Server Network Connectivity

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IEEE P802.3db 100 Gb/s, 200 Gb/s, and 400 Gb/s Short Reach Fiber Task Force

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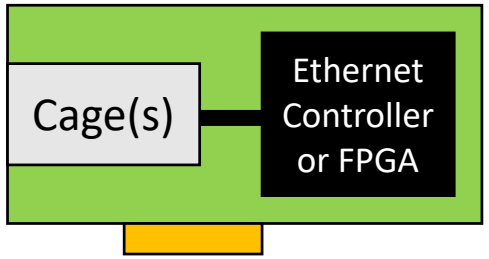
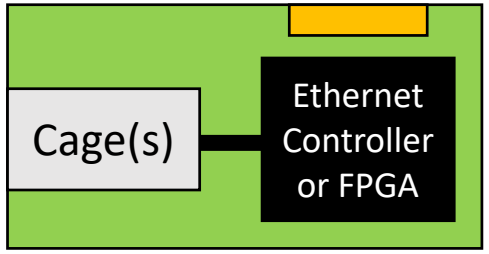
Introduction

- Servers typically sit at the lowest point of the cloud data center network
- Servers are also emerging in enterprise and carrier data centers for various applications
- Server connectivity comes in a variety of form factors
- Servers support a wide range of pluggable media, including all those to be defined by this Task Force

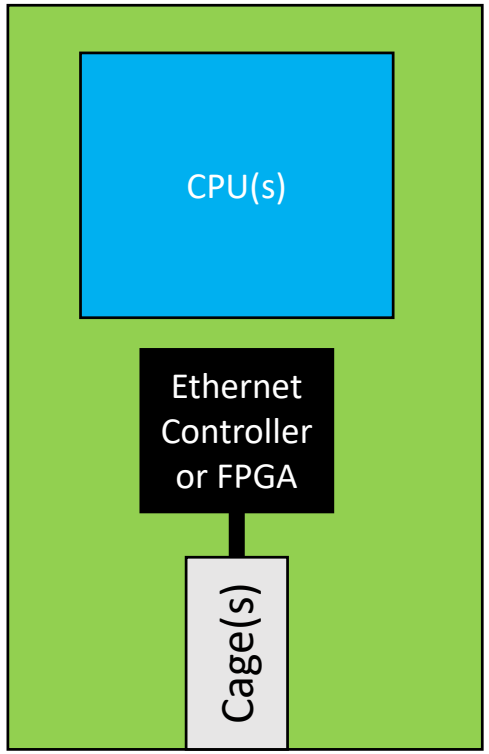
Common Server Form Factors for Pluggable Media



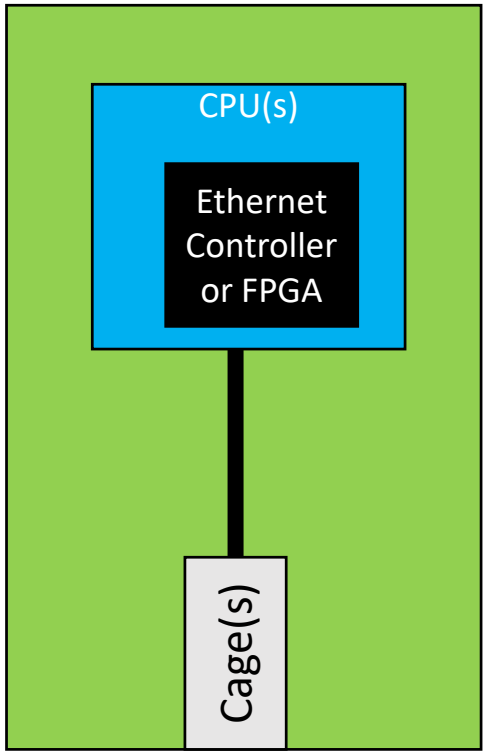
PCI-E



OCP



LAN on Motherboard



SoC

Server Pluggable Media Implications

- While some server networks progress to the fastest PMD rates quickly, a sizable portion of the server connections transition later
  - Today, servers are transitioning from 10G/lane technology to 25G/lane technology
- Typically, an end customer provisions a server with their desired pluggable media of choice at time of installation
  - The pluggable media specifics are usually not known in advance
- Any media type that can physically fit into the cage will be inserted
- It is a customer expectation that the server should automatically recognize, classify, configure, and enable the media (as allowed)

Partial List of Common Optical Module Types for Servers – 2H'2020

- 1G-SX
- 1G-LX
- 10G-SR
- 10G-LR
- 10G-ER
- 40G-SR4
- 40G-LR4
- 40G-FR
- 40G-ER4
- 25G-SR
- 25G-LR
- 25G-ER
- 50G-SR
- 50G-FR
- 50G-LR
- 100G-SR4
- 100G-SR2
- 100G-LR4
- 100G-ER4
- 100G-DR2
- 200G-SR4
- 200G-DR4
- 200G-FR4
- 200G-LR4

