CISCO SYSTEMS

izn DATA STORAGE FACILITY CRITICAL TO GERMAN GOVERNMENT USES NEW TECHNOLOGY IN ORDER TO DECREASE OPERATIONAL COSTS RAPIDLY AND SUSTAINABLY

Customer

izn (Informatikzentrum Niedersachsen), the data centre and state network provider for central government ministries in Lower Saxony, Germany

Industry
Public sector:

Government

Business challenge

izn must increase data storage facilities while reducing government expenditure. To save on operating costs and standardise operations the decision was taken to consolidate multiple stand-alone storage networks with a single vendor. izn also wishes to use new Internet Protocol (IP) based technologies within the storage area network environment in order to offer more cost-effective services to government customers.

Storage solution

A Cisco Business Ready Data Centre has been deployed across two separate data centres for resilience: At each centre are dualled Cisco MDS 9509 Multilayer Director storage area network (SAN) switches using virtual storage area network technology (VSAN) for customer data separation. Each Cisco MDS Multilayer Director is connected by fibre channel to a mirrored director in the second data centre. The data centre is accessible via a WAN (Wide Area Network) MPLS (Multi Protocol Label Switching) backbone known as iznNet that connects 2,200 locations across Lower Saxony.

Business value

With the virtualisation of SAN facilities and the Cisco MDS Multilayer Director platform to manage instead of several disparate systems, overheads have been reduced and availability maximised with the result of raising the overall service-effectiveness. IP-based protocols will allow lower cost service options, allowing the introduction of price-differentiated services to match different classes of data.

Informatikzentrum
Niedersachsen
Landesbetrieb

"CISCO'S MDS IS AN IMPORTANT COMPONENT OF THE NEW BUSINESS MODEL USING NEW TECHNOLOGY, STANDARDS AND AUTOMATED PROCESSES TO REDUCE COSTS WHILE KEEPING SERVICES AT THE SAME LEVEL. JUDGED AGAINST A CONVENTIONAL DATA SOLUTION, WE CALCULATED THAT WE SAVE FIFTY PERCENT OF COSTS IMMEDIATELY JUST BY INTRODUCING THE MDS SOLUTION."

HERR GERHARD HEINZE, HEAD OF DATA CENTRE, izn

As part of the drive to reform government administration in Lower Saxony the izn data centre is to massively increase the amount of critical data that it stores while cutting costs. The centre handles many different applications and systems, but Cisco's MDS Multilayer Director technology with its open standards enables the consolidation of data onto a single platform while allowing the partitioning of applications into virtual storage area networks. This will result in a noticeable reduction of operational costs.

A public service

Founded in 1997, izn is the Hanover-based, state-owned central provider of IT services for the state of Lower Saxony, the second largest of the German states. Spread across the wide north German plain, this state accounts for six of the 69 seats in the Bundesrat, the regionally-based upper House of Parliament.

izn is responsible for the computer network used for public administration by central government departments across the state – currently 2,500 connected locations – and a highly secure data centre covering 1,400 square metres.

As well as operating the data centre and the state network, the 420 employees at izn provide software development and hardware procurement, IT training and consultancy services for central government customers.

Information regarded as mission critical is stored by izn. Each Ministry decides what should be stored according to administrative procedures, or the nature of the information itself.

Historically, storage systems were assigned to specific applications and the data centre holds separate data stores in closed systems for Ministries such as Finance and the Interior and applications such as ERP (Enterprise Resource Planning). The five main suppliers used for storage equipment were EMC, Fujitsu Siemens, HP, IBM and Hitachi Data Systems (HDS).

izn understood that providing technical support of multiple vendor equipment is expensive and difficult. The consolidation of systems would streamline operations and reduces the manpower required for administration. izn decided, therefore, that both ministry-specific vertical applications and generic applications like enterprise management systems should be processed and stored within the data centre on a single consolidated platform.

Solving crime and keeping cash flowing

Herr Gerhard Heinze, head of data centre, izn, explains just how important business support applications, like accounting and cash systems, are. "The data centre runs every single accounting transaction made by the government of Lower Saxony. Several billion euros a year are transferred through the data networks. It is vital, therefore, that the data centre is available 24 hours-a-day, every day. If data processing stopped here, the lights would go out in Lower Saxony."

Arguably the most business-critical applications are the payment system for 16.000 users and a police application for filing records. There are also statistical, financial and tax management systems.

izn provides police officers in Lower Saxony with real-time access to information that allows them to tackle crime collaboratively across the state. 18,000 officers using 11,600 workstations have access to data previously stored separately on local servers and at the police headquarters in Hanover. Integration into the HDS platform has already reduced operational overheads and makes the fight against crime far more efficient.

