

StarFabric and ASI for ATCA Interconnect Solutions



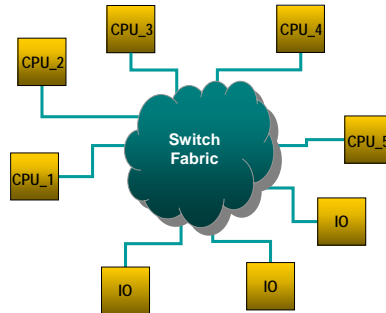
Agenda

- **What is StarFabric and ASI?**
- **What Type of Solutions are Provided?**
- **What Applications can they be used in?**
- **How do they Work?**



StarFabric and ASI

- Scalable Switched Fabric Architecture
- High Performance, Low Cost Switching
- Protocol Agnostic
- Multiple CPU to IO Interconnect
- Available in PICMG 2.17, 3.3 and 3.4



StarFabric and ASI Comparison

- **StarFabric**
 - Protocol Agnostic Fabric
 - 2.5 Gbit per second Full Duplex Serial Links
 - Across a backplane or 40 feet of CAT5
 - Address Routing - 100% Backwards Compatible to PCI
 - Path Routing – Multiple Processor Interconnect Solution
 - PICMG 2.17 and PICMG 3.3
 - Price < \$100 USD Per Link
- **Advanced Switching (ASI)**
 - Protocol Agnostic Fabric
 - 2.5 Gbit to 20 Gbit per second Full Duplex Serial Links
 - Backplane Interconnect
 - Path Routing – Multiple Processor and Multiple IO Interconnect Solution
 - PICMG 3.4
 - Price > \$500 USD Per Link

