

Programmable I/O Controllers as Data Center Sensor Networks

Shaun Walsh, VP Corporate Marketing
Sanjeev Datla, Sr. Director Engineering
Emulex

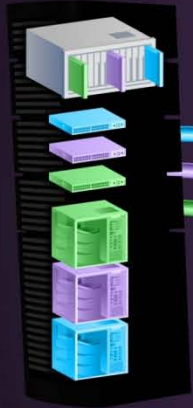
Agenda

- Market Directions
- Programmable I/O
- Emulex Connect Programs

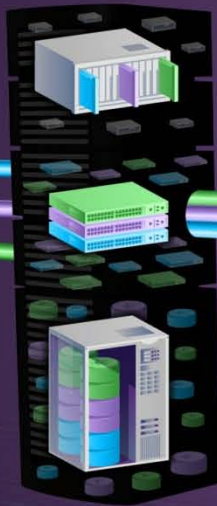
The Future of I/O

10G Ethernet and FCoE are enabling technologies to support the Virtual Data Center and Cloud Computing.

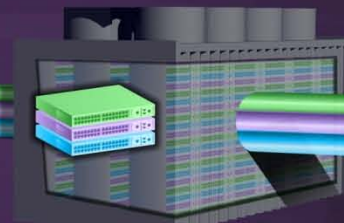
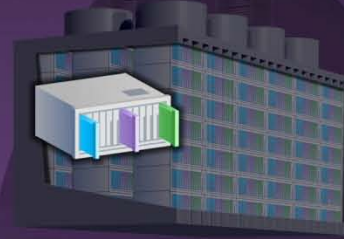
Discrete Data Center



Virtual Data Center



Cloud Data Center



Private cloud

Private cloud

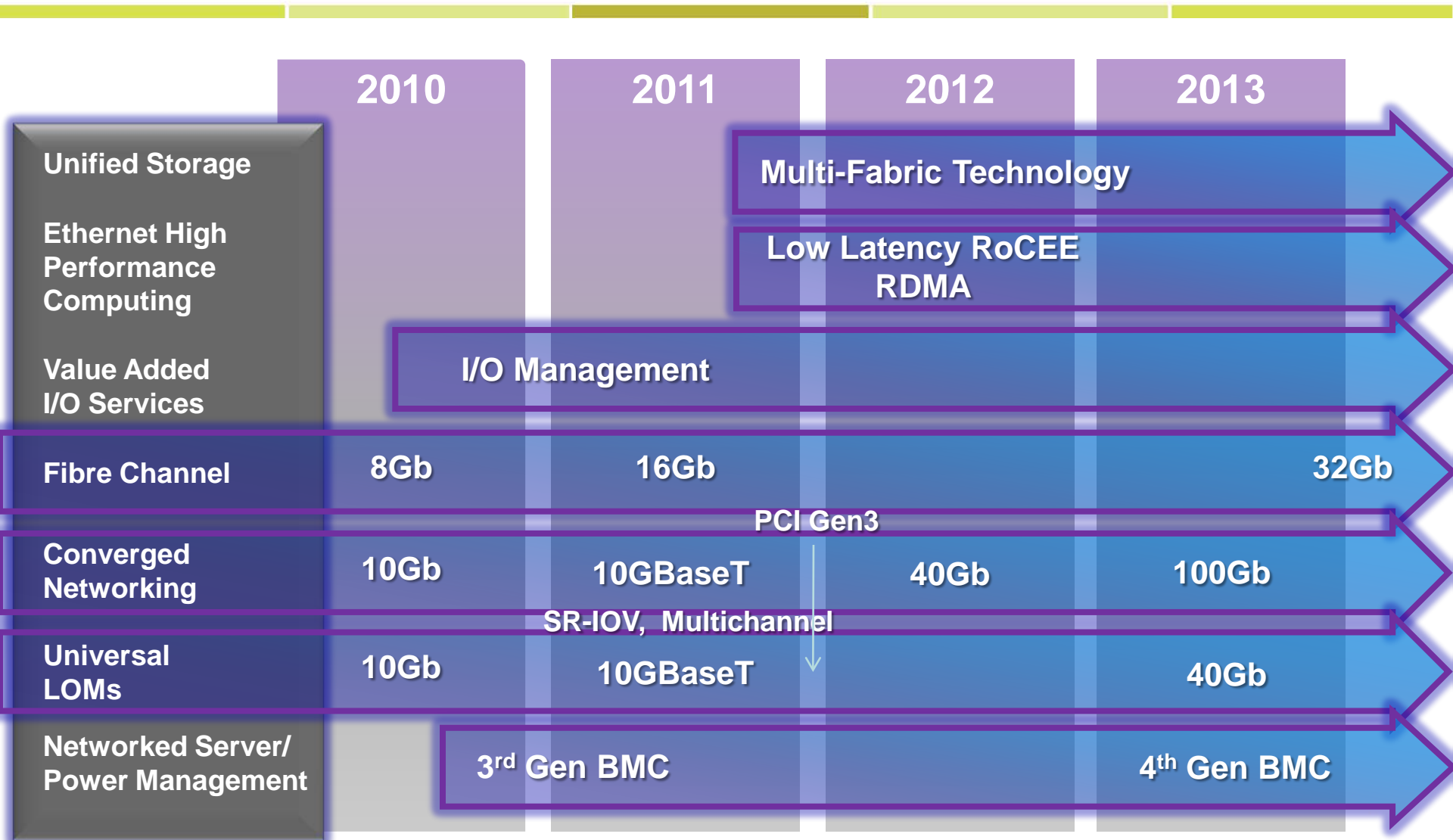


- 3 Discrete Networks
- Equipment Proliferation
- Management Complexities
- Expanding OPEX & CAPEX