Another vital facility at izn is the state land registry (LGN) containing the digital cadastral (public record) register for tax administration and statistics. Altogether izn administers 40 Terrabytes of government administrative data.

German reformation

A major restructuring of government administration in Lower Saxony is under way. Public offices are being closed down and new ones built. At izn where each ministry had separate links into the data centre, the process of centralisation to reduce costs meant a new Cisco MPLS network reaching 2200 locations was completed in 2002. The same principle is being applied to data storage as ministries are encouraged to store critical applications in a single secure storage facility.

A state-owned company like izn is under scrutiny for the way it uses taxpayers' money: izn has to work carefully and effectively. Gerhard Heinze, head of the data centre izn, and of control and planning of large-scale systems, explains: "Data storage is expensive to maintain. When all the storage area networks are standardised, work will be done much more cost-effectively."

He summarises izn's objectives. "We decided to consolidate several systems into one and bring about seven fundamental improvements:
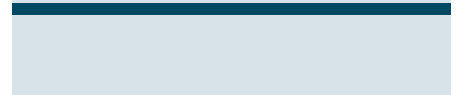
- decrease cost

- higher data transfer rates inside the storage area network

- greater high storage capacity

- more efficient usage of storage

- flexibility – storage on demand

- higher scalability

- increase of availability of the overall system

"Instead of different storage systems being assigned to particular computers or servers, a common technology will make data available to all authorised computer users," says Heinze.

Identifying the solution

Having decided the strategy, the search was on for a high performance infrastructure solution for the new SAN to connect some 250 servers to the storage network. Many weeks were spent on market analysis and evaluation.

Herr Erik Krex, who has technical responsibility for the storage project, explains how they approached the challenge: "We considered what kind of applications our customers wanted, the number of users using the applications and what kind of infrastructure would be needed in the future."

"CISCO CONVINCED US, SO WE BOUGHT A CISCO SYSTEM. DIFFERENT PRODUCTS WERE TESTED WITHIN THE DATA CENTRE AGAINST BENCHMARKS OF RELIABILITY, SPEED OF TRANSFER, INTEGRATION OF VSAN TECHNOLOGIES AND AVAILABILITY. ANALYSIS SHOWED THAT CISCO HAD THE RIGHT PRODUCT FOR THE JOB."

HERR GERHARD HEINZE
HEAD OF DATA CENTRE
izn

With network and data storage technology converging, specialists in these areas appreciated that they had much in common. Cisco's relationship with the network department at the izn led to introductions to data storage managers and to a series of workshops where the concept of Cisco's Business Ready Data Centre was introduced. izn managers presented their requirements. Once issues like redundancy, integration and scale had been agreed, Cisco submitted a storage area network (SAN) design.

Heinze says, "Cisco convinced us, so we bought a Cisco system. Different products were tested within the data centre against benchmarks of reliability, speed of transfer, integration of VSAN technologies and availability. Analysis showed that Cisco had the right product for the job."

A painless deployment

Cisco's Customer Advocacy specialists were on hand to assist with the integration. Krex found the process remarkably easy. He says: "We talk the same language as Cisco and we developed the solution together, working as a team. The Cisco people were on hand when we needed them."

A test solution was run with a connection to the HDS storage area. Response times for the data to be written from the servers to the storage racks were checked, as was reliability of the data. Installation went without a hitch. Krex explains: "There was not much time to do any testing as our operations must run 24/7 without a break. We had to build it, complete a pre-configuration and get it running. The whole SAN implementation process went quickly and without problems."

In the first step the SAN will link four Cisco MDS 9509 Multilayer Directors in a dualfabic constellation at two locations to:

• two Hitachi Data Systems (HDS) Lightning 9980V, the main existing disk storage environment

• three HP servers that hold NIVADIS, a central police database

• eight IBM PMV servers.

The existing SAN platforms in the data centre are being connected to the MDS in a phased implementation, with the HDS facility the first to be linked.

Krex says: "Everything went ahead well. The products were brand new, but we could build basic functionalities without any problems. It was really easy. Other competitors have a long way to go before they can offer a solution out of the box. It really impressed us. We had thought that a switch or interface at the centre of our systems could be a weak point, but everything is running very well."

Storage – an extension of the network

Just as virtual private network (VPN) technology provides secure dedicated resources and availability for different customer groups in a multiple-customer network, in the SAN environment virtual SANs on the MDS Multilayer Director platform provide a similar function. Storage has become an extension of the network itself and Cisco is providing an end-to-end Business Ready Data Centre solution.

While risk has been reduced, the availability of the overall SAN services has been increased. izn has built an extraordinarily reliable environment with two separate facilities in which storage area networks are identically configured and all data generated and processed is automatically mirrored.

Each of the four Cisco MDS Multilayer Directors, doubled in each of the two centres, has a redundant chassis, power supply and management hardware as well as doubled fibres between the two devices on each site.

