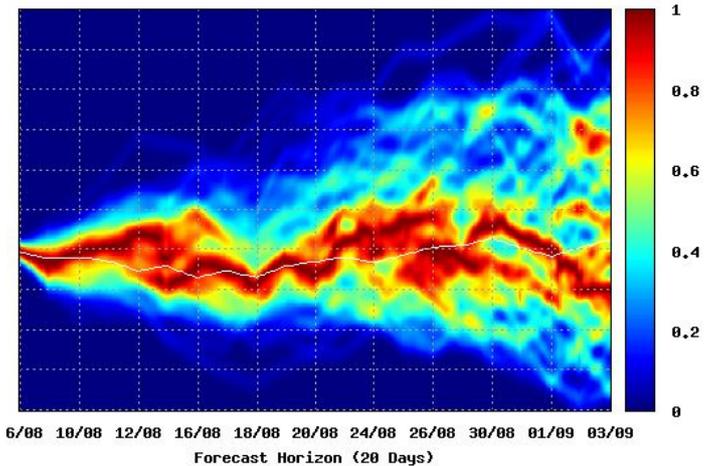


Case Study

Siemens Corporate Technology

» Thanks to Fujitsu, we have a stable, predictable and scalable HPC solution that is helping us make more accurate simulations of the copper and energy markets. This allows us to make the best decisions in a rapidly changing market «

Dr. Christoph Tietz, Senior Key Expert Engineer, Siemens AG, Corporate Technology



The customer

Siemens AG is a global powerhouse in electronics and electrical engineering, operating in the fields of industry, energy and healthcare as well as providing infrastructure solutions, primarily for cities and metropolitan areas. For over 165 years, Siemens has stood for technological excellence, innovation, quality and reliability. The company is the world's largest provider of environmental technologies. Around 40 per cent of its total revenue stems from green products and solutions. In 2012, revenue from continuing operations was €78.3 billion and income from continuing operations was €5.2 billion.

The challenge

Working in the field of electronics and technology on such a large scale, Siemens must purchase significant amounts of commodities such as copper. It also recently established a treasury division to trade commodities at its own risk. The company realised that if it could predict the market more effectively it could make big savings on procurement. Using 30 networked Linux workstations, it rolled out its own bespoke modelling application – Simulation Environment for Neural Networks (SENN) – designed to simulate the commodity markets.

“Commodity prices are essential to Siemens and can have a major impact on the procurement process. But calculating a single forecast is not enough because we must take into account so many variables. Instead we need to build multiple models for multiple scenarios, look at the distribution of results and establish the most probable outcomes,” explains Dr Christoph Tietz, Senior Key Expert Engineer at Siemens Corporate Technology. *“We were using a number of Linux workstations initially to perform these calculations but this posed a number of problems.”*

Firstly, the Linux workstations were a shared resource so Dr Tietz and his team could never be sure there would be enough computing power available. There were also reliability issues which affected performance. Moreover, because it was a heterogeneous mix of devices, it was impossible to tell how long it would take to complete any given task.

“We carry out most work over the weekend so we need to be absolutely sure that it will perform successfully without human intervention,” adds Dr Tietz. *“We realised that this diverse collection of Linux workstations just couldn’t provide the levels of stability and predictability we required.”*

The faster Dr Tietz and his team get results, the better they can understand the forecasts. Previously it would take three days to model a 20-day outlook based on 200 individual forecasts. Now it happens overnight. That enables Siemens to be much more responsive to volatile markets and unexpected events.

The customer

Country: Germany
 Industry: Technology
 Founded: 1847
 Employees: 370,000
 Website: www.siemens.com



The challenge

Siemens Corporate Technology wanted to install an HPC cluster that would enable it to more accurately predict essential commodity prices by performing multiple market simulations and forecasts.

The solution

Working with Fujitsu, it implemented an HPC solution based on 18 PRIMERGY BX900 blade servers, containing a total of 216 CPU cores. The cluster runs HPC Software PCM Fujitsu Edition and is linked to an ETERNUS DX60 storage array from Fujitsu.

The benefits

- Calculations can be performed three times faster, leaving more capacity to invest in refining the simulation models
- A 20-day outlook based on 200 individual forecasts would previously have taken three days to complete – now it happens overnight
- The cluster is more responsive to real world events, allowing Siemens to quickly incorporate data shocks into the modelling process
- The solution can be easily scaled, enabling Siemens to add new commodities, including gas, oil and aluminium, to the simulation process
- For more than three years the procurement and treasury divisions of Siemens use the forecasts as decision support instrument. This long business relationship is the perfect proof for the added value of the forecasts

The solution

Siemens Corporate Technology decided that a dedicated HPC cluster would solve its problems and allow it to process the complex calculations more quickly. It asked a number of companies to propose a solution; Fujitsu was selected because of the standard of its hardware, the added value services included and its collaborative approach. It was also the most cost-effective solution submitted.

"The other companies all came back with a very prescriptive, commoditised response, dictating what we needed. Fujitsu, on the other hand, were flexible and more interested in working together to design a system tailored to our specific needs," continues Dr Tietz. *"We had access to people who really knew their stuff and it was genuinely fun to work and learn together."*

Following six months of planning and design, the new HPC cluster went live in October 2011. It consists of 18 PRIMERGY BX900 blade servers, each containing 12 CPU cores. The cluster is housed in regular office space rather than a dedicated computer room, meaning Fujitsu and Siemens had to plan well for heat ventilation.

"The new cluster is stable and because it is homogeneous – running on the same kernels – we can predict exactly how long each simulation will take," says Dr Tietz. *"And we don't have to share the computing resource so we can use it to run our SENN simulations 24x7. That means we are getting a lot more done."*

The cluster runs HPC Software PCM Fujitsu Edition and is linked to an ETERNUS DX60 storage array from Fujitsu. The core OS is Red Hat Enterprise Linux. It is so reliable that it has not experienced any downtime in the year it has been up and running.

The benefit

The HPC cluster is delivering a faster, more reliable experience, enabling SENN to produce more accurate simulations. Time not spent in production is invested in refining the modelling process.

"It is three times as fast as the previous solution so we can perform three times as many calculations and still have plenty of capacity to put into making the simulations as accurate as possible," comments Dr Tietz. *"It's also giving us a better understanding of how the real world affects our models. There are some variables you just cannot predict, whether it is a political event or a natural disaster. We can now react to these much more quickly and build models that can cope with these 'data shocks'."*

"Our forecasts act as decision support for the procurement and treasury divisions," explains Dr Tietz. *"Since we installed the HPC cluster, we have received fewer complaints about the accuracy of our simulations. As far as I am concerned the best feedback is no feedback."*

Siemens Corporate Technology is currently using the Fujitsu HPC cluster to forecast copper and energy prices but is looking to expand gas, oil, aluminium and foreign exchange. As new commodities are brought on board, the company will increase the computing power accordingly by adding more blade servers and cores.

"Thanks to Fujitsu, we have a stable, predictable and scalable HPC solution that is helping us make more precise simulations of the copper and energy markets. We now know how accurate our forecasts will be and can put a percentage probability on various outcomes. This allows us to make the best decisions in a rapidly changing market."

About Fujitsu

Fujitsu is the leading Japanese information and communication technology (ICT) company offering a full range of technology products, solutions and services. Over 170,000 Fujitsu people support customers in more than 100 countries. We use our experience and the power of ICT to shape the future of society with our customers. Fujitsu Limited (TSE:6702) reported consolidated revenues of 4.5 trillion yen (US\$54 billion) for the fiscal year ended March 31, 2012. For more information, please see www.fujitsu.com

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