Agile, Robust Switching Technology for IP Surveillance

Solution Guide

IP Surveillance

- IP Networking Built to Surveillance Industry Standards
- Innovative Leading-Edge Technology
- Reliable, Secure and Simple to Deploy

ZyXELonenetwork

Redefining network integration

Why ZyXEL?

Complete Network Portfolio
- Telco, enterprise and consumer
- Security, Switches, Wireless LAN and IP Telephony

Field-Proven Networking Solutions
- Over 400,000 European companies have chosen ZyXEL for enterprise solutions
- End-to-end solutions that include complementary products and services

Technology Warranty & Support
- High performance networking
- Lifetime hardware warranty
- Latest technology
- Local vendor technical support
- Free product firmware enhancements

Overview

As the security surveillance industry continues to migrate from traditional analogue technology Closed Circuit Television (CCTV) to IP or convergence-based technology more businesses are looking to add IP surveillance to their core network infrastructure. Today, ZyXEL has established alliances with leading CCTV manufacturers to deliver solutions that guarantee interoperability, quality of service (QoS), remote accessibility as well as simplified installation and management

Table of Contents

The Challenges

IP-based video surveillance is growing as an integral part of security procedures in many organizations. New camera and surveillance technology is driving the demand for a better communication infrastructure. With IP-based video surveillance, it brings many important benefits to the operator and user such as improved video quality, flexible deployment, manageability, scalability and intelligent content analysis.

An IP surveillance system differs from the analogue CCTV network by combining many or all of the elements of the traditional analogue security network. The IP network put into place plays an important role in the performance of the video monitoring and capture quality by providing the connectivity, network bandwidth, security and bandwidth optimization for good quality video traffic transmission. All of which are important to the performance of the solution to the end user.

To offer superior surveillance solutions testing and certification of all interoperable parts of the network is essential. Successful certification gives resellers and installers confidence. A tried and tested solution will deliver the reliability and quality of the video camera streams to ensure the customer has complete confidence on the IP surveillance installation.

Connectivity

Ethernet is the most popular LAN technology to establish the connection between end systems and the network. The most common type of Ethernet cables are either RJ45 Category 5 or 6 Ethernet or Fiber based SFP. Both provide transfer rates up to 100 Mbps, 1 Gbps or 10 Gbps. When designing IP surveillance environments, the user should consider how many networking devices (IP cameras, switches and computers) are required, what resilience is needed and what type of transmission will be used. This defines which architecture to deploy and what speed to pursue. By working with tried and tested technologies and vendors that have performed interoperability testing the reseller and end user can guarantee that these issues should all be well covered to establish an efficient IP network environment.

Deployment and Configuration

The migration from an analog surveillance system to a full IP surveillance network takes time and effort to make the current administrators familiar with the knowledge and configuration know-how of IP networks. To make deployment and configuration processes easier and less time-consuming, intelligent tools such as a user-friendly interface that comes with the IP surveillance solution is the answer.

Network Bandwidth

The amount of bandwidth required is determined by the number of cameras, the quality of image, amount of real time monitoring and the required storage capacity. As the deployment is defined the decision needs to be made as to whether the IP surveillance network is an isolated network or a converged network. The benefits of IP surveillance over a converged network is its ability to transfer video from cameras to the recording devices and monitoring stations business network therefore saving the cost of having separate installations and improving manageability for the end customer. The video camera traffic is completely separated and isolated from the traditional network data. Since heavy data traffic overwhelming the network could affect video transmission. This is important.

Transmission Traffic

IP networks use a completely different network principle to the traditional analogue CCTV network. Rather than using extensive coaxial cabling the IP network uses a single standards based cabling infrastructure. At a basic level in an isolated surveillance network the quality could be defined by providing fast Gigabit connections between elements. However video traffic which can be sensitive to packet delay, drop and jitter if too much network traffic information of different types is passed without manageability or testing. In IP surveillance environments where videos and data share the same network infrastructure to ensure the desired reliable connectivity and quality is achieved it is important to keep the video transmission traffics isolated and managed at a steady level.

