



## Water Agency Improves Network Availability and Halves Complexity

### EXECUTIVE SUMMARY

#### CUSTOMER

San Antonio Water System

#### INDUSTRY

State and local government

#### EMPLOYEES and CUSTOMERS

- 2000 employees
- 365,000 individual customers or households

#### BUSINESS CHALLENGE

- Improve network availability and critical work order database performance
- Maintain operation costs while managing increasing customer growth and service demands
- Alleviate bandwidth constraints at the network edge without purchasing new equipment

#### NETWORK SOLUTION

Cisco Routed Access solution; Layer 3 routing capability for the wiring closet

#### BUSINESS RESULTS

- Halves network complexity and reduces network management burden
- Reduces new service implementation costs by 25-30 percent
- Doubles bandwidth, eliminates congestion, and improves network security with minimal capital outlay

**San Antonio Water System uses Cisco® Routed Access to make the most of their network equipment investment.**

#### BUSINESS CHALLENGE

The San Antonio Water System (SAWS) is a public utility owned by the city of San Antonio, Texas. Its mission is to provide quality, reliable water and wastewater service at a reasonable cost. The agency's 2000 employees are responsible for maintaining the water system infrastructure such as wells and pumps, supplying quality drinking water, collecting and treating wastewater, and planning the best use of current and future water resources for one of the fastest-growing metropolitan areas in the United States.

SAWS senior network engineer Darrin Gannaway works hard to ensure that customers get the best value and service for their money from his agency. Five years ago, SAWS replaced its aging token ring network with an end-to-end Cisco® Ethernet IP network to improve customer communications and service access. The SAWS Cisco IP network connects central office departments and resources with 19 remote office locations.

Over the past two years, network utilization in all 20 locations expanded significantly due to the city's growth and service demands and to the introduction of more bandwidth-intensive desktop applications. Of most concern, SAWS began to have intermittent problems with its Maximo database application that runs the pivotal work order tracking and resolution system. The bandwidth-intensive application would stop working when network capacity dropped below certain levels.

Gannaway needed a way to create more available bandwidth between the backbone and floor distribution switches throughout his enterprise network. But his standard options—buying additional fiber-based cards to add to the modular switches or buying more powerful switches at locations where the existing switches were already at capacity—would severely strain his limited operations budget.

#### NETWORK SOLUTION

While attending a local Cisco seminar, Gannaway learned that he could double his network bandwidth without having to purchase new equipment by deploying Cisco's Routed Access solution. Routed Access uses Layer 3 routing in the wiring closet, thereby unifying common protocols, troubleshooting commands, and training.

**“Routed Access eases our management burden, gives us more control over our security at the network edge, lets us convert resources to a common Cisco IOS software platform, and makes it much easier to implement new projects.”**

Darrin Gannaway, Senior Network Engineer, San Antonio Water System

Gannaway says, “I was just so impressed with what I heard at the seminar that I wanted to try it right away, so I developed a design and gave it to Cisco and my engineers to review. Then we set up a pilot test, but it worked so well in testing that we actually rolled it out fairly quickly.” The entire process from inception to deployment took less than three months.

Gannaway’s SAWS network had been running Layer 3 routing protocols on Cisco Catalyst® Series core switches and Layer 2 routing protocols on Cisco Catalyst Series access or wiring closet switches. For network resilience, the core switches were dual-homed, or connected, into the floor distribution switches: one link carried traffic, the other served as a hot backup link. However, the backup link was essentially an idle unused resource.

By upgrading the Catalyst switch software to support routing in the access layer, Gannaway was able to employ both active and redundant links at the same time.

Routed Access uses either Cisco’s versatile proprietary Layer 3 Enhanced Interior Gateway Routing Protocol (EIGRP) or the standards-based Open Shortest Path First (OSPF) to provide routing services in the wiring closet or access layer. Gannaway and his staff are pleased with the routing protocol’s ability to run different types of traffic on every device and to support unequal traffic load balancing when needed. He notes, “Routed Access with EIGRP halves our configuration, management, and troubleshooting efforts.”

The Routed Access solution also offers Gannaway more flexibility in the event that a switch fails.

Unlike Layer 2 Spanning-Tree and trunking protocols that require significant advance route planning, the built-in intelligence of the Layer 3 EIGRP dynamically figures out the best alternative path and reroutes traffic automatically.

#### Product List

##### Switching and Routing

- Redundant Cisco Catalyst 6500 Series Switches
- Redundant Cisco Catalyst 4500 Series switches
- Cisco Catalyst 3550 Series switches
- Cisco 3700 Series multiservice access routers

## BUSINESS RESULTS

Gannaway says that everything in the SAWS network environment, whether it is a router or a switch, now relies on routed Layer 3 technology. The benefits are significant.

- **Halves network complexity and saves headcount**—Gannaway says that he has saved on manpower with Routed Access because he is no longer forced to spend resources solving time-consuming Layer 2 Spanning Tree protocol problems. The unified Layer 3 routing solution streamlines applications and simplifies management, troubleshooting, and training because everything runs on consistent protocols. In fact, Gannaway was able to cancel a request for another engineer because his network support load dropped.
- **Improves network security and eliminates congestion**—Using a Routed Access solution enables Gannaway to implement more security controls at the network edge, so attempted security breaches are stopped at the source. Filtering out traffic at the network edge also eliminates backbone congestion. “We did not realize how much unnecessary traffic contributed to the congestion on the uplinks until we put filters at the access layer and saw how much we were removing,” Gannaway says.
- **Improves network availability**—With its use of the EIGRP dynamic routing protocol, Routed Access overlays a fast recovery mechanism on top of the network’s existing physical redundant links. This “hardening” of the network transforms failure recovery from noticeable minutes of downtime to application users to transparent sub-second recovery.

- **Reduces new service implementation by 25-30 percent**—Routed Access also offers value because the SAWS IT staff is able to add new services without having to reconfigure the network each time. For example, Gannaway reports that his IT staff is getting ready to initiate a big wireless project, and he estimates that he will save 25–30 percent on new service implementation time and costs.
- **Doubles bandwidth with no equipment purchase**—According to Gannaway, Cisco’s modular, scalable Cisco switches really proved themselves with the Remote Access upgrade. He says, “We were able to take advantage of bandwidth that we already had and leverage our existing investment with a relatively simple Cisco IOS software upgrade. We were even able to trade in our Supervisor IIs for credit towards the Supervisor IV, which dropped our upgrade costs even lower.”

An active member of the local Cisco users group, Gannaway recommends the Routed Access solution to his colleagues at meetings: “I tell them that it eases our management burden, gives us more control over our security at the network edge, lets us convert resources to a common Cisco IOS Software platform, and makes it much more cost-effective to implement new projects.”

### **FOR MORE INFORMATION**

Cisco has helped municipalities improve the quality and scope of services to their residents while holding down operating costs. To learn more about how Cisco Network Foundation and Cisco Routed Access Solutions can help your organization or community, contact your local account representative or visit <http://www.cisco.com/go/resilientservices>

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