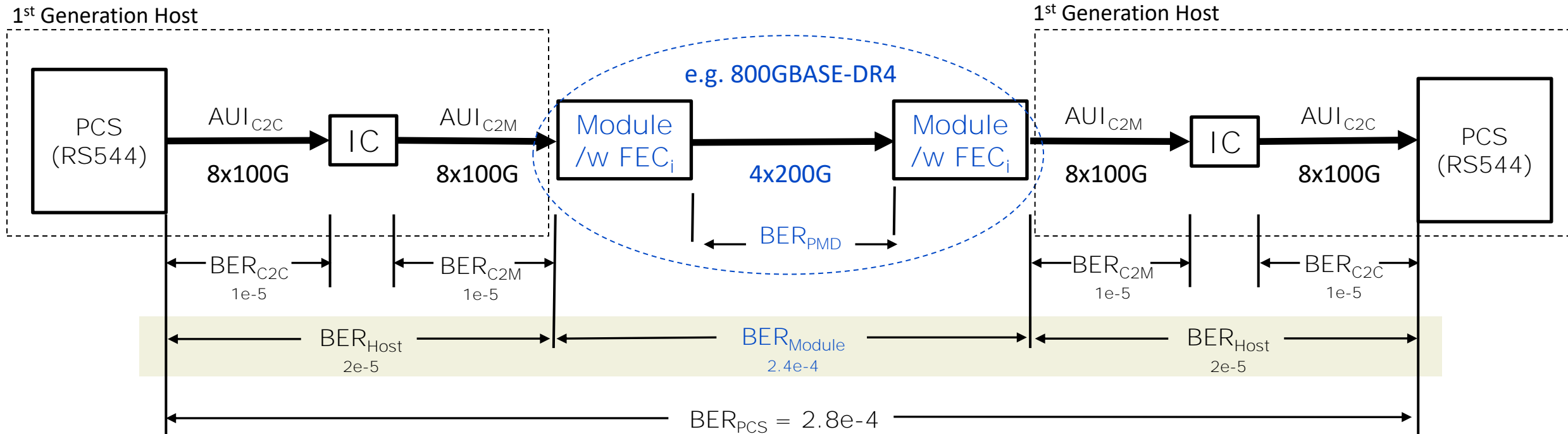
Legacy: 100G host and 100G PMD (i.e. 802.3df)



