

German scientific R&D center builds next generation data center to manage 1PB a week data throughput



EXECUTIVE SUMMARY
CUSTOMER NAME · Deutsches Elektronen-Synchrotron (DESY)
LOCATION · Hamburg, Germany
INDUSTRY · Research
COMPANY SIZE · 1900 employees
BUSINESS CHALLENGE · Demand to analyze huge volumes of scientific data doubling every year · Existing networking resources unable to manage increase in demand
NETWORK SOLUTION · Cisco Data Center 3.0 · Cisco Data Center Networking · Cisco Nexus next generation data center technology
BUSINESS VALUE · Helps maintain DESY's international reputation for research excellence · Increases data center efficiency and cost effectiveness · Consolidates and rationalizes data center resources · Makes setting up a new application or provisioning server and storage resources easier and quicker

DESY, a leading center for research in particle physics and photon science, is using a Cisco Data Center Networking solution to help manage huge volumes of data produced by investigating atomic structure and reactions, and needed to analyze sub-atomic experiments at large particle accelerators.

Business Challenge

Deutsches Elektronen-Synchrotron (DESY), a research centre of the Helmholtz Association in Germany, is one of the world's leading centers for research in the structure of matter and for photon science. It develops and uses accelerators (smaller but similar to the Large Hadron Collider at CERN) and detectors for photon science and particle physics.

Research at DESY is at the cutting edge of scientific development. For example, PETRA III is a 2304 meter long ring accelerator for electrons and will be one of the most brilliant storage ring-based X-ray sources in the world. It concentrates a very high powered beam of light onto a single, tiny point to gather atomic level detail of cells and material construction. This research enables scientists to create, for example, a 3D image of a single virus to understand behavior better and develop more effective drugs, or film a chemical reaction to help improve processes such as solar energy production.

DESY is also part of CERN's LHC Computing Grid project – a worldwide network of computing centers charged with processing huge volumes research data that will be generated from LHC experiments. This, alongside data from its own research, has put huge demand on DESY's computing facilities.

DESY's data center facilities, located at its headquarters in Hamburg, handle around a Petabyte of data every week, the equivalent of the 10 billion user photos stored on Facebook.

But DESY estimates that demand is doubling every year. To meet this on-going demand, DESY needed to develop a powerful data center capacity.



Network Solution

Based upon the Cisco Data Center 3.0 vision for building next-generation data centers, DESY had deployed a Cisco Data Center Network solution using Cisco Nexus switches, Cisco's latest technology innovation in data center networking.

Cisco Nexus Data Centre switching has enabled DESY to deliver 10 Gigabit Ethernet today, and future migration to unified fabric in its data center, providing the organization with exceptional scalability, continuous operation and transport flexibility.

DESY also uses Cisco Wide Area Networks (WAN) to support external links to the data center. These include two, 10 Gigabit connections to the German research network DFN, a 10Gigabit link to DESY's site in Zeuthen (near Berlin) and a new 10Gigabit link to the German LHC Tier-1 Center in Karlsruhe.

In addition to the Cisco data center networking solution, DESY has also started to deploy a Cisco Unified Communications system comprising around 800 Cisco Unified IP phones and using the Cisco networking infrastructure to carry voice around the organization.

Dr Kars Ohrenberg, head of the communication networks group at DESY, says, "DESY wanted Cisco's data center networking expertise and technology because of our long history with Cisco, the excellent experience we've had regarding stability with the equipment, but also because of vision. The Cisco vision of the converged network brings everything together on a single, easy to manage infrastructure from basic file and print operations through to voice communication and the advanced data center solution we've recently deployed."

DESY chose the Cisco Nexus platform because it delivers the foundation for a next generation data center. It has given DESY a high density, 10Gigabit network backbone with more than 60 ports. Initially, it will enable DESY to integrate its fiber channel fabric with its data network and eventually replace fiber channel with 10Gigabit Ethernet to create a single, integrated network infrastructure for the whole organization.

"The Cisco data center networking solution is enabling DESY to manage the huge volumes of data that is and will continue to be demanded of our computing resources. The high performance, reliability and scalability that the Cisco technology delivers are a critical part of DESY being able to maintain its reputation in the research environment for speed, efficiency and excellence. I don't think we could have achieved this in a cost effective way without the Cisco Nexus platform."

Dr Kars Ohrenberg, Head of the Communication Networks Group, DESY

Ohrenberg adds, "Cisco Nexus is like a blank sheet. Although it comes with a lot of in-built functionality, it allows you to switch on only what you need for your particular requirement and implementation. That makes for a very simple and elegant design and makes it easy to use and manage."

The Cisco data center networking solution at DESY has been implemented by DESY IT staff and Cisco engineers with support from Dimension Data, a Cisco Gold Certified Partner.

Business Results

"The Cisco data center networking solution is enabling DESY to manage the huge volumes of data that is and will continue to be demanded of our computing resources," says Ohrenberg. "The high performance, reliability and scalability that the Cisco technology delivers are a critical part of DESY being able to maintain its reputation in the research environment for speed, efficiency and excellence. I don't think we could have achieved this in a cost effective way without the Cisco Nexus platform."

Continuing its adoption of the Cisco Data Center 3.0 strategy, DESY is planning to use its Cisco data center solution to begin virtualizing services such as data storage and servers. This will help to reduce costs further and increase agility. For example, setting up a new application or provisioning server and storage resources will be easier and quicker.

DESY has also seen additional improvement by making data center operations and management faster and easier. For example, because of the zero-service-loss architecture of Cisco Nexus switches, system and software upgrades and other maintenance operations can be done without any down time.



"DESY is an organization that manages a huge amount of data and the Cisco data center networking solution is very important in enabling us to do this.

We must have the kind of technology that provides high performance and reliability. There may be other vendors that could deliver something like this, but without Cisco we would not have achieved this cost effectively or have the benefit of Cisco's vision and strategy for a unified and consolidated data center networking infrastructure," says Ohrenberg.

PRODUCT LIST

Routing and Switching

- Cisco Nexus 7000 Series Switches
- Cisco Catalyst 6500 Series Switches
- Cisco Catalyst 4948 Switch

Voice and IP Communications

- Cisco Unified Communications Manager (CallManager)
- Cisco Unified IP Phones 7900 Series
- Cisco Unified MeetingPlace Conferencing System



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Printed in the UK

The Print Consultancy (01483 771211) / Jan 09