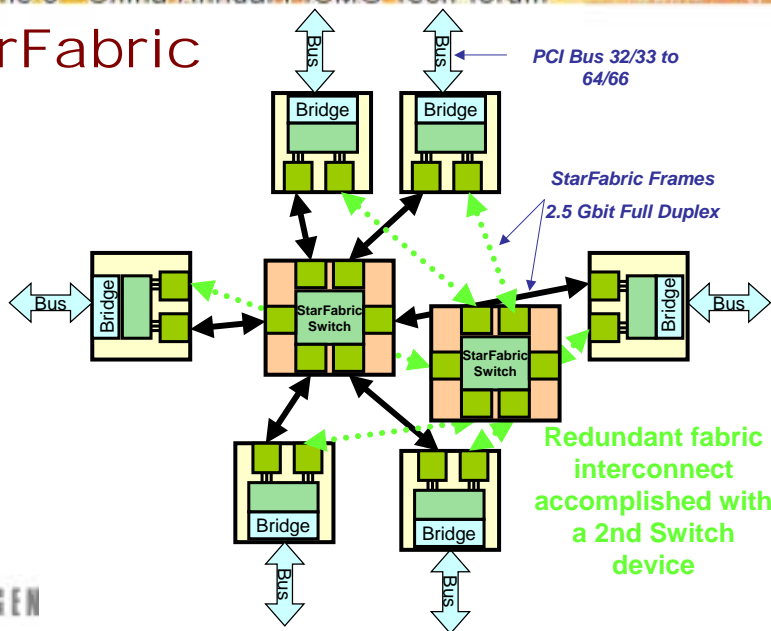


StarFabric and ASI Status

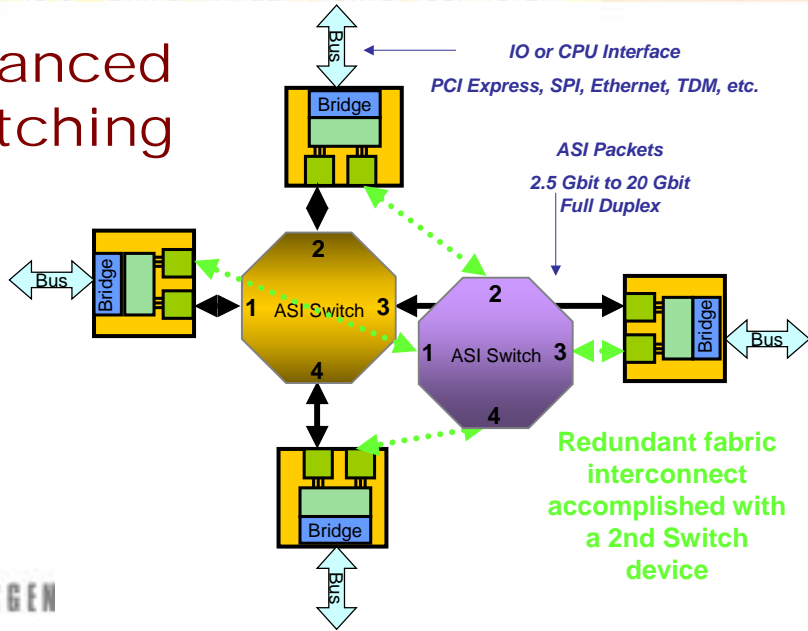
- **StarFabric Components and Boards Shipping**
 - Software Fully Developed and Available
 - Two Products in Production – SG2010 and SG1010
 - Silicon and Boards
 - Industry Standards PICMG 2.17 and PICMG 3.3
 - PICMG 2.17 Ratified in May 2002
 - PICMG 3.3 Ratified in May 2003
 - StarFabric Trade Association
 - Multiple Design Wins
 - Over 75 design Wins World Wide
 - ATE, Communications, Storage, Embedded Computing, Military, Medical, Servers, etc.
- **Advanced Switching in Development**
 - Leading contributor to ASI SIG
 - Over 55 Members in the ASI SIG today
 - AS Switches and Bridges in Development
 - First Samples Q22005



StarFabric



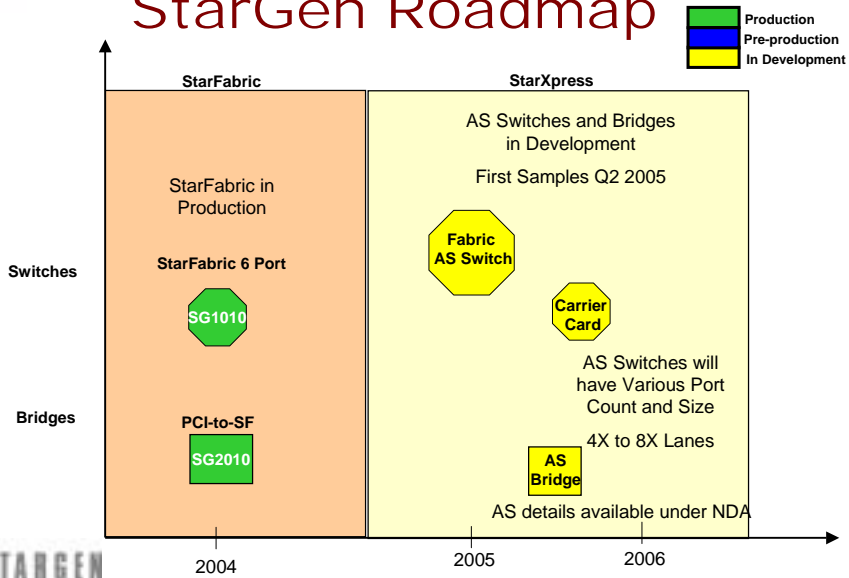
Advanced Switching



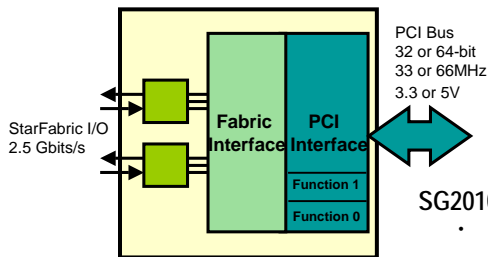
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StarGen Roadmap



SG2010 PCI to StarFabric Bridge

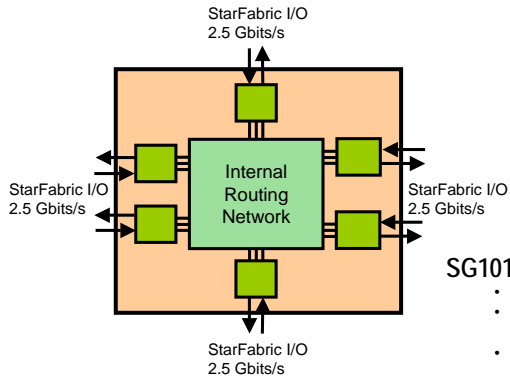


SG2010 Features

- Two StarFabric Ports for redundancy
 - Bundled for 5Gb/s port
- One 64-bit/66MHz PCI Bus
- Legacy addressing capability supports 100% PCI software compatibility
- Gateway functionality for multi-processing and path routing support
- Supports 50-bit global address space
- Four classes of service with separate buffer space for each class
- Lead Free and Industrial Temp available



