

Anatomy of a Successful IPv6 Integration: Bechtel

Federal agencies that are planning for IPv6 integration can learn from the experience of Bechtel, a global engineering, construction, and project management company with headquarters in San Francisco, California. The Bechtel National business line is a leading service provider to the U.S. government, and specializes in large, complex projects in such areas as defense, space, energy, security, and the environment.

In 2005, Bechtel embarked on integrating IPv6 into its network infrastructure and applications, with the goals of supporting new types of applications and services and enabling more rapid project mobilization at temporary job sites, including disaster scenes. "Employee training and assistance in IPv6 planning were critical to getting the initiative properly launched," says Fred Wettling, a Bechtel Fellow and the company's technology strategy manager. Therefore, Bechtel engaged Cisco® and its partner Command Information to acquire their respective expertise in networking and IPv6 integration.

Bechtel's project goals matched those of federal government: to preserve as many existing IT investments as possible and not interfere with critical day-to-day business operations.

Viewing the Operation from a Network-Centric Perspective

The first step for Bechtel was to understand the impact of IPv6 on IT, operations, and the business model. Working with Cisco and Command Information, Bechtel identified numerous ways that it could take advantage of IPv6 peer-to-peer and autodiscovery capabilities to improve operational efficiency and competitiveness, including:

- Helping field engineers verify that current construction matches blueprints. Engineers will be able to walk the construction area wearing helmet-mounted cameras and using handheld computers that the wireless network automatically recognizes.
- Setting up temporary job sites more quickly by eliminating the need to provision a wired network and electricity. Now Bechtel simply places wireless Cisco routers with Power over Ethernet in the trailers at job sites. The routers are instantly recognized by the IPv6 network and begin delivering voice, video, and data services.
- Rapidly setting up command posts for emergency response. Field personnel will be able to use handheld devices to receive real-time video feeds and monitor data from IPv6 sensors for everything from wind speed and chemical levels to the pulse and blood pressure of workers in a hazardous environment.

Gradual Process Minimized Disruption

At the outset of the planning process, Bechtel decided to make the transition to IPv6 gradually instead of all at once. The migration was planned so that all global IPv4 and IPv6 network devices and applications could coexist for as long as necessary – a method called the dual-stack approach.

Bechtel began by confirming that IPv6 worked in a lab environment. Next it conducted a pilot rollout in the production environment. The phased approach gave Bechtel the confidence that IPv6 was stable, manageable, and secure, and also helped the company roll it out rapidly in other locations.

Integrating IPv6 into the Network

“Rather than establish a separate effort to adopt IPv6, we decided to include IPv6 as part of our regularly scheduled hardware and software upgrades and application certification processes,” says Wettling. Most Cisco hardware and software has supported IPv6 for several years. Therefore, rather than replacing foundation network devices, Bechtel generally just needed to make sure that the devices had adequate memory and were running a version of the Cisco IOS® Software that supports the IPv6 capabilities that are important to Bechtel, such as security features.

Transitioning Applications

As part of the Bechtel standard application certification, the company began testing its applications – both commercial and internally developed – for IPv6 compliance in an environment that has end-to-end IPv6 connectivity. Now, all applications used at Bechtel must be able to operate in an environment running IPv6 before they can be released into production. Applications are configured to use IPv6 transport if it is available and IPv4 if it is not.

Migrating Without Disruption

Although much work remains, Bechtel and its partners are pleased with the results so far. “Bechtel and Cisco testing indicates that the IPv6 solution is working technically as expected,” says Dave West, director of field operations for the Federal Division of Cisco. “The transition process from IPv4 has been transparent to Bechtel end users, which is one of the company’s goals.”

Wettling concludes, “By making IPv6 a part of our everyday work, we can proceed with the IPv6 integration with little additional cost or effort. These early days of IPv6 are like the early days of the Internet, when many business managers asked, ‘Why pursue this? What can this really do?’ The answer, unknown at the time, was everything from instant news and e-commerce to blogging and video-sharing sites. For IPv6, this is only the beginning of big things to come.”

To read the full case study, visit www.cisco.com/web/strategy/docs/gov/bechtel_cs.pdf.

To watch a Webcast, visit www.cisco.com/go/semreg/federalipv6/155533_1.

To read a white paper on Bechtel’s IPv6 integration, visit www.cisco.com/web/partners/pr67/pr41/docs/C11-439724-00_PlanningandAccomplishingtheIPv6Integration_v2.pdf.



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