



*Premier blade for compute-intensive workloads and
broadband media applications*

IBM BladeCenter® QS20



For success in demanding computing environments, organizations require innovative technology to break through performance limitations of traditional processors. For high performance computing such as digital content creation, image and signal processing, scientific research, seismic processing and other compute-intensive applications, it may take a new technology and approach to the system-level architecture to achieve the desired level of performance.

Enter the IBM BladeCenter QS20 based on Cell Broadband Engine (Cell BE) processor. It is a high performance blade especially suitable for some compute-intensive, single-precision, floating-point workloads. It helps to accelerate these targeted workloads to many times the speed of a traditional microprocessor, including image processing, signal processing, and graphics rendering applications.

Highlights

***First Cell Broadband Engine™
(Cell BE) processor-based
systems***

***Accelerate some algorithms to
many times the speed of a
traditional microprocessor***

***Dense computing power and
unique capabilities of Cell BE***

***Especially suitable for compute
intensive workloads across a
number of industries***

Optimized for performance, built for tough signal processing and high performance workloads

Clients in aerospace, defense, medical imaging, seismic computing, digital media, and other industries have for many years relied on performance gains from increasing clock speeds of “traditional” microprocessor architectures.

However, in recent years this approach to performance improvement has been challenged by the physical characteristics of semiconductors and by traditional processor architecture implementations. Increasing frequencies and deeper pipelines have reached diminishing returns on performance due to issues with power consumption/dissipation and memory latencies. The QS20 addresses this problem head-on with two 3.2 GHz Cell BE processors on the blade.

Based on Power Architecture™ technology, the Cell BE processor was originally developed in collaboration with IBM, Sony Corporation, Sony Computer Entertainment Inc. (Sony and Sony Computer Entertainment collectively referred to as Sony Group), and Toshiba Corporation.

Cell BE is a multi-core broadband processor based on IBM’s Power Architecture. A single chip contains a Power Processing Element (PPE)

and eight Synergistic Processing Elements (SPEs). Each SPE has an on-chip local store. The PPE has an on-chip L1/L2 cache. Also on the chip are memory and I/O controller. The PPE is a general purpose 64-bit RISC processor (PowerPC® 2.02) with 2-way hardware multithreading. L1 cache for the PPE is 32KB instruction and 32KB data. Each of the eight SPEs is a special purpose RISC processor with 128-bit SIMD (Single Instruction Multiple Data) capability and 256KB local memory. The PPE and the eight SPEs are connected with a high bandwidth Element Interface Bus.

This innovative multi-core architecture and ultra high-speed communications capabilities is especially suitable for high performance workloads such as digital media, medical imaging, aerospace and defense, seismic computing, and communications.

Dense computing power and flexibility

IBM BladeCenter is an industry leading technology that allows dense packaging of processors, provides I/O capability within and outside the BladeCenter chassis, and provides infrastructure like power and cooling. It simplifies management of both the hardware and software.

In terms of flexibility, the IBM BladeCenter QS20 is equipped with Gigabit Ethernet and 4x InfiniBand I/O capability, and is able to connect to many host systems. It complements our more mature rack-optimized and blade server product lines based on Xeon®, Opteron® and POWER® processors



Summary

QS20 is based on Cell BE processor, a multi-core architecture optimized for parallel processing and streaming applications, and could yield higher performance for some algorithms and applications in target industries.

Standard Configurations

Form Factor	Double-wide blade server for BladeCenter
Processors	3.2 GHz Cell BE Processors
Number of Processors	Two standard, each with one PPE and eight SPE processing elements
Level 2 (L2)	512KB per Cell BE Processor, plus 256KB of local store memory for each SPE
Memory	1GB (512MB per processor)
Internal Disk Storage	40GB IDE HDD
Networking	Dual Gigabit Ethernet
I/O Upgrade	None supported
Optional Connectivity	1 or 2 InfiniBand 4x adapters connected via PCI-Express
Operating Systems	Fedora core 5-based Linux® available at http://www.bsc.es/projects/deepcomputing/linuxoncell/
Warranty	1 year

For more information
Contact your IBM representative
Or visit:

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Systems and Technology Group
Route 100
Somers, New York 10589

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