County Government Capitalizes on Network to Improve Public Safety and Quality of Life

EXECUTIVE SUMMARY

Arlington County, Virginia

- Local government
- Arlington County, Virginia, USA
- 200,000 residents
- 26 square miles

BUSINESS CHALLENGE

- Protect public safety
- Expand e-government services
- Close the digital divide

NETWORK SOLUTION

- Deploy a reliable, secure fiber-optic network
- Deliver voice, video, and data to public safety field personnel

BUSINESS RESULTS

- Increased network stability by 30 to 50 percent
- Increased situational awareness for first responders
- Provided connectivity to nonprofit service providers and schools
- Improved community quality of life

Arlington County, Virginia built a highly reliable Cisco network to improve first responders' access to information and increase service effectiveness.

BUSINESS CHALLENGE

Located directly across the Potomac River from Washington D.C., Arlington County, Virginia covers 26 square miles and serves nearly 200,000 residents. As home to the Pentagon and Ronald Reagan National Airport, Arlington County often attracts national attention. Its fire and police departments were first to arrive at the Pentagon on September 11, 2001, for example, and in the following weeks the county's incident commander assumed control of operations for emergency response.

ARLINGTON
VIRGINIA

Figure 1: Arlington County Logo

Top priorities for Arlington County are public safety, expanding and extending the reach of e-government services, and economic development. "Nearly half of our population is under 40 years old and tech-savvy, and they demand online government services and outdoor wireless access," says Christopher T. David, chief technology officer. The remainder of the population is diverse, and the county is committed to bridging the "digital divide" by providing network access to citizens who cannot afford it at home.

The Arlington County IT department had nearly completed its design for a new network to replace its leased lines when the events of September 11 transpired. Arlington County reworked its network design with a renewed emphasis on the reliability and availability required to deliver vital citizen services during times of emergency.

NETWORK SOLUTION

Arlington County built its new fiber-optic network based on Cisco network solutions, which provide the reliability that public safety agencies require. "When we deployed the Cisco foundation infrastructure, we immediately experienced a 30 to 50 percent increase in stability across the entire network compared to using T1 leased lines," says David.

The county extended the network to one agency at a time, beginning with its ten fire stations in January 2002, trade centers and water pollution control sites in February 2002, and the Department of Human Services (DHS) in March 2002.

By June 2002, just 228 days after the first agency connected to the network, all 40 county sites were enabled. In 2005, Arlington extended its network to the City of Alexandria, which lies outside the county boundaries, to facilitate interagency collaboration. Now public safety agencies in the two jurisdictions can use the network to share criminal databases, Geographic Information System databases, and more.

The Cisco network can carry voice and video as well as data, creating new process efficiencies that improve public safety and citizen services. For example, the fire department uses Cisco video solutions to broadcast a real-time training broadcast directly to each fire station, avoiding the time and expense of creating and delivering ten copies of a videotape. “First responders can watch the training at any time, at any location with access to the government network,” says David. “This is a far more effective process for public safety education.”

Effective emergency response in today’s world requires a combination of “guns, hoses, and technology,” according to David. During emergencies, the county IT department supplies the technology component by deploying either a mobile command vehicle or smaller “crash cart” to the emergency scene, providing instant wired and wireless connectivity for voice, video, and data. The technology command vehicle and crash cart provide the Cisco technology to connect via the fastest connection available at the site: Ethernet, satellite, DSL, wireless, or even dial-up. Cisco IP phones facilitate communication throughout the chain of command. “By providing commanders in any location with greater situational awareness through voice and video, the crash cart and mobile command vehicles avoid the need to deploy the entire chain of command to the scene,” says David. “They enable a more distributed approach to emergency management. Wireless connectivity, in particular, is enabling us to de-tether public safety personnel from their desktops by making all information, applications, and voice services available from the field.” The crash cart has already been used in several emergencies, including an anthrax scare.

Individual government agencies are taking advantage of the Cisco network to increase their own service effectiveness. An example is the Arlington County DHS, which works with a multitude of human service providers, primarily nonprofit organizations that provide services to homeless shelters, battered-women shelters, advocacy services, outreach services, and others. Previously, many of these organizations had very limited networking capabilities, impeding their effectiveness and also making it difficult for the DHS to meet myriad reporting standards in response to state and federal requirements. DHS provided connectivity at low cost by equipping each partner site with a cable modem that connects service organizations to the local cable provider’s network, which in turn connects to the county network. As of early 2006, DHS had connected nine organizations comprising 22 individual sites. “The Cisco network solution helps us meet our goal for cost-effective delivery of community-based human services,” says Tim Tomlinson, chief of automation services for the DHS.

Wireless access benefits citizens as well as county employees and service providers. Arlington County offers all residents and visitors free wireless access from public areas such as libraries.

“The Cisco network enables us to deliver more government services—more reliably and securely than ever before. It truly is an enabler for smart growth.”

— Christopher David, CTO, Arlington County

BUSINESS RESULTS

The mobile command vehicle and crash carts serve an important role in the county’s public safety strategy by delivering actionable information, including voice, video, and data, to first responders. “Situational awareness is paramount for public safety,” says David. “The more information that we can provide to the field—and the more information that field personnel can provide to the incident commander—the better the outcome.”

The standards-based IP network enables interagency collaboration among Arlington County and public safety agencies in nearby Fairfax County, Montgomery County, Louden County, and the District of Columbia. Approximately 80 agencies reside within a 50-mile radius.

PRODUCT LIST

Routing and Switching
- Cisco Catalyst 6509 switches
- Catalyst 4500 switches
- Catalyst 3500 switches
- Cisco 3800 Series routers in crash cart

Broadband Cable
- Cisco Universal Broadband Router (UBR) 7200
- Cisco UBR 925
- Cisco Cable Modem Termination System (CMTS)

Content Networking
- CiscoWorks
- Cisco Information Center

Security and VPN
- Cisco Intrusion Detection System
- Cisco PIX firewall appliances
- Cisco VPN solutions

Storage Networking
- Cisco IP/TV video servers

Voice and IP Communications
- Cisco CallManager in crash cart
- Cisco IP phones in crash cart

Wireless
- Cisco Aironet wireless access points

The county is taking advantage of its Cisco network to deliver new services to meet citizen demands. For example, interested citizens can sign up to receive updates about public-safety information delivered over the Arlington County Community Alert System network to their e-mail inbox, personal digital assistant, cell phone, or the scrolling banner at the bottom of their automobile's satellite radio. To date, over 14,000 citizens have enrolled. Similarly, during emergencies, county employees can stay informed by watching a news channel that is broadcast to their PCs using the Cisco IP/TV solution.

Providing free connectivity at libraries helps bridge the digital divide. Cisco networking technologies may also help make the county a more attractive destination for conventions. When the Department of Economic Development began planning a new convention center, it approached the IT department for ideas on how network technologies such as streaming video and wireless might give the county a competitive edge in attracting groups.

The county considers its Cisco network infrastructure an important enabler for "smart growth," a fundamental tenet of local economic development. "We support smart growth, rather than growth at any cost, to attract and retain residents and businesses," says David. Most people think of smart growth as considering whether new construction meets citizens' needs. Another aspect, equally important, according to David, is ensuring that the network infrastructure provides the reliability and stability to enable the county to increase its service effectiveness.

Arlington County schools also benefit from the government's fiber optic network. "When government and schools share the network, they avoid redundant costs and processes," says David. The county's Gunston Middle School takes advantage of the network to offer a program called Gunston@Home, which provides students with online broadband access to educational materials, using the county's network. Its goal is to address the achievement gap by enabling all students to have equal access to educational resources from home.

NEXT STEPS

The reliable, available network positions Arlington County to introduce new voice, video, and data services as the need arises. For example, the Arlington County Water Authority is reformulating its water pollution control plan to include network-based sensors for monitoring chemical levels, water pressure, and more. Sensor data could be sent over the network, so that it can be monitored constantly, enabling the Water Authority to detect and correct irregularities more quickly. Public safety agencies are investigating using their Cisco Outdoor Wireless solution in conjunction with Global Positioning System devices to monitor first responders' physical locations, not only in terms of their longitude and latitude, but also their elevation—that is, their current floor in the building.

"The Cisco network enables us to deliver more government services—more reliably and securely than ever before," says David. "It truly is an enabler for smart growth."

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Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

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70119/AT/AC/03.06
Printed in the USA Lit # C36-338221-00