National Education and Research IT Provider Transforms Its Core Network for Massive Data Growth

Summary

Company:

CSC – IT Center for Science Ltd.

Industry:

Education

Business Challenge:

- Meet rising traffic demand by upgrading its core network to 100 Gbps
- Efficiently support large and growing volumes of customer data
- Deliver the most flexible and cost-effective solution

Technology Solution:

- MX960 3D Universal Edge Routers with MPC4E Modular Port Concentrators

Business Results:

- Achieved cost-effective upgrade to current network elements
- Delivered capacity and agility to deliver large amounts of capacity when customers need it
- Leveraged open standards to provide needed flexibility for interworking
- Simplified operational environment and ensured investment protection

CSC

CSC – IT Center for Science Limited is a state-owned Finnish company administered by the Ministry of Education and Culture of Finland. CSC develops and maintains the centralized research and education IT infrastructure for Finland and provides nationwide information and communications technology (ICT) services for education and research management, as well as libraries, archives, museums, and cultural organizations. It provides researchers with Finland's most extensive range of scientific software and scientific databases along with powerful supercomputers, data center facilities, and dedicated services for universities. CSC's infrastructure includes Funet, the Finnish national research and education network, which provides high-speed data network connectivity to its customers.

Business Challenge

CSC had been operating the Funet backbone at 10 Gbps, but traffic had steadily grown to the point where it needed higher throughput. Additionally, its users can have extremely demanding data requirements that make it challenging to accommodate peak demand. For example, a research project might need a huge increase in capacity at short notice.

"Our network is a crucial part of our services because it connects all of our customers to the services they need and to each other for collaboration," says Teemu Kiviniemi, development manager of the Funet network. "We have to support about 75 organizations and 370,000 users and the network underpins everything we do."

After researching a variety of options, CSC concluded that it needed to significantly upgrade the core Funet network, moving from 10 to 100 Gbps across its national backbone.

"Configuration is easy. We save a lot of time by using the same operational processes everywhere, for configuration, management, and monitoring."

Teemu Kiviniemi, Development Manager of the Funet Network, CSC – IT Center for Science Ltd.

Technology Solution

CSC had successfully deployed Juniper Networks technology to create high-speed networks across Finland, and it turned to Juniper once again to create its new core, using the Juniper Networks® MX960 3D Universal Edge Router, equipped with the MPC4E Modular Port Concentrator. These modular SDN-ready edge routers deliver over 10 Tbps of system capacity, high port density, and line performance, which are critical for cloud and data center deployments. The Juniper systems were provided by Cygate Oy,

a secure network and data center solutions provider. Cygate is a Juniper Networks Elite partner and has in-depth local expertise in Juniper's products to be able to deliver the required router hardware and capacity updates and extensions. Cygate also provides related support and replacement services for CSC.

CSC uses the MX960 routers to interconnect and provide access to all of its 75 customer organizations. They support both IPv4 and IPv6 traffic types and use MPLS to provide logical separation between different types of traffic (such as VPLS or Ethernet frames over MPLS), and to establish dedicated capacity between users, when required. "The rich set of protocols that Juniper offers gives us a lot of flexibility," Kiviniemi says. "Even more importantly, they are delivered using open standards, which is very important to us as we have to be able to interwork with many other networks and research organizations. We have a lot of experience with the Junos operating system and we've been really happy to see how the software and the hardware continue to develop, always offering us new features and functionality."

CSC had considered and in parts also used multiple 10 Gbps links, but the MX960 had the capacity to permit a native 100 Gbps solution. "Using the MX Series and MPC4E was the simplest and most cost-effective way for us to upgrade," Kiviniemi says. "We are state-funded, so our procurement process is very rigorous. Not only was the Juniper solution the most cost-effective, it also simplified design and avoided the need for multiple upgrades, which saved us time and operational overhead."

Business Results

CSC now has the capacity and agility to deliver large amounts of capacity as and when its customers need it. "Our aim is always to upgrade before we hit congestion and now we know we have enough capacity to confidently accommodate our customers' demands, even when they need a lot of capacity at short notice," Kiviniemi says. "The new MPC4E cards for the MX Series have over 10 times the capacity of our previous line cards, which is a very powerful upgrade path for the MX Series and we can still reuse all of our old 10 Gbps line cards in other systems. This is crucial, as a lot of our customers work with very large data sets and need to move terabytes or even petabytes of data."

CSC also uses MX Series 3D Universal Edge Routers for its customer premises equipment (CPE) solution. This has created a simplified operational environment, with a single OS and a common feature set from core to customer premise. "Configuration is easy," Kiviniemi says. "We save a lot of time by using the same operational processes everywhere, for configuration, management, and monitoring."

The MX5, MX40, MX80, and MX104 routers have a small form factor and easy license-based upgrade model, which is a real benefit. It allows CSC to deploy cost-effective capacity on its CPE, which it can upgrade from 1 to 10 Gbps capacity when it needs to without changing physical systems.

Next Steps

CSC currently offers 10 Gbps connections, but is already planning for 100 Gbps connections directly to customers. And the MX960 has the investment protecting capacity to provide even higher scale and throughput in the future, so CSC can be confident that the MX Series routers will continue to support CSC's needs, whatever its future requirements.

"We are very pleased with how this whole project has worked," Kiviniemi says. "Finland is a large, sparsely-populated country, so it's important that we can easily move huge amounts of data over the network rather than transporting hard disks. It means our customers can forget about the network and concentrate on the real work that they do such as research, education, and teaching."

For More Information

To find out more about Juniper Networks products and solutions, please visit www.juniper.net.

About Juniper Networks

Juniper Networks challenges the status quo with products, solutions and services that transform the economics of networking. Our team co-innovates with customers and partners to deliver automated, scalable and secure networks with agility, performance and value. Additional information can be found at Juniper Networks or connect with Juniper on Twitter and Facebook.

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