Centillion 100 EtherSpeed Switching Host Modules

Supports Scalable Port Density and Capacity

Protects Network Investment

Provides Transition to ATM

Allows Flexible Switching Solution

The EtherSpeed™ Ethernet switching host modules for the Centillion 100™ maximize the productivity of installed networks by providing high-performance, low-cost switched Ethernet and Fast Ethernet solutions that are fully compatible with existing networks.

Powerful yet flexible, EtherSpeed modules can be used in applications ranging from backbone networks to high-density workgroups and desktops. The Centillion 100 asynchronous transfer mode (ATM) core architecture offers a scalable, high-performance LAN and ATM switching solution on a single platform.

With a 3.2 gigabit-per-second (Gbps) ATM backplane and distributed, parallel LAN and ATM switching, the Centillion 100 increases network capacity, provides dedicated bandwidth to servers and desktops, and reduces network response time. Up to six switch modules, each equipped with an autonomous local switch, can be plugged into the Centillion 100. Ethernet, Fast Ethernet, Token Ring, and ATM modules can be mixed and matched to create a solution that meets any environment's specific needs.

EtherSpeed is a member of the Bay Networks family of high-performance Ethernet solutions. Working with the BayStack™ 10 and 100 megabit-per-second (Mbps) stackable hubs, BayStack Ethernet and Fast Ethernet switches, and 100 Mbps interfaces on the Access Stack Node (ASN™) and Backbone Node (BN®) routers, EtherSpeed contributes to one of the industry's most complete Ethernet solutions.

Bay Networks

Benefits

Supports Scalable Port Density and Capacity

EtherSpeed easily and cost-effectively supports the configuration of up to 88 switched 10 Mbps Ethernet ports per switch. At 3.2 Gbps, the Centillion 100 offers nonblocking switching performance to all ports, providing more than one million packets per second (pps) throughput per switch. Centillion 100 switches can be interconnected by one or more 155 Mbps ATM ports into a high-speed GIGArray™. The ATM links act as an extension of the Centillion ATM backplane, allowing scalable port density based on individual user needs. Up to 16 switches can be configured into a GIGArray for aggregate throughput of up to 10 million pps. File server and router connections can be implemented with either 100 Mbps Fast Ethernet or ATM using LAN emulation (LANE).

Protects Network Investment

Compatible with existing network infrastructures and transparent to today's applications, EtherSpeed modules can be seamlessly integrated into the network to alleviate bandwidth constraints and improve network performance.

Provides Transition to ATM

The built-in ATM fabric of the Centillion 100 allows networks to move to ATM incrementally, without expensive forklift upgrades. For networks not ready for ATM, the Centillion 100 provides a powerful, futureproof LAN switching solution. Networks that require multiple switches can simply use ATM as a "big pipe" to interconnect Centillion 100s, significantly increasing backbone bandwidth and reducing network response time. When ATM servers and desktops are required, ATM ports can be added when and where they are needed.

Allows Flexible Switching Solution

Designed to combine multi-LAN switching and ATM on a single platform, the Centillion 100 supports any combination of Ethernet, Fast Ethernet, Token Ring, and ATM modules to fit the needs of both current and future networks. The flexible architecture of the Centillion 100 easily supports a variety of LAN types. Modules with diverse port densities and media support can be added, providing a long-term, switched internetwork solution.

Features

EtherSpeed Switching Host Modules Description

EtherSpeed modules are designed to optimize the performance of large networks. The Centillion 100 learns and caches up to 8,000 MAC addresses in high-speed content addressable memory (CAM). Each EtherSpeed offers 1.25 MB of buffer memory to maximize congestion tolerance in busy networks.

A total of four EtherSpeed switching host modules are available, each designed for a specific application. A fully configured Centillion 100 can support a maximum of 88 switched Ethernet ports over unshielded twisted pair (UTP) cabling.

- The EtherSpeed Master Control Processor (MCP) Module offers eight switched 10BASE-T ports, as well as Flash memory and 4 MB of processor memory. Each Centillion 100 must be configured with at least one MCP module of any type to support switch operations.
- The EtherSpeed Switching Host Module offers 16 switched 10BASE-T ports for supporting desktops, servers, and other end devices.
- The EtherSpeed 10/100FX Switching Host Module includes 12 switched 10BASE-T ports, plus two switched 100BASE-FX ports for supporting high-speed 100 Mbps backbone trunk links over fiber optic cabling.
- The EtherSpeed 10/100TX Switching Host Module features eight 10BASE-T switched ports, plus two switched 100BASE-TX ports for supporting high-speed file server and router connections over UTP cabling.