Solution Benefits

IP networks have become the standard infrastructure for businesses to run their application, security surveillance does not need to be an exception to this. Power over Ethernet makes IP surveillance installation simpler, less expensive, and more flexible. ZyXEL offers complete PoE switch portfolio coming with Gigabit and Fast Ethernet, with small and large port count models, with or without fiber depending on if long distance deployment required, and latest PoE standard 802.3at supported. Additionally, the ZyXEL PoE switches are made with high-quality components to ensure stability and durable connectivity essential to IP surveillance applications. ZyXEL IP surveillance solution offers the resellers a number of advantages:

Reduced Installation Cost

Cabling and labor costs can be reduced using the existing IP network while utilizing the PoE technology to power the IP camera directly from the IP switch. This not only lowers the initial cost, but also offers wider options in camera positioning and deployment, thus improves effectiveness of surveillance.

ZyXEL One Network Experience

Aiming for relieving our customers from repetitive operations of deploying and managing a network, ZyXEL One Network is designed to simplify the configuration, management, and troubleshooting, allowing our customers to focus on the business priorities. ZyXEL One Network presents an easy-to-use tool, ZyXEL One Network Utility (ZON Utility), to realize speed network setup. ZyXEL Smart Connect allows ZyXEL networking equipment to be aware and recognize each other and further facilitating the network maintenance via one-click remote functions such as factory reset or power cycling. ZyXEL One Network redefines the network integration across multiple networking products from switch to Wi-Fi AP and to Gateway.

ZyXEL even opens up its One Network protocols to third-party developers to help them delivering more integrated, easy-to-deploy network applications.

Quality of Service (QoS)

Guaranteed efficiency and quality of the network services is key for images to be delivered to multiple recorders or management stations. The combination of PoE and Virtual LAN (VLAN) technologies enables better management, reduced installation costs and segmentation of camera images when delivered to multiple locations while guaranteeing the quality of captured image across the IP network.

Future-Proof

When installing IP-based surveillance solutions, both the resellers and businesses benefit from the advantages using scalable, standards-based technologies. If the network needs expansion, or the captured images require more bandwidth, it is easy to upgrade, relocate or add additional surveillance devices. In traditional analogue solutions, dedicated single coaxial cables are needed to run all devices; in contrast, IP networks are already massively deployed and can be configured to securely share the network among all business applications.

Flexible, Scalable Solutions

ZyXEL offers surveillance solutions using open-standard technologies that enable easy integration and scalability. ZyXEL's range of IP networking products can be combined with video solutions for surveillance and remote monitoring applications to address the need from a broad spectrum of industry segments. Based upon extensive experience in delivering IPTV images across service providers and ISP networks, ZyXEL has developed technologies to deliver the necessary solutions to the IP surveillance market.

Basic Concepts & Scenarios

The following section shows various deployment scenarios using ZyXEL Switches and explains the capabilities and benefits of each solution.