SG1010 StarFabric Switch



SG1010 Features

- Six StarFabric Ports
- Transmit and Receive on all ports simultaneously at full speed
- 30 Gb/s of aggregated, non-blocking, full-duplex switching capacity
- Asymmetric link support
- Supports four classes of service and three routing methods
- Lead Free available



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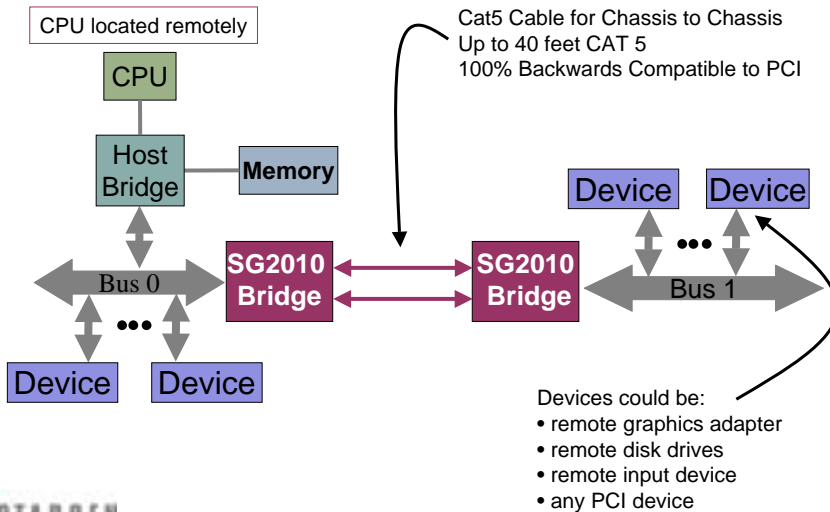


Target Applications

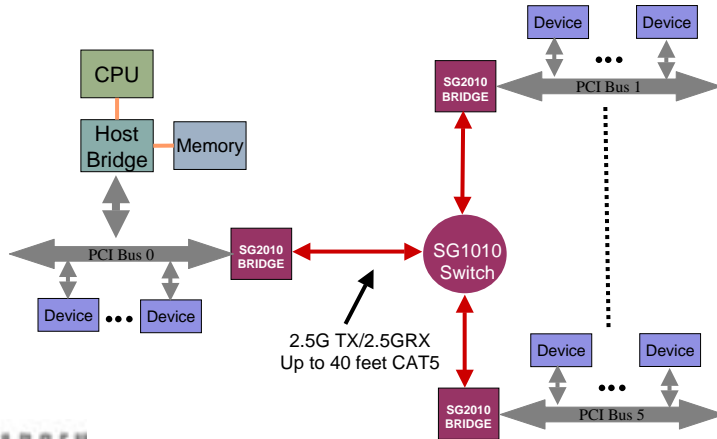
- Bladed Servers
- Embedded Computing
- Communications Access/Edge
- Storage Routers
- Storage Arrays
- Communications Routers



StarFabric PCI Expansion

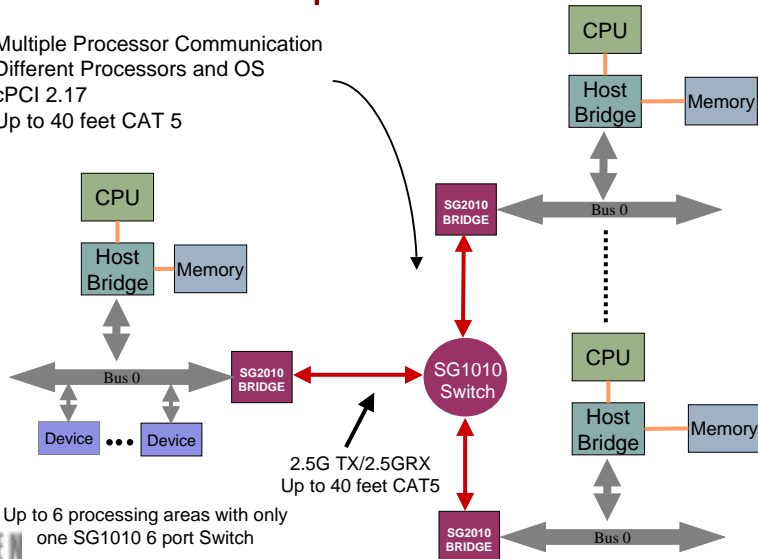


StarFabric Multiple PCI Slot Expansion



StarFabric Multiple Processors

Multiple Processor Communication
Different Processors and OS
cPCI 2.17
Up to 40 feet CAT 5