- Converged Networks
- Virtualized I/O Networks
- Universal Multi-Channel
- Multi-Fabric Unified I/O
- Simplifies I/O Management
- SR-IOV, VXLAN, GRE
- Reducing OPEX & CAPEX

- Cloud Computing (Private & Public)
- Modular Building Blocks "Legos"
- Open Cloud Connectivity I/O Engine
- Multi-Client Secure Network I/O (Multi-Tenant)
- Optimized Low-Latency (RoCEE) Delivery
- Avoid CAPEX & OPEX

I/O Roadmap



Connecting The Cloud

Mobile & Access



Programmable I/O Engine, Multi-Tenant & Overlay Networks



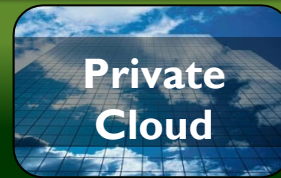
Cloud & Telco



I/O Management, Low Latency I/O for HPC



Servers & Clusters



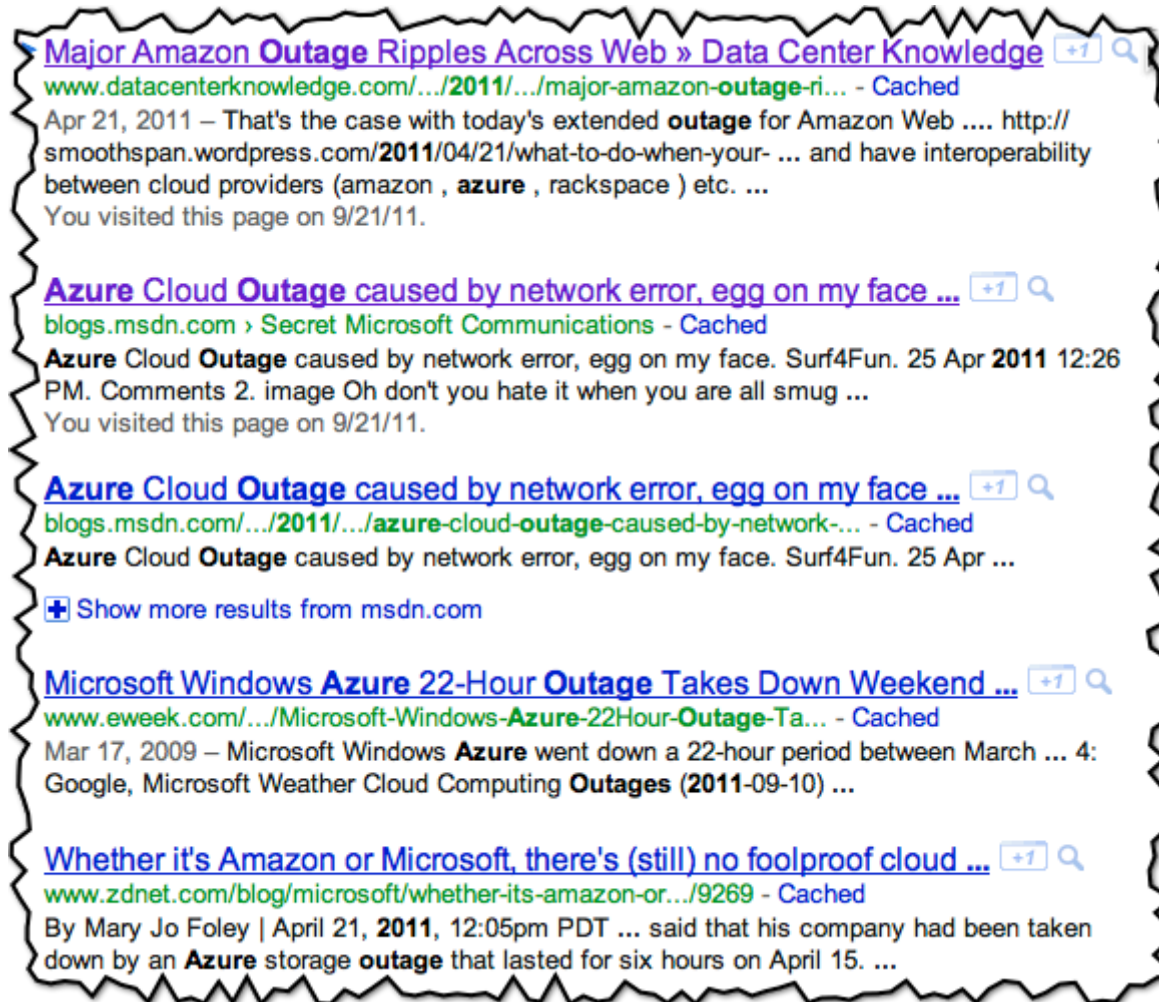
Multi-Fabric FC & CNAs (16Gb FC, 10/40G)







