Imperial College London

High Performance Processing Server for AI

Broadberry™

Date:
Q1 2018

Application:
Artificial Intelligence

Tags:
Disease Prediction by Machine Learning

CUSTOMER:

Imperial College London

Aims to harness advances in science and technology to save lives in developing countries. They work with partners to deliver proven tools as well as discover pathbreaking new solutions that are affordable and reliable.

SOLUTION BRIEF:

Imperial College London were funded by the Bill and Melinda Gates Foundation and Medical Research Council to provide a powerful server solution for predicting how disease will spread.

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Imperial College London

Application

- Data Analysis
- Disease Control

Project Background

An international group of scientists led by Imperial College London and the World Health Organization analysed data on Ebola cases in children under 16 during the current outbreak in Guinea, Liberia and Sierra Leone, comparing them to cases in adults.

Broadberry supplied Imperial College London with 3x high performance processing servers to power the data analysis for this international project.

The research was supported by the Medical Research Council, the Bill and Melinda Gates Foundation, the Models of Infectious Disease Agent Study of the National Institute of General Medical Sciences (National Institutes of Health), the National Institute for Health Research Health Protection Research Unit (NIHR HPRU) in Modelling Methodology at Imperial College London, the EU PREDEMICS consortium, the Wellcome Trust, and Fogarty International Center.

Key Requirements:

- Massive CPU compute performance
- Low Power Usage
- High-Throughput Network Connectivity
- Be delivered under a strict budget

Project Findings

"These findings show that Ebola affects young children quite differently to adults, and it's especially important that we get them into treatment quickly. "

– Professor Christl Donnelly
MRC Centre for Outbreak Analysis and Modelling

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Broadberry Solution

After carefully analysing the requirements for this project, we decided the Broadberry S2612BP Multi Node Server would be the perfect solution with its high compute capability in a density optimised chassis.

Our chosen solution consisted of supplying 3x Broadberry S2612BP Multi Node Servers, providing 16x compute nodes in total connected via Mellanox Infiband network adapters.

Working with Intel Engineers to Approve the Solution

The Intel chassis which powers the Broadberry S2612BP Multi Node Server was designed to a maximum of 140W processors, however we wanted to use the Intel® Xeon® Gold 6142 Processor which dissipates 150W.

Broadberry engineers worked closely with Intel to ensure that for this specific project, Intel would validate and approve the use of these processors.

Supplying all of the Top 20 Universities in the UK

Broadberry have worked with various departments in almost every university in the UK over the past 25 years.

Our enterprise-grade, affordable server and storage solutions have powered a wide range of projects from AI to archiving.

Key Numbers

3
Servers

16
Compute Nodes

512
Physical Processing Cores

1
First Intel Xeon Scalable Processor Solution delivered in the UK

Solution Specifications

Our accepted solutions was 3x Broadberry S2612BP Multi Node Servers configured for high processing performance.

Each Server Node: (4x Nodes per Server)

- 2x Intel® Xeon® Gold 6142 Processor - 22M Cache, 2.60 Ghz
- 12x 32GB 2666MHz DDR4 ECC Reg CL19 DIMM
- 2x 240GB Intel S3520 SSD's
- System Management Module
- ConnectX®-3 VPI adapter card, single-port QSFP, QDR IB (40Gb/s) and 10GbE, PCIe3.0 x8 8GT/s
- 4 Port 12G SAS Bridge Board (RAID 0/1/10) AHWBP12GBGB

Broadberry S2612BP Multi Node Server Specifications:

Chassis Dimensions	17.24" x 30.35" x 3.42"
Power Supply	2x 2130 W
Chassis Form Factor	2U, 4 node Rack Chassis
Target Market	High Performance Computing
Power Supply Type	AC

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Intel Compute Module

Performance Optimised for Compute Density

The Intel® Server Board S2600BP product family is a purpose built, rack-optimised server board ideal for use in hyper-converged, data analytics, storage, cloud, and high performance computing applications. Designed to support the Intel® Xeon® processor Scalable family and up to 16 DDR4 DIMM slots per server board (8 DIMMs per processor), the S2600BP family maximises memory and processor bandwidth to meet demanding compute use requirements.

