



FOUNDRY
NETWORKS

CASE STUDY: USC INFORMATION SCIENCES INSTITUTE

Foundry Helps Research Institute Accelerate Technological Innovations



SUMMARY

The University of California's Information Sciences Institute (ISI) is one of the world's leading research centers in the fields of computer science and information technology. ISI is actively engaged in a broad spectrum of information processing research, as well as being heavily involved in the development of advanced computer and communication technologies.

OBJECTIVE

USC and ISI have always been on the forefront of academic and information science research. Many of the Internet's standard protocols, for example, were initially tested within the USC and ISI networks. Having a history of innovation, ISI continues to prove its technological prowess. ISI's research and tests of advanced bandwidth-intensive applications such as grid computing, artificial intelligence, embedded programming, and others will help shape technology's future.

As a leader in information technology, ISI demands a high-performance network that matches the brain power and creativity of its users. Because the network supports diverse applications—from a homeland security test bed and cluster computing to garden-variety administrative applications—the network must be secure, reliable, and robust.

“What makes our network unique is that we are not only running a high-performance computing lab,” says Richard Nelson director of computing at ISI. “We are also supporting bread-and-butter, daily business activities.”

SOLUTION

To keep the ISI network running at peak performance, ISI relies on Foundry equipment. Foundry devices have been a mainstay in the research center's network since 2002. The ISI network connects to the University of Southern California wide area network at 10 Gigabit Ethernet (10GbE) through a Foundry BigIron® 8000 router.

Within the ISI local area network, a FastIron® SuperX switch transports 10GbE to each floor of ISI's 12-story building. FastIron Worgroup X series switches carry Gigabit Ethernet to the desktops throughout the building. To prevent network bottlenecks, ServerIron® balances traffic loads across the servers. The entire network is managed, configured, and monitored by IronView® Network Manager, which also helps ISI detect and prevent network intrusions.

The powerful ISI network supports approximately 350 users and 1,000 ports.

WWW.ISI.EDU

INDUSTRY

Education/High-Performance Computing

COMPANY DESCRIPTION

The University of Southern California's Information Sciences Institute (ISI) is a major contributor to the nation's information technology knowledge base, and it is actively engaged in a broad spectrum of information processing research, as well as the development of advanced computer and communication technologies.

OBJECTIVES

- Deploy a high-performance network to support the research institute's bandwidth-intensive applications such as grid computing, artificial intelligence, computational science, and advanced networking
- Interconnect with USC network over a high-speed connection
- Implement a standards-based network solution that can easily support a complex, evolving heterogeneous environment

SOLUTIONS

- Foundry BigIron 8000 routers connect ISI to the USC wide area network at 10 Gigabit Ethernet
- Behind the BigIron routers, a FastIron SuperX switch distributes 10GbE to each floor of the building where FastIron Worgroup X series switches carry Gigabit Ethernet to the desktops
- ServerIron balances traffic loads across the servers
- IronView Network Manager helps ISI detect and prevent intrusions, as well as configure and manage the network devices

RESULTS

- ISI is able to preserve its network investment and reduce total cost of ownership because Foundry equipment maintains its overall value as networking technology advances
- Because Foundry devices are easy to maintain and configure, ISI can manage more computers in multiple offices with minimum staff
- With Foundry equipment in the network, ISI can sustain a flexible, complex environment that supports multiple device manufacturers and protocols
- IronView Network Manager and IronShield help detect and prevent network intrusions and attacks

RESULTS

Because of ISI's complex environment of Linux, Macintosh, and Windows-based clients, the research institute must have a network based on open standards with interoperable devices. With a constantly evolving environment, ISI needed network equipment that would easily adapt to equipment, user, and application changes.

"Foundry absolutely plays well with the other devices in our network and helps us maintain a heterogeneous environment. We don't know what people will throw at us in terms of projects or equipment," explains Nelson. "In a research environment you are exploring the frontiers, and you must be able to respond quickly. A proprietary device may prevent you from meeting your customers' needs. Foundry is not a barrier to our pursuit of excellence."

Robust, reliable network performance helps ISI excel. With Foundry in the network, ISI can easily support bandwidth-intensive applications such as grid clustering, application modeling, video streaming, and other research projects. The JetCore-based BigIron 8000 has a switching capacity of 220 million packets per second, and it can scale to as many as 232 Gigabit Ethernet ports, 28 10 Gigabit Ethernet ports or 672 10/100 ports.

"Foundry equipment allows us to easily scale as our needs change. We have a strong backbone that gives us a lot flexibility to support new switches with no problem at all," says Nelson. "Foundry has been very simple for us to manage, and it gives us better performance—allowing me to provide more value to my customers and users."

Foundry networking solutions combine superior performance with extensive management features. ISI can easily manage its multifaceted network with a two-person, part-time IT team. "We can accomplish more with Foundry devices in the network," says Nelson.

Configuring, administering, and monitoring the network is straightforward with Foundry IronView® Network Manager. The flexible INM allows the team to use a command-line interface or a Web-based interface to administer the network.

"Many IT people still want to type in commands via a serial line," says Nelson. "We also have a group who likes the Web interface and the new security and network tracking features."

Using the recently added Snort, INM combines Snort and sFlow to monitor network traffic in real time and to detect dangerous payloads and suspicious anomalies. These security features, combined with IronShield™, help protect ISI from denial-of-service attacks.

"Adding Snort to IronView has made it much more compelling and interesting," says Nelson. "We like that IronView is based on open standards so that we are not bound to a more expensive proprietary world."

ISI expects its long-standing relationship with Foundry to continue well into the future. Foundry has been able to support ISI's stringent requirements and its advanced technological needs, while keeping costs at a minimum. Nelson is particularly pleased with Foundry's focus on protecting ISI's network investment.

"When not first to market, Foundry is best to market. They comply with standards and upgrade their firmware to keep pace with technology," says Nelson. "Foundry's attention to these details helps customers preserve their investment and support a competitive TCO."

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— Richard Nelson,
Director of Computing Information
Science Institute
University of Southern California,
Viterbi School of Engineering

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