Cisco Live ASIC Strategy
Investor Breakout Session

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June 26, 2013
FORWARD-LOOKING STATEMENTS

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Where do we use ASICS?

- Packet Processors
- Switches / Fabrics
- I/O interfaces / controllers
- Specialized memory devices
- And more…

- Dozens of new designs each year
- Many vendors, technologies
- Significant Industry ASIC spend

Set-top box: 1 ASIC
Cat3k: 2x ASICs
Cat4500 Linecard: 4x ASICs
NX7K F2-linecard: 13 ASICs
100G DWDM: optical ASIC
CRS-3 Linecard: 7 ASICs
CRS-3 Fabric card: 3 ASICs

ASIC + HW + SW => Drive Product and Systems Leadership
A typical ‘large’ ASIC

2-3 years development time:
- 10s to 100+ engineers
- 100-1000+ servers used
- Over a million lines of source code
- Billions of gates

Very close relationship with ASIC partner:
- Macros, tools, libraries, IP
- Millions of dollars of NRE

I/O capacity:
- Thousands of signal pins
- Nx100Gbps to Tbps+

Power/cooling challenges:
- Advanced reduction techniques
Cisco’s Silicon Strategy

Cisco Custom Silicon
- Strategic, Sustainable Product Differentiation
- Tailored and optimized performance
- Development acceleration (HW/SW co-design)
- Schedule autonomy
- Gross margin improvement
- Platform feature extensibility
- Investment protection

Commodity Silicon
- Opportunistic
- Time to Market
- Targeted Feature Alignment
- Add Cisco value on top with Software stack

Drive Differentiation and Leadership

ASIC development & supply chain partnerships drive silicon-based differentiation
Custom ASICS enable product differentiation, control, and cost advantage through scale
Supply chain partnerships enable access to external Silicon IP, capabilities & technology
## Silicon Ecosystem Overview

<table>
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<tr>
<th><strong>Services offered:</strong></th>
<th><strong>Foundries</strong></th>
<th><strong>ASIC partners</strong></th>
<th><strong>EDA suppliers</strong></th>
<th><strong>IP suppliers</strong></th>
<th><strong>Merchant Si suppliers</strong></th>
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<tbody>
<tr>
<td>ASIC and silicon manufacturer</td>
<td>Cisco’s partners for custom Silicon development; source IP &amp; supply design services</td>
<td>Provide front end design tools (rtl design simulation) and back end design tools (physical design, timing) for custom ASIC development</td>
<td>Supply strategic IP to Cisco (when not developed internally)</td>
<td>Cisco’s suppliers for commercial, off-the-shelf silicon</td>
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<td>Manage foundry relationships &amp; subcontractors</td>
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### Industry Leaders:

- **Foundries:** Intel, TSMC, Avago, LSI, IBM, STI, Texas Instruments, Synopsys, Cadence
- **ASIC partners:** Mentor Graphics, ARM, PLDA, Tensilica, Cadence
- **EDA suppliers:** Mentor Graphics, ARM, PLDA, Tensilica, Cadence
- **IP suppliers:** MEMC, VSI, CORTINA, Inphi, Aquantia, Cavium
- **Merchant Si suppliers:** Broadcom, Intel, Texas Instruments, ARM, Cadence
Programmable to Intelligence in Design
Silicon Photonics – Convergence of Optics and Silicon Ecosystems

CPAK 100G Transceiver
Optics & CMOS:
• Convergence of design tools
• Convergence of fabrication techniques
• Convergence of packaging techniques

▶ Interconnect innovation
Final Thoughts

Cisco ASIC strategy providing **value** to our customers and is integral part of HW/SW based **systems** design

Significant investment provides advantage to Cisco on **differentiation**, **control** of destiny, **cost** and **leadership**

Cisco has **strong relationships** with both Commercial and ASIC partners and suppliers

**SDN** and **Silicon Photonics** are good examples of **technology leadership** and strengths of Cisco ASIC strategy
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