Storage Systems






Even the best fail... sometimes







[Major Amazon Outage Ripples Across Web » Data Center Knowledge](#)  
www.datacenterknowledge.com/.../2011/.../major-amazon-outage-ri... - Cached
Apr 21, 2011 – That's the case with today's extended **outage** for Amazon Web [http://smoothspan.wordpress.com/2011/04/21/what-to-do-when-your- ...](http://smoothspan.wordpress.com/2011/04/21/what-to-do-when-your-...) and have interoperability between cloud providers (amazon , **azure** , rackspace) etc. ...
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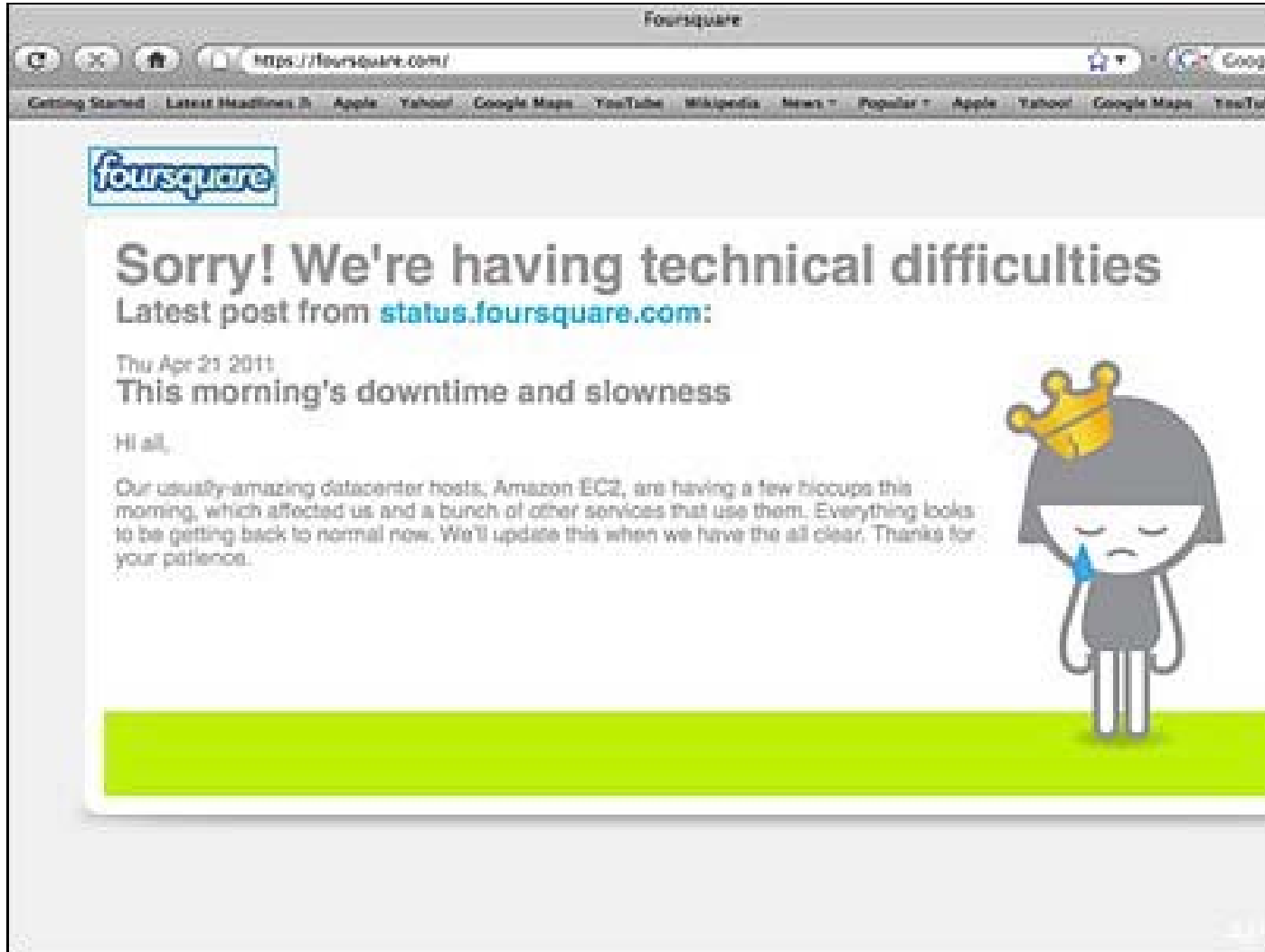
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Mar 17, 2009 – Microsoft Windows **Azure** went down a 22-hour period between March ... 4: Google, Microsoft Weather Cloud Computing **Outages (2011-09-10)** ...

[Whether it's Amazon or Microsoft, there's \(still\) no foolproof cloud ...](#)  
www.zdnet.com/blog/microsoft/whether-its-amazon-or-.../9269 - Cached
By Mary Jo Foley | April 21, 2011, 12:05pm PDT ... said that his company had been taken down by an **Azure** storage **outage** that lasted for six hours on April 15. ...

