

Increases Network Performance

The TokenSpeed™ Switching Host Module for the Centillion 100™ provides relief for congested Token Ring backbones. The module increases aggregate throughput, reduces response times, and simplifies network management without network disruption or forklift upgrades.

network latency. The modular design of the switch allows the chassis to support up to six plug-in switching modules, mixing and matching among Token Ring, Ethernet, and ATM.

Simplifies Network Topology

TokenSpeed offers compatible switching technology that provides the simplicity and cost-effectiveness of bridges combined with the performance and topology benefits of routers. Additionally, the Centillion 100's built-in ATM fabric provides scalable, high-performance LAN switching today and an incremental, low-cost migration path to ATM tomorrow.

The TokenSpeed module works with other Bay Networks Token Ring products, contributing to a complete, standards-based Token Ring solution. Along with the Centillion 100, the module delivers high-speed, performance-enhancing switching capabilities to existing hub- and router-based networks.

Protects Network Investment

Provides Transition to ATM

The 3.2 gigabit-per-second (Gbps) ATM backplane and distributed, parallel switching of the Centillion 100 increase network capacity, provide dedicated bandwidth to servers, and reduce end-to-end

Benefits

Increases Network Performance

TokenSpeed increases network performance by cost-effectively segmenting congested rings and providing servers with dedicated bandwidth. Upgrades are incremental and require no desktop changes or new network management tools. With up to 24 Token Ring ports per switch, the Centillion 100 provides the aggregate throughput needed in today's switched networks. Unlike shared networks, where per-port throughput is important, switched environments require high aggregate throughput to ensure the best network performance. Designed for superior end-to-end network performance, the Centillion 100 offers an aggregate throughput of 400,000 packets per second (pps).

Simplifies Network Topology

TokenSpeed is an ideal solution for networks struggling to maintain distributed bridged backbones, easing network administration and reducing source route hop counts. The Centillion 100 can be used to build a switch-based collapsed backbone that simplifies the existing network topology while increasing overall backbone capacity and reducing bridge hops between clients and their servers. With TokenSpeed's Virtual Ring capability, different physical Token Ring segments can share the same ring number or routed subnet.

Protects Network Investment

Fully compatible with existing Token Ring networks, the TokenSpeed operates within all protocol environments. Additionally, the module interoperates with bridges and is transparent to routers.

Provides Transition to ATM

The Centillion 100's architecture includes a built-in path to ATM, delivering the capacity and flexibility of high-speed cell switching with no up-front risk. When ATM is needed, interfaces can be easily and cost-effectively added to the switch.

Features

TokenSpeed Switching Host Module Description

Each TokenSpeed switching and master control processor (MCP) module provides wire-speed switching for four rings; up to 24 rings can be internetworked by a single Centillion 100. A 4 or 16 megabit-per-second (Mbps) ring can be connected to the switch via a lobe port or the ring-in or ring-out port of a Token Ring hub. Devices such as servers can be connected directly to a switch port for dedicated bandwidth. Shielded twisted pair (STP), unshielded twisted pair (UTP), and multimode fiber optic cabling options are all supported.

A 100 MIPS, RISC-based packet engine on each TokenSpeed provides powerful transparent, source route, and source route transparent (SRT) switching. Local packets are switched natively by the RISC engine; packets destined for another switch module are first converted to ATM cells by an onboard, high-speed segmentation and reassembly (SAR) chip, then switched across the ATM backplane to the destination module.

The Centillion 100 is capable of learning and caching up to 10,000 MAC addresses and 500 unique RIFs. TokenSpeed forwards traffic directly between stations to reduce source route explorer overhead on the network. High-capacity parallel switching between the ATM core and packet processor, together with the powerful SAR hardware and large address caches, enable the Centillion 100 to offer sustained throughput of 400,000 64-byte Token Ring frames per second.

Virtual Ring Simplifies Token Ring Topology

Any combination of Token Ring ports on the Centillion 100 can be grouped into a Virtual Ring. The physical segments within a Virtual Ring appear as a single ring with one ring number. Source route, SRT, transparent, or TSRF bridging options are available for internetworking the Virtual Rings, or an installed router can be used to provide Layer 3 routing. Virtual Rings eliminate source route hops and allow microsegmentation without incurring any topology changes or reconfiguration burden. A convenient partitioning scheme for departments spanning multiple segments, Virtual Rings limit broadcast ranges and increase network efficiency, flatten complex internetworks, and lower router equipment costs by concentrating multiple ring segments into a single subnet.

