Low Cost 10GE / 40GE / 100GE Switch-Server Interconnect

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Outline

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10GE Switch-Server Interconnect Requirements

Diagram: Donn Lee, Google, IEEE HSSG Presentation, April, 2007
HSSG estimates of 10GE Switch-Server deployment start: 2008 - 2009
40GE Switch-Server Interconnect Requirements

Diagram: Robert Hays, Intel, IEEE HSSG Presentation, April, 2007
HSSG estimates of 40GE Switch-Server deployment start: 2009 - 2012
100GE Switch-Server Interconnect Requirements

(Data Rate Annotations: Chris Cole)

HSSG estimates of 100GE Switch-Server Deployment start: 2012 - 2018
# 10GE Switch-Server Interconnect Alternatives

<table>
<thead>
<tr>
<th>Distance</th>
<th>Technology</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10m</td>
<td>CX-4</td>
<td>- 4 x 3G XAUI</td>
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<tr>
<td></td>
<td></td>
<td>- 8 differential Cu pairs</td>
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<tr>
<td></td>
<td>SFP+ Cu (linear)</td>
<td>- 1 x 10G LRM SFI</td>
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<tr>
<td></td>
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<td>- 2 differential Cu pairs</td>
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<tr>
<td></td>
<td>SFP+ Cu (limiting)</td>
<td>- 1 x 10G SR SFI</td>
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<tr>
<td></td>
<td></td>
<td>- 2 differential Cu pairs</td>
</tr>
<tr>
<td>&lt;100m (includes &lt;10m)</td>
<td>10GBASE-T</td>
<td>- 4 x 3G XAUI</td>
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<tr>
<td></td>
<td></td>
<td>- 4 differential Cu pairs</td>
</tr>
<tr>
<td></td>
<td>SFP+ Optics (linear)</td>
<td>- 1 x 10G LRM SFI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 2 OM3 MMFs</td>
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<tr>
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<td>SFP+ Optics (limiting)</td>
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<td></td>
<td></td>
<td>- 2 OM3 MMFs</td>
</tr>
<tr>
<td></td>
<td>Other Form Factors / Specs</td>
<td>(?))</td>
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</tbody>
</table>
40GE Switch-Server Interconnect Alternatives

- **<10m**
  - QSFP Cu (linear)
    - 4 x 10G LRM SFI
    - 8 differential Cu pairs
  - QSFP Cu (limiting)
    - 4 x 10G SR SFI
    - 8 differential Cu pairs
  - Other Form Factors / Specs (?)

- **<100m (includes <10m)**
  - QSFP Optics (linear)
    - 4 x 10G LRM SFI Parallel
    - 12-fiber OM3 MMF ribbon
  - QSFP Optics (limiting)
    - 4 x 10G SR SFI Parallel
    - 12-fiber OM3 MMF ribbon
  - Other Form Factors / Specs (?)
100GE Switch-Server Interconnect Alternatives

- <10m
  - “CQ” Cu
    - 4 x 25G EQ
    - 8 differential Cu pairs
  - “CQ” Optics
    - 4 x 25G Parallel
    - 12-fiber OM3 MMF ribbon
  - Other Form Factors / Specs (?)

- <100m (includes <10m)
  - “CQ” Optics
    - 4 x 25G WDM
    - 2 SMFs
  - Other Form Factors / Specs (?)
Switch-Server Interconnect Approach Proposals

- **10GE**
  - Develop industry consensus on lowest cost alternatives for switch-server interconnect
  - Different alternatives may be optimum for different data center applications
  - Success of 100GE critically depends on the existence of widely accepted common approaches to low cost switch-server interconnect

- **40GE**
  - Maximize re-use of existing 10G specifications and components
  - Develop 4x10G PMD specifications in 40GE PAR A TF
  - Complete 4X10G MSA specifications
  - Develop 40GE components based on 10GE technology

- **100GE**
  - Develop 4x25G PMD specifications in 100GE PAR A TF
  - Develop other 4x25G PMD specifications in future 100GE PAR(s) TF(s)
  - Develop all new specifications optimized for 100GE applications (this holds for 10x10G PMDs in PAR A for switch-switch interconnect)
  - Develop 4X25G MSA specifications
  - Develop new 100GE components