CUSTOMER CASE STUDY

MTU Aero Engines

With energy-efficient, cost-effective servers and reliable service before and after purchase, Fujitsu has once again been able to provide MTU with a new Linux high performance cluster.

For MTU, the cost-effectiveness, excellent service and competent technical advice Fujitsu provides really set its HPC solutions apart.

At a glance

Country: Germany
Industry: Aviation / Engine Construction
Founded: 1934
Employees: 9,000
Website: www.mtu.de

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Challenge

To calculate air flow in engines, MTU, a longstanding German aircraft engine manufacturer, requires systems that provide good value for money for the necessary computing power over their entire lifespan. Energy costs, expected repair charges and the hardware prices play just as crucial a role in its decisions as the advice it receives on the systems required.

Solution

The high performance cluster provides the computing speed, reliability and performance MTU needs with 216 FUJITSU Server PRIMERGY CX2550 computing nodes and InfiniBand switches.

Benefit

- Low energy consumption
- Good value solution in terms of TCO
- Competent advice at all stages of the purchase, not only from the sales staff, but also the technical experts during the configuration, and a single point of contact for all service requests
- Fast Intel® Xeon® processors

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Customer

MTU Aero Engines AG is Germany's leading engine manufacturer. Its core business lies in low pressure turbines, high pressure compressors, turbine center frames and manufacturing and repair services. In the commercial sector, the company plays a key role in the development, manufacture and sale of high tech components for new engines as part of international partnerships. And in terms of commercial maintenance services, it is one of the top five global service providers for aerospace engines and industrial gas turbines. In the military sector, MTU Aero Engines serves as the system partner for almost all of the German Armed Forces' aircraft engines.

Products and services

- 216 x FUJITSU Server PRIMERGY CX2550 computing nodes with:
  - Dual socket, 2x CPU Intel® Xeon® E5-2680v3 12 Core/ 24 Thread 2.50 GHz 30 MB
  - Mellanox QDR Single Port InfiniBand ConnectX-3 HCA 40 Gb/s
  - SATA-DOM, 6 Gb/s, 64 GB, Enterprise 172 TBW
  - iRMC S4
  - 2 x 1 Gb/s Ethernet controller on Board
  - 128 GB RAM, DDR4, registered, ECC, 2.133 MHz, per node
  - 48 months maintenance
  - Customizing according to customer specs

Challenge

MTU has a total of four high performance computing clusters in operation. The company uses these clusters to calculate air flow for turbomachinery and aircraft engines, and so determine whether to position the compressor section before the combustion chamber or the turbine section. In computer aided engineering, it is vital to ensure that the necessary performance is provided at all times.
The Munich-based company has been using Linux HPC clusters since the turn of the millennium, and was one of the first industrial firms to do so. It therefore has many years of experience with components and systems. It chose Fujitsu to provide its most recent solution as it offered the most cost-effective HPC clusters for its individual use case. Both the upfront costs and the operating and electricity costs were taken into account as part of the decision. MTU currently has four parallel clusters in operation, three of which have been supplied by Fujitsu. The company values its independence: each year a cluster is tendered out, and MTU is open to solutions from all providers. It does not want to be bound by the form factor produced by a particular manufacturer – for example when it comes to rack design. With Fujitsu, it is on the safe side and can keep itself manufacturer-agnostic.

Solution

After every tender, the offers provided by each manufacturer are put through a thorough series of tests. As well as the price of the hardware, MTU also wants to check the availability of the components required. The energy costs for operating and cooling the devices also play a key role in the company's final decision. Energy consumption depends on the design of the system. Having a sophisticated cooling system means that less energy is required for the fans, but board development becomes more expensive. However, experience has shown that although this can lead to higher hardware costs, the increase is often balanced out by the drop in energy charges.

For this reason, MTU's tenders request the energy consumption in watts for a nominal load operating point and an idle operating point for each system. Then it calculates how many kilowatt hours the suggested installation requires. Fujitsu scored very well in this area. Service and maintenance costs also play a role when it comes to assessing the TCO. To estimate this, the company has to understand the precise configuration of the system. As well as customizing the BIOS settings to meet its customer's needs, Fujitsu also ensured that the firmware and BIOS versions were identical across the entire cluster, and provided stickers to indicate the customer's host names.

Benefit

Cost-effectiveness may be a decisive factor, but many benefits are seen long before and after the actual purchase. As early as the tender phase, MTU and Fujitsu discussed which components would suit the firm's needs. It was particularly helpful that MTU was able to ask these questions not only to the sales staff, but also the technical specialists. Regular technology briefings with experts helped MTU to decide the best moment to place its order for the systems. Another key advantage of the Fujitsu solution was the low amount of expenditure required when errors occur. One example of this is the analysis function for ECC storage error correction. The systems can detect when storage faults occur. MTU then simply calls Fujitsu, who in turn supplies drives that MTU can replace itself. Parts that need to be replaced more frequently are always kept in stock. The IT department therefore doesn't have to wait to receive a replacement part, and can instead send out a technician with the right module as soon as they receive the error message. So everything works in a single step.

For MTU, the cost-effectiveness, excellent service and competent technical advice Fujitsu provides for its HPC solution really set it apart.

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