- BER_{C2C} (100G) = $1e-5$
- BER_{C2M} (100G) = $1e-5$
- BER_{PMD} (100G) = $2.4e-4$
- BER_{PCS} (100G) = $2.8e-4$

All of these specifications were set by 802.3ck and leveraged by 802.3df

Inter-generational #1: 100G host with 200G PMD

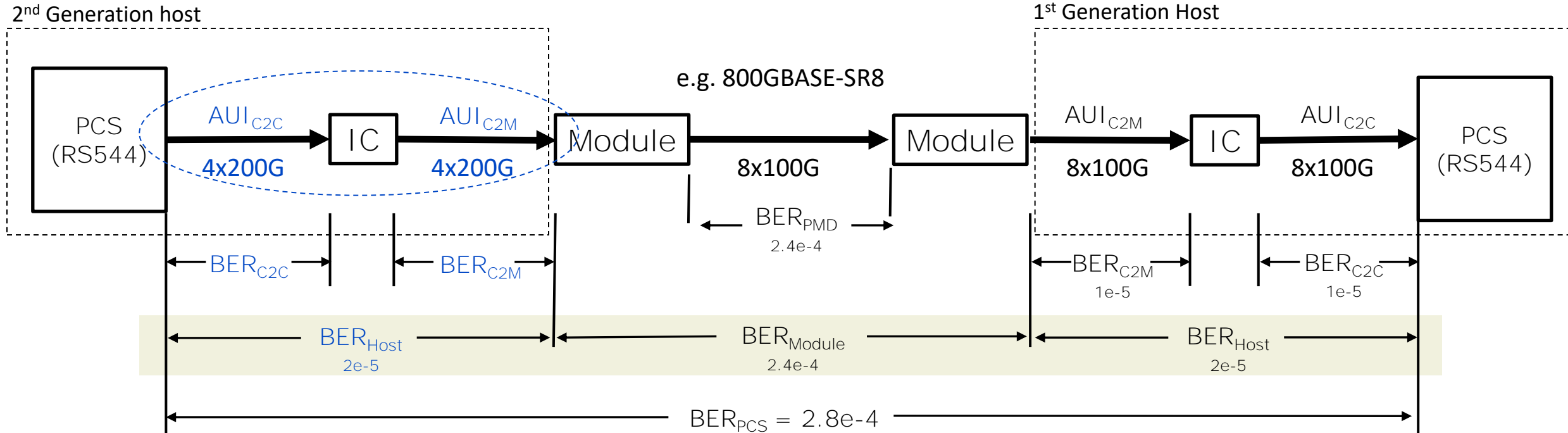


Hosts are unchanged, therefore BER_{Module} must remain unchanged at $2.4e-4$

Inner FEC must convert from BER_{PMD} (200G) to $BER_{Module} = 2.4e-4$ (or better)

$$BER_{Module} (200G) = BER_{Module} (100G) = 2.4e-4 \text{ (or better)}$$

Inter-generational #2: 200G host with 100G PMD

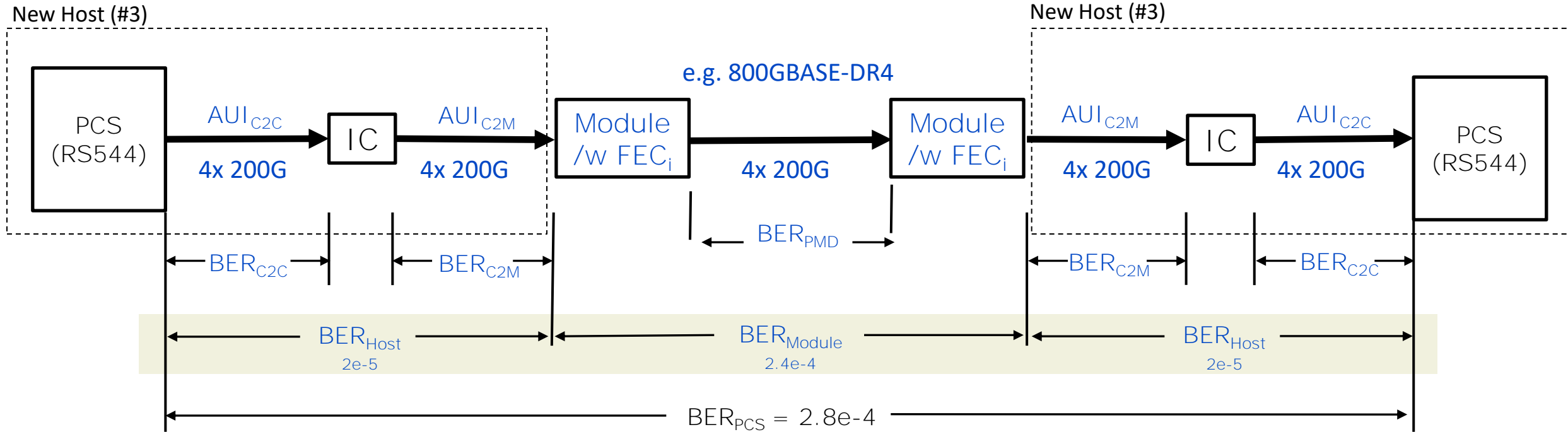


BER_{Module} and BER_{Host} of 1st generation host (right side) are unchanged

The BER_{Host} of 2nd generation host is still constrained to $2e-5$

$$BER_{host} (200G) = BER_{host} (100G) = 2e-5 \text{ (or better)}$$

Brave new world: 200G host with 200G PMD



Nothing new to see here ! Everything already constrained by the previous slides.

