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Find the *Mercury Computer Systems ImpactRT 3100* at our website: *Click HERE*

RapidIO®

Computer Systems, Inc.
MERCURY

ImpactRT 3100 System



The First RapidIO Multicomputer

The ImpactRT™ 3100 system is a fully integrated multicomputer for today's toughest commercial applications such as medical and semiconductor imaging. Built on next-generation technologies of PowerPC® G4+ microprocessors for computing and RapidIO® technology for communications, the ImpactRT 3100 system provides up to 76 processors with 600 GFLOPS or 2.4 TOPS of computing power.

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.

In addition to opening new levels of system performance, the ImpactRT 3100 system extends Mercury Computer Systems' proven application and solution expertise to the next-generation multi-computing architecture. Mercury provides a reliable foundation for deploying and maintaining applications throughout today's long program life cycles. Customers can now develop applications to address even more demanding image and digital signal processing challenges with the assurance of continued support from the multicomputing partner of choice for leading defense, medical, and industrial system integrators.

ImpactRT™ 3100

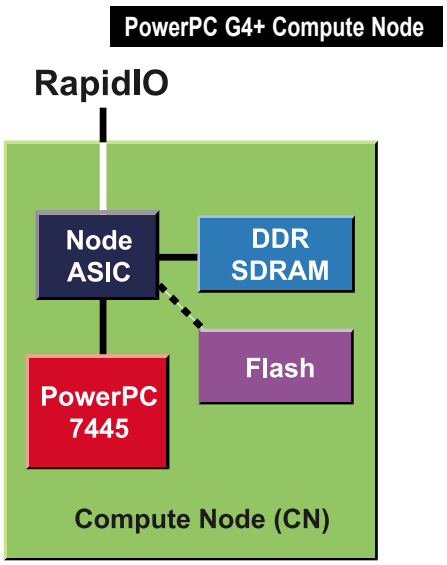
Scales to 76 processors with 600 GFLOPS or 2.4 TOPS

Up to 60 GB/s aggregate over the RapidIO switch fabric

Up to 10 GB/s Fiber I/O

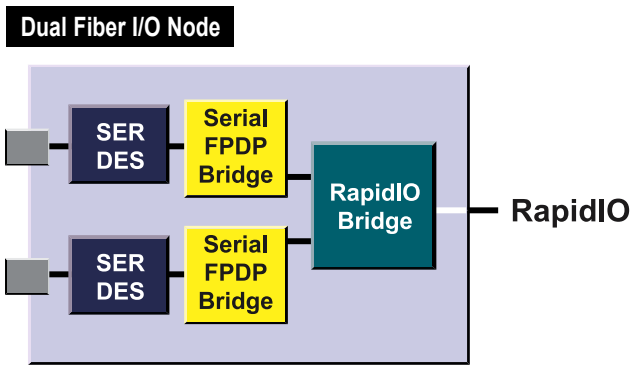
Software compatible with RACE++ Series

Enhanced reliability, availability, and serviceability



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Processing and I/O Power

The ImpactRT 3100 system supports up to 76 compute nodes (CNs). Each CN includes a 1 GHz PowerPC 7445, 256 or 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 that enables multiple simultaneous communications among compute nodes. The system also includes a PCI interface module. Through a RapidIO-to-PCI bridge, this module provides a PMC slot for I/O devices, and the PCI connection to a slot 1 system host running Windows 2000.

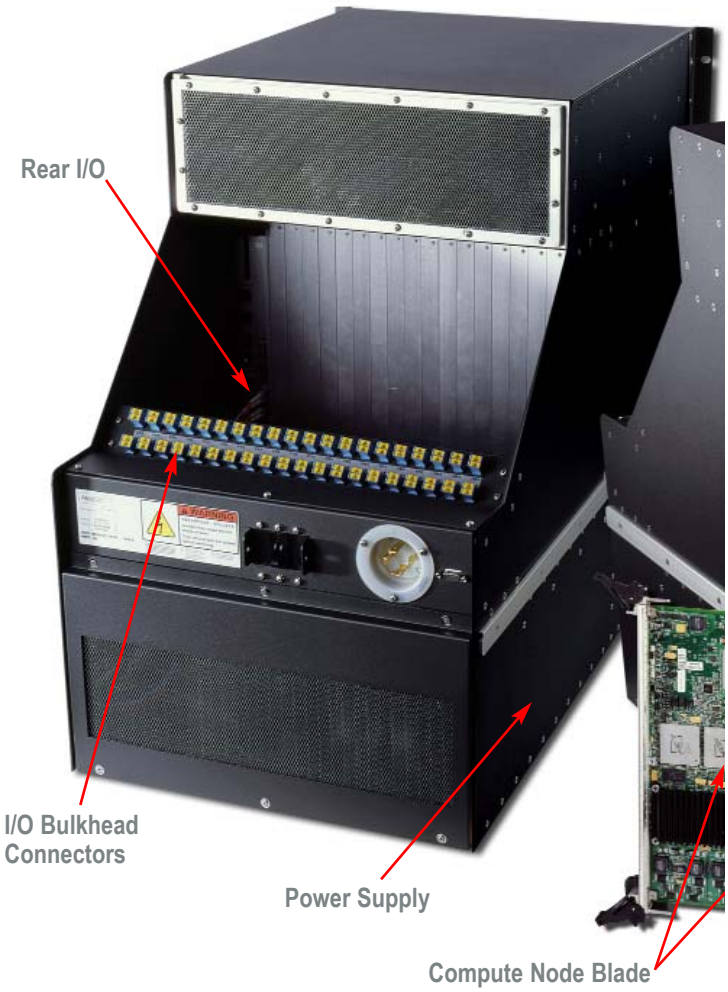
Up to 40 fiber-optic interfaces in the rear of the system pull in sensor I/O for an aggregate peak of up to 10 GB/s. Every I/O interface is a 2.5 Gigabits/s fiber I/O connection running the Serial FPDP protocol for low overhead and low latency. Each I/O and compute node in the system has a direct connection to the RapidIO switch fabric, delivering up to 1.2 GB/s of full duplex data transfer, resulting in an aggregate of up to 60 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 MC/OS™ 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.

