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- ATMS
- Tunnels
- ETC
- E-Bus & Tramway
- Video Surveillance

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Department of Transportation Deploys Intelligent Transportation System over Fiber Gigabit Ethernet

Project Introduction

The third largest state-owned highway system in the United States is maintained by the state DOT (Department of Transportation). The state DOT planned to centralize traffic control/monitoring of highways (including roads, bridges, and tunnels) across the state’s five central TMCs (traffic management center). These TMCs serve as hubs for regional emergency response and incident management operations of traffic-related events. TMC operators will have access to real-time traffic information from DOT personnel, state police, emergency response agencies, cameras, sensors, and other tools to ensure traveler safety by notifying drivers of traffic conditions and emergency events via VMS (variable message sign) broadcasts and other public media. “Our role is to facilitate the safe and efficient travel of drivers… By coordinating fast, effective incident response and communicating traffic information to the public in a timely manner from our Traffic Management Centers, we can provide the best possible driving experience for our customer.” said the DOT Commissioner.

System Description

Moxa’s EDS-510A-T industrial Ethernet switches (equipped with Moxa SFP-1G gigabit Ethernet SFP modules) were selected to assemble regional gigabit Ethernet backbones over fiber for each TMC with transmissions of up to 120 km. The EDS-510A-T managed switches were configured with IGMP snooping to optimize bandwidth usage and reduce network congestion. Each EDS-510A-T provides secure connections with TACACS+, SNMPv3, IEEE802.1x, HTTPS, and SSH to deny unauthorized network access, features Turbo Ring™ technology to provide network redundancy with recovery times in under 50 ms (at 250-switch load), and supports topology options, such as Ring Coupling, to provide a backup path and ensure uninterrupted connectivity when link failure occurs.

The NPort 6450-T terminal servers feature Moxa’s Real COM mode, which allows secure remote operation, and provide Ethernet connectivity to existing serial devices such as vehicle loop sensors, and VMS (variable message sign) equipment. In addition, the wide-temperature tolerance (-40 to 75°C) of the EDS-510A-T switches and NPort 6450-T terminal servers enable them to perform reliably without air conditioning in severe highway operating conditions.
Application Requirements

- Gigabit network backbone for large volumes of video data
- NEMA TS2 compliance for network components
- Network redundancy with secure data encryption capability
- Network traffic management for bandwidth efficiency
- Industrial durability to withstand severe outdoor conditions
- Fiber interface for long distance transmission with high scalability

Moxa’s Advantage

- The EDS-510A-T provides two Gigabit Ethernet ports for redundant ring and one Gigabit Ethernet port for uplink solution to support massive video and data transmissions
- The EDS-510A-T features Turbo Ring™ technology to minimize network downtime (recovery time < 50 ms @ 250 switches)
- The EDS-510A-T supports IGMP snooping and tagged VLAN for more efficient bandwidth usage
- The EDS-510A-T provides SFP slots for up to 120 km of data transmission
- The EDS-510A-T is NEMA TS2 certified and passes anti-vibration standards to offer robust performance
- The NPort 6450-T provides secure connections for existing serial devices via Real COM and TCP Server/Client modes
- The NPort 6450-T provides port buffers for storing serial data when the Ethernet connection fails
- All Moxa products are available in wide-temperature (-40 to 75°C) models to provide the durability required for highway applications

EDS-510A-T
7+3G-port Gigabit managed Ethernet switch

- 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- Turbo Ring™ and Turbo Chain™ (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IGMP Snooping for filtering multicast traffic and port-based VLAN
- -40 to 75°C operating temperature

NPort 6450-T
RS-232/422/485 secure terminal server

- LCD panel for easy IP address configuration
- Secure operation modes for Real COM, TCP Server, TCP Client, Pair Connection, Terminal, and Reverse Terminal
- Non-standard baudrates supported with high precision
- Port buffers for storing serial data when the Ethernet is off-line
- -40 to 75°C operating temperature

SFP-1G-T Series
Gigabit Ethernet SFP modules

- -40 to 85°C operating temperature
- 1 1000BaseLX port with LC connector
- Up to 120 km transmission
- Support SFP-Digital Diagnostic Monitor (SFP-DDM) function

Moxa Integrated IP Solutions for Intelligent Transportation

- Empower highly resilient industrial Ethernet infrastructure
- Extend your ITS network over fiber connections
- Enable reliable serial-to-Ethernet connectivity
- Ensure real-time traffic data acquisition, computing, and control
- Establish traffic monitoring through rugged IP video surveillance

Product Portfolio

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular products
- Ethernet-to-fiber media converters
- Serial-to-Ethernet device servers
- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers
**Project Introduction**

Jiangsu province is home to almost 80 million Chinese residents and government officials decided to install electronic citation systems to discourage traffic violation, assuring the safety of drivers and pedestrians at highly-congested traffic intersections.

