SYBASE®

European Southern Observatory

"THE SAVINGS ARE STAGGERING. THIS TRANSLATES TO ABOUT 1,000 ROUND TRIP AIRFARES (PLUS GROUND TRANSPORTATION PLUS ACCOMMODATIONS AND SUPPLIES) BEING SAVED. THAT'S ABOUT $2.6 MILLION."

—DR. PETER QUINN, HEAD OF THE DATA MANAGEMENT AND OPERATIONS DIVISION, EUROPEAN SOUTHERN OBSERVATORY

CUSTOMER SUCCESS STORY

INDUSTRY

- Life Sciences

SYBASE TECHNOLOGY

- Adaptive Server® Enterprise (ASE)
- Replication Server®
- Sybase IQ

BUSINESS CHALLENGE

- Achieving robust and instantaneous database management and replication at transcontinental distances.

KEY BENEFITS

- Saves about $2.6 million in travel costs
- Provides real-time services for mission-critical, transaction-intensive applications
- Improves query performance

The European Southern Observatory, a multinational organization that conducts astronomical research, wanted to accelerate space exploration by circumventing the negative effects of weather. Using Sybase® technology, it revolutionized the operations of ground-based astronomical observatories, allowing scientists to complete research up to 10 times faster.

BUILDING A SCIENTIFICALLY USEFUL DATA ARCHIVE

European Southern Observatory (ESO) was formed in 1962 to construct and operate astronomical observatories in the southern hemisphere and is funded by 11 European countries. Among its earlier achievements was observing and snapping pictures of the Shoemaker-Levy 9 comet crashing into Jupiter, which made world headlines in 1994.

With its four telescopes poking skywards on 7,800-foot Paranal Mountain in Chile's Atacama Desert, whose brilliantly clear skies and aridity are ideal for star-gazing, ESO is revolutionizing the operations of ground-based astronomical observatories.

Half a world away in the northern hemisphere in an urban research park near the Munich airport, ESO's Data Flow System (DFS) is critical to efficiently using telescope time at Paranal Mountain and to building a scientifically useful data archive.

The combination of telescope and database has eliminated what is known as the "weather lottery" among astronomers and cosmologists. Rapid weather variations and inclement weather are reasons why the U.S. National Aeronautics and Space Administration (NASA) launched the Hubble Space Telescope into orbit 380 miles above the Earth in 1990: the weather lottery that makes it a sometimes-you-win, sometimes-you-lose game with earth-bound telescopes isn't a factor with a telescope in space.

Initiated in 1999, DFS is built on a collection of data management tools, databases, and software processes. The end-to-end flow of information from this array drives astronomical observations and stores the data in ESO's science archive. Data from the archive became publicly available worldwide in early 2005 to benefit the international research community. This development makes ESO a leader in creating the Virtual Observatory concept.

SYBASE KEY TO ESO RESEARCH

Driving DFS is a trio of key Sybase technologies. Sybase Replication Server manages multiple data management platforms with bi-directional, heterogeneous replication and synchronization across enterprise, client/server, desktop and mobile systems. Sybase IQ is a highly scalable data analytics engine optimized for query performance in business intelligence and large data warehouses. Sybase Adaptive Server Enterprise (ASE), the third in the trio, is a data management platform that provides real-time services for mission-critical, transaction-intensive applications.

"Robust and instantaneous database replication at transcontinental distances [Munich is about 7,000 miles from the ESO observatory] is critical," said Dr. Peter Quinn, head of the ESO's data management and operations division. The capacity to react rapidly to changing conditions, to two-way information flow across multiple times zones, and to address operational problems at the observatories is essential.

"SERVICE OBSERVING" SAVES MILLIONS

DFS stores, processes, combines and distributes data. It works so intelligently there's no need even for an astronomer to travel to ESO's Chilean telescopes to make observations in the traditional way.

To do this, Quinn employs "service observing." With this approach, astronomers use computer software to design their observing programs where they are. Once complete, they're transferred over the Internet to ESO headquarters, where they're checked before being transferred using Sybase technology and stored in local databases. Given the right weather conditions, the observations are executed. The data is then transmitted back to ESO in Munich. After processing and checking for quality, the data is forwarded to the originator.

"The European astronomical community has been extraordinarily enthusiastic about this new approach," Quinn said. Service observing is working so well for ESO that other ground-based observatories in the world are implementing the system for themselves.

Quinn's stellar work has led ESO to win a 21st Century Achievement Award, the highest award possible, at the 2005 Computerworld Honors announced on June 6 in Washington, D.C. The combination of technologies that bypasses the vagaries of weather is unexpectedly raising productivity levels and return on investment (ROI), and saving time and effort.

The savings translate to $2.6 million a year for travel alone. In terms of time, researchers can complete their work 10 times quicker, for example, taking one year instead of 10. A turn-round of that magnitude not only boosts productivity, it also releases the scientist to uncover more answers. With more research at hand for worldwide collaboration among scientists, the concept of the Virtual Observatory is being realized, increasing scientific return on investment.

"The savings are staggering," said Quinn, noting that ESO supports about 1,000 users sessions each year. "This translates to about 1,000 round trip airfares (plus ground transportation plus accommodations and supplies) being saved. That's about $2.6 million."

DISCOVERING NEW WORLDS

In April 2005, ESO confirmed that an international team of astronomers had discovered an exoplanet—a planet outside our solar system—five times the mass of Jupiter. The exoplanet is gravitationally bound to a young brown dwarf, an elusive object too massive and hot to be classified as a planet, but too small and cool to shine as a star.

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