Quick Solution Finder

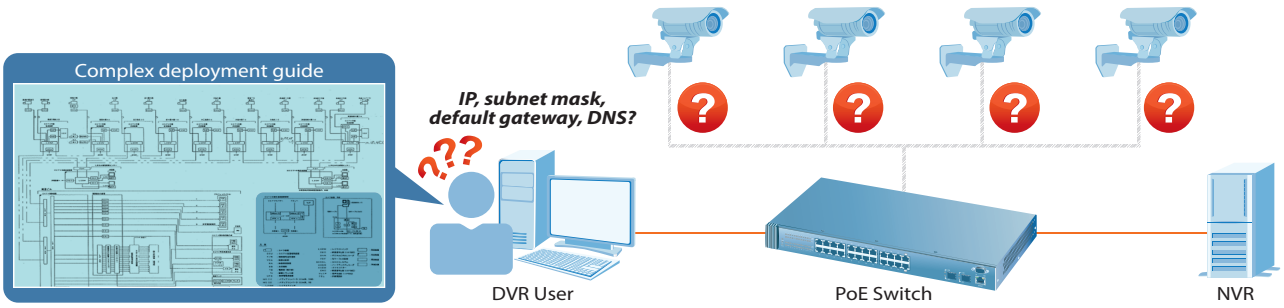
Scenarios			Basic Infrastructure	Fiber Aggregation	Network Resilience	Video Transmission Control
Customer Needs						
Sites and scale			Single site	Single or multi-site, long distance	Single or multi-site, large scale	Single or multi-site, large scale
Deployment challenges			1. Flexible IP surveillance deployments 2. Less construction costs and time 3. Scalability 4. Enhanced event management	1. Long-distance transmission 2. High video quality 3. Non-blocking Gigabit bandwidth	1. Remote storage 2. Performance monitoring 3. Fast link failover to prevent network failures	1. Remote monitoring 2. Superior video quality 3. Managed IP networks
ZyXEL Enterprise Switching Solution Offerings						
Description			Helps analogue CCTV operators migrate smoothly to IP surveillance.	Ensures the quality of long-distance video transmission between multiple sites.	Helps to establish high availability IP surveillance systems.	Provides superior video quality and avoids unwanted packet flooding.
Key features			• Complete PoE switch and injector portfolio	• L2 managed and Gigabit switches • Supports VLAN and QoS	• L3/L2 managed and Gigabit switches • Supports RMON, DDMI, MSTP/RSTP/MRSTP	• L3/L2 managed, 10 Gigabit and Gigabit switches • Multicast and IGMP snooping
PoE	**Unmanaged**	**ES1100-8P/16P**	Yes	-	-	-
		GS1100-8HP/10HP	Yes	-	-	-
	Smart managed	**GS1900-8HP/10HP/24HP/48HP**	Yes	-	-	-
		GS1920-24HP/48HP	Yes	-	-	-
	L2/L2+ managed	**GS2210-8HP/24HP/48HP**	Yes	Yes	Yes	Yes
		GS3700-24HP/48HP	-	Yes	Yes	Yes
	10GbE	**XGS2210-28HP/52HP**	-	Yes	Yes	Yes
		XGS3700-24HP/48HP	-	Yes	Yes	Yes
10GbE		**XS1920-12**	-	-	-	Yes
L2/L2+ GbE		**GS3700-24/48**	-	Yes	Yes	Yes
		XGS3700-24/48	-	Yes	Yes	Yes
L3 GbE		**XGS-4526**	-	Yes	Yes	Yes
Fiber		**XGS-4528F**	-	Yes	Yes	Yes
Accessory		**PoE12-HP**	Yes	-	-	-

Migrating to IP Surveillance —

Utilize the Ethernet Network for Surveillance Safety

Today, Ethernet IP (Internet Protocol) is the de facto standard of most business networks. The first benefit of IP networks is that one Ethernet infrastructure can provide multiple services such as data, voice, video and surveillance to save extra efforts laying coaxial cables; and the high-definition IP CAM also calls for high-speed Ethernet services. However, the migration can be a challenge for operators or administrators lacking Ethernet and IP knowledge. Learning about IP camera setup or Ethernet switches can be time-consuming and even intimidating to typical CCTV operators.

ZyXEL's Ethernet Switch solution can be easily deployed and integrated along with the unique ZyXEL One Network technology. With the comprehensive ZyXEL PoE solutions, businesses can easily embrace the advantages of IP surveillance technology.



Challenges of migration from CCTV to IP surveillance

Performance Features of the Solution

- Standard-based PoE, IEEE 802.3af and -at compliant
- Flexible PoE solution — PoE switches and PoE injector
- Power outlet locations are irrelevant in most cases since CAT-5 Ethernet cabling of up to 100 m can be used to provide electricity on the data cabling to a PoE IP camera.
- Less installation, deployment costs and time
- The Smart Connect of ZyXEL One Network simplifies management and trouble shooting

ZyXEL's Complete PoE Solution Consists of a Range of PoE Injectors and PoE Switches

- **PoE Injector**

PoE injection is an economical solution for installations with 2 to 4 PoE elements. The PoE injector is a single-port PoE device in which both power and data can be delivered to other PoE devices (PD) via a single CAT-5 Ethernet cable without extra power supply. The PoE injection is easy to use without any configuration.

- **PoE Switches**

Applying PoE switches to IP surveillance infrastructures is not only economical for cost control since system power and data are transmitted via a CAT-5 Ethernet cable, but it is also convenient for network administrators to maintain and inspect system functionality.