At each local site, if a vehicle crosses the intersection during a red light or violates the speed limit, images of the vehicle license plate will be taken as evidence and stored on the computer. The computer will later transmit all images to the main control center, where evidence and violation notices will be processed and sent out to vehicle owners for payment collection. This requires long-distance transmission of image data from local sites back to the main control center and a reliable network for continuous operation. Also, the devices at the local site will require industrial durability to withstand severe temperature variances.

**System Description**

Long distance transmission and network redundancy are both important characteristics of ITS applications. At each intersection, loop sensors and flash lighting are linked together to IP cameras for triggering video capture. All traffic control and monitoring devices, including IP cameras, traffic signals, and front-end embedded computer with storage solutions, are connected directly to the EDS-508A-MM-SC switch via Ethernet. Three EDS-508A-MM-SC managed switches connect to an EDS-408A-3M-SC managed switch to form a fiber ring with Moxa’s Turbo Ring technology to provide network recovery in under 20 ms when failure of a network segment occurs.

The EDS-408A-3M-SC and the EDS-508A-MM-SC are equipped with fiber ports that provide long distance transmission of gathered evidence for processing and feature IGMP snooping to reduce LAN congestion by filtering multicast traffic. The EDS-408A-3M-SC provides an additional fiber uplink to the remote industrial core switch at the main control center, which features high-performance full Gigabit capability with high port-density to handle large amounts of image data for advanced traffic data management. An optional industrial network management software, MXview, can significantly improve management of network components graphically via a web browser from a remote site to ensure a reliable and resilient network.

In addition, both EDS-408A-3M-SC and EDS-508A-MM-SC feature wide operating temperature of -40 to 75°C, fanless and DIN-Rail compact design, which are ideal for harsh environments in roadside cabinets.
Application Requirements

- Long-distance data transmission from local site to uplink to the main control center
- Network redundancy for reliable connectivity
- Wide-temperature tolerance for outdoor operation
- Rugged and compact design for installation in roadside cabinets

Moxa’s Advantage

- One-stop shopping for edge-to-core industrial Ethernet switches and industrial network management solutions
- Turbo Ring technology for recovery times under 20 ms
- IGMP snooping for more efficient bandwidth usage
- Wide-temperature operation to withstand extreme operating conditions
- Fiber transmission for communication between remote locations and main control room
- NEMA TS2 compliance for EMC (Electro Magnetic Compatibility)

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Product Portfolio

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- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers
The World’s Fifth Longest Tunnel Deploys Ethernet for Mission-Critical Traffic Control System

Location: Taiwan

Project Introduction
Taiwan’s Hsuehshan Tunnel is the second longest road tunnel in Southeast Asia (fifth longest in the world) and is composed of three independent tunnels (one pilot tunnel, one West-bound tunnel, and one East-bound tunnel) stretching 12.9 kilometers through Hsuehshan Mountain, the second highest mountain in East Asia.

Emergencies occurring inside a tunnel of this length can be disastrous, especially a fire-related incident. To minimize traveler casualties during an emergency, a traffic control system, consisting of two entry gates and two exit gates, is deployed to respond accordingly in events of emergencies by lowering appropriate gates to effectively divert traffic and prevent vehicle entry into dangerous areas.

System Description
The tunnel gate system is controlled by OMRON PLCs that respond to automated traffic control signals or can be manually operated. The serial-based PLCs are integrated onto the Ethernet network using Moxa’s NPort 5230 serial-to-Ethernet device servers. When an emergency occurs, the NPort 5230 allows PLCs to be directly accessible from the network to lower entry gates immediately.