Even rare failures ding credibility



Emulex: How do we fit in, to help

Emulex connectivity solutions include:

- ❑ Programmable I/O Controllers
- ❑ Software Development Kits
- ❑ Performance Management Application Software

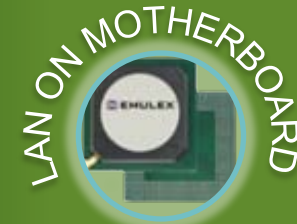
Emulex Product Portfolio

Management Services



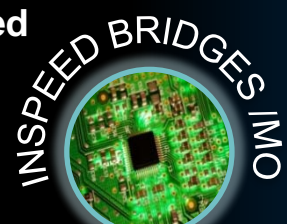
- Unified Control
- Server Management
- Advance Services

Enterprise I/O



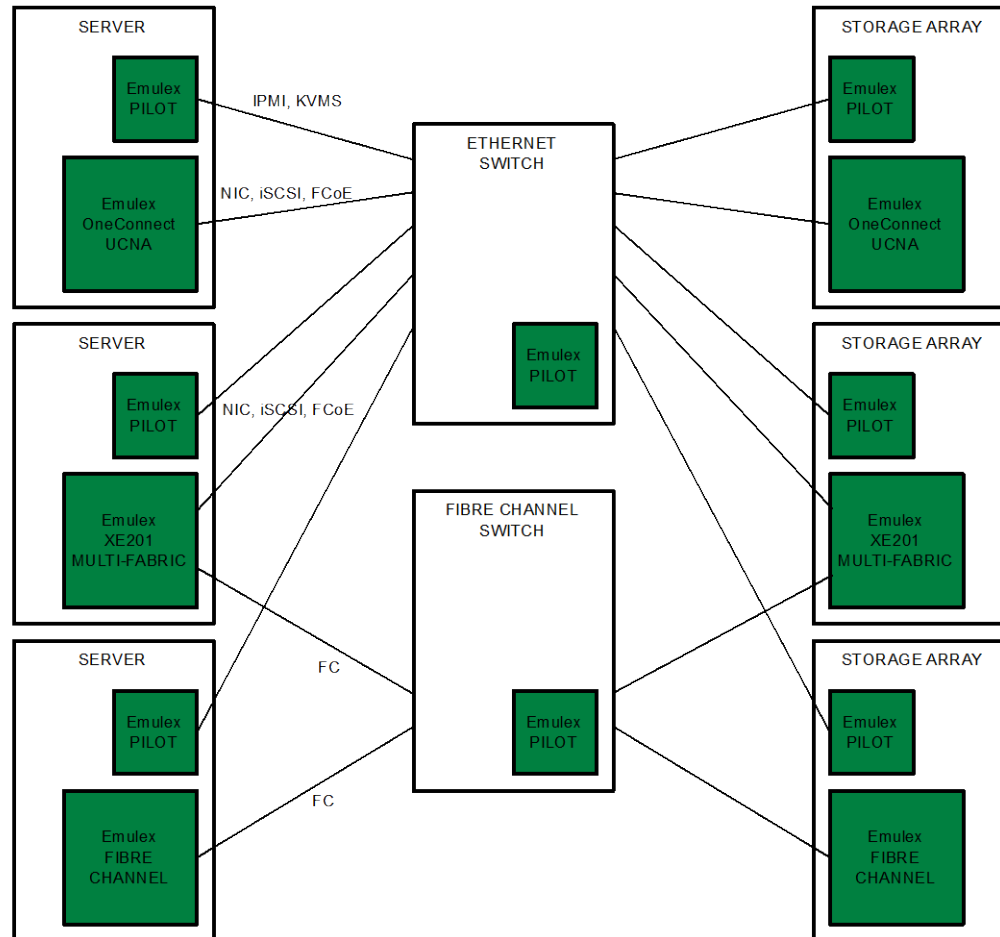
- Fibre Channel
- 10GbE Convergence
- Security I/O

