

*Advanced technology for high-performance, reliable,  
frame- and cell-based networking*



# Packet Routing Switch PRS28G

## Highlights

### A multigigabit-per-port switch solution

The IBM Packet Routing Switch PRS28G provides a powerful engine for high-throughput switch applications. A second-generation member of IBM's family of packet routing switch products, it provides scalability to satisfy a wide range of applications, including Enterprise and WAN edge, access, and backbone switches. With port speeds of up to OC48, the IBM Packet Routing Switch PRS28G is an ideal solution for large frame or cell switching systems.

Manufacturers who use the Packet Routing Switch PRS28G benefit from IBM's advanced silicon technology and the proven reliability, redundancy and load balancing features of IBM's packet routing switch technology. The switch offers:

- 16 input ports and 16 output ports
- 28.4-Gbps aggregate chip throughput (1.77-Gbps port speed)
- 28.4- to 227.2-Gbps throughput, using single stage expansion, and terabit throughput using multistage expansion
- Four levels of traffic priority
- Built-in broadcast and multicast support
- Packet loss-less switchover support
- Load balancing
- Virtual output queuing with Grant method-based queue flow control

### High throughput and non-disruptive migration

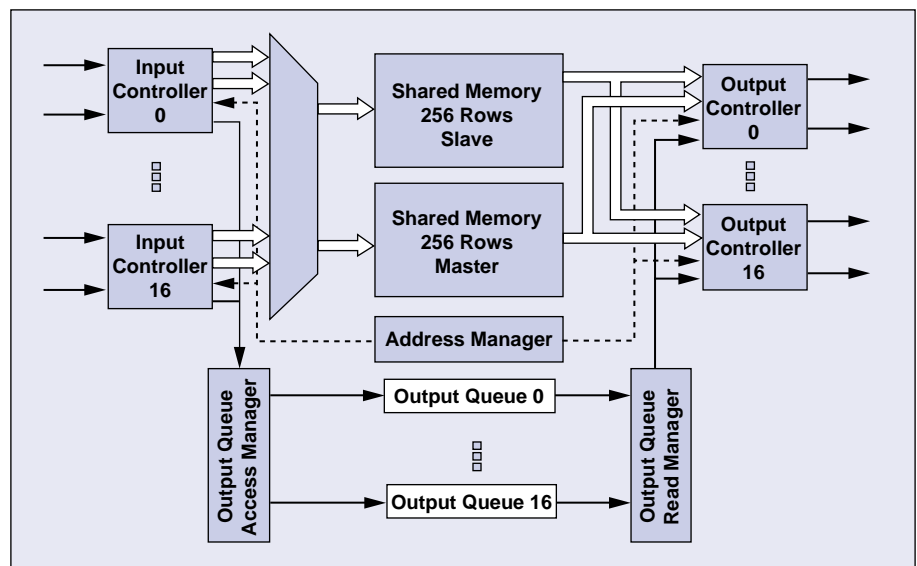
The IBM Packet Routing Switch PRS28G enables non-blocking, scalable switch fabrics featuring 28.4-Gbps to 227.2-Gbps throughput. It provides variable-sized, fast packet switching and is capable of supporting frame- and cell-based traffic. Further, it provides exceptional scalability, permitting configuration growth in speed per port, number of ports and aggregate capacity. The resulting scalability enables non-disruptive migration as system requirements change.

The Packet Routing Switch PRS28G incorporates two 888-Mbps per-port, self-routing, sub-switch elements and a control section that is common to both elements. Its shared output buffer provides sharing of memory space

among the chip's ports, delivering superior performance compared to input-buffer-based and output-buffer-based switches with identical memory size. A Grant method-based flow control feature allows the attached traffic manager to perform virtual output queuing. The chip also provides four levels of traffic priority. Using this capability, an application can, for example, give precedence to real time traffic, such as voice and video, over best-effort data traffic.

### Speed and port expansion enable scalable designs

The IBM Packet Routing Switch PRS28G supports two types of speed expansion to provide performance and cost flexibility. Manufacturers can use internal speed expansion to double port speed



The IBM Packet Routing Switch PRS28G is a high-performance, scalable switch solution for diverse applications.

## Specifications

Supply Voltage	3.3 V +/- 5% and 1.5 V +/-5%
Power	15 W @ 100%
Max. Junction Temperature	0° to 100° C
Package Size	624-pin E-CCGA; 10.4 mm x 10.4 mm

by combining the switch's two on-chip sub-switch elements. This approach, which reduces the number of input and output ports to eight, is an economical solution for building small ATM switches with OC-48 port speed.

Speed expansion can also be achieved by combining two Packet Routing Switch PRS28G chips externally. This approach doubles the chip's four serial I/O data paths to support port speeds of 3.5 Gbps on all 16 ports. In this configuration, which enables ATM protocol engine applications at OC-48 speed, the Packet Routing Switch PRS28G core can operate at 56.8 Gbps.

Configurations incorporating external speed expansion also permit an increased fixed packet size from 64 to 80 bytes, up to 128 to 160 bytes, in 8-byte increments. This flexibility, in conjunction with packet concatenation, improves overall throughput of the switch.

The IBM Packet Routing Switch PRS28G provides additional scalability through port expansion. This capability, which supports single stage and multistage switch designs, gives manufacturers the flexibility to design systems that make the most business sense for their applications. The single stage method of port expansion is well suited for ATM and IP switching where throughput is of prime importance. The multistage method is ideal for applications, such as connected processors, that require extensive connectivity and experience light traffic.

### Redundancy support for high availability

To increase availability, switch fabrics are often designed with two redundant planes. If an element in one plane fails, the other plane is available to take over. The IBM Packet Routing Switch PRS28G supports this crucial redundancy capability.

Each Packet Routing Switch PRS28G element access manager has two links to the switch core—one to each plane—and a packet filtering function. The built-in filtering mechanism acts as a redundancy control while the dual links from the switch element access manager to the switch core provide the means for loss-less switchover.

### Serial interface chip available

For manufacturers who are building chassis-based systems requiring a high-speed interconnect across a backplane or short cable distances, IBM offers the IBM Packet Routing Switch Serial Interface. This companion chip is a simple interface that converts the data aligned serial link interface to a Utopia 3-like parallel interface. It enables traffic managers that support 32-bit parallel interfaces to connect to a redundant switch fabric based on the Packet Routing Switch PRS28G.

### Development tools expedite time-to-market

Packet switch controller software and a reference switch core are available from IBM to help reduce manufacturers' development time and cost. The software offerings, which include the IBM Primary Switch Controller (PSC) software and IBM Secondary Switch Controller (SSC) software, operate the switch subsystem control layer. The 56-Gbps reference switch core supports single-shelf switch designs where the port adapter line rates are the same as the switch port speed. The reference switch core is well-suited for a redundant 16-port OC-48 ATM switch or a layer 2 and above design that supports 32- to 64-port Gigabit Ethernet.

For more information visit our Web site at [www.chips.ibm.com](http://www.chips.ibm.com).



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IBM Microelectronics Division  
1580 Route 52, Bldg. 504  
Hopewell Junction, NY  
12533-6351

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