This list does <u>not</u> include the multitude of passive copper cables, active copper cables, AOCs, multi-rate modules, consortium modules, enhanced performance modules (i.e. no FEC operation), nor new modules in development

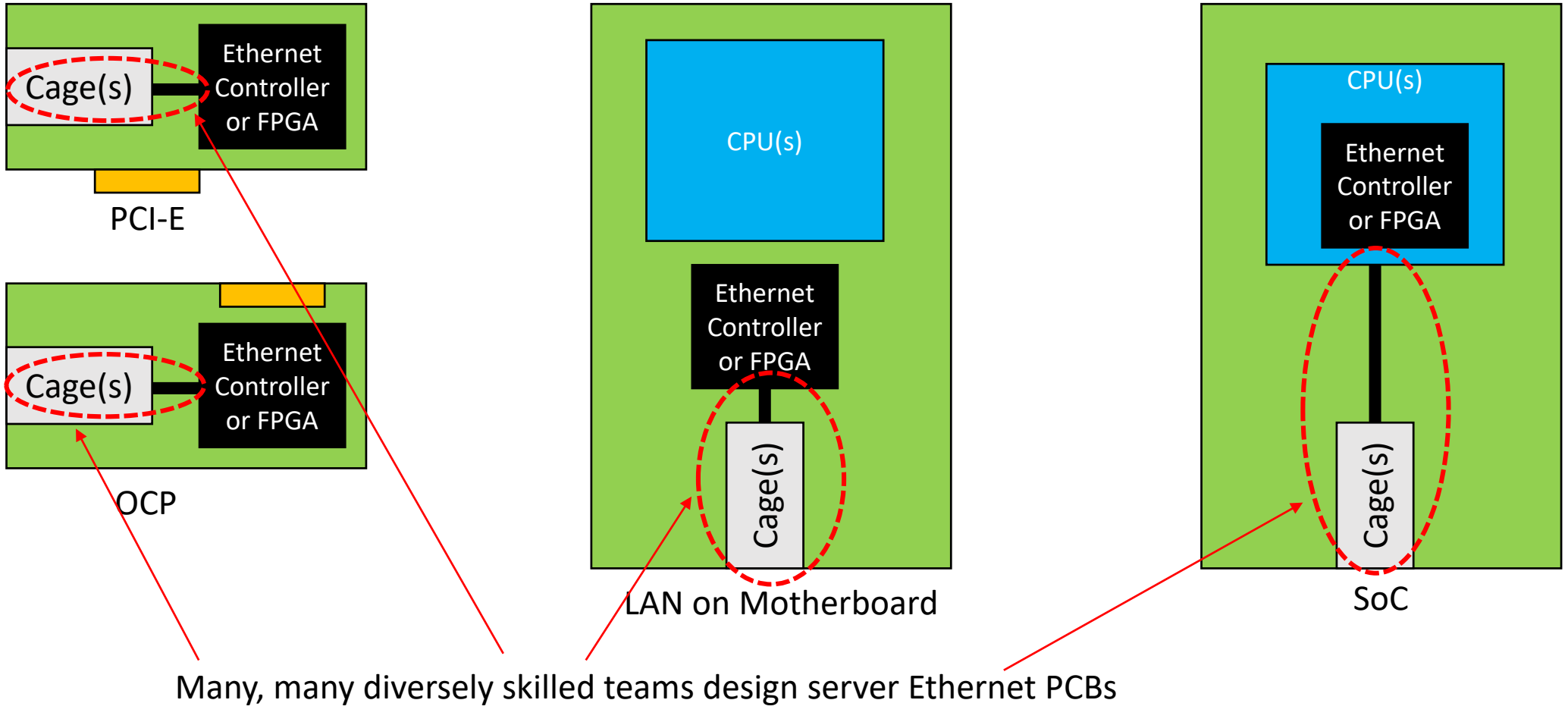
Point #1

- Servers can and likely will use all the PHY types developed in this Task Force
  - If the Task Force chooses to define two PHYs with different reaches, servers will use both

Server Ethernet Design Process

- Approximately 20-50+ new, unique server Ethernet designs are created each year for a period of 3-10 (or more) years.
  - Call it 60 to 500 different designs over a product lifecycle
- To enable voluminous designs, the multi-faceted host requirements of Ethernet PHY and interface specifications are typically distilled to “simple” rules/guidelines for PCB designers
- Overlapping host PCB specifications minimize the design rule/guideline complexity

Customer Designed Server Ethernet PCB Elements



Points #2 & #3

- If two PHYs with different reaches are chosen, the host requirements of each must be the same
- Additionally, the host requirements for all PHY types defined in this Task Force should not place any new demands on the AUIs being defined in IEEE P802.3ck

Summary

- Ensure that the 30m vs 100m PHY types work with same host
- Don’t ask for any unique host budget from servers!

Thanks!