Embedded

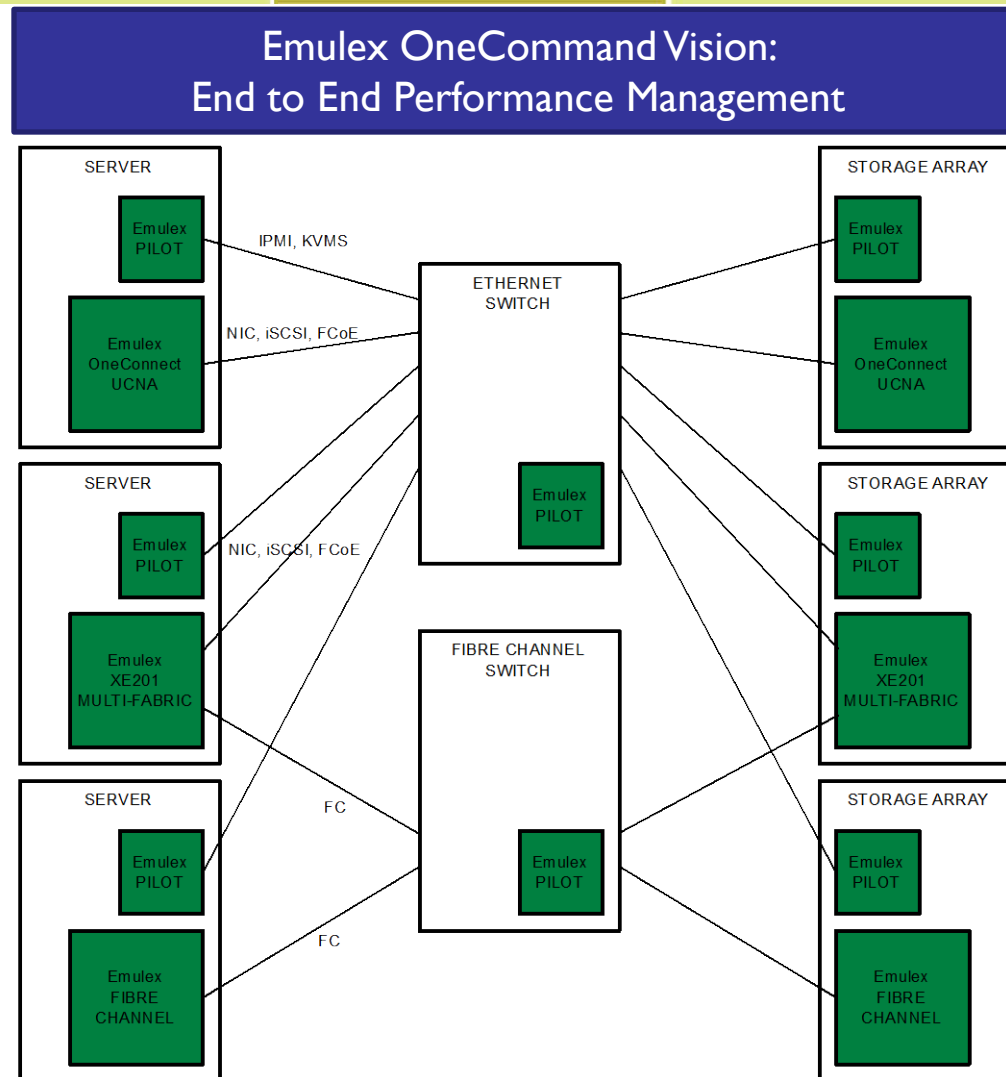


- Storage I/O & SSD
- Expanded Targets
- SAS to FC Routing

Emulex in the modern data center



End-to-End Performance Mgmt.

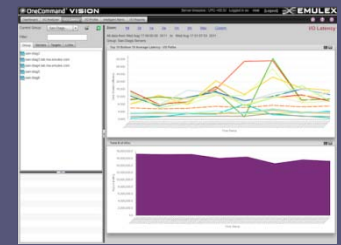


Emulex OneCommand Vision



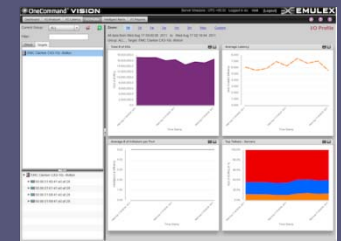
Data-Center Performance Monitoring

- Lightweight monitoring of 1000's of production servers
- Interoperates with Active Directory (AD), LDAP, and Virtual Center
- Alert integrations with HP OpenView, MS SCOM, and others
- "Probe-less" Protocol Analysis



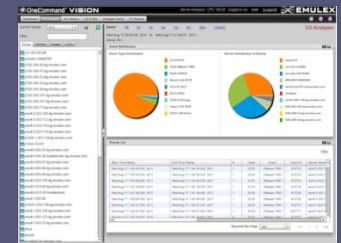
Intelligent Analytics and Reporting

- Monitor critical performance, availability, and utilization metrics
- Built in alerting functions automate problem detection
- Automatics SNMP and Email alerting when thresholds are exceed
- Analytics and Correlation Engine (ACE) and professional services

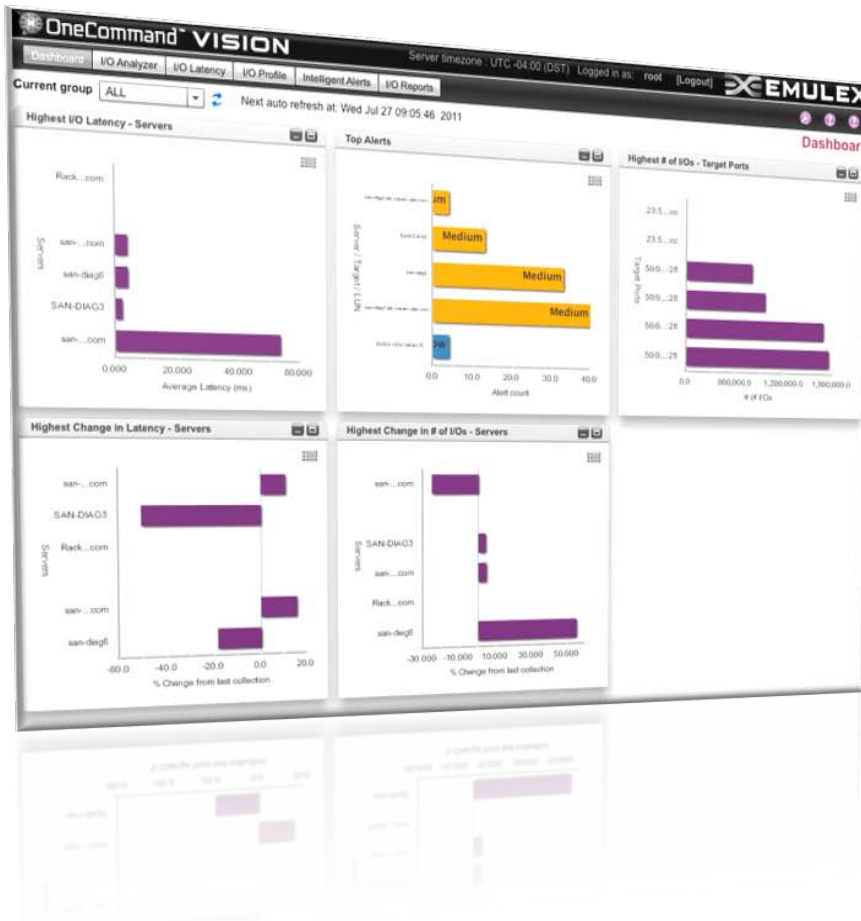


Intuitive User Interface

- Dashboard reports potential performance issues
- Navigate by Server, Target, or LUN
- View and analyze historical performance data
- Configurable Resource Groups