High PoE Power Budget

The high power budget support enables ZyXEL PoE switches to comfortably accommodate the power-hungry PDs (Power Devices), like Dome Camera, PTZ (pan–tilt–zoom) camera, video IP phones, and 802.11ac access points which required on a modern IP surveillance network.

Flexible Deployment

With one single cable, ZyXEL's PoE switches ease PD deployments especially for locations with hard-to-reach power outlets. In addition, some of the ZyXEL PoE switches feature combo (SFP/RJ-45), SFP or SFP+ ports to make long-distance deployment with better resiliency.

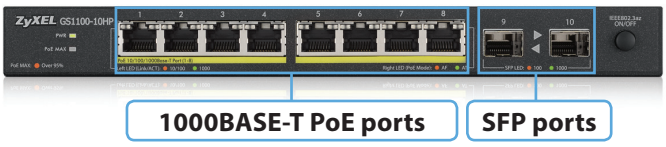
ZyXEL's new small port count PoE switches GS1100-10HP (unmanaged series) and GS1900-10HP (Web-smart managed series) come with eight (8) Gigabit PoE+ ports and two (2) SFP ports. All PoE ports support the PoE Plus standard, which makes GS1100-10HP and GS1900-10HP suitable for high-density surveillance deployments; the two fiber uplinks also help extending networks to remote locations easily without sacrificing any downlink Gigabit port.

ZyXEL One Network add-on Features

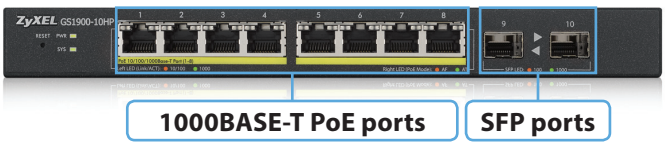
The ZyXEL One Network combines multiple unique, innovative technologies to deliver the easiest, most efficient network setup and initial provision for businesses. The Smart Connect feature of ZyXEL One Network can actively present important information of the attached IP CAM, including its IP & MAC addresses and PoE power consumed, which is essential for troubleshooting. In addition, remote power recycling of the attached IP CAM can also be performed when needed – without the need to go on-site or to figure out how it's connected.

Moreover, ZyXEL One Network also provides the flexibility to be integrated into third-party equipment, like NVR, to significantly improve efficiency of IP surveillance management.

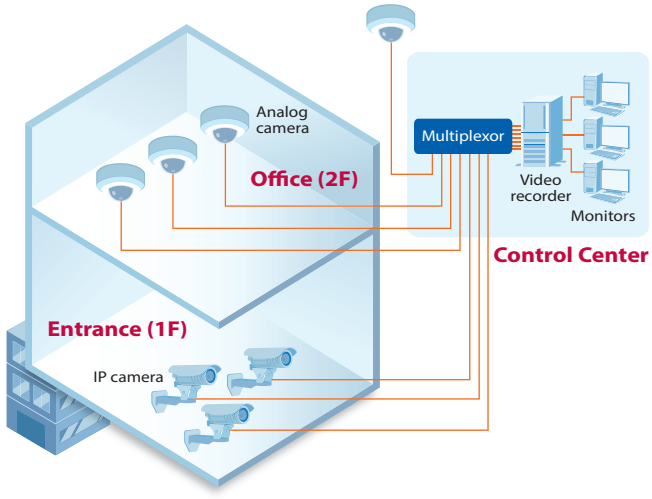
GS1100-10HP



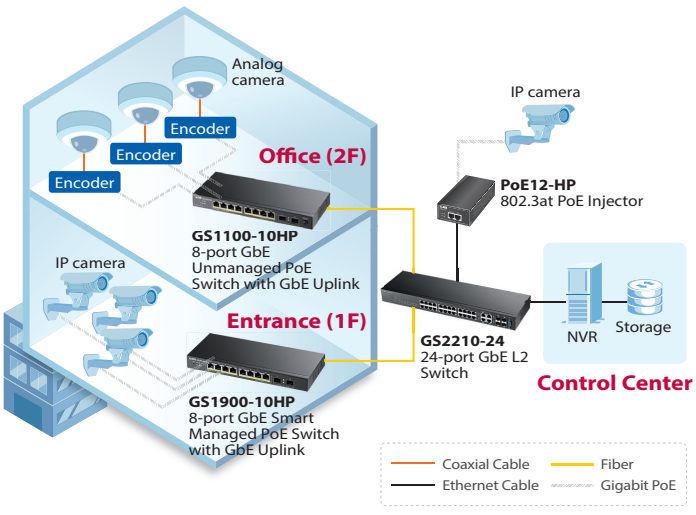
GS1900-10HP



Traditional CCTV Surveillance

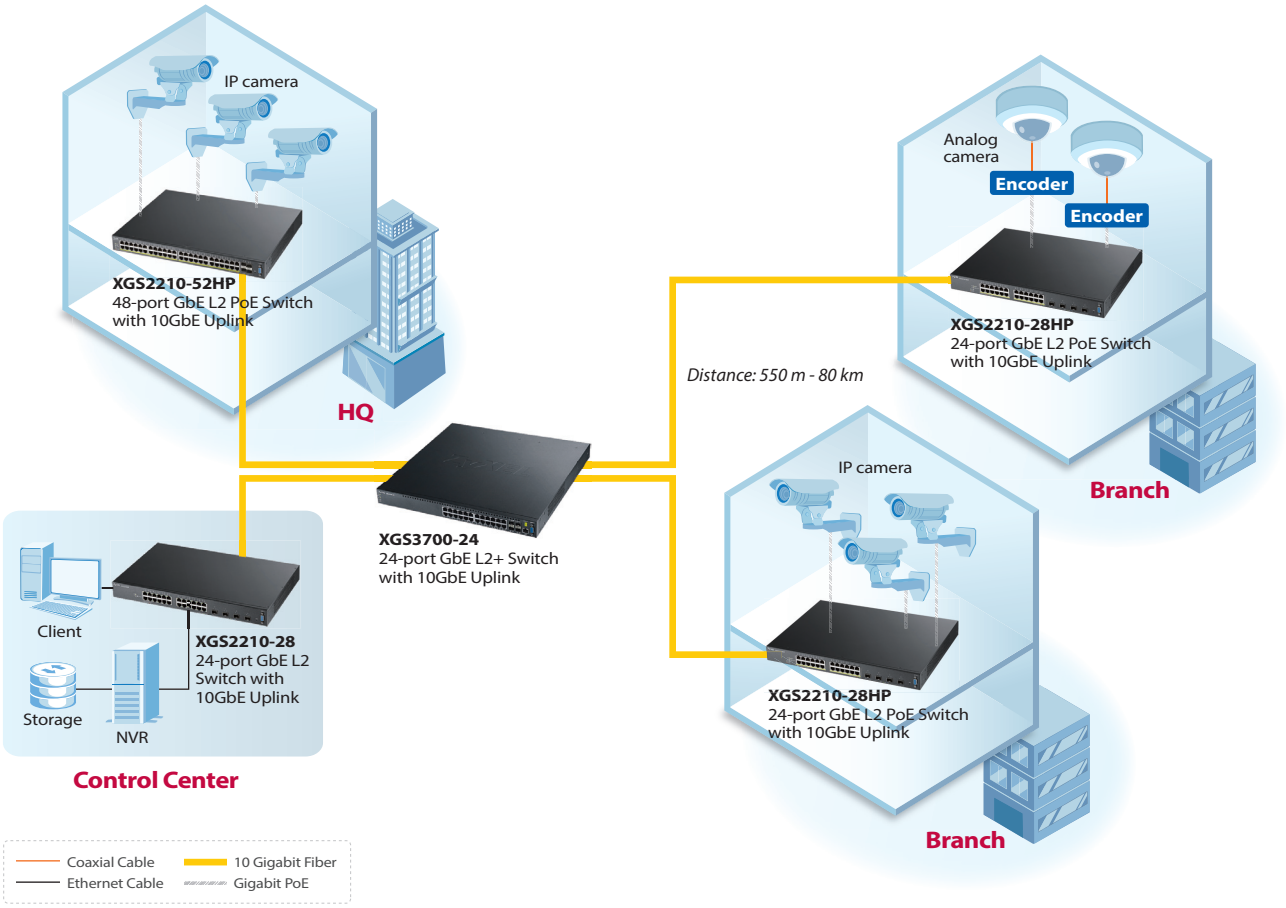


IP-based Video Surveillance



Fiber Aggregation

Fiber aggregation describes the deployment of IP surveillance in multiple long-distance sites and ensures quality of video traffics. ZyXEL Switches with fiber connections help businesses expand video surveillance coverage to their branches with excellent video quality.