For transmission requirements between the control gates, the system integrator utilized Moxa’s EDS-508-SS-SC to form a single-mode fiber optic Ethernet redundant ring network to ensure continuous network connectivity in case of a segment failure. The fiber ring network is also linked to the local control room via a fiber connection. With deployment of this reliable network for traffic control, Hsuehshan Tunnel operators can regulate traffic flow to ensure the safety of travelers in the event of an emergency.
Application Requirements

- Industrial-grade durability to withstand roadside conditions
- Integration of serial-based PLCs to the Ethernet network
- Redundant network connectivity to ensure system functionality
- Wide-temperature tolerance for severe operating environments

Moxa’s Advantage

- All Moxa products are ruggedly designed for extreme and hazardous environments with high MTBF and a 5-year warranty
- The NPort 5230 device servers connect RS-232/422/485 serial devices for remote control/monitoring
- The EDS-508-SS-SC features Turbo Ring and Turbo Chain technologies for recovery times under 20 ms at 250-switch load
- The EDS-508-SS-SC supports IGMP snooping and tagged VLAN for more efficient bandwidth usage
- Moxa’s industrial products offer wide-temperature operation for severe environments
- Easy configuration and real-time administration by web browser, Windows utility, or Telnet/serial console

NPort 5230

2-port RS-232/422/485 serial device server
- Versatile socket operations modes, including TCP Server, TCP Client, and UDP
- Built-in 15 KV ESD protection for all serial signals
- 2 or 4-wire RS-485 with patented Automatic Data Direction Control (ADDC)
- -40 to 75°C operating temperature range (T models)

EDS-508-SS-SC

8-port managed Ethernet switch
- Network redundancy with RSTP/STP/MSTP
- E-mail or relay warning with user-defined events
- Port trunking, VLAN, QoS, and IGMP
- Easily managed with web browser or Telnet/Serial Console

Moxa Integrated IP Solutions for Intelligent Transportation

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Product Portfolio

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular products
- Ethernet-to-fiber media converters
- Serial-to-Ethernet device servers
- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers

Visit www.moxa.com/ITS or scan the QR code to learn more about Moxa’s industrial networking solutions.
Project Introduction
Transportation authorities in France planned to implement an environmental tax for all HGVs (heavy goods vehicles) when traveling across a network of national highways totaling over 1500 kilometers in length. The HGV tax for each vehicle will be determined with an onboard GPS device and toll enforcement will be performed by a system of sensors and cameras to capture license plates of HGVs not in compliance with the new tax program. The system will be used to count traffic and can even identify vehicle types with contour mapping. Upon detection of a violation, the system will send the license plate image back to the control room to be processed for payment collection.

System Description
Multiple modularized cabinets are installed atop over 150 gantries throughout the national highway system. In each cabinet, a camera and a vehicle detection device are connected to an EDS-G509-T (or EDS-510A-3GT-T) industrial Ethernet switch. These switches feature high-performance Gigabit capacity to transmit large volumes of images and transaction data to control centers. They are also configured with IGMP snooping to optimize bandwidth usage and reduce network congestion. The EDS-G509-T is also equipped with 5 fiber ports to provide long distance transmission for ITS network.

Inside the roadside cabinet, the ioLogik E1212-T Ethernet remote I/O connects to humidity/temperature sensors and intrusion detection for cabinet environmental monitoring to enhance equipment safety and reliability. Also, its compact size allows the ioLogik E1212-T to fit easily into space-limited roadside cabinets.

In addition, all Moxa’s models feature -40 to 75oC wide temperature tolerance to perform reliably without air conditioning in severe highway operating conditions.
**Application Requirements**

- Gigabit fiber network backbone to transmit large volumes of data back to the main control center
- Wide-temperature tolerance for outdoor operation
- Rugged and compact design for installation in roadside cabinets

**Moxa’s Advantage**

- The EDS-510A-3GT-T & EDS-G509-T provide Gigabit Ethernet ports to support massive video and data transmissions
- The EDS-G509-T supports fiber interface for long distance transmission
- Future proof IPv6 ready
- All Moxa products are available in wide-temperature (-40 to 75°C) models, and feature long MTBF for high reliability

**ioLogik E1212-T**

Ethernet Remote I/O with 2-port Ethernet switch, 8 DIs, and 8 DIOs

- Built-in 2-port Ethernet switch for daisy-chain topologies
- Free support of Moxa’s push-based Active OPC Server
- Support wide operating temperature (-40 to 75°C)
- Compact design to fit in space-limited locations (ex. cabinets)

**EDS-510A-3GT-T**

7+3G-port Gigabit managed Ethernet switch

- 2 Gigabit Ethernet ports for redundant ring and 1 Gigabit Ethernet port for uplink solution
- Turbo Ring™ and Turbo Chain™ (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IGMP Snooping for filtering multicast traffic and port-based VLAN
- -40 to 75°C operating temperature

**EDS-G509-T**

9G-port full Gigabit managed Ethernet switch

- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- Fiber optic options for extending distance and improving electrical noise immunity
- Turbo Ring™ and Turbo Chain™ (recovery time < 50 ms @ 250 switches), RSTP/STP, and MSTP for network redundancy
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- IGMP Snooping for filtering multicast traffic and port-based VLAN
- -40 to 75°C operating temperature

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**Product Portfolio**

- Industrial Ethernet switches
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- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers

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Video Transmission over IEEE 802.11n WLAN for Bus Surveillance System

Project Introduction
A transportation company in Hawaii serves thousands of travelers each day across well over 100 routes each week with approximately 50 bus vehicles operating out of 2 bus depots. The administration wanted to implement an intelligent surveillance system able to provide standard video recordings during normal operating conditions but also able to capture high-definition video footage when an emergency occurs aboard a vehicle. With multiple surveillance cameras installed throughout the bus, video surveillance is captured at 300 dpi under normal conditions. However, when an emergency is identified by the bus driver, the quality of pertinent video data will increase from 300 dpi to 720 dpi (HD) to provide enhanced imagery of the incident for a duration of 20 minutes. The enhanced recording of the event will then be tagged and stored on the bus until it can be extracted via a wireless connection when the vehicle returns to the depot.

System Description
Aboard each bus, video footage captured by the vehicle is stored on an onboard storage drive. When an unexpected incident/emergency is identified by the bus driver, image quality is immediately increased from 300 dpi to 720 dpi for 20 minutes and stored on the onboard storage drive. Control room operators at the bus depot will then be notified of the recorded event(s) and will process request(s) for wireless transfer of video data when the bus arrives at the depot. The file size for 20 minutes of 720 dpi video is approximately 200 MB.

For this high-bandwidth wireless application, the AWK-3131 IEEE 802.11n wireless client was installed onboard each bus. While the bus is parked in the depot, it will connect with the AWK-4131 IP68-rated access points attached to the outer wall of the control center builder, to maintain highspeed 802.11n wireless communications with MIMO (multiple-input multiple-output) capabilities to reach transfer speeds of up to 300 Mbps. Furthermore, the island is subjected to experience humidity, salty precipitation from the surrounding ocean and possible prolonged rain storms all of which could cause corrosion and massive water damage to the outdoor wireless devices. With the AWK-4131 being IP68 waterproof and its corrosion-resistant connectors, the constant and reliable wireless connection was guaranteed.
Application Requirements

- Substantial bandwidth will be required to upload high-definition video via a wireless connection to the depot command center
- Wireless access points will need to withstand against humidity, constant downpour and the rusting effects caused by the sea water

Moxa’s Advantage

- IEEE 802.11n transmission with MIMO capabilities provides data rates of up to 300 Mbps to provide efficient transfer of 720 dpi video footage from the bus to the control center
- IP68 rated (AWK-4131 only) for outdoor protection against severe rain, and corrosion-resistant connectors to reduce maintenance efforts

AWK-3131
IEEE 802.11 a/b/g/n WLAN AP/bridge/client
- Rugged, industrialized shelling to protect against shock and vibration
- IEEE 802.11n transmission with MIMO capabilities provides data rates of up to 300 Mbps to provide efficient transfer of 720 dpi video footage from the bus to the control center

AWK-4131
IEEE 802.11 a/b/g/n IP68 WLAN AP/bridge/client
- IEEE 802.11n standardized for HD video streaming
- IP68-rated metal housing waterproof and dust-tight
- Salt spray tested stainless steel connectors
- IP68 rated for outdoor protection against severe rain, and corrosion-resistant connectors to reduce maintenance efforts

Application Requirements

- Substantial bandwidth will be required to upload high-definition video via a wireless connection to the depot command center
- Wireless access points will need to withstand against humidity, constant downpour and the rusting effects caused by the sea water

Moxa’s Advantage

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Product Portfolio

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular products
- Ethernet-to-fiber media converters
- Serial-to-Ethernet device servers
- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers
**Project Introduction**

Stretching 14.5 kilometers with 31 stations, a major tramway will link northern and southern communities of a highly-populated region in France. To ensure a sustainable transportation development with a limited budget, the tramway network infrastructure must be highly cost-effective and perform with industrial reliability, especially in a country with over 20 tram networks.

