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Find the *Mercury Computer Systems ImpactRT 3200* at our website: *Click HERE*

RapidIO

Computer Systems, Inc.
MERCURY

ImpactRT 3200 System



Scales to 72 processors with 778 GFLOPS or 3.1 TOPS

Up to 57.5 GB/s aggregate over the RapidIO switch fabric

Up to 36 GB/s Fiber I/O

Software compatible with RACE++ Series

Enhanced reliability, availability, and serviceability

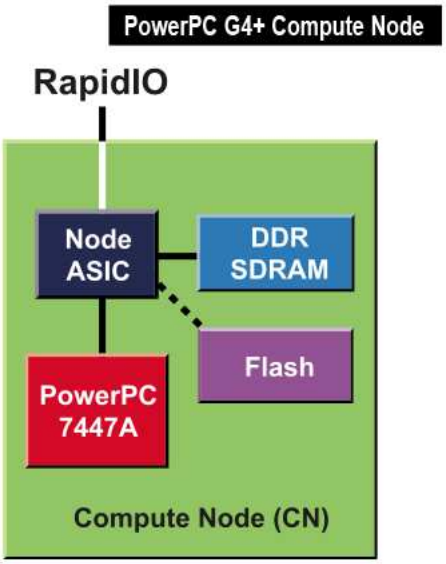
mc.com

The ImpactRT™ 3200 system is a fully integrated multicomputer that combines RapidIO interprocessor communications with PowerPC 7447A microprocessors to provide an ideal solution for high performance industrial and laboratory computing. As the second installment of the ImpactRT 3000 family of RapidIO-based CompactPCI multicomputing systems from Mercury, the ImpactRT 3200 demonstrates RapidIO's continued success and adoption. It also extends the sweet spot of ImpactRT 3000 series performance with up to 72 processors with 778 GFLOPS or 3.1 TOPS.

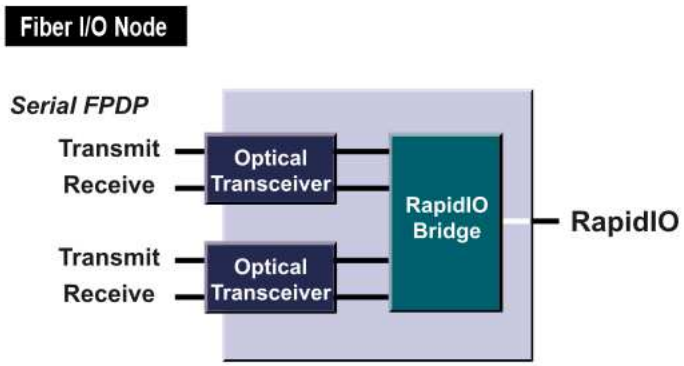
Multicomputing software from Mercury translates the system potential into system performance, delivered right to the application software. Multiprocessor development and debugging tools provide the productivity and insight for creation of complex real-time applications. Multiprocessor communication libraries and algorithm libraries turn islands of processing power into parallel processing systems that increase throughput while reducing latency. Both the development tool chain and the APIs are backward-compatible with existing solutions, thereby minimizing the risk for technology upgrades.

Extreme Performance in a RapidIO CompactPCI Multicomputer

ImpactRT 3200 systems provide a 3X improvement in I/O capacity over first-generation ImpactRT 3100 systems. Together with a 30% increase in compute power, this gain in I/O allows the ImpactRT 3200 system to handle more sensor data more rapidly, keeping the processors running at peak efficiency and creating more results, more rapidly.



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Processing and I/O Power

The ImpactRT 3200 system supports up to 72 compute nodes (CNs). Each CN includes a 1.35 GHz PowerPC 7447A microprocessor, 512 MB of DDR SDRAM, and a GxCE compute node ASIC. The ASIC is both the memory controller and the interface to the RapidIO switch fabric, which enables multiple simultaneous communications among compute nodes. Each 6U processor board contains four compute notes and a RapidIO switch with four off-board links. Two links are routed through the J4 connector to a switch on a RapidIO interlink module. The remaining two links go through the J5 connector to a rear transition module for very high-speed I/O.