One important function of the SAN is to copy data as quickly as possible. In an emergency each of the centres is able to run all procedures and applications independently.

Savings for the tax payer

izn will reduce government costs by scaling up operations to manage far more data – much of which is still held on individual desktops – at less cost. izn is consolidating a number of application-specific islands onto the larger shared SAN infrastructure which is able to support and manage multiple applications, hosts and storage devices. Many small applications have to be kept separate for security reasons so for izn the most important function of the MDS Multilayer Director is its capability to create virtual SANs (VSANs).

The Cisco MDS 9509 uses VSAN technology exclusive to Cisco to partition storage area networks logically. This allows multiple applications to be reliably stored in a single physical infrastructure, effectively creating a large SAN that is built of small SANS each suited to the storage requirements of different applications. This approach provides a huge increase in scalability, allowing izn to grow rapidly in line with government requirements.

Krex recalls: "The creation of separate virtual SANs proved to be quick and easy using Cisco's methodology. The VSAN routing features on the MDS make it easier for storage area network managers to segment and control storage traffic. Adding switches or changing configurations does not disrupt all the devices on the network."

VSAN technology increases overall availability of the SAN topology by using logical separations. A hardware problem in one VSAN, e.g. failure of an HBA in one server, doesn't have any impact on other logical VSANs.

"The Cisco Business Ready Data Centre model provides a high level of robustness which other suppliers still have to achieve. Software and hardware from different manufacturers can be safely handled."

"THE CISCO BUSINESS READY DATA CENTRE MODEL PROVIDES A HIGH LEVEL OF ROBUSTNESS WHICH OTHER SUPPLIERS STILL HAVE TO ACHIEVE. SOFTWARE AND HARDWARE FROM DIFFERENT MANUFACTURERS CAN BE SAFELY HANDLED."

HERR ERIK KREX
OPERATIONS & PLANNING DATACENTER
izn

Heinze explains: "Cost savings and reduction of administration are the main aims. At the same time we want to introduce standard processes for change management and the provision of storage capacity throughout the entire system. Within a centralised system it should be easy to achieve high standards and facilitate workflows." A group of specialists is to be exclusively responsible for the assignment of storage space, configuration changes and expansion in the new storage area network.

Heinze says: "Cisco's MDS is an important component of the new business model using new technology, standards and automated processes to reduce costs while keeping services at the same level. Judged against a conventional data solution, we calculated that we save fifty percent of costs immediately just by introducing the MDS solution."

New connections

Traditionally SANs are built on fibre channel. "This protocol performs well. We use it to link storage facilities and production servers. But other protocols are planned for the future," says Krex.

Because Cisco's MDS Multilayer Director is protocol-neutral it can be adapted to new standards like iSCSI (Internet Small Computer Interface System) to connect servers to an IP network. Hard disks can be moved into a storage area network without reconfiguring remote servers, allowing smooth migration towards a data centre where services like back-up can be carried out centrally. Krex says: "We built the MDS with eight iSCSI ports so that it will be easy to build iSCSI communications to make cost savings for smaller systems. Cheaper connections mean cheaper systems."

As more ministerial data applications are transferred to the data centre, more ports are required. The MDS is modular, and has the capacity for bundled fibre channels for greater scalability. New ports are easy to add. Krex explains: "We have not yet activated all ports. We are currently running per MDS switch 2x16 fibre channel ports plus two blades for the management, and 8 iSCSI blades. But we plan to expand all four MDS to their total capacity, comprising 64 fibre channels and 16 IP ports."

Later, fibre channel over IP (FCIP) services will be introduced. Historically, data centre connections required dark fibre or SDH (Synchronous Digital Hierarchy) circuits, but with FCIP it is possible to benefit from the IP network and extend the potential distance between data centres, a huge advantage when linking stores of dispersed data for mirroring or processing.

The Cisco Business Ready Data Centre is helping izn to adapt to changing government requirements, making it possible to offer its customers distinctive services with appropriate performance levels. Once the multiple systems and storage mediums have each been consolidated, izn will offer service options priced according to the type of data that is stored.

Eventually there will be a maximum of three storage systems, differentiated by performance and price, with the most critical data stored in the highest performing system. Krex explains how this will work: "We have several components which are linked over the SAN infrastructure, and we have storage systems split into different levels. We need to be able to show this graphically so that they can be managed and billed to customers. Cisco tools are making this possible."

More immediately, the MDS Multilayer Director platform offers a rapid return on investment and operational costs. Heinze says: "Improving our working processes has clearly visible and positive economic results for izn – all done as a result of MDS Multilayer Director systems."

CISCO SYSTEMS

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
      800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco.com Web site at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic
Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy
Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal
Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden
Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe