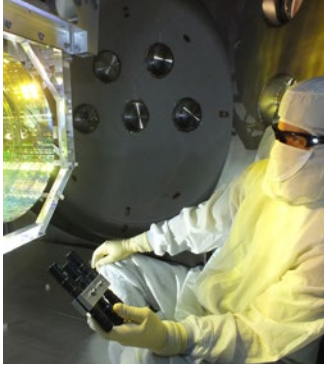

LIGO is a national facility for gravitational-wave research, providing opportunities for the broader scientific community to participate in detector development, observation, and data analysis.

LIGO CALTECH RELIES ON NEXSAN AND WESTLAKE TECHNOLOGIES TO OBSERVE THE GRAVITATIONAL WAVES OF COLLIDING BLACK HOLES

CUSTOMER OVERVIEW

The Laser Interferometer Gravitational-Wave Observatory (LIGO) is designed to open the field of gravitational-wave astrophysics through the direct detection of gravitational waves predicted by Einstein's General Theory of Relativity. Among their prolific projects is the operation of the twin Laser detectors, located in Livingston, La. and Hanford, Wash. The LIGO Observatories are funded by the National Science Foundation (NSF) and were conceived, built and are operated by Caltech and MIT. Recently the LIGO detectors discovered gravitational waves which indicated the merger of two black holes that resulted in a single, more massive spinning black hole. The successful results of their endeavors confirmed Albert Einstein's 1915 general theory of relativity.
.

CHALLENGE

Einstein's theory was such a radical idea at the time, it has taken 100 years to devise a way to develop, test, analyze and measure the physical reality of gravitational waves. Gravitational waves are "ripples" in the fabric of space-time caused by such powerful universal processes as colliding black holes, exploding stars and even the birth of the universe. These ripples travel at the speed of light through the universe and carry information about their origins as well as clues to the nature of gravity.

The proving of Einstein's general theory of relativity takes precise measurements, and massive volumes of data. In fact, this project has already resulted in 6.4 PB of data comprised of more than 1.7 Billion files of raw instrument data and analytics processing information, all contained in a central data archive.

For large, data-intensive processing like this, a storage solution that delivers high performance, capacity and reliability was critical. It was also important that the LIGO project implement a storage solution that delivered high density and power efficiency to both optimize its storage footprint and save on power and administration costs.

SOLUTION

To meet the high-capacity and reliability needs of the LIGO project, LIGO turned to its strategic partner, Westlake Technologies Inc. (WTI). WTI supported Caltech's storage implementation for the Infrared Processing and Analysis Center (IPAC) at Caltech that performs data intensive processing tasks for NASA's infrared astronomy program. For IPAC, WTI recommended Nexsan storage solutions for their high efficiency and reliability. Given their superior performance for IPAC, WTI turned again to Nexsan to support the needs of the LIGO project.

NEXSAN

1445 Lawrence Drive
Thousand Oaks, CA 91320

866.4.NEXSAN
www.nexsan.com

NEXSAN

> Nexsan and Westlake will be with us on this continued exploration of colliding black holes, neutron stars and hopefully many other exciting unexpected discoveries."

STEPHEN B. ANDERSON
SENIOR RESEARCH SCIENTIST
LIGO CALTECH

"Nexsan delivers one of the most robust storage portfolios to achieve the innovative storage, protection and management of valuable data," said William Allen, Consultant, Westlake Technologies Inc. "The Nexsan E-Series and BEAST storage solutions are total workhorses, with the long-term value LIGO needs for its data intensive research projects. We've deployed over 26PB of Nexsan solutions for Caltech's research operations, between LIGO and IPAC at Caltech over the course of nine years and our customers are very happy with the support they have received."

For the Caltech LIGO implementation, WTI provided various Nexsan solutions, beginning with the SATABEAST architecture, on to Hybrid offerings, as well as the current solution set of Nexsan E-Series storage systems. The Nexsan systems are used as block storage devices and managed by the LIGO team under Stuart Anderson. Stuart's team connects the Nexsan units to the data archive which stores volumes of raw instrument data and analytics information. The Nexsan E-Series storage solutions can be deployed with a mix and match of HDDs and SSDs to optimize LIGO's capacity, performance and cost requirements. The Nexsan storage systems offer LIGO capacity optimization for high reliability at an affordable price as part of a tiered data archive that includes flash and tape storage managed by the Oracle Hierarchical Storage Manager software.

"Just like the 'Energizer bunny,' Nexsan storage just keeps going and going. They are unquestionably great solutions that are easy to install, manage and use," added Jennifer Manzano, CEO of Westlake Technologies, Inc. "Together, Nexsan and WTI have a great mix of superior technology, support and expertise. That gives LIGO the reliable support, high-performance solution and service they need for their data-intensive research projects."

RESULTS

Today, Caltech continues to achieve new levels of storage performance and reliability with its Nexsan solutions, boosting their storage ROI with scaling capacity and controlled infrastructure and energy costs. The research organization expects to continue to leverage the high value of Nexsan storage solutions as they continue to explore other cataclysmic events in distant universes.

"The discovery of the gravitational waves from the merger of two black holes opens a new window on the universe by beginning the era of observational gravitational-wave astronomy," said Stuart B. Anderson, Senior Research Scientist, LIGO Caltech. "We will continue exploring the next wave of uncharted territory as we continue to improve the sensitivity of the LIGO instruments and probe ever further out into the Universe. Nexsan and Westlake will be with us on this continued exploration of colliding black holes, neutron stars and hopefully many other exciting unexpected discoveries.".

ABOUT NEXSAN

Nexsan™ is a global leader in unified storage solutions that are focused on seamlessly and securely enabling a connected workforce. Its broad solution portfolio empowers enterprises to securely manage, protect and utilize valuable business data – while allowing users to sync, share and access files from any device, anywhere, anytime. www.nexsan.com.

NEXSAN

1445 Lawrence Drive
Thousand Oaks, CA 91320

866.4.NEXSAN
www.nexsan.com