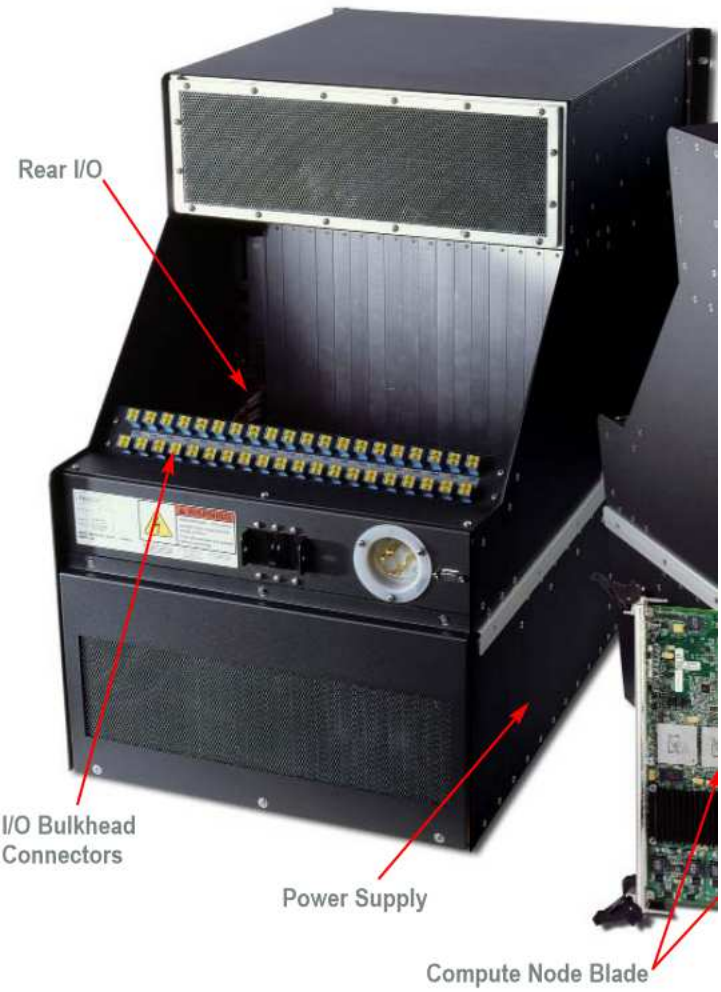
The ImpactRT 3200 system provides I/O expansion capacity through a carrier board that can accept two mezzanine cards, each of which can be either a RapidIO XMC or a PMC card. RapidIO XMC sites each have a dedicated connection directly to the RapidIO switch fabric. Each PMC site connects to the system fabric through a RapidIO-to-PCI bridge, which also provides the PCI connection to a slot 1 system host single-board computer running the Windows 2000 operating system.

Up to 72 fiber-optic interfaces pull in sensor I/O at an aggregate peak rate of up to 36 GB/s. Every I/O interface is a 2.5 Gigabits/s fiber I/O connection running the Serial FPDP protocol for low overhead and low latency. Each dual fibre I/O node and compute node in the system has a direct connection to the RapidIO switch fabric, delivering up to 1.2 GB/s of full duplex data transfer, resulting in an aggregate of up to 57.5 GB/s of simultaneous communication among the nodes.

Multiprocessor Software Environment

Mercury's multiprocessor software for both development and runtime operation makes the difference between a collection of independent processing nodes and a coordinated set of processors working together to solve a problem at peak performance.

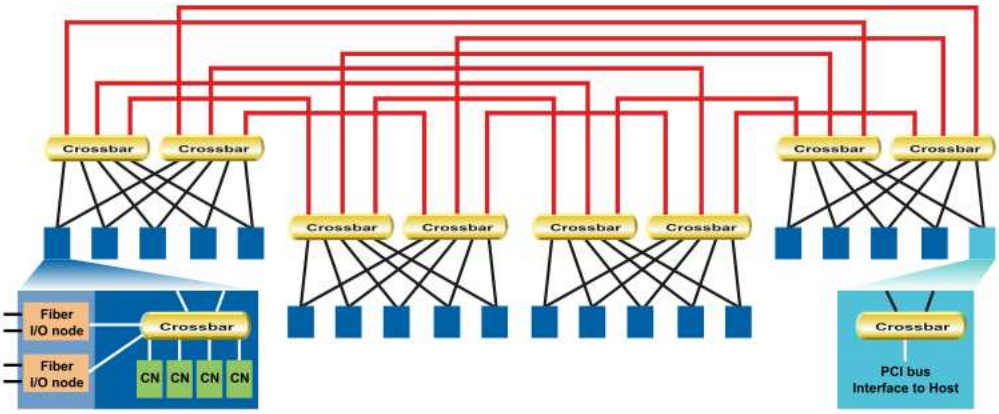
The MCOE™ multicomputer operating environment provides the system services for managing resources in a distributed processor system and the multiprocessor library for coordinated, high-speed data transfer among processors and I/O interface. Hand-coded algorithm libraries have been painstakingly optimized for the AltiVec vector engine in the PowerPC processors. The Scientific Algorithm Library (SAL) provides hundreds of floating-point functions for signal processing and image processing. The PixL™ image processing library includes fixed-point functions covering algorithms from morphology operators to fixed-point fast Fourier transforms.



