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A Switch in the Weather

By James Rogers | 05.25.04

The European Centre for Medium-Range Weather Forecasts is planning to upgrade its core network switches to support its research into the continent's climate.

Based in Reading, just outside London, the Centre forecasts the weather for all 25 European Union member states, up to 10 days in advance.

Not surprisingly, this is extremely data intensive, gobbling up 2 petabytes of storage and a bewildering array of servers. The infrastructure breaks down into three main parts at the ECMWF data center in Reading.

Processing power is provided by two large clusters of IBM Corp. (NYSE: IBM - message board) p690 servers running the AIX operating system. Each cluster contains 30 servers and 960 processors, with 4.2 terabytes of disk space.

A data handling system is responsible for storing all the meteorological data. This uses a total of 12 p660 and p690 servers from IBM. A storage area network and tape robots from both Storage Technology Corp. (StorageTek) (NYSE: STK - message board) and IBM are also deployed.

At the core of this is a high-performance network, built around two E600 Ethernet switches from Force10 Networks Inc. These are linked together by a trunk of four 10-Gigabit Ethernet connections. The Centre's server clusters and data handling system are then connected to the switches via four Gigabit-Ethernet connections.

However, the demands on the ECMWF to fine-tune its forecasts are constantly increasing, and the Centre is working on an upgrade of its switch hardware. This will involve the deployment of new E600s from Force10 Networks in September.

Matteo Dell'Acqua, head of the networking and computer security section at the ECMWF, says, "The new generation will enable us to support packet load-balancing, which we do not have today."

And the benefits?

The end result will be data transfer rates up to four times faster than is currently possible, meaning researchers will be getting much quicker access to information.

Clearly, things move quickly in weather forecasting. The two existing Force10 switches were only installed at the beginning of March this year, and went into production on April 21.

Previously, the EWMCF used two switches from another vendor at the heart of its network. "These were an old generation," says Dell'Acqua. "The switches would not have been able to meet our performance requirements."

"Instead, the Centre is thinking about deploying the previous switches on its general purpose network."

But what lessons did the ECMWF learn during the migration from another vendor to Force 10 switches?

As in most tricky IT projects, planning was key. "We had a project plan and we did it step by step," he says. This process will be repeated again in September.

"We will bring the new switches in and connect them to the existing switches. Then we will move the servers across from the old switches to the new switches one at a time."

With so many servers within the data center, this is a time-consuming job, and Dell'Acqua estimates that it will take about a month to migrate all the machines.

The ultimate goal: ensuring that the forecasts keep going out. "We have never missed a forecast in 25 years."

— James Rogers, Site Editor, Next-gen Data Center Forum

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