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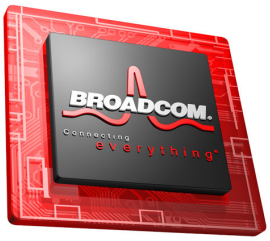
BCM56700 PRODUCT Brief



16-PORT, 192-GBPS LOSSLESS SWITCH FABRIC

FEATURES

- Sixteen 12+ Gbps HiGig2™ or HiGig+™ switch fabric ports
- Non-blocking 192-Gbps wirespeed fabric performance
- Forwarding rate of 240 million packets per second
- Scalable to 1.28 terabit switch in multistage configuration
- Sixteen integrated high-speed XAUI™ interfaces
- Eight priority queues per port for user data
- Dedicated queues for system management packets and flow control messages allow user data to have eight levels of priority.
- Supports deficit round-robin, weighted round-robin, and strict-priority scheduling algorithms
- Service-aware flow control guarantees packet delivery.
- Port trunking and mirroring across multiple devices
- Hardware-based mechanism to minimize packet loss in case of link failure
- Hot-swap capable with AC coupling
- Resilient link configuration through active multipath forwarding
- Configuration and management via PCI interface
- Advanced diagnostic features including IEEE 1149.1 boundary scan, JTAG, and extensive BIST functionality

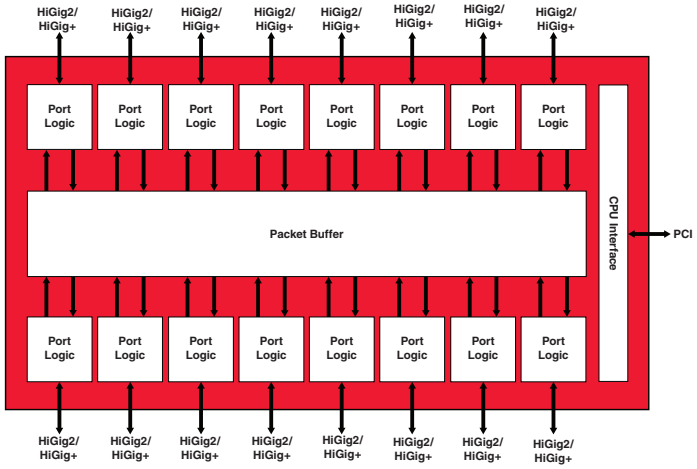
SUMMARY OF BENEFITS

- System vendors can build 160G to 1.28T high-performance, high-port density chassis systems.
- Integrated data-buffer memory eliminates the need for expensive, high-speed external memory.
- Multiple classes of service (CoS) and very low latency enable the support of VoIP and other voice, video, and data applications.
- Dedicated queue improves flow control response time and ensures reliable traffic delivery.
- System management queue reduces chassis system cost by eliminating the need for a separate management network.
- Built-in high-speed serial interfaces with Broadcom-unique SerDes technology eases and accelerates system design, while reducing cost and conserving board space.
- Hardware-based failover minimizes packet loss if a link failure occurs.
- High level of integration and low power enable next-generation modular and stackable switch solutions.

APPLICATIONS

- Switch fabric in high-performance chassis systems
- Switch fabric in high-end stand-alone or stackable Gigabit- and 10-Gigabit Ethernet switches
- HiGig™ switch fabric in advanced TCA chassis platforms

BCM56700 Block Diagram



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General Description

The BCM56700 switch fabric is designed to enable next-generation modular and stackable Ethernet switching systems based on Broadcom's industry-leading StrataXGS® family of switches.

The BCM56700 enables vendors to design a chassis system that provides:

- A variety of line cards to match user requirements
- Multiple generations of upgrades in functionality and port density
- Cost reduction with every new generation of line cards

Wirespeed Performance

The BCM56700 delivers wirespeed switching performance across all the ports simultaneously. Each HiGig2/HiGig+ runs at 12+ Gbps full duplex, which results in 192-Gbps of full-duplex switching bandwidth.

High Integration

The BCM56700 offers an unprecedented 192 Gbps of switching bandwidth on a single chip. The high level of integration dramatically reduces the design complexity and power consumption of modular chassis systems. The BCM56700 also integrates all the SerDes circuitry associated with all 16 fabric ports. Each SerDes interface is CX-4 and PICMG3.1-compliant and can directly drive 12 Gbps of data across InfiniBand® cable or chassis backplane.

Scalability

A difficult challenge of switch fabric design is providing a scalable solution that is cost-effective in small chassis configurations. The BCM56700 addresses this issue by using a single building block, which is cost-effective for small configurations and can scale to 1.28T using multiple switch fabric stages. This solution provides the most effective approach to the scalability vs. cost trade-off.

Quality of Service

The BCM56700 provides support for 10 classes of traffic (eight for user data and two for system management). The BCM56700 features an advanced packet scheduler that uses a combination of deficit-round-robin, weighted-round-robin, and strict-priority scheduling to enforce the bandwidth allocation configured by the system user. System management packets are always scheduled ahead of user data using strict priority.

The BCM56700 further improves system reliability by supporting hardware-based link failover, which dramatically reduces packet loss when a link failure occurs.

Efficient Management

With a dedicated system management queue, the BCM56700 enables system management traffic to coexist with user traffic, thus reducing the system cost by eliminating the need for a separate chassis management network.

The BCM56700 switch fabric is managed by a host CPU using a PCI bus running at speeds of up to 66 MHz. Advanced DMA is supported in hardware. Moreover, the CPU port behaves like a 17th switch fabric port, which provides for efficient exchange of data between the CPU and the BCM56700.

The BCM56700 can also operate without a host CPU by using forwarding tables and the I^2C interface to initialize chip registers.

Service Aware Flow Control

The BCM56700 switch fabric supports Service Aware Flow Control with dynamic threshold management. This mechanism ensures reliable packet delivery while still being able to respond effectively to temporary traffic bursts. The BCM56700 also features a queue dedicated to system flow control messages, which guarantees message delivery and shortens the system flow control response time.

Summary

The BCM56700 device's features, integration, and low cost set a new standard in switch fabric design and enable system vendors to build next-generation switching systems that are scalable and cost-effective and can be upgraded incrementally to suit a user's needs.

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