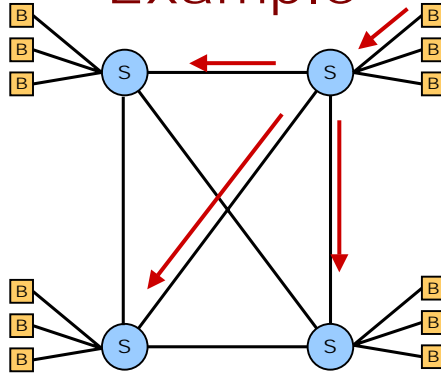


Up to 6 processing areas with only
one SG1010 6 port Switch



12 Node Fabric Topology

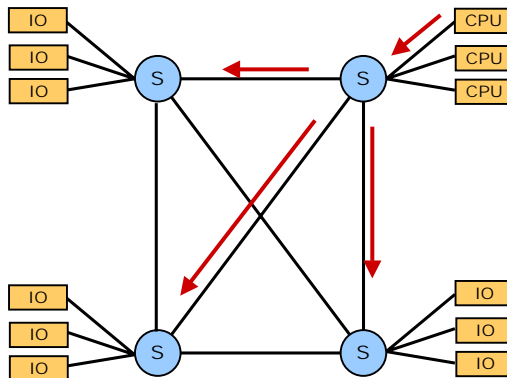
Example



cPCI Backplane, PICMG 2.17
ATCA 3.3
Proprietary Backplane
40 Feet CAT 5 Cable



CPU and IO Fabric Topology

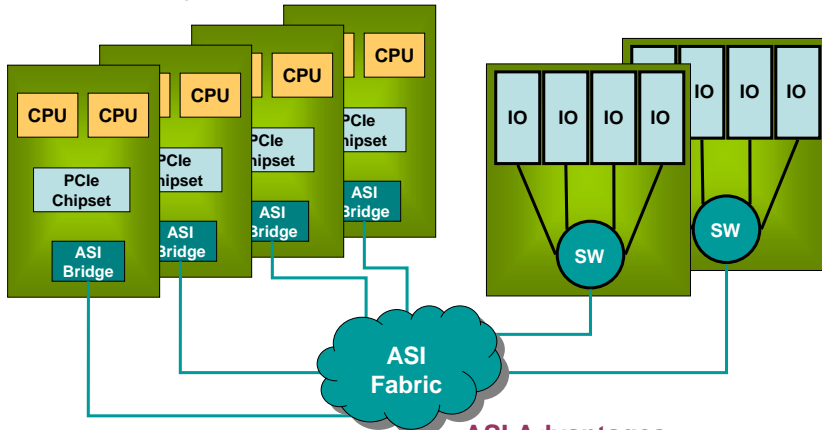


CPU to CPU and CPU to IO Traffic Flows



ASI Enabled Bladed Server

Easy Transition with Disruptive Capabilities



ASI Advantages

- SW transparent for easy transition
- Peer-to-Peer CPU's with sockets
- PI-8 Binding allows PCIe re-use
- Shared I/O
- CPU & I/O dis-aggregation
- HA Features (i.e. Rapid Failover)

