Solution Facts

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Swisscom Mobile focus on virtual tape solution

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The leading Swiss provider of mobile telecommunication services, Swisscom Mobile, has migrated the data protection of its two data centers in Bern and Luzern to the virtual tape solution CentricStor from Fujitsu Siemens Computers. The Fibre Channel over IP (FCIP) connected cross-location storage solution not only considerably reduces the time window for the mobile phone company's backup: distributed redundancies and cache mirroring based on CentricStor's Grid Architecture now also ensure maximum disaster resistance, plus they considerably reduce administration and maintenance costs. As the general contractor, Fujitsu Siemens Computers was also responsible for integrating CentricStor into the existing IT infrastructure at Swisscom Mobile.

CentricStor:
Disaster protection
spanning over two sites

Swisscom Mobile, a subsidiary of the very successful Swiss telecommunications company Swisscom, operates two data centers at Bern und Luzern, 120 kilometers apart. *"It wasn't easy to find a suitable storage solution that precisely meets our requirements by resolving capacity, performance and availability issues as well as the location problem"*, says Christian Kattenbusch, responsible as Head of Common IT Services at Swisscom Mobile for the company's SAN and backup infrastructure.

The CentricStor Virtual Tape Appliance fully met the requirements of the mobile telecommunication service provider, and the migration of backup to CentricStor was concluded at the end of November 2006. *"That was a great challenge for our project team, but everyone involved is more than happy now"*, sums up Kattenbusch.

The heart of the backup and restore implementation is a CentricStor model VTA 4000, with identically configured components installed via the CentricStor Grid Architecture in both data centers in Bern and Luzern. The locations are connected by a high-capacity DWDM glass-fiber cable (Dense Wavelength Division Multiplexing). Four FCIP connections, each providing nominal 1 Gbit bandwidth, are available to geographically extend the grid of CentricStor. Compression increases the capacity of the line to 4 x 2 Gbit. The cross-location redundant backup takes place via this glass-fiber network, but both locations can also operate completely autonomously in the event of a local disaster.

CentricStor not only enables the parallel writing of redundant tape media in two geographically separated tape libraries, but also the mirroring of cache data from both locations. The use of Automatic

Mobile Unlimited from Swisscom Mobile for connections anywhere

Failover, Cache Mirror and Dual Save results in the maximum possible system redundancy, so that all data is also directly available for a restore via the virtual interfaces in the event of a fault. At present, the cache capacity for both locations is approximately 60 TB and designed for a storage-resident data volume of two to three working days. Swisscom Mobile plans an extension to 100 TB, increasing the resident storage of the compressed cache data to five working days.

"This configuration gives us maximum fail-safety and permanent data availability – even when a location fails completely", says Kattenbusch. But business continuity and disaster recovery were not the only key considerations when Swisscom Mobile started thinking about purchasing a virtual tape storage solution.

"In 2005 we could already see that we were pushing the limits with our traditional tape processing and that is why we gave some thought to it in an early stage", explains Kattenbusch . Like almost all companies, Swisscom Mobile also has a rapidly increasing volume of data. More important even than the capacity bottleneck foreseen by the IT department was system performance: with a growing data volume, a tight time window was the most pressing problem for data backup. Necessary restore processes could no longer be effected timely, because all the tape drives were busy handling long-lasting backup jobs.

The requirement was that about 90 percent of the backup had to take place at night between 8PM and 6AM, processing enormous amounts of data: *"On average we back up 30 TB every night at an average data rate of 850 MB/s; we have Oracle databases, which each account for more than 5 TB and the backup of a single complete test environment can achieve 17 TB"*, says the Swisscom expert. *"During the day, our production systems are no longer burdened with any backup and CentricStor manages all the restore jobs directly during working hours. Since the current backups of our test databases are resident available in the cache, restore can be done in the shortest time possible."*

Guaranteed data availability with the central administration of backup and restore, with lower maintenance costs

CentricStor is based on a highly efficient virtual tape technology (True Tape Virtualization), which provides universally integrated disk-to-disk-to-tape backup for all company data. The complete virtualization of tape processing is integrated in a fully transparent manner between the application and backup servers on the one hand, and the physical tape libraries on the other. The large number of CentricStor interfaces, both at the front and back end, support mainstream backup applications on market-leading system platforms as well as the prevailing tape automation environments.

"Using the modular CentricStor Grid Architecture the solution can not only be flexibly scaled according to the customer's data growth requirements and reconfigured during operations", says Gilbert Huber, Special Sales CentricStor Enterprise Business at Fujitsu Siemens Computers in Switzerland.

"The system architecture is also particularly suited for installation at the two separate Swisscom Mobile locations, connected by an optical glass-fiber solution on the basis of Cisco 9216 Multilayer Fabric Switches. We have implemented the replication and transparent mirroring of data between data centers over a distance of some 120 km (70 miles) for the first time ", says Huber.

IT Service Manager Kattenbusch is convinced of the advantages of cross-location virtualization. *"CentricStor offers the speed advantages of disk storage for all our systems in Bern and Luzern, coupled with the robustness and capacity reserves of tape storage. The redundant configuration, which automatically ensures the availability of our data, even if a location fails completely, could not be implemented with other comparable solutions."*

Kattenbusch also names further reasons in favor of the Virtual Tape Appliance: *"Our maintenance and administration costs have been reduced in the same way as licensing costs, since the systems are now utilized optimally "*, says Kattenbusch.