Onboard passenger infotainment is delivered via audio speakers and display boards, and IP camera is deployed to smooth tramway operation. Vehicles will connect with the depot via secured wireless access points for maintenance. Also, for passenger convenience, tickets will be available at each tramway station through automated ticketing kiosks.

**System Description**

In each station, Moxa’s V2402-LX embedded computers, display boards, and IP camera are connected to the EDS-P510 switch, which enables a highly resilient SFP fiber optic network featuring Turbo Ring network redundancy technology to provide Gigabit recovery times under 50 milliseconds (tested at 250-switch load). The ioLogik R2110 remote I/O devices are also deployed to control the state of the back-up battery that sits inside the tower, the audio amplifier, and the lightning arrester. Featuring 12 digital inputs and 8 digital outputs, they also collect data from digital on/off devices.

Aboard each tram vehicle, a V2426-LX embedded computer broadcasts audio/video passenger information and is connected to a TN-5308-4PoE switch, which also provides tough network connectivity with shock/vibration-resistant M12/PoE connectors for the onboard IP surveillance system.

The tram vehicle also includes the EPM-3337 expansion module of the V2426-LX embedded computer to provide a combination of Wi-Fi, GPRS, GSM, EDGE, HSDPA, and GPS wireless communication. It connects to AWK-3121 wireless access point as the tram vehicles enter the depot for system maintenance.

“Moxa provided a full solution to meet every aspect of the project requirements, and not just with highly durable products but also with a customer-oriented service attitude,” says Pascal Gudefin, Project Director of Besançon tramway.
Application Requirements

- Long-distance data transmission across different ticketing kiosks
- Redundant network connectivity to ensure system operations
- Industrial-grade durability to withstand onboard shock/vibration
- Cost-effective solution

Moxa’s Advantage

- The EDS-P510 features Turbo Ring and Turbo Chain technologies for Gigabit recovery times under 50 ms at 250-switch load
- -40 to 75°C wide operating temperature to withstand extreme conditions
- Complete edge-to-core solutions to ensure interoperability and minimize system integration costs
- EN 50155 certification for moving vehicle applications

EDS-P510

7+3G-port Gigabit PoE managed Ethernet switch

- Gigabit fiber Turbo Ring and Turbo Chain (recovery < 50 ms), and RSTP/STP/MSTP
- Long-distance fiber transmission up to 120 kms
- IEEE 802.3af PoE compliant
- Port trunking, VLAN, QoS, and IGMP snooping
- Manageable with web browser or Telnet/Serial Console

TN-5308-4PoE

8-port EN 50155 PoE Ethernet switch

- IEEE 802.3af PoE compliant
- Provides up to 15.4 watts at 48 VDC per PoE port
- EN 50155 and EN 50121-4 certified
- -40 to 75°C operating temperature range

AWK-3121

Industrial IEEE 802.11a/b/g wireless AP/bridge/client

- IEEE 802.11a/b/g compliant
- Supports long-distance data transfer and 100 ms Turbo Roaming
- WEP/WPA/WPA2/802.11X encryption for secure transmissions
- Compliant with essential sections of EN 50155
- Industrial design: IP30, DIN-Rail mounting, -40 to 75°C operating temperature range

V2426-LX

X86-based Atom EN50155 embedded computer

- Dual independent displays (VGA + DVI)
- Various connection options: 2 10/100 Mbps Ethernet ports (M12 connector), 4 RS-232/422/485 serial ports, 3 USB 2.0 ports, and 6 DIs, 2 DOs
- CompactFlash socket for storage expansion
- 2 expansion slots module for further system integration
- EN 50155 certified

EMP-3337

V2400 series expansion modules

- HSDPA, GPS, WLAN (11a/b/g/n) connectivity, -25 to 55°C operating temperature

V2402-LX

X86-based Atom embedded computer

- Dual independent displays (VGA, DVI, LVDS)
- Various connection options: 4 RS-232/422/485 and 8 RS-232 serial ports, 2 Gigabit Ethernet ports, 6 USB 2.0 ports, and 4 DI/DOs
- CompactFlash socket for storage expansion
- E-Mark certified

ioLogik R2110

RS-485 remote I/O with 12 DIs, 8 DOs

- 12-channel 24 VDC digital inputs with DI Event Counter mode and software selectable filtering time
- 8-channel 24 VDC digital outputs with pulse output mode and software selectable pulse width
- Over-temperature protection (up to 175°C)
- Over-current protection (400-mA/channel)