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Mercury's full suite of multiprocessor development software is also available for the ImpactRT 3200 system. The broadly adopted MULTI® integrated development environment provides integrated debugging, profiling, program building, and version control facilities that streamline the development of critical application software. The TATL™ trace analysis tool and library shows multiprocessor interactions useful for debugging multiprocessor resource contentions and load imbalances.

ImpactRT 3200 Topology



Easy Application Migration

In addition to opening new levels of processing performance and data bandwidth, the ImpactRT 3200 system offers an easy migration path for existing RACE++® and ImpactRT 3100 system applications requiring additional performance. Applications currently deployed on ImpactRT 3100 solutions are completely transportable.

Applications that currently run on RACE++ multicomputers can move to the ImpactRT 3200 system with virtually no code changes. In most cases, porting is as simple as updating the system configuration file. The existing RACE++ APIs operate without modification, so customers can take advantage of RapidIO performance gains without any additional application investment. New RapidIO features not accessed through the RACE++ API can be brought online as the needed to meet application requirements.



RapidIO-Based Solutions from Mercury

Mercury Computer Systems has emerged as the clear leader in delivering RapidIO-based multicomputing systems for the most demanding applications. The prompt adoption of these systems in commercial, telecommunications, and military applications demonstrates the acceptance of the RapidIO standard, and a broad ecosystem is emerging to further strengthen the market.

As the pioneer of heterogeneous switch fabric-based computing, Mercury remains uniquely equipped with system expertise, application expertise, and support and consulting resources to craft RapidIO-based systems to individual customer requirements. The ImpactRT 3200 system demonstrates the company's continued focus on optimally-engineered computing solutions for high performance applications in commercial and defense-related segments. Its clear growth path and compatibility with prior generations of RACE++ and ImpactRT 3100 solutions assures customers of long term stability and support throughout the lifetime of their applications.

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ImpactRT 3200 Specifications

Compute Nodes

Processor	1.35 GHz PowerPC 7447A with AltiVec
Memory	512 MB SDRAM
Communication	1.2 GB/s RapidIO, full duplex

I/O Nodes

Interfaces	Full duplex fiber interfaces
Speed	2.5 Gbaud max, 1.062 Gbaud compatible
Protocol	VITA 17.1 Serial FPDP
Media	Short wave (850 nm) fiber
Distance	100 meters of 62.5 µm fiber or 150 meters of 50 µm fiber
Communication	1.2 GB/s RapidIO, full duplex

Initial Chassis

Dimensions

Width	17.6" (447 mm), for 19" rack mount
Height	26.2" (665 mm)
Depth	31.6" (802 mm)

Input Power

208-240 VAC 50-60 Hz
Breaker: 25A, 3-phase, single toggle

Serviceability

Hot-swappable blower modules
Removable hard drives
Front-accessible chassis intake air filter
Power supply voltage monitoring and alarming
Field-replaceable power supply

Configuration

Max compute nodes	48
Max dual I/O nodes	24
Max disk drives	3

Future Chassis (preliminary)

Dimensions

Width	17.6" (447 mm), for 19" rack mount
Height	26.2" (665 mm)
Depth	29.0" (737 mm)

Input Power

208-240 VAC 50-60 Hz
Breaker: 25A, 3-phase, single toggle

Serviceability

Hot-swappable blower modules
Removable hard drives
Front-accessible chassis intake air filter
Power supply voltage monitoring and alarming
Field-replaceable power supply
N+1 redundant power supplies

Configuration

Max compute nodes	72
Max dual I/O nodes	36
Max disk drives	3



Computer Systems, Inc.
MERCURY
The Ultimate Performance Machine

On the cover: ImpactRT 3200 chassis

For more information, go to www.mc.com

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