Emulex OneCommand Vision



- Monitor and Manage I/O Performance
 - From the Applications Perspective
 - Enforce Availability and Performance SLAs
 - Optimize Resource Utilization
 - Prevent performance brown-outs and downtime
 - Lower Time-to-Resolution (TTR)
- Designed for Data-Center & Cloud
 - Supports heterogeneous environments
 - No special hardware required
 - Broad Hyper-Visor and OS support
 - VMware, Hyper-V, Linux KVM,
 - Window, Linux, Solaris, AIX (roadmap)
 - Support for Emulex and non-Emulex adapters

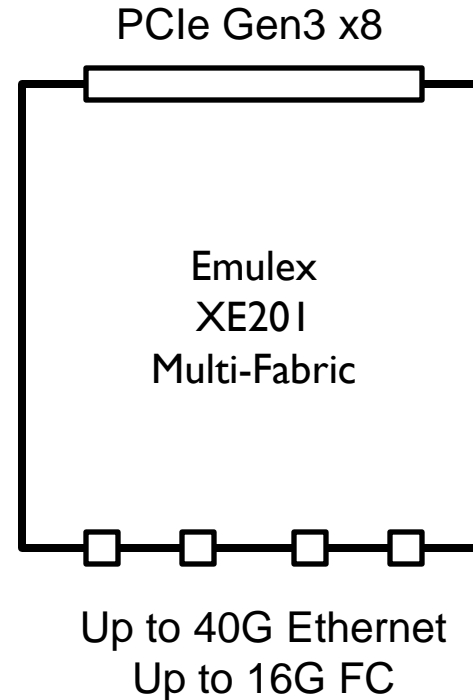
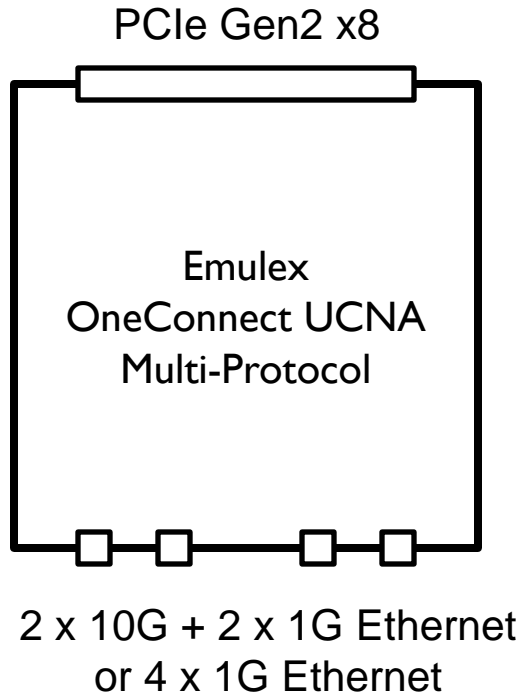
Emulex OneCommand Vision



- I/O Performance and Availability Management
- Application's Perspective
 - I/O Latency
 - Path redundancy
 - Cross-domain errors impacting performance
- Support for Plug-ins and Scriptable
- REST API