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Southern Italian Communities Converge Video Surveillance via IP-Based Infrastructure

Project Introduction
The Italian government and a number of local municipalities in southern Italy, including Lecce, Mural, and San Pietro, decided to increase their safety and security facilities with the largest IP video surveillance framework ever deployed in Italy. The video surveillance systems must operate around the clock to offer increased security in local public spaces, such as historic centers, train stations, tourist attractions, and the surrounding motorways. Video surveillance deployment of such large scale required expertise of network infrastructures and telecommunication technologies. Among the multiple telecommunication technologies used to cover such a wide area over a reliable and efficient network, one of Italy’s leading system integrators utilized a combination of existing SDH networks, newly deployed Gigabit Ethernet technology, and wireless connectivity to assemble this vast network of advanced IP video surveillance.

System Description
Moxa’s EDS-P510-T industrial Ethernet switches were installed to connect the PoE (Power-over-Ethernet) IP cameras along the highway. In addition to its PoE capability that can provide up to 15.4 watts of power per PoE port, the EDS-P510-T was also selected for its three Gigabit ports that are capable of forming a Gigabit Ethernet backbone to meet the high bandwidth needed for transmitting large amounts of video data. The switches are equipped with tagged VLAN and IGMP snooping functions. The tagged VLAN function delivers video streams to a designated destination via the tag on each frame, eliminating the need to configure streams at each physical port to achieve higher operational efficiency. IGMP snooping reduces the amount of traffic on the Ethernet LAN by pruning multicast traffic.

Due to the length of the highway, SFP-1GLXLC-T small form factor pluggable transceivers were installed to provide fiber optic data transmission. The network also adopted Moxa’s Turbo Ring and Turbo Chain technologies, which ensure continuous video surveillance in the event of a network segment failure with network recovery in less than 50 ms.

In addition, the wide-temperature tolerance (-40 to 75°C) of the EDS-P510-T industrial Ethernet switches enables them to perform reliably in roadside cabinets without air conditioning or heating.
Application Requirements

- Power-over-Ethernet capability for connecting PoE IP cameras
- Tagged VLAN and IGMP snooping for bandwidth efficiency
- Gigabit network backbone for the large volume of video data
- Highly scalable fiber interface for long distance transmission
- Industrial-grade durability to withstand severe outdoor conditions

Moxa’s Advantage

- The EDS-P510-T provides up to three Gigabit ports to support massive video and data transmissions
- The EDS-P510-T has four PoE compliant Ethernet ports, ideal for locations where AC power is not readily available
- The EDS-P510-T supports IGMP snooping and tagged VLAN for more efficient bandwidth usage
- The EDS-P510-T features Turbo Ring and Turbo Chain technologies to minimize network downtime
- The EDS-P510-T provides three combo 100/1000BaseSFP slots for up to 80 km of data transmission
- The EDS-P510-T includes remote power management, an extended operating temperature, and high availability

EDS-P510-T

Gigabit PoE managed Ethernet switch

- Advanced PoE management function
- 4 10/100BaseT(X) 802.3af (PoE) compliant Ethernet ports and 3 combo Gigabit Ethernet ports
- IGMP Snooping for filtering multicast traffic and port-based VLAN, IEEE 802.1Q VLAN and GVRP to ease network planning
- -40 to 75°C operating temperature

SFP-1GLXLC-T

Gigabit Ethernet SFP module

- 1 1000BaseLX port with LC connector
- 10 km transmission
- -40 to 85°C operating temperature

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Product Portfolio

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Highways in China Deploy High Definition IP Surveillance Systems with Advanced Network Management

**Location:** China

**Project Introduction**
The “Safe City” program, launched nationwide in 2006, has triggered the installation of millions of surveillance cameras across China in over 600 cities. Surveillance systems are increasingly implementing high-definition IP cameras and many have also deployed PoE-based IP cameras to take advantage of simple deployment, cost-effectiveness, and easy maintenance.