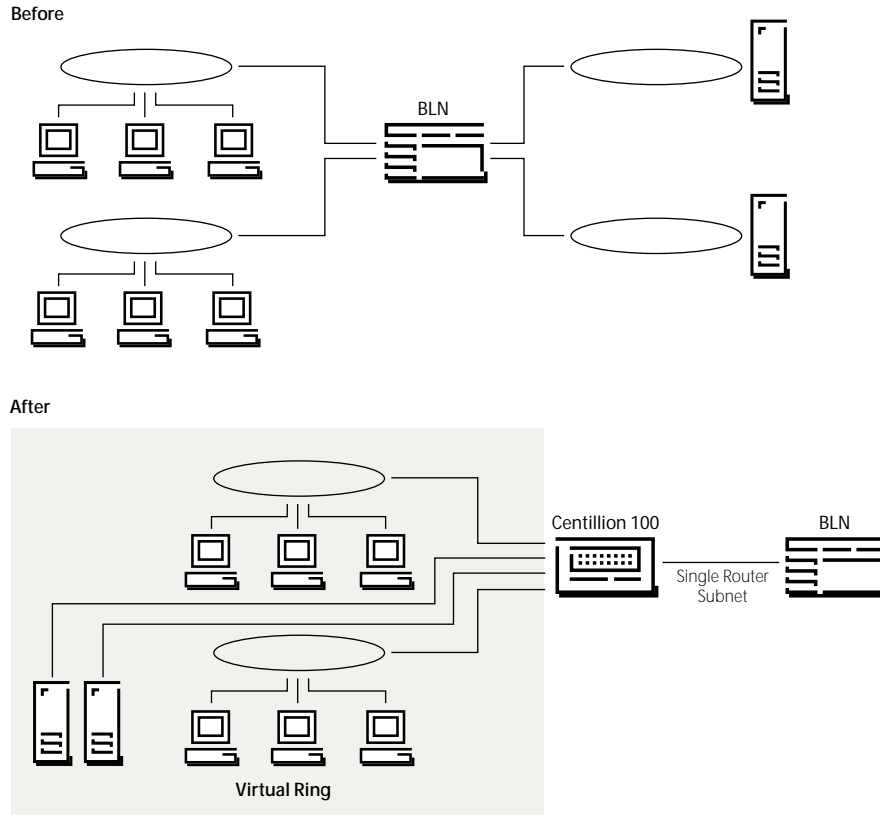
Extensive Filtering and Proxy Capabilities

TokenSpeed offers advanced filtering and proxy capabilities. Up to 128 filters can be configured per port or per Virtual Ring. Any pattern within the first 255 bytes of a packet can be compared, and handling instructions can be specified for both match and nonmatch conditions.

Source Route Explorer Proxy

When enabled, the TokenSpeed's source route explorer proxy can learn and cache source routing RIFs for up to 500 destinations. Instead of forwarding a source route explorer broadcast, a TokenSpeed can look up the destination station from its cache, fill in the RIF, and forward the packet directly to the destination, reducing broadcast traffic and setup latency. It automatically tracks station moves, adds, and changes. In addition, the switch detects load-sharing stations that have been assigned identical MAC addresses and will forward explorers to these stations via standard source route broadcast methods.

Figure 1 | Relief for Overburdened Routers



NetBIOS Proxy and Filters

The TokenSpeed can learn and store NetBIOS names and address mappings into a NetBIOS name cache. Rather than flood the network with NetBIOS name broadcasts, the TokenSpeed looks in its name cache for the target stations and forwards them directly to their destination. Specific name filters can be configured on a per-port basis to restrict NetBIOS traffic flow. A user-configurable timer will limit the frequency at which broadcast frames to any NetBIOS name will be forwarded. This reduces unnecessary broadcast traffic and ensures that more bandwidth is available to applications.

Improves Network Security

The Centillion 100 supports the creation of filters to monitor and control network access. When enabled, a roving monitor capability dynamically mirrors multiple streams of filtered traffic to one or more switch ports designated as monitor ports. A traffic redirection feature drops or redirects unauthorized traffic to a security server for audit trail, and access authorization traps prevent unauthorized SNMP access.

TokenSpeed Applications

Collapsed Backbone The Centillion 100 allows multiple backbone rings to be consolidated into a single, multigigabit collapsed backbone, removing bottlenecks and providing maximum scalability. Dispersed, congested bridges can be replaced with more robust and powerful

TokenSpeed modules. A Centillion backbone retains the simplicity of bridges while providing a quantum leap in capacity comparable to the highest performance routers. For large topologies, multiple switches can be interconnected with one or more ATM ports into a scalable, high-speed GIGArray™. In addition to increasing interswitch bandwidth and providing consistently low network latency, the GIGArray increases network reliability by automatically rerouting conversations in the event of a link outage.

