Solution-Soft

Two Large German Banks Merge
Time Machine® Meets Challenges & Needs in Major Migration & Consolidation Project

About the Customer

The newly combined entity is the leading bank for private and corporate clients in Germany. With the segments Private Clients, Mittelstandsbank, Corporates & Markets, Central & Eastern Europe as well as Asset Based Finance, the bank offers its customers an attractive product portfolio, and is a strong partner for the export-oriented SME sector in Germany and worldwide. With the merging of the two banks in 2009, they now have a total of some 1,200 branches, resulting in the densest network of branches among all private German banks. It has above 60 sites in more than 50 countries and serves approximately 14 million private clients as well as one million business and corporate clients.

Technical Challenges

After two large German banks merged, one of the primary goals was to consolidate the combined servers and applications. This meant the two previously separate banks would have to merge, migrate & consolidate over 1600 applications from the combined banking systems. Adding to the complexity of their situation is they run more than ten different operating system versions and, additionally, they use Microsoft's Active Directory (AD) for LDAP directory services, single sign-on, and domain authentication across many of their systems the latter of which further complicates date & time testing. Their goal to complete this project was set at eighteen months!

One of the requirements for merging the two financial institutions was that their IT processes must be able to handle numerous date & time events. As with any banking organization, the applications running at both entities process a vast number of temporal events daily, weekly, monthly etc… These range from loan maturity dates, monthly billings, and interest calculations and on and on. Therefore, testing of all time & date logic across the breadth of their applications was clearly necessary to verify the migration & integration of the software services from the merger of the two banks.

In general, running date, time, time-zone and duration-triggered event tests can be complicated at best due to difficulties that arise from changing the system time such as database reloads, backup problems, file time stamps issues and more. Adding Active Directory in fact eliminates the ability to do any forward date testing as AD's explicit use of Kerberos for domain authentication requires that every machine in the network has its system time no more than five minutes offset from the Domain Controller's (DC) time. Simply put, if the system time difference between any machine and the DC is more than five minutes, that machine is locked out of the network.

Some of the specific obstacles needing to be addressed by a solution for the customers testing:
- Requirement to test all core applications which run on multiple OS platforms
- Need for software testing solution that allows "time travel" without changing the system time
- Managing the changes to future dates across hundreds of servers
- The solution must be able to provide virtual clocks within an Active Directory environment
- Need flexibility in the licensing model across all platforms

One quote from the customer summed all this succinctly "What we need for some upcoming tests is some software that allows us to "time travel" without changing the system time."

Time Machine Solution

The customer presented the date & time testing challenge to their on-site consultancy firm. As it turned out, this group has had many successful experiences using Time Machine with other migration projects around the globe and so recommend Time Machine as a solution. After a very large scale proof of concept evaluation, Time Machine was chosen.

Implementation

SolutionSoft Systems' Time Machine provided the now combined large banking organization an easy process for integrating all data, applications, and servers.

In late December 2009 the Bank agreed to the solution suggested by their consultant and purchased Time Machine for all their UNIX, Linux, & Windows testing platforms, nearly 1200 servers.

The project was streamlined through the use of Time Machine, decreasing valuable time and increasing productivity in the application testing process of the integration. As the software allows running simultaneous Time & Date testing scenarios the customer immediately saw an overall cost savings on manpower, hardware & software costs.

Incorporating Time Machine into their test strategy they were able to:
- Meet all project requirements to test core applications running on multiple platforms
- Time-travel all applications to any & all required future dates
- Streamline their testing process and duration

Customization Required for the Implementation
- **RPC control of Solaris Virtual Zones**

At the request of the client Solution-Soft provided an extended mechanism to allow the control of virtual times & dates within and local to a specific Solaris Local Zone. Previously all virtual clocks were global across all Solaris zones and controlled from the master zone. This was due to the shared kernel architecture that is fundamental to the design of Solaris Zones. Solaris Local Zones are a type of server virtualization from SUN Microsystems.

- **Global Time Management**

The customer had a further request that managing the changes to virtual clocks across many machines should be an easy & secure process and would apply the changes simultaneously on how ever many machines were specified. Solution-Soft provided a SSH layer process to allow this. This gave the bank the ability to control the virtual date across many machines from a single console.

Conclusion
SolutionSoft System's Time Machine provided the now combined large banking organization an easy process for integrating all data, applications, and servers. The bank utilized Time Machine across all their UNIX, Linux, & Windows testing platforms with more than 500 servers. As a result, the 1,200 applications were tested successfully and the project was finished within the 18 month deadline.

Time Machine allows your entire testing infrastructure to be dynamically encapsulated in a "Virtual Time", thus providing the ONLY solution to perform effective date & time testing in a secure environment