In conjunction with newly installed PoE IP cameras, existing non-PoE IP cameras needed to be integrated into the network. PSD switches will need to be deployed to supply power to the PoE IP cameras. These high-definition IP cameras will provide real-time traffic information via fiber transmission for traffic management teams at the central command center and assist government agencies with vehicle tracking when needed.

**System Description**
Existing IP cameras will be integrated into the new surveillance network through Moxa’s EDS-G509-T. New PoE IP cameras will be connected to the EDS-P510-T, which will also provide power to the cameras via its seven PoE ports. The EDS-G509-T and EDS-P510-T will link the IP cameras to the central command center through the fiber ports, connecting them to Moxa’s award-winning ICS-G7852 managed switch, an ideal component for a surveillance system of this size because of its modular design with high scalability. At the core of the command center’s network management system, is Moxa’s advanced network management software, MXview, which automatically detects all network nodes (up to 2,000 nodes) and generates a highly intuitive graphical representation of the actual network layout with physical link indications to notify operators within seconds of a severed link and/or an unavailable network node.
Application Requirements

- Gigabit fiber network backbone to transmit large volumes of video data back to the main control center
- Network redundancy with secure data encryption capability
- PSD (power supply device) switches to power PoE cameras
- Intelligent network management software to monitor status of all network nodes
- Wide-temperature tolerance for outdoor operation
- Rugged and compact design for installation in roadside cabinets

Moxa’s Advantage

- The EDS-P510-T & EDS-G509-T provide Gigabit Ethernet ports to support massive video and data transmissions
- Redundant Gigabit Turbo Ring technology to minimize network downtime (recovery time < 50 ms @ 250 switches)
- Future proof IPv6 ready
- The EDS-P510-T switch provides up to 15.4 watts of power per PoE port and supply power to PoE-based IP camera
- Moxa’s MXview allows the monitoring of up to 2,000 network devices for easy configuration and offers the ABC-01 tool to provide effortless troubleshooting
- All Moxa products are available in wide-temperature (-40 to 75°C) models, and long MTBF to provide high reliability

Projects Awarded

- The Intelligent Transportation Project in Shandong Qingdao
  EDS-205A/208A Series
- Video Surveillance System for Shanghai World Expo
  EDS-501A Series
- Vehicle Recognition System in Jiangyin City
  EDS-205A/208A Series, EDS-405A/408A Series
- Monitoring System for Government Facilities in Fujian
  EDS-205A/208A Series, EDS-405A/408A Series
- Vehicle License Plates Recognition System in Shenzhen City
  EDS-G308 Series
- Video Surveillance System in Guangxi Duty-free Zone
  EDS-510A Series, IMC-21 Series
- Video Surveillance System in Guangzhou City
  EDS-510A Series

EDS-P510-T

7+3G-port Gigabit PoE managed Ethernet switch
- 3 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports; 2 ports for redundant ring and 1 port for uplink
- Provides up to 15.4 watts at 28 VDC per PoE port

EDS-G509-T

9G-port full Gigabit managed Ethernet switch
- 4 10/100/1000BaseT(X) ports plus 5 combo (10/100/1000BaseT(X) or 100/1000BaseSFP slot) Gigabit ports
- Fiber optic options for extending distance and improving electrical noise immunity

ICS-G7852

10GbE-port Layer 3 full Gigabit modular managed Ethernet switch
- Up to 48 Gigabit Ethernet ports plus 4 10G Ethernet ports
- -40 to 75°C operating temperature range

MXview

Industrial network management software
- Discovers and visualizes network devices automatically
- Monitors up to 2,000 network devices and notifies users in real time when events occur
- Tracks past network status and events by playback
- Presents historical traffic statistics and comprehensive event logs for troubleshooting

Moxa Integrated IP Solutions for Intelligent Transportation

- Empower highly resilient industrial Ethernet infrastructure
- Extend your ITS network over fiber connections
- Enable reliable serial-to-Ethernet connectivity
- Ensure real-time traffic data acquisition, computing, and control
- Establish traffic monitoring through rugged IP video surveillance

Product Portfolio

- Industrial Ethernet switches
- Industrial wireless AP/bridge/client and cellular products
- Ethernet-to-fiber media converters
- Serial-to-Ethernet device servers
- RTU controllers and remote I/O
- IP video surveillance products
- Industrial embedded computers

Visit www.moxa.com/ITS or scan the QR code to learn more about Moxa’s industrial networking solutions
Your Trusted Partner in Automation

Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems.