

Naples Upgrades Transit Service with Innovative Subway 2.0

Metronapoli enhances riders' experience and security using Cisco wireless/wired solutions to control its subways.

Challenge

Founded 2800 years ago, Naples is one of the world's oldest and most treasured cities. Prosperous and cosmopolitan, the municipality lies along Italy's Gulf of Naples and is renowned for its culture, architecture, and cuisine.

Yet, today, with one million residents, Naples is Italy's most densely populated metropolis and beset by increasing automobile traffic and pollution. To preserve the city's charm and environment, its leaders sought to increase the public's use of the transit system.

"To encourage ridership on the subway, we had to reinvent how our system operated," says Mr. De Luca, CEO of Metronapoli, which manages Naples' rail network. "We needed to improve the services of trains, and make them more reliable and safer. We also wanted to offer onboard information services like entertainment and advertising to attract riders."

Achieving these objectives was a formidable challenge. At the time, traffic control operators at the subway's Operation Center had little control over or communications with the city's two-car trains when the vehicles were in motion. The only way to track a train's location was via metal contacts on the tracks that triggered a light to blink on a map at the center. Additionally, surveillance cameras in the cars lacked continuous, real-time links to the center. Administrators could not immediately determine if a train had difficulties or if there were disturbances within the cars.

"To provide a world-class experience for our passengers, we needed ongoing communications between the trains and our staff," says Mr. Orazio, chief of the Operations Department, Metronapoli. "We wanted to advance our transit system to the digital age, giving us complete control and support for new services and applications."

Solution

Subway 2.0 demanded vision, innovative technologies, and expertise. Naples required a wireless IP network that would provide reliable, real-time communications between the Operating Center and trains as they traveled along underground track at speeds up to 80 kilometers per hour. The network had to be secure and scalable, and deliver such critical data as train controls, video surveillance feeds, and voice services. "There are only a handful of networking technology providers worldwide that can provide such a solution," says Orazio. "With the public's safety at stake, we needed the best."

Cisco briefed Metronapoli executives on its architectural and implementation plans for Subway 2.0. "Cisco's vision of Subway 2.0 matched ours," says De Luca. "Cisco put us on the right track."

Cisco then provided demo versions of the solution's products that were tested in a lab environment with support from Cisco Advanced Services. The results encouraged Metronapoli to proceed with an actual pilot implementation.

"Cisco's Advanced Services team listened to our concerns and worked with us to fine-tune the design and configurations," says Orazio. "Cisco gave us the confidence to test its system on one of our lines."

For its trials, Metronapoli selected a small transit line that extends 10 km across Naples. There, it deployed networking systems on the trains, along railway tunnels, and at five stations and the Operating Center.

Two Cisco^{AE} 3200 Series Rugged Integrated Services Routers with Cisco 3204 Wireless Mobile Interface Cards were installed in each train and nearly 100 Cisco Aironet^{AE} 1240 AG Series Access Points were positioned in the tunnels. The Fast Roaming functionality of the Cisco access points helps ensure little latency as the trains speed along from the coverage of one access point to the next. "Cisco's unique Fast Roaming feature was one of its many technologies that made this project feasible," says Orazio.

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— Mr. Orazzo, Chief of the Operations Department, Metronapoli

The access points link to two redundant wired networks consisting of Cisco Ethernet switches, which connect to the Operating Center. There, administrators use the Cisco Wireless Control System and Cisco 4400 Series Wireless LAN Controllers to manage the wireless solutions. The administrators monitor components from a central console and remotely troubleshoot any issues, preserving services continuity.

The Cisco network also features comprehensive security. Guarding the operating center are two Cisco ASA 5500 Series Adaptive Security Appliances for robust firewall, intrusion prevention, and content security functionality. All wireless links utilize strong encryption, and administrators use two Cisco Secure Access Control Servers to enforce network access policies and authenticate all wireless users and devices.

Moreover, the network is fully redundant. The Cisco technologies provide nearly instant failover should any device fail, offering resiliency for safety-critical applications.

“We certainly had initial concerns due to the project’s boldness and complexity, but Cisco Advanced Services addressed all issues, and our trials were very successful,” says Orazzo. “Cisco provided a complete solution, from hardware and software, to the full range of services needed to bring our undertaking to fruition within schedule.”

Results

Metronapoli would like to extend its Cisco network to its entire urban transit system to create the core of an advanced railway infrastructure. When completed, the new metro system will have 50 km of track and 46 stations. Metronapoli’s Cisco infrastructure can support an array of applications and functionality that will improve service levels as well as protect riders’ safety.

“We now can completely monitor our trains and continually know the location and status of our vehicles and passengers,” says Orazzo. “Using our standards-based network, we can easily add new applications and scale the system. Additionally, our network has a long lifecycle, providing Naples with extraordinary value.”

“ Cisco was the right partner to realize our goals.”

— Mr. De Luca, CEO, Metronapoli

The video surveillance system across the subway system will enhance security from the moment riders enter stations. Additionally, voice over IP (VoIP) services will provide an emergency call system that allows passengers to speak directly with the Operations Center.

PRODUCT LIST

Wireless

- Cisco 3200 Series Rugged Integrated Services Routers
- Cisco 3204 Wireless Mobile Interface Cards
- Cisco Wireless Control System
- Cisco 4400 Series Wireless LAN Controllers
- Cisco Aironet 1240AG Series Access Points
- Cisco ME 3400 Series Ethernet Access Switches
- Cisco Catalyst 2950 Series Switches **Security**
- Cisco ASA 5500 Series Adaptive Security Appliances
- Cisco Secure Access Control Server for Windows **Services**
- Cisco Advanced Services bundle, including Planning, Design, and Implementation (PDI) and Transfers of Information (TOI)

Monitors in the cars will display multimedia feeds to provide passengers with such information as train schedules and public service announcements. Metronapoli is even considering providing wireless Internet access on its trains to further enhance the riding experience.

“With our Cisco solution, people can travel in a safer and more resilient environment,” says De Luca. “Cisco was the right partner to realize our goals.”

Subway 2.0 is a harbinger of Naples’ future. Naples can replicate Metronapoli’s system throughout its infrastructure, from streets and parks to sewers and other facilities. The citywide wireless network could soon provide the mobility and control needed to rapidly deliver a range of municipal and business services and applications.

“For modernizing urban environments, wireless solutions offer very substantial cost savings over laying cabling, which can often be impractical,” says De Luca. “By deploying a wireless network, the metro of Naples stands to enjoy a return on investment within three years as it offers citizens new levels of security and a range of new services and conveniences.”

For More Information

To find out more about the Cisco Unified Wireless Network, go to: <http://www.cisco.com/go/wireless>.



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