Overview

The IBM Network Processor family provides a highly customizable, scalable technology for the development of interconnect solutions for Internet or enterprise network providers. The IBM Network Processor can be used stand-alone in a desktop solution or as a component in a large multi-rack solution. Scaling of this nature is accomplished through the use of IBM's high performance, non-blocking packet switching technology and IBM's data aligned serial link interface which can be adapted to other industry switch technologies.

The IBM Network Processor integrates switching engine, search engine and security functions (IPSec) on one device to support the needs of customers who require high capacity, media rate switching of layer 2,3,4 and 5 frames. Three IBM 28.4G Packet Routing Switch priority levels are supported for port mirroring, high priority user frames and lower priority frames.

The IBM Network Processor's ability to enforce hundreds of rules with complex range and action specifications, a new industry benchmark for filtering capabilities, makes an IBM Network Processor-based system uniquely suited for server farm applications.

A system developed with the IBM Network Processor uses a distributed software model. Some functions are performed in the Control Point which provides support for layer 2 and layer 3 routing protocols, layer 4 and layer 5 network applications and systems management. Wire speed forwarding and filtering functions are performed by a combination of the IBM Network Processor hardware and resident picocode. In support of this model the IBM Network Processor hardware and Code Development Suite include on-chip debugger facilities, a picocode compiler, and a picocode and system simulator which decrease the time to market for new applications.

Features

- 40 Fast Ethernet/4 Gb MACs and SMII, GMII and 8b/10b interfaces supporting industry standard PHY components. Hardware counters provided in each MAC support all RMON groups. Additional MIB support is accomplished through a combination of hardware and picocode.
    - OC48, four OC12, sixteen OC3 and OC48c integrated Packet Over Sonet (POS) interface supporting industry standard POS framers
    - Fiber Channel 8b/10b interface
    - Support for IEEE 802.3ad link aggregation and VLAN detection (frame type 8100)
    - Support for jumbo frames (9018 w/o VLAN, 9022 w/VLAN)

- Support for up to 630 Fast Ethernet ports when connected to an IBM 28.4G Packet Routing Switch through two high speed ports

- 10 Protocol processors providing 1333 MIPS of processing power

- Embedded PowerPC™ processor, providing additional design flexibility for network interconnect devices (IBM32NPR101EPXCAC133 only)

- High capacity SDRAM output buffering and control store allowing significantly larger forwarding tables, a much greater number of supported traffic flow queues, and data buffering at lower cost than traditional SRAM solutions

- Hardware accelerators to perform frame forwarding, frame filtering and frame alteration

- Ability to enforce hundreds of rules with complex range and action specifications, a new industry benchmark for filtering capabilities.

- Hardware managed/software configured bandwidth allocation control of hundreds of thousands of concurrent communication flows

- Hardware support for Port Mirroring

- Integrated ATM switching support which allows seamless integration between Gigabit Ethernet and ATM (future enhancement)

- Increased media rates supporting emerging 10 Gb Ethernet standards, as well as OC192 (future enhancement)

Technology

• IBM SA-12E 0.25 μm technology migrating to IBMSA-27E 0.18μm copper technology

• IEEE 1149.1a JTAG compliant.

IBM Network Processor Interfaces