$$BER_{Module} (200G) = BER_{Module} (100G) = 2.4e-4 \text{ (or better)}$$

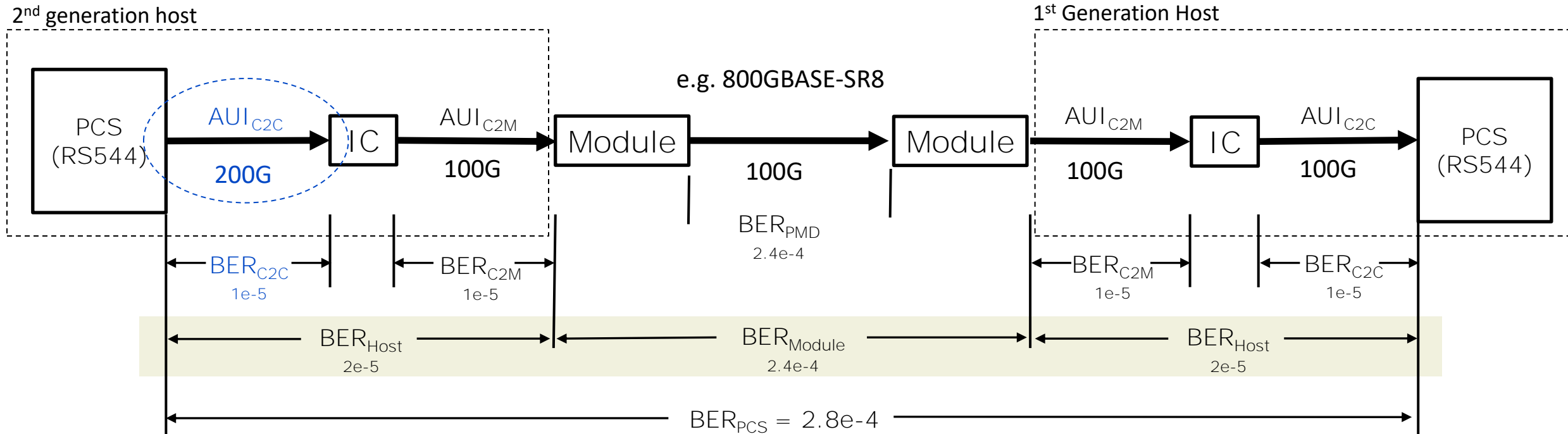
$$BER_{host} (200G) = BER_{host} (100G) = 2e-5 \text{ (or better)}$$

Summary

- Maintaining a consistent AUI BER target across 100G/lane and 200G/lane generations greatly simplifies the goals of interoperability and reduces product implementation variants
 - Inter-generational example #1 (100G host and 200G PMD) constrains $BER_{\text{Module}}(200\text{G})$ to be $2.4e-4$ (or better)
 - Inter-generational example #2 (200G host and 100G PMD) constrains $BER_{\text{Host}}(200\text{G})$ to be $2e-5$ (or better)
- Deviating from the above BER targets may impact broad market potential through more and/or more complex (e.g. use of MII Extender) product variants and should be carefully considered by the task force

Thank You!

Inter-generational: Mixed host (200G C2C, 100G C2M)