A 133 MIPS RISC-based packet engine on each EtherSpeed module provides transparent Ethernet switching. Each module also contains high-speed ATM segmentation and reassembly (SAR) hardware. Local packets are switched natively by the packet engine. Packets destined for another switch module are first converted to ATM cells by the ATM SAR, then switched across the ATM backplane to the destination module.

High-capacity, parallel switching between the Centillion 100's ATM core and the EtherSpeed's packet engine, coupled with the high-speed SAR hardware and large address cache, enable the Centillion 100 to provide aggregate throughput of more than 1 million Ethernet pps.

Network-Wide Virtual LANs Simplify Network Topology

A network-wide, port-level virtual LAN (VLAN) capability allows network microsegmentation without changing the logical network topology, significantly easing network address administration.

Any number of Ethernet ports in a Centillion 100 network can be grouped into a VLAN. Up to 32 VLANs are supported on each switch. A per-VLAN Spanning Tree capability ensures VLAN compatibility with external bridges and routers. An external router provides VLAN routing.

VLANs enable servers to be physically centralized while servers and their client segments are logically partitioned into the same VLAN. This allows clients and servers to belong to the same subnet, eliminating added router hops. VLANs also reduce equipment costs by allowing ports on a switch to be part of multiple subnets, eliminating the need to dedicate a switch per subnet.

Robust Filtering Controls Network Traffic

EtherSpeed has an advanced set of filtering capabilities that simplify network management. Up to 64 user-defined filters are supported. Filters can be configured per port or per VLAN. Any pattern of up to 12 bytes within the first 255 bytes of a packet can be easily compared, enabling packets to be forwarded, dropped, mirrored, or redirected based on the information. A roving monitor capability can be enabled dynamically to mirror multiple streams of filtered traffic to one or more switch ports that are designated as monitor ports.

NetBIOS Broadcasts

The Centillion 100 NetBIOS filtering capabilities reduce unnecessary broadcast traffic to maximize bandwidth availability for applications. The switch learns and stores NetBIOS names and address mappings into a NetBIOS name cache. Rather than flood the network with NetBIOS name broadcasts, the switch looks up the target station in the name cache and responds in proxy. Specific name filters and a broadcast suppression timer can also be configured on a per-port basis to restrict NetBIOS traffic flow.

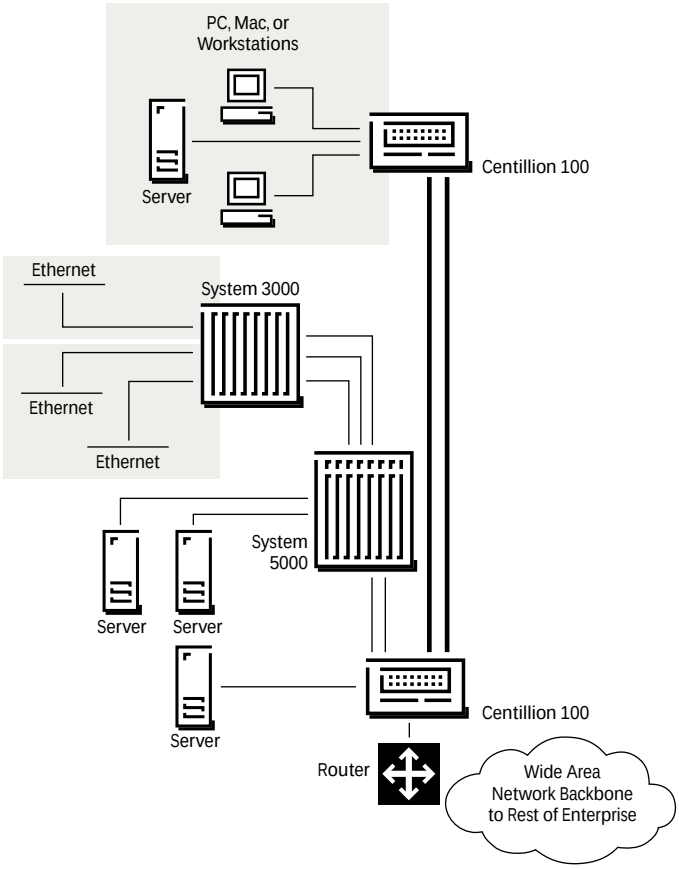
EtherSpeed Applications

Backbone Switch for Large Networks

Delivering over 10 Gbps of switching capacity, the Centillion 100 is ideally suited for use as a backbone switch in network centers. Its ability to support multiple LAN types on a single platform allows Ethernet and Token Ring segments to be consolidated while providing dedicated bandwidth to servers. In large networks, multiple Centillion 100 switches can be interconnected directly with ATM to build a scalable, high-performance backbone that removes bottlenecks, simplifies network management, and reduces equipment cost while leveraging the existing network investment.