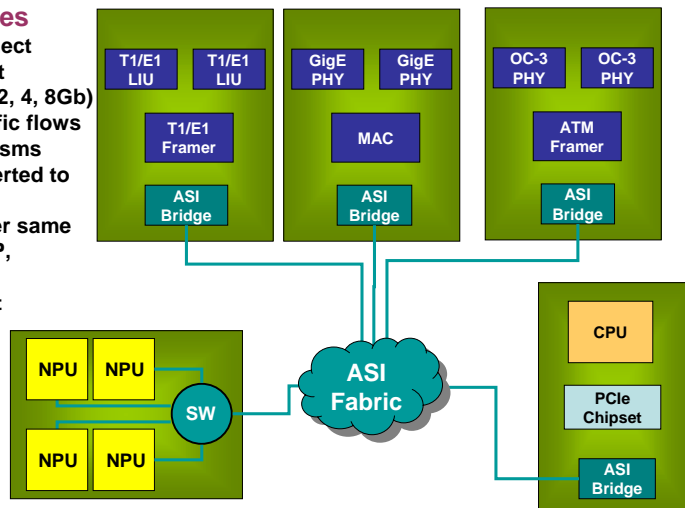


ASI Enabled Edge Router

Any protocol, any processor

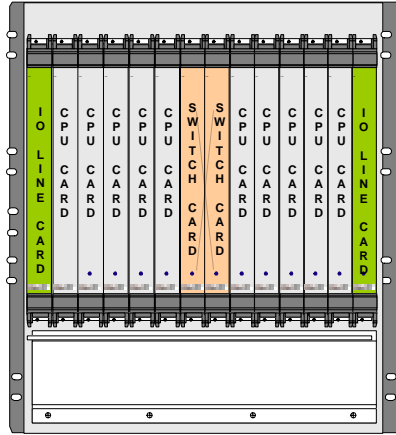
ASI Advantages

- Low latency interconnect
- Low jitter interconnect
- Bandwidth flexibility (2, 4, 8Gb)
- Lossy or lossless traffic flows
- Multiple QoS mechanisms
- Exceptions easily diverted to central processor
- Multiple protocols over same PHY (i.e. ATM, TDM, IP, Ethernet)
- Low cost interconnect



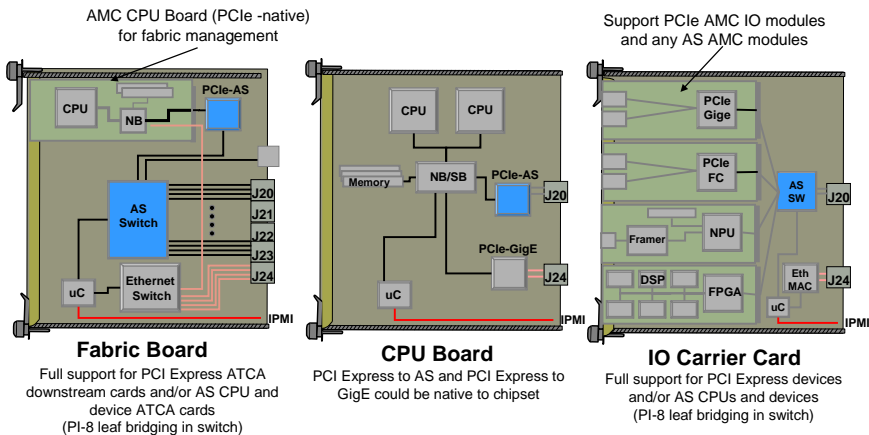
Advanced TCA® & ASI

- IP on Base Channel
 - Redundant GigE
 - CPU-to-CPU communication
 - Control, management, low bandwidth data movement
- AS on Fabric Channel
 - Redundant 4X or 2X links
 - CPU-to-CPU communication
 - CPU-to-IO communication
 - High bandwidth, low latency, and real time data traffic



Advanced TCA®

Possible ASI
ATCA Boards



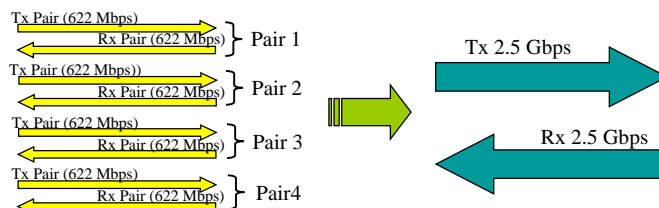
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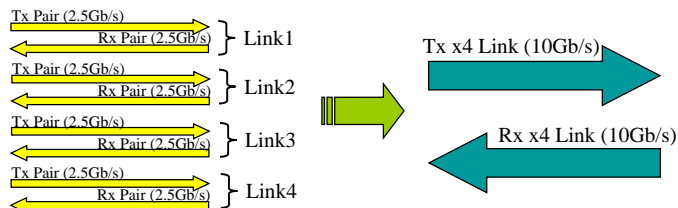
StarFabric Physical Layer