Future-Ready Platform for the Multi-Cloud, Data-Fueled Enterprise

The S2600BP product family is built with the latest Intel® Xeon® processor Scalable family. This latest generation processor is designed for performance with high scalability and resiliency with no I/O compromise, and supports a wide range of existing and emerging workloads. The S2600BP product family uses a number of key processor advancements:
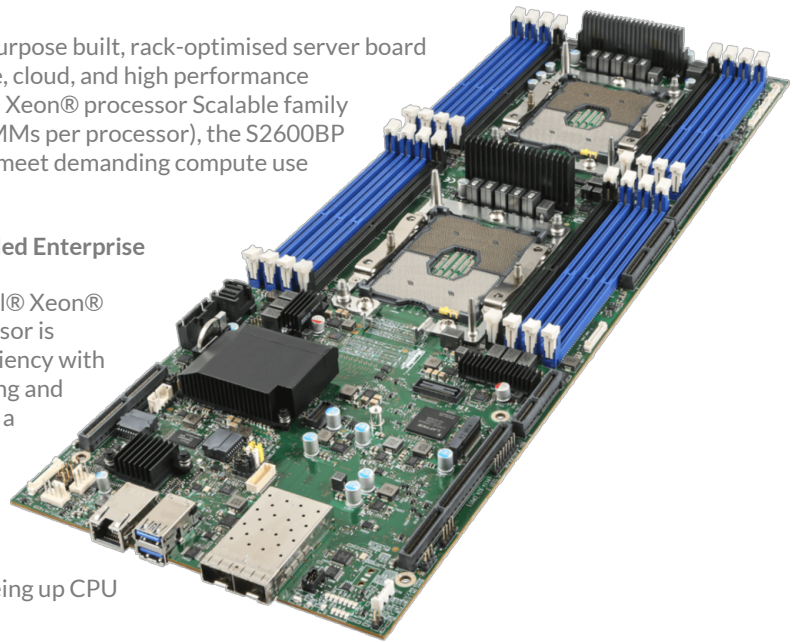
- Intel® QuickAssist Technology (Intel® QAT) delivers up to 100Gbps performance for authentication, public key functions, and compression/decompression workloads, while freeing up CPU cycles and reducing demands on the server.

- Intel® Omni-Path Architecture integration, delivering 100Gbps port bandwidth for improved performance and lower latency in medium to large clusters.

- Integrated 10G Ethernet with RDMA eliminates TCP/IP overhead by offloading transport to NIC for faster switching and packet filtering.

- Intel® AVX-512 enables tiering, de-dup, thin provisioning and exceptional processing of compute-intensive tasks.

Built with Intel Quality, Reliability, and Performance

Intel® Server Products are backed by Intel's design excellence and manufacturing expertise to deliver processing power with high levels of flexibility, manageability, and reliability. Product and design quality is paired with 3-year standard warranties and robust technical and incident resolution support to ensure customer satisfaction.

Accelerating Time to Market with Innovative Data Center Solutions

The S2600BP product family is a foundational component of Intel® Data Center Blocks. These fully validated, unbranded server systems include Intel's latest data center technology already optimized to work better together allowing partners to accelerate time to market with reliable data center solutions. The process of configuring and validating the components of solutions that are tuned to meet specific customer requirements is a complex and resource intensive process. Intel® Data Center Blocks based on the S2600BP product family can help reduce this complexity, making it easier to build innovative server solutions that can support the demands of today's data center workloads.

Discover the Benefits

| Density-optimised 2U rack server with high-speed networking and I/O | Future-ready platform for the multi-cloud, data-fueled enterprise | Accelerates time to market with innovative data center solutions |

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Trusted by the Worlds Biggest Brands

We have established ourselves as one of the biggest storage providers in the UK, and since 1989 supplied our server and storage solutions to the world's biggest brands. Our customers include:

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