Figure 2 | Building a Switched Collapsed Backbone Network

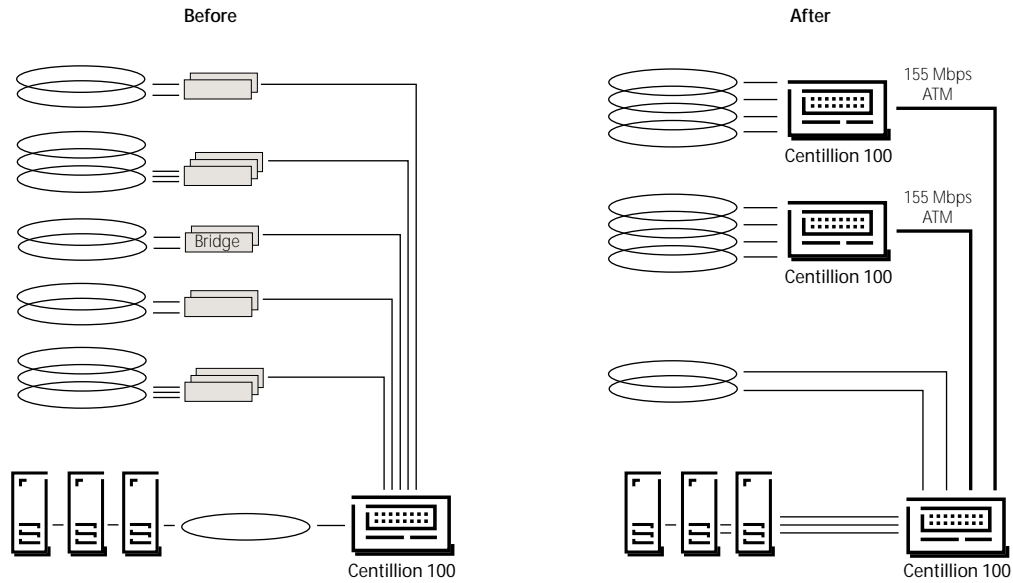
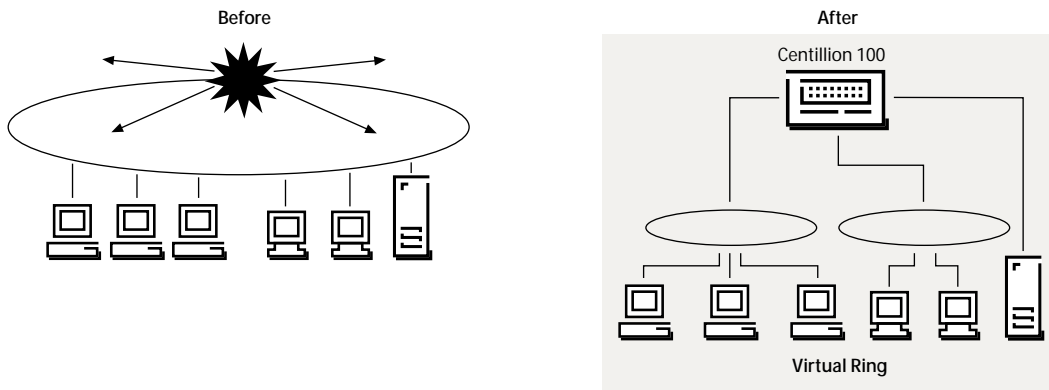


Figure 3 | Optimizing 4 Mbps Ring Performance



Router Front-End The Centillion 100 can be used to off-load overburdened routers that are running out of capacity, ports, or subnet addresses. A Layer 2 device, the Centillion 100 is transparent to routers. Multiple physical rings can be grouped into a Virtual Ring and then fed into a single router port, flattening the router network and reducing the number of subnet addresses needed. Most importantly,

the price/performance advantage of the Centillion 100 provides substantial savings while improving network performance.

Microsegmentation The Centillion 100 boosts the performance of slow 4 Mbps rings. There is no need to upgrade 4 Mbps Token Ring adapters to 16 Mbps, or incur the burden of reconfiguring every desktop. With the Centillion 100, large congested rings can be segmented into multiple smaller rings, making more

bandwidth available for each user. The Centillion 100 offers a cost-effective alternative to bridges and routers for microsegmentation; Virtual Rings support microsegmentation while eliminating concerns about hop-count restrictions or bridge reconfiguration.

Technical Specifications

Technical specifications for the TokenSpeed Switching Host Module appear in Table 1.

Table 1 | TokenSpeed Switching Host Module Technical Specifications

Local Switching Capacity	128 Mbps
Processor	100 MHz, 64-bit MIPS RISC
Buffers	2.5 MB
Processor Memory	2.25 MB
Priorities	IEEE 802.5 Standard
Interfaces	UTP, STP, multimode fiber
Connectors	RJ-45, DB9, ST
Connection Types	MAU Ring-in/Ring-out, MAU station, Direct Station Connection
Speeds	4/16 autosensing
Packet Filters	MAC filters, NetBIOS Name Filters, NetBIOS Broadcast Filters, Custom Filters
Broadcast Reduction	NetBIOS Name Caching and Filtering, RIF Caching and Source Route Explorer Filtering, Virtual Ring Partitioning
Transparent and Source Route Switching	
IEEE 802.1d Spanning Tree	
Virtual Ring	

Ordering Information

Ordering information for the TokenSpeed Switching Host Module appears in Table 2.

Table 2 | TokenSpeed Switching Host Module Ordering Information

Order Number	Description
AS1104001	4-port TokenSpeed Switching Host Module for UTP and STP
AS1104002	4-port TokenSpeed Switching Host Module for Multimode Fiber
AS1104003	4-port TokenSpeed Switching Host Module with Master Control Processor for UTP and STP



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