- **Low cost serial physical layer**
 - 622Mbps LVDS
 - Bi-directional = 1.25Gbps total bandwidth
 - Four 622Mbps differential pairs aggregated to form one 5Gbps 'port'
 - Hot plug capable point-to-point connections
 - Chip-to-chip, across backplane and rack-to-rack capable
 - >10 meter distances with CAT5



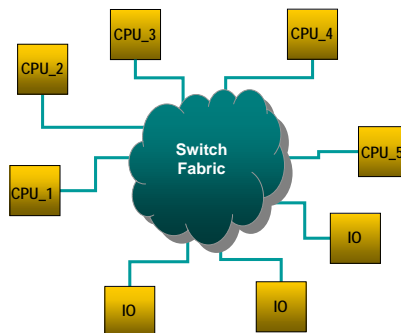
Advanced Switching Physical Layer

- Identical to PCI Express*
- Lane: two differential pairs, simultaneous Tx/Rx
- Links: aggregate 1, 2, 4, 8, 12, 16 or 32 lanes
- 8b/10b encoding
- Scrambling
- Polarity inversion & lane reversal
- Simplified PCB Layout

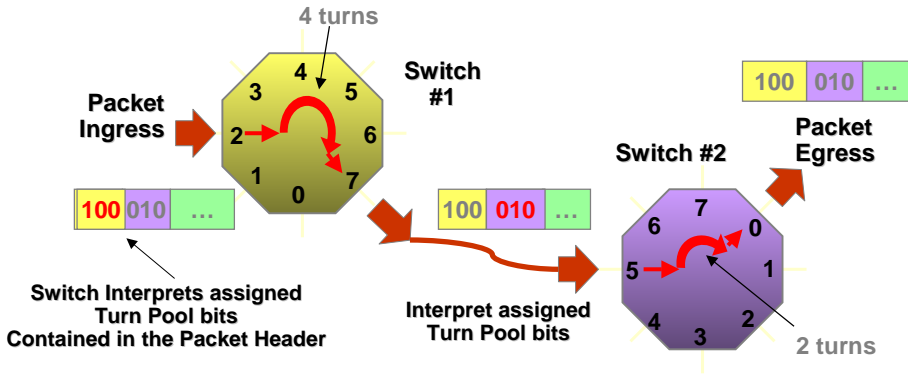


Path Routing

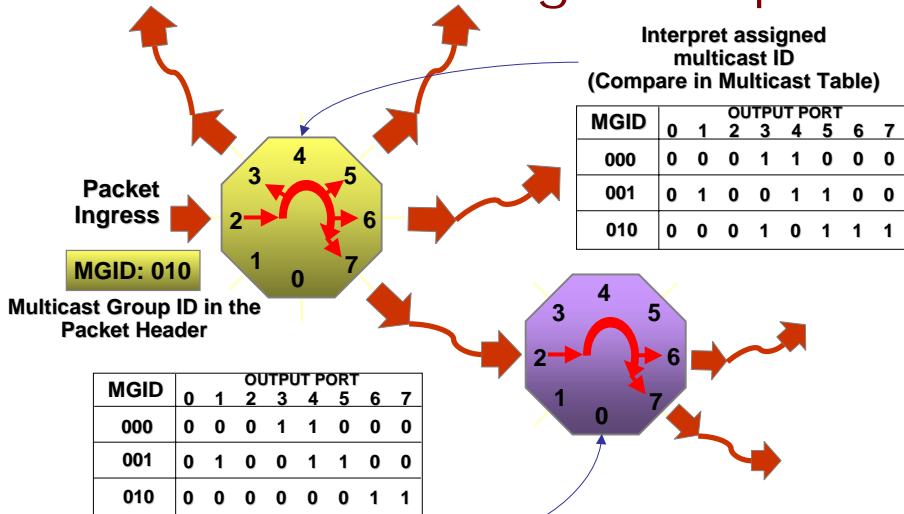
- Scalable Switched Fabric
- Switches do not require software to manage path routing
- Source Bridge specifies Path to be traveled from Origin to Destination
- Peer-to-Peer communication does not require a central software entity to manage routes



Unicast Routing Example



Multicast Routing Example



Thank You

- For More Information Visit...
- www.stargen.com
- www.asi-sig.com
- Questions...Please Contact us
- Steve DeFrain - StarGen
 - defrain@stargen.com
- Leffrey Yuan – Memec Unique
 - Leffrey.yuan@memec-asiapacific.com

