



Case Study

Intel® Xeon® Processor
Quad-Core
45 nm technology
Hospital IT



"The need to capture medical device data at the bedside is growing at an extraordinary rate. Many healthcare institutions now deploy DataCaptor enterprise wide. The new 45nm Intel Xeon Processor and our innovative software architecture allows us not only to satisfy our enterprise clients today, but to leverage this platform for further innovation."

Olivier Rozenkranc
Vice President of Research and Development,
Capsule Technologie

Transforming Hospital Device Connectivity

Capsule Technologie's innovations bring a new level of connectivity to hospitals with 45nm Quad-Core Intel® Xeon® Processors.

Working continuously to define the future of hospital IT, Capsule achieved new levels of scalability with the latest version of DataCaptor®. DataCaptor is a universal, generic data acquisition and distribution software engine that enables the collection of patient vital signs from bedside medical devices.

The server side solution is architected to allow deployment on the latest generation dual socket high bandwidth servers with the new 45nm Quad-Core Intel® Xeon® Processor.

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- The Challenge** **Maintain quality of service** while increasing the number of medical devices connected simultaneously
- Reduce administrative cost**
- Simplify the implementation** by reducing the number of servers required.

The Solution **Capsule's latest software release, architected to take advantage of multi-core technology**, easily installed with no modification on 5400 series, 45nm Intel Xeon Processor based servers

After extensive benchmarking, Capsule demonstrated that over 600 patient bedsides could be supported and data distributed to electronic medical record systems. This number of simultaneously connected patient bedsides is equivalent to the number of bedsides typically connected in ten community hospitals.

Capsule Technologie's software is able to take full advantage of multi-core processors, allowing enterprise wide deployments on a single server

Innovation :

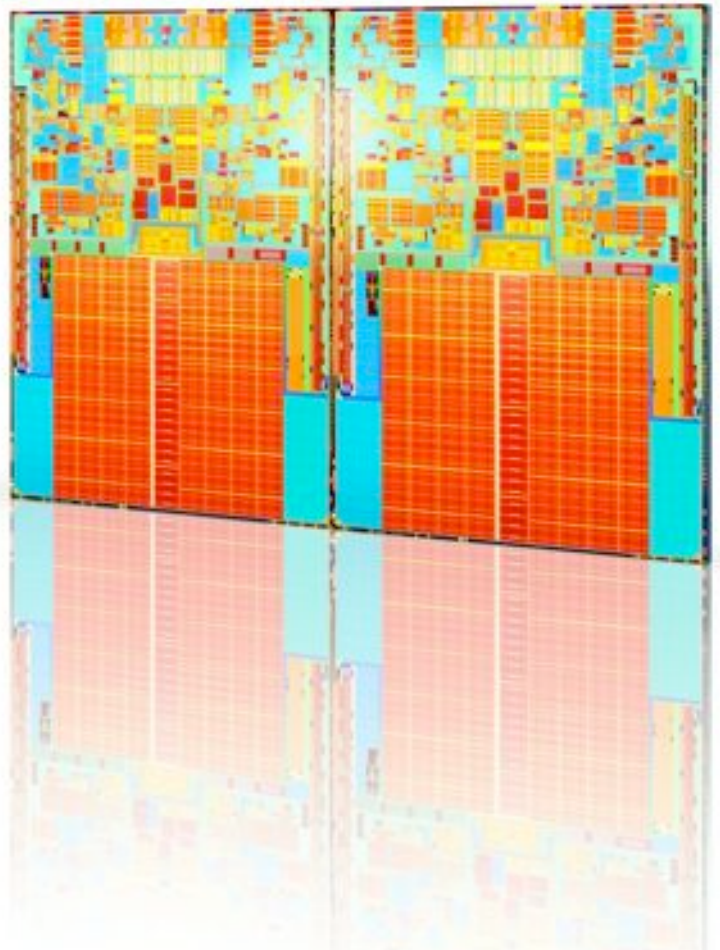
To be successful in the hospital IT landscape, innovation is crucial. Capsule Technologie is already deploying proven solutions in large hospitals, but is planning ahead : targeting even larger hospitals, defining how medical devices could interact with EMR (Electronic Medical Record) solutions in the future.

How it works :

Captured in real time, patient vital signs are sent from each bedside medical device to the DataCaptor server. The data from each device is then processed, filtered and formatted independently, based on hospital information system requirements. Output formats include industry standard XML and HL7. This critical transformation requires a large amount of processing power as well as network capabilities. Capsule Technologie's software development team has obtained outstanding results: 2000 medical devices connected simultaneously on a single server.

These results are possible due to the new dual socket server featuring two Quad-Core Intel Xeon Processors, 5400 series at 3.2GHz built with 45nm technology.

The motherboard also plays a crucial role: high frequency 1.6 GHz front side bus and Intel IOAT version 2 assured fast, scalable and reliable network performance.



"The new Quad-Core Intel Xeon Processor leverages our product architecture to scale and processes critical patient data in real time."

Frédéric Darguesse
Software Architect,
Capsule Technologie



Software development :

This unprecedented increase in throughput was accomplished due to Capsule's software development team precise understanding of multi-core programming. Processing the data from 2000 medical devices means the server side software has to deal with an impressive number of network connection "sockets" and process extraordinary amounts of data in parallel. Leveraging the power of the two Quad-Core Intel Xeon Processors to spread calculations efficiently, Capsule Technologie's engineers worked with Intel's Software and Solutions Group to validate their server application.



About Capsule Technologie

Capsule is the world's leading, award-winning provider of solutions for medical device data integration. Founded in 1997, the company has established market leadership through its suite of hardware and software products, its unique expertise in medical device protocols and firmware, and through its strong partnerships with major medical device manufacturers and healthcare information technology companies. In 2007 and 2008, Frost & Sullivan recognized Capsule's contribution and honored the company with the Enabling Technology Award in the Patient Monitoring Industry for Medical Device Connectivity Excellence. Deloitte also acknowledged Capsule for its stellar revenue growth and presented the company with the Deloitte Technology Fast 50 and Fast 500 EMEA Awards. For more information, the company's website at <http://www.capsuletech.com>

About Intel Corporation

Intel, the world leader in silicon innovation, develops technologies, products, and initiatives to continually advance how people work and live. Founded in 1968 to build semiconductor memory products, Intel introduced the world's first microprocessor in 1971. Today Intel - the world's largest chip maker - is also a leading manufacturer of computer, networking, and communications products.

Scalability test :

Testing procedure completed by Capsule's software development team.

Base load :

Input variables : 22.800 variables/s coming from the DataCaptor Device Interface®

Output variables : 2.273 variables/s after filtering

Processing : 760 processing rules

Generation : HL7 output generation in real-time

Result :

DDI : up to 2.000 DataCaptor Device Interface® connected

Server load : 82% average CPU usage, 100% peaks

Server configuration :

Intel server : Windows® 2003 Advanced Server 64bit,

12 GB of RAM and 250 GB SATA hard disk

Processor : Quad-Core Intel Xeon Processor 5400 series (3.2 Ghz, 12 MB cache, 45 nm technology), dual socket.

Motherboard : Intel, IOAT v2, dual gigabit ethernet, 1600 MHz memory bandwidth



Contact Capsule Technologie :

<http://www.capsuletech.com>

Contact Intel :

Xeon processor : <http://www.intel.com/products/server/processors>

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