Mercury's full suite of multiprocessor development software is also available for the ImpactRT 3100 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.

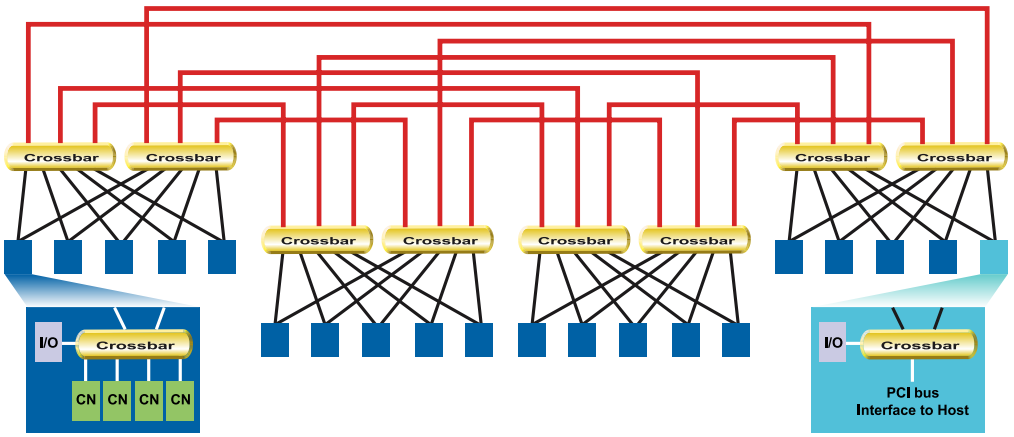


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Easy Application Migration

In addition to opening new levels of processing performance and data bandwidth, the ImpactRT 3100 system offers an easy migration path for existing RACE++® applications requiring additional performance. Applications that currently run on RACE++ multicomputers can move to the ImpactRT 3100 system with virtually no code changes.

ImpactRT 3100 Topology



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 customer desires.



RapidIO-Based Solutions from Mercury

RapidIO is an open standard, but only Mercury has the experience to deliver it as a reliable, low-risk, high-performance embedded multiprocessing solution. As the pioneer of heterogeneous switch fabric-based computing, Mercury is uniquely equipped with system expertise, application expertise, and support and consulting resources to craft RapidIO-based systems to individual customer requirements. RACE Series™ and RACE++ Series applications readily move to the ImpactRT 3100 environment, protecting customer investments and providing a smooth growth path for fielded systems.

The ImpactRT 3100 system is only the first in a new generation of embedded multicomputing solutions from Mercury, the industry's leading provider of heterogeneous embedded solutions for high-performance digital signal and image processing. It extends Mercury's advantages and expertise in scalability, system and application software, and performance density into a new performance domain.

RapidIO®

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ImpactRT 3100 Specifications

Compute Nodes

Processor	1.0 GHz PowerPC 7445 with AltiVec
Memory	256 or 512 MB SDRAM
Communication	1.2 GB/s RapidIO, full duplex

Dual I/O Nodes

Interfaces	2 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

Dimensions

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

Weight

165 lbs., fully loaded

Input Power

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

Peripherals

Windows 2000 host
Up to 3 hard drives, 36 GB each
CDRW 12x write /10x re-write /32x read

Serviceability

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

Configurations

Memory per compute node	256 or 512 MB
Max compute nodes	76
Max dual I/O nodes	20
Max disk dives	3

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