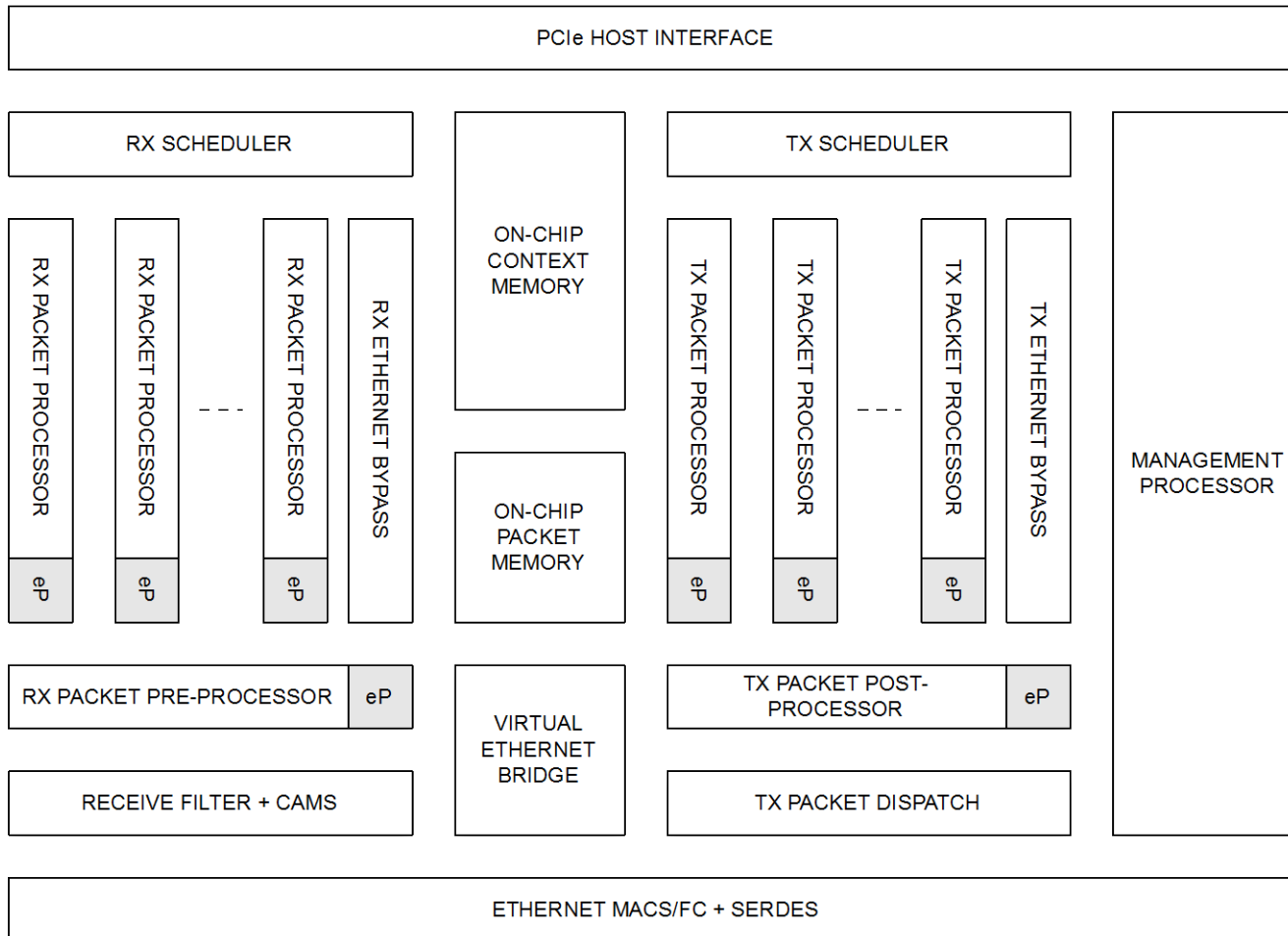
Programmable I/O Controllers

10 Gigabit Ethernet and 40G Ethernet/16G FC I/O Controllers: Multi-Protocol and Multi-Fabric

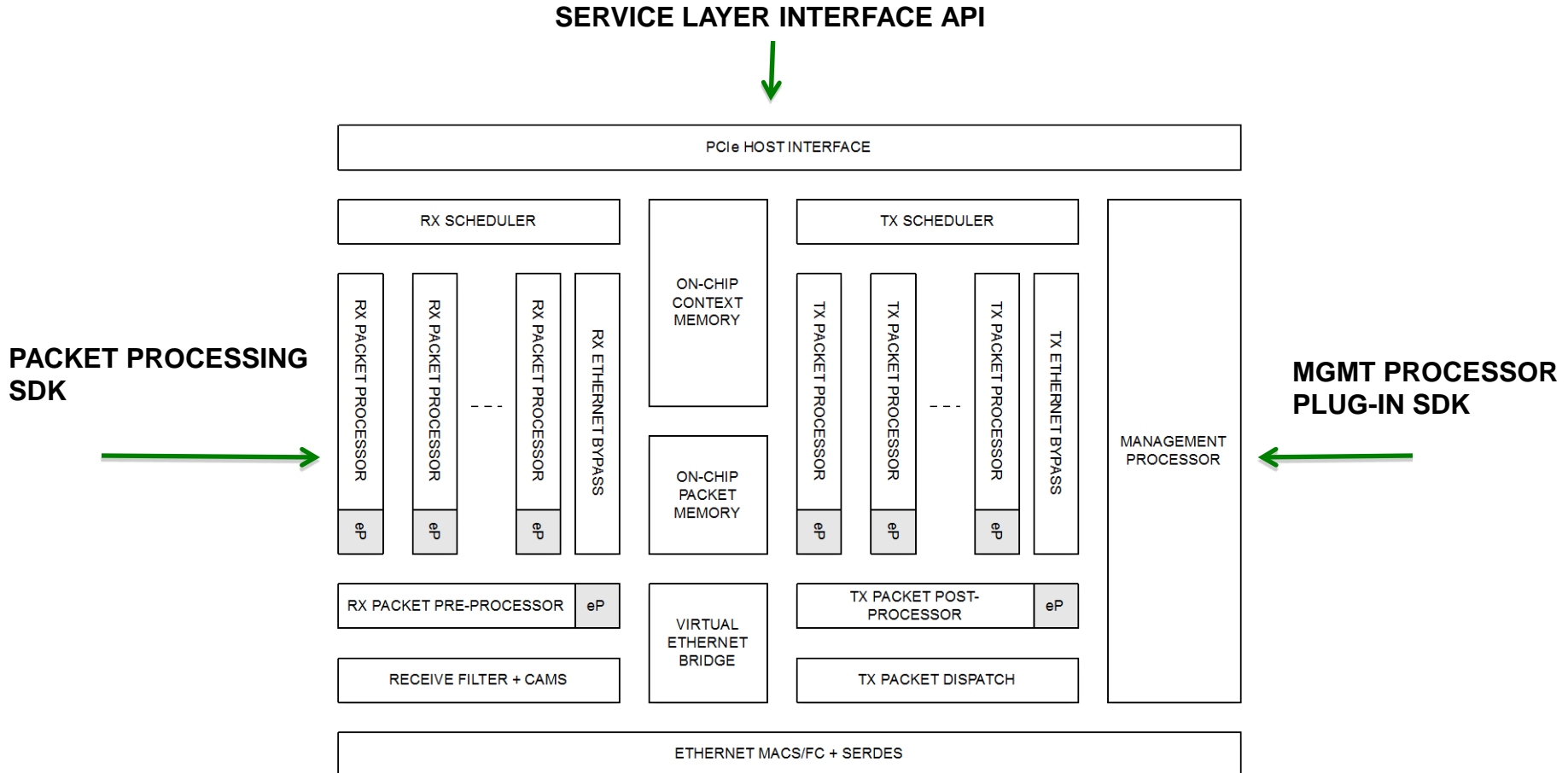


COMMON ARCHITECTURE, DRIVERS AND SDK

I/O Controller Architecture



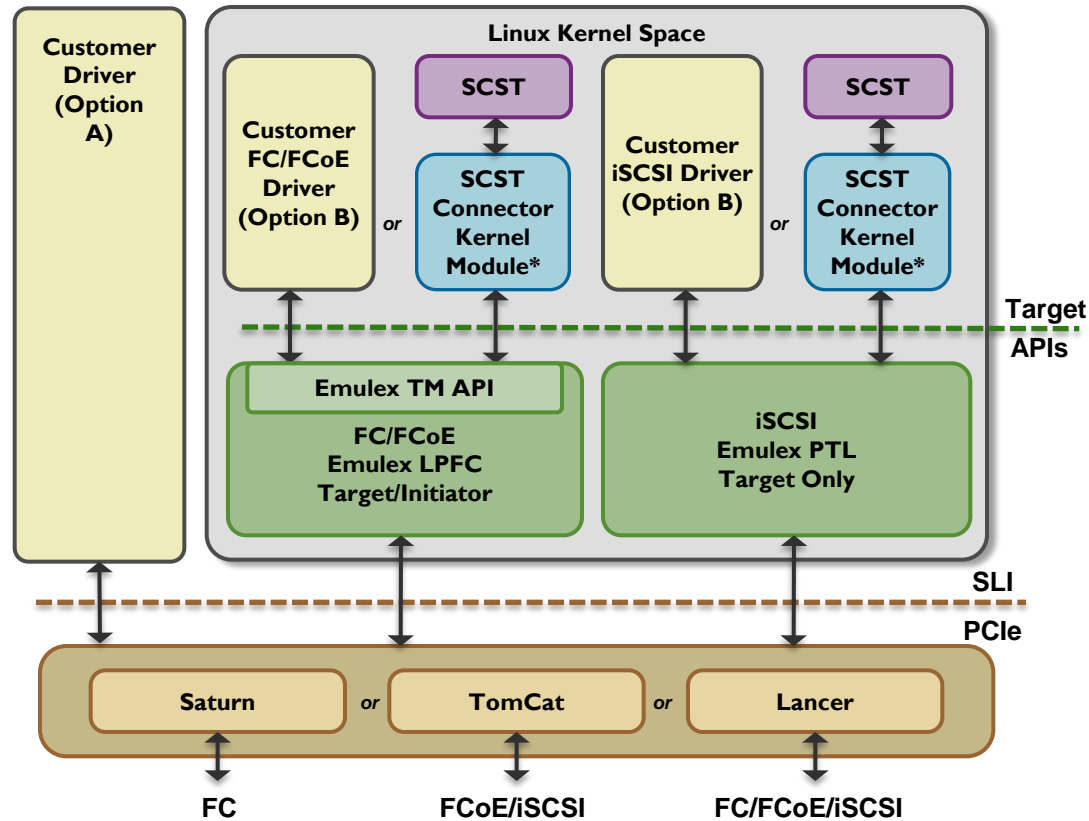
Levels of APIs and SDKs



Levels of API/SDK: Examples

- ❑ Service Layer Interface
 - ❑ Port our drivers to your OS/driver environments
- ❑ Management Processor Plug-in SDK
 - ❑ Pre-boot operations
 - ❑ Custom control plane functions/protocols
 - ❑ Agentless dynamic management
- ❑ Packet Processing SDK
 - ❑ CAM programming and frame steering
 - ❑ Custom filtering and frame processing
 - ❑ Protocol customizations or new protocols

SDK and API Examples



Emulex Connect Program

Developer Alliance Tier Overview

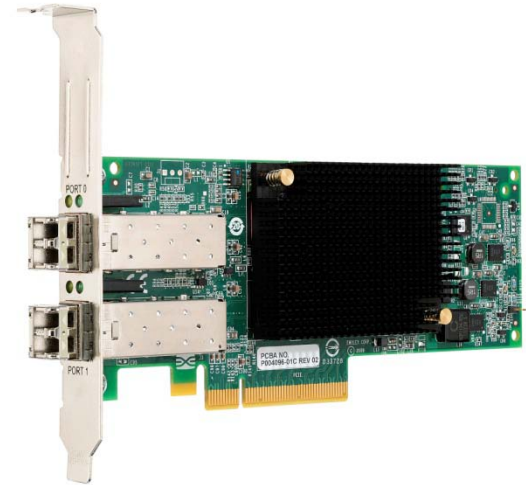
□ What is it?

- New tier for the Emulex Partner Program allowing Emulex to provide channel partner benefits to Alliance/Developer partners
- Developers would receive access to special pricing for cards (both 8Gb FC and 10GbE) through the Connect Partner Program
- Special Pricing would be managed logistically through the existing Deal Registration Process



Developer Alliance Incentives

- ❑ Developer Kit Incentive
 - ❑ First Two cards free (managed through portal or through ITRs)
 - ❑ Additional cards (max of 10 total, so cards 3 through 10) would be available at a 65% discount
 - ❑ Discount would be managed through deal registration process existing in Connect Program
 - ❑ Developer Partners would have to sign up for the Emulex Connect Program and would have to purchase cards through an authorized distributor (Ingram Micro, InfoX, Synnex, Tech Data)



Questions