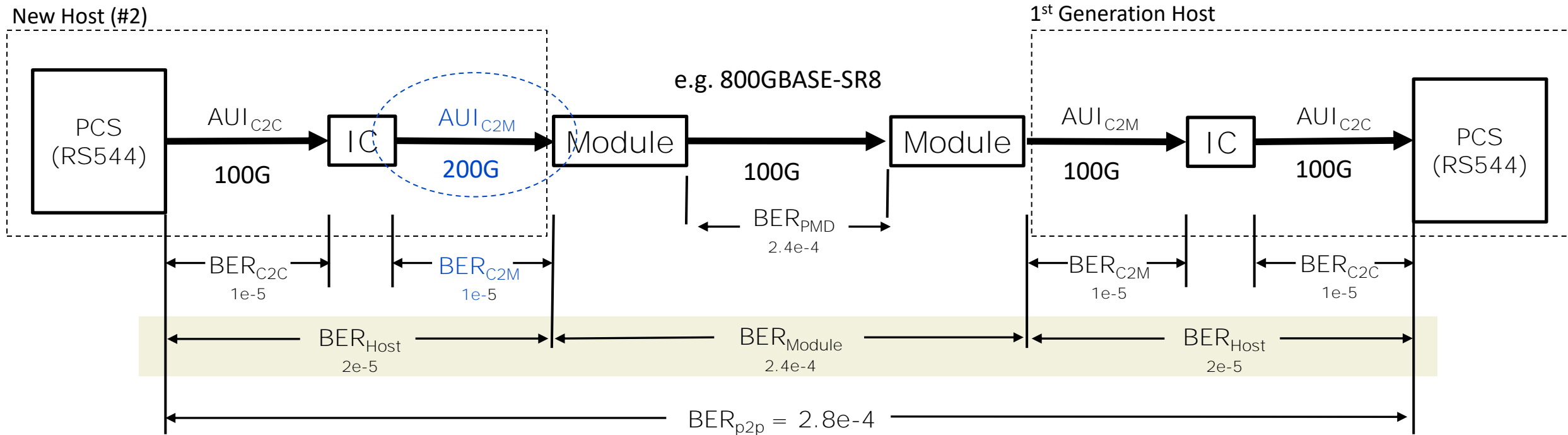


Only thing that is changed is that the C2C AUI on left host is upgraded to 200G/lane

Since nothing else has changed the AUI C2C (200G) can only be budgeted 1e-5

$$BER_{C2C}(200G) = 1e-5$$

Inter-generational: Mixed host (100G C2C, 200G C2M)

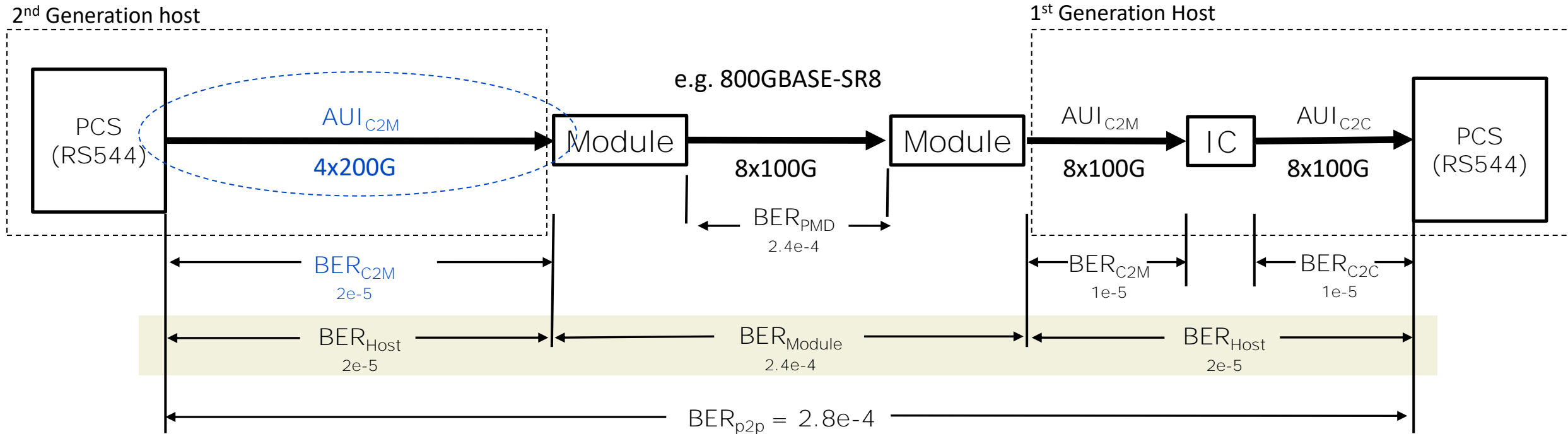


Only thing that is changed is that the C2M AUI on left host is upgraded to 200G/lane

Since nothing else has changed the AUI C2C (200G) can only be budgeted 1e-5

$$BER_{C2M}(200G) = 1e-5$$

Inter-generational: Single 200G C2M AUI



The BER_{Host} of 2nd generation host is still constrained to 2e-5

Can define a single C2M AUI (200G) with a BER target of 2e-5