Performance Features of the Solution

- Suitable for multi-site, small and medium-sized businesses
- Flexible fiber transmission distance from 550 m to 80 km
- Gigabit bandwidth for non-blocking surveillance video stream
- IEEE 802.1Q VLAN
- IEEE 802.1p priority queues enable users to prioritize mission-critical video traffics
- 10 Gigabit capability for more smooth and stable HD video transmissions

Fiber Connections

ZyXEL's Layer 2 and Layer 2+ Switches with fiber connections permit stable, reliable, secure and high-speed transmission over long distance. They enable headquarter and branch networks located in different sites to connect directly without the 100-meter limitation of copper wires. With fiber connection deployments, IT administrators can take advantage of the feature to plan for extended range of surveillance areas.

QoS

Video traffic is sensitive to packet delay, drop and jitter in IP surveillance environments where videos and data traverse the same network infrastructure. To ensure optimization for video streaming QoS and multicast, the management features are an integral part of IP surveillance networking solutions. QoS ensures streaming performance at a steady level by transmitting data according to its priority and by the requests of the applications. The following are QoS features that guarantee video quality.

- **IEEE 802.1Q VLAN**

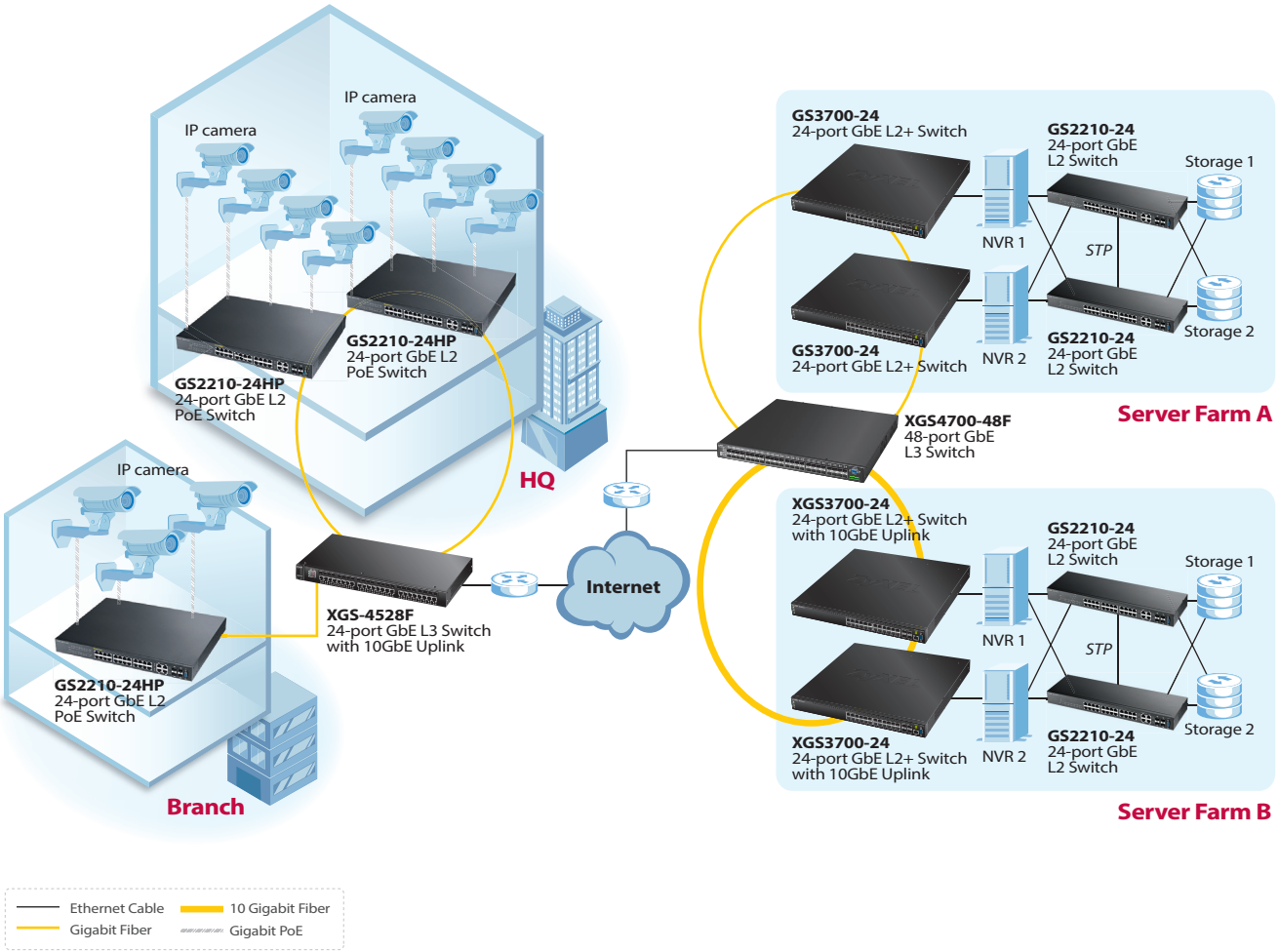
  VLAN technology allows a physical network to be partitioned into multiple logical networks, where only devices within the same group can communicate with each other. Devices on a logical network can belong to one or more groups such as video surveillance VLAN, employee VLAN and guest VLAN. With VLAN technology, the video surveillance IP network can be separated into virtual networks and this helps optimizing the utility for both application data and surveillance video.

