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GES0016
16-Port, 32Gbps Configurable Switch Fabric

Paion GES0016 Switch Fabric

The Paion GES0016 is one of a powerful new series of high-performance chips from Paion. OEMs can use them to build state-of-the-art Fast Ethernet/Gigabit Ethernet switches. The chips work together in a variety of configurations with the GEP2C02 network processors and other GES0016 switch fabrics to build a switch ranging from simple Fast-Ethernet-to-Gigabit-Ethernet uplinking all the way up to complex multi-stage non-blocking 512-port switches with hundreds of gigabits per second of throughput. All configurations give wirespeed performance with dramatically minimized latency while avoiding Head Of Line (HOL) blocking.

The Paion gigabitPLUSô architecture offers outstanding computing power for high-performance switch design. Network Processor chips are completely programmable and designed for optimum system performance and extendibility. Non blocking memory access and other patent pending techniques allow rapid on-board routing decisions. And a high degree of functional integration minimizes chip count while allowing for all the sophisticated traffic classification, shaping and management features demanded in today's emerging Differentiated Service system offerings.
These chips give you the power to build tomorrows switches - today.

Features

- Sixteen full-duplex ports for connection to Paion Network Processors
- Variable-sized packet switching
- Path analysis via back-propagation of port status information
  to optimize routing across multiple switch fabrics: minimizes latency
- Wirespeed layer 2/3 and multicast switching
- Cascaded routing
- Broadcast loop resolution
- Host processor/Mirror port copy routing
- Link aggregation according to IEEE 802.3ad
- Trunking support for 2,4, or 8 port trunks
- Intelligent dynamic load balancing across multiple trunk ports
- Strict priority queuing with 4 levels of priority
- Jumbo packet support

Interfaces

- 16 Paion Gigabit Interface (PGI) channels for glueless
  connection to the GEP2C02s or GES0016s:
  2.5Gbps/channel
- PCI to host interface of 32b@33/66MHz
- Management: SNMP, RMON, SMON

Applications

- Enterprise Ethernet switching and routing
- Metro Ethernet switching
- EPON/OLT switching
- L4~L7 switching for load balancing, Intrusion
  Detection Systems (IDS), intelligent
  switching
- IPv6, NGcN switching

Specifications

Package	HSBGA 901-pin
Fabrication	CMOS 0.18¥ m
Power Supply	1.8V Core, 3.3V I/O
Power Dissipation	<10 W
Interface to Host	PCI 33/66 MHz, 32b
System Clock	250 MHz

Performance

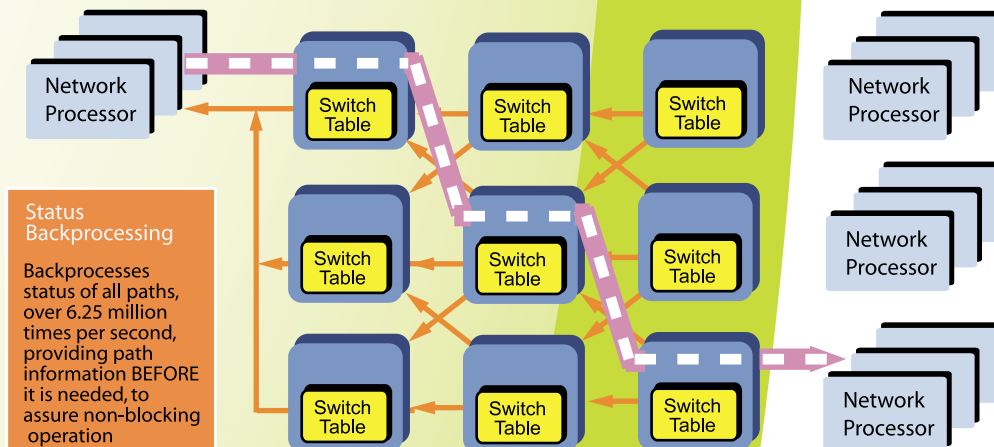Wirespeed non-blocking switching capability

Scalability

- Single-stage non-blocking to 48 GbE ports
- Multi-stage non-blocking Clos configurations
  to 128 GbE ports

Flexibility

Multiple configuration options and flexible topology extension

Low latency

Out-of-band control channel and pipelined packet forwarding assures industry leading latency

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Status Backprocessing

Backprocesses status of all paths, over 6.25 million times per second, providing path information BEFORE it is needed, to assure non-blocking operation

Tremendous Scalability and Power - The GES0016 switch fabric ICs can be clustered to give non-blocking switch fabric performance for the GEP2C02 Network Processors providing wire speed Layer 2-7 switching in configurations ranging from 32 Fast Ethernet Lines to 128 Gigabit Ethernet Lines.

Path Availability Switch Tables - Updated at least every 160 ns, the switch tables maintain status information on all paths through the multi-level switch fabric configuration. Optimum path selection decisions can be made by the attached GEP2C02 Network Processors ensuring that cross-switch packet forwarding latency is the lowest in the industry.

Flexible Configuration - The switch fabric chips can be arranged singly - with up to eight GEP2C02 Network Processors attached - or in a variety of multi-chip multi-level configurations. By connecting chips together in a multi-level Clos architecture arrangement, non-blocking packet switching systems of up to 256 Gbps switching can be built. The GEP2C02 Network Processors can be optionally configured with a redundant fabric link, allowing an extremely robust system design.

Out-of-Band Control Channel - Paion uses a unique patent-pending out-of-band state backprocessing communications path to pass path control information through the switch fabric. Data moves through the fabric at wirespeed - unimpeded by control information.

System Configurations

16 GbE ports system

48 GbE ports system
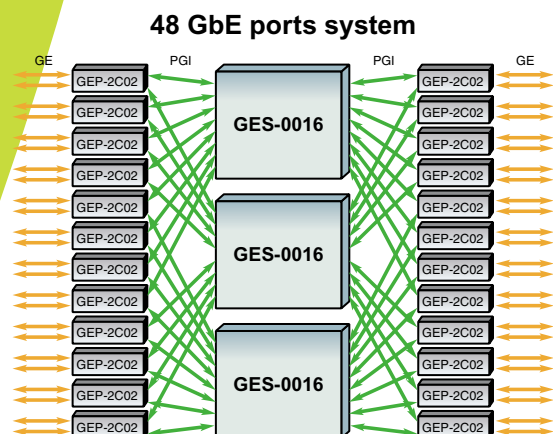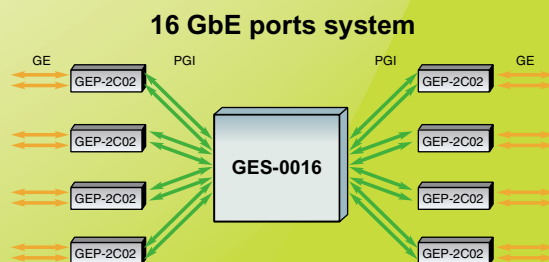
gigabitPLUS¢ - All You Need

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