Swisscom Mobile

swisscom mobile
Go far. Come close.

With approximately 70% market share and about 2,400 employees, Swisscom Mobile is by far the largest provider of mobile telecommunication services in Switzerland. More than four million customers make use of Swisscom Mobile's country-wide network. The Swiss market leader has received several technology awards for its leading mobile services.

Mobile Unlimited from Swisscom Mobile combines five technologies for wireless data transmission: HSDPA, UMTS, EDGE, GPRS and WLAN. It is possible to use all five technologies with a single PC card. As in a car with automatic transmission, gears are changed automatically as soon as a faster speed is available. In this way, Swisscom Mobile customers are automatically and securely connected to the fastest available broadband technology of their current location. Mobile Unlimited is the world's first product to enable seamless handover - in other words, an automatic, seamless and uninterrupted exchange between the various transmission technologies. In addition to the Unlimited PC Card 5in1, Unlimited Laptops, including notebooks from Fujitsu Siemens Computers, can also use these mobile phone technologies.

For all Swisscom Mobile customers with mobile TV compliant devices, the 100 second edition of Swiss TV News, produced specially for mobile phones, is fed into the mobile network. After about one month the service had already recorded more than 40,000 subscriptions and is thus more popular than downloading ring tones and games for mobile phones.

Compared with a classic extension of two high-capacity tape libraries, the CentricStor-based solution costs only marginally more, but offers a multiple of functionality and security. Instead of the previous eight dedicated tape libraries, Swisscom Mobile now only needs two Scalar i2000 tape libraries – one per location, each with 1,200 slots and six LTO Ultrium 3 tape drives. This not only reduces the hardware, media and service costs, but also the previously required expenses for administration and the failure rate of the tape physics. And Kattenbusch now has a substantially greater degree of flexibility, as the backup at the front end takes place absolutely independently of the tape physics. Archiving of tapes, configuration changes of tape libraries or the relocation of capacities are possible at all times during ongoing operations. *"We also measure progress by the reduction in the number of failures, which of course also greatly relieves the workload of our support staff"*.

A project of this magnitude and complexity could only be successfully accomplished with the close cooperation of everyone involved. Its distributed system over two locations makes Swisscom Mobile a technological pioneer: no experience was to hand with regard to latency, throughput and performance for mirroring tape data via an FCIP connection over a distance of 120 kilometers. *"When we started, this was still a new technological territory. There were no reference projects"*, says Kattenbusch. Cisco Systems, which has worked together successfully with Swisscom for years, came on board as network specialist. And with Fujitsu Siemens Computers as the general contractor, all technical issues were quickly resolved. *"We didn't just buy the pure hardware, but a complete solution from a competent partner. We wanted one point of contact only – and that has also worked really well"*, says the Head of Service.

Group-by-group migration of the server and client backup to the new environment went smoothly. Data that had to be archived long term on account of statutory requirements was simply read from the old tapes and backed up anew with CentricStor. In the meantime, Kattenbusch has tested the reliability of the system in extensive tests: Load tests, simulated cable breaks, failure of an automated tape library and simulated power failures, right through to total location failures put the solution through its paces.

"The system runs in a stable and trouble-free manner. Even the failure of a tape library did not influence the backup servers. CentricStor autonomously processes the data accumulated in the internal cache. We of course always hope that no faults will occur, but when they do, fail-safe operation is vital to a telecommunications company. With our CentricStor solution we are now more than prepared for every emergency", says the storage expert. He is also contemplating an extension: *"We are currently considering whether we can further increase capacity and performance through an additional CentricStor system of a similar type, so that we can meet future Service Level Agreements (SLAs), particularly as data volumes will also increase in future and because the requirements made of Swisscom Mobile can change at any time."*

CentricStor –suitable solution for complex IT infrastructures

The technological leading-edge offering of mobile services that Swisscom Mobile provides to more than four million customers needs an appropriately comprehensive IT infrastructure. Key applications are the Siebel CRM system and the billing application based on Oracle Infranet. About 1,000 employees in the call center and a further 5,000 users in local partner shops are connected to the CRM system alone. An SAP system is also used for billing. In addition, there are also several hundred smaller systems, such as the Internet servers, 320 Oracle databases and historically evolved special applications for various tasks. Therefore, the hardware landscape is aligned to the various user requirements: in addition to approximately 300 Windows servers, around 800 servers are in use running Solaris, HP-UX and Linux.

The opportunity to use with CentricStor up to 500,000 logical volumes of various sizes for all connected operating systems supports Swisscom Mobile's heterogeneous IT landscape in an optimal way. *"We have set up thousands of logical volumes and are now experimenting with optimal sizes. However, this isn't a problem at all, because CentricStor enables both volume configuration and cache optimization during ongoing operations"*, says the Swisscom expert. *"The flexibility of CentricStor allows us to agree differentiated SLAs for tape backup. We have now defined SLAs for our top 30 applications – both for regular operations and in the event of disaster recovery"*, concludes Kattenbusch.

Published by:

Fujitsu Siemens Computers
Infrastructure Products
Storage Business
storage-pm@fujitsu-siemens.com
http://www.centricstor.com/

Company stamp

http://www.fujitsu-siemens.com/