- **IEEE 802.1p Class of Service, Priority Protocol**

  ZyXEL's Layer 2 PoE Switches provide IEEE 802.1p features that specify the user priority field and define up to eight separate traffic types. This feature gives video traffic the highest priority to guarantee video quality. With ZyXEL's Layer 2 PoE Switches, bandwidth resources are used more efficiently and real-time multimedia streams can be transmitted constantly.

Network Resilience

The network resilience application describes how to build a high-availability IP surveillance system. When some nodes in the IP network are disconnected, it's important for IP surveillance operators to quickly identify the problems and recover the network to avoid security threats. To achieve this goal, IP networks should have a network monitoring status mechanism to ensure network resilience. As such performance monitoring and STP features are very critical elements for network architecture.



Performance Features of the Solution

- Suitable for multi-site, large-scale businesses
- Aggregation switch balances network traffic
- Remote Network Monitoring (RMON) for performance monitoring and status collecting
- Digital Diagnostics Monitoring Interface (DDMI) SFP
- Fast network resilience to prevent network failure
- MSTP/RSTP/MRSTP standard support

Balanced Network Traffic

In a multi-site surveillance environment, the network architecture is divided into aggregation and access layers. The access layer switches are generally Layer 2 which provide port capacities to connect cameras or application clients. The aggregation layer switches are generally Layer 3 which provide not only Gigabit fiber connectivity to the distribution switches, but also enough bandwidth for the high-volume traffics.

Performance Monitoring via RMON Features

Performance monitoring is used to gather, store and report performance data for early detection of network problems. The ZyXEL Switches with RMON features will collect and monitor the network status data; in which the RMON features enable switches to continuously monitor the setting by themselves and send out the preconfigured event/alarm messages once the monitored values are over/under the rising/falling threshold. For example, when some IP cameras have abnormal traffics, RMON feature will alarm the network administrators and help taking proactive activities to prevent security threat.

DDMI SFP Enhances Management Capability

The enhanced digital interface enables a real-time link to be established between the switch and the SFP transceiver. This enables the switch to access operating parameters within the fiber link, and it includes digital features such as soft control and monitoring of SFP I/O signals. In addition, the DDMI functionality enables the capability to implement digital alarms and warnings.