High-Density Switch for Ethernet Workgroups and Desktops When fully configured, the Centillion 100 supports up to 88 Ethernet ports. With such high port density, the EtherSpeed is well suited for use in workgroups where desktops are running out of bandwidth. With EtherSpeed, a desktop can receive a full 10 Mbps of bandwidth, alleviating bandwidth constraints and maximizing the productivity of the existing network. Flexible VLAN support simplifies management and enables workgroups to be partitioned based on communications patterns. Desktop and backbone Ethernet switching with the Centillion 100 is shown in Figure 1.

Figure 1 | **Desktop and Backbone Ethernet Switching**



Flexible Backbone Options The ATM core architecture of the Centillion 100 allows ATM to be transparently deployed when and where it is needed. In large networks, ATM can be used as a riser or interbuilding link technology to build a nonblocking backbone. Multiple ATM links between Centillion 100s can load share to provide aggregate interswitch bandwidth in excess of 155 Mbps. The Centillion 100's integral ATM capabilities ensure predictable, low end-to-end latency; cells flow through the core of the network at only 10 µsec latency per intermediate switch hop.

Using the EtherSpeed 10/100 modules, 100 Mbps Fast Ethernet can also be employed to support high-speed backbone links or router and file server connections. Hybrid applications implementing ATM in the backbone for scalability and Fast Ethernet for efficient, cost-effective resource connections are also fully supported.

Technical Specifications

Technical specifications for the Centillion EtherSpeed switching host modules appear in Table 1.

Table 1 **Centillion 100 EtherSpeed Switching Host Modules Technical Specifications**

Number of Ports	
EtherSpeed MCP Module	8 switched 10BASE-T ports
EtherSpeed Switching Host Module	16 switched 10BASE-T ports
EtherSpeed 10/100FX Switching Host Module	12 switched 10BASE-T ports and 2 switched 100BASE-FX ports
EtherSpeed 10/100TX Switching Host Module	8 switched 10BASE-T ports and 2 switched 100BASE-TX ports
Speeds	
10BASE-T Ports	10 Mbps
100BASE-TX Ports	100 Mbps
100BASE-FX Ports	100 Mbps
Performance	
10BASE-T Ports	14,800 pps forwarding per port
100BASE-TX Ports	220,000 pps aggregate forwarding
100BASE-FX Ports	220,000 pps aggregate forwarding
Centillion 100	Aggregate throughput of over 1 million pps per switch
Processor	133 MHz, 64-bit MIPS RISC
Interfaces	10BASE-T, 100BASE-TX, 100BASE-FX
Processor Memory	2 MB in switching module, 4 MB in MCP module
Buffer Memory	1.25 MB for modules with 10 Mbps ports only
	4.25 MB for modules with 10 Mbps and 100 Mbps ports
Connectors	
10BASE-T, 100BASE-TX	RJ-45
100BASE-FX	SC
Bridging Mode	Transparent
Spanning Tree per VLAN	802.1d
Address Storage	10,000 MAC addresses per switching system

Ordering Information

Ordering information for the Centillion 100 EtherSpeed switching host modules appears in Table 2.

Table 2 | **EtherSpeed Switching Host Modules Ordering Information**

Order Number	Description
AS1904001	16-port EtherSpeed Switching Host Module for 10BASE-T (1.25 MB buffer memory, 1K CAM)
AS1904002	16-port EtherSpeed Switching Host Module for 10BASE-T (1.25 MB buffer memory, 8K CAM)
AS1904004	8-port EtherSpeed/MCP Switching Host Module with Master Control Processor for 10BASE-T (1.25 MB buffer, 4 MB processor memory)
AS2004002	EtherSpeed 10/100TX Switching Host Module with 8 10BASE-T Ports and 2 100BASE-TX Ports (4.25 MB Buffer)
AS2004001	EtherSpeed 10/100FX Switching Host Module with 12 10BASE-T Ports and 2 100BASE-FX Ports (4.25 MB Buffer)

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