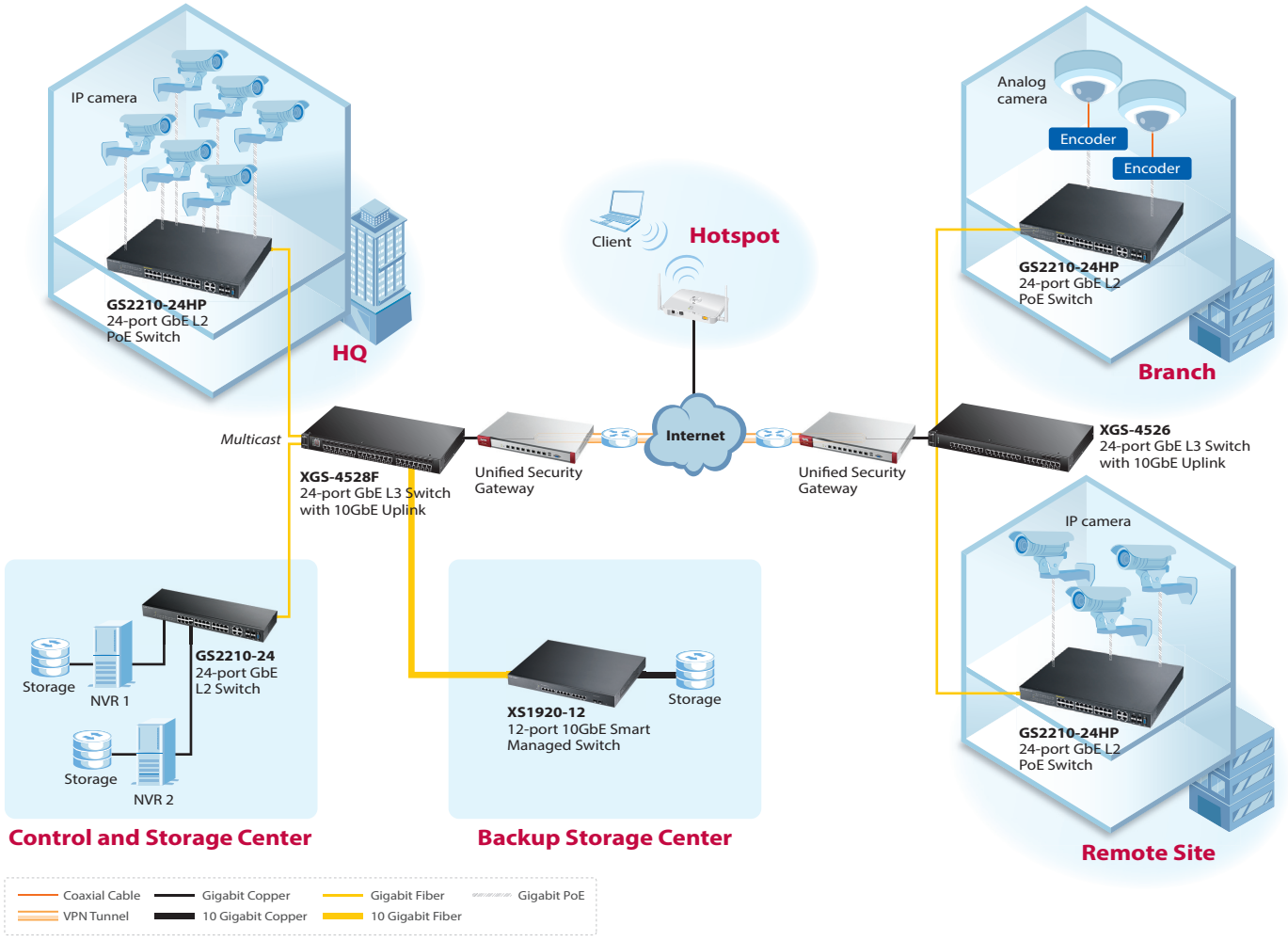
The DDMI enables users to have the capability of performing component monitoring, fault isolation and failure prediction tasks on their transceiver-based links. This feature also ensures the businesses to be proactive in preventative maintenance of the network for guaranteed non-stop operations.

Network Resilience

To build a high-availability IP surveillance system, the network must offer link redundancy with failover protection. The key element of high-availability IP surveillance system is Spanning Tree Protocol (STP) technology; the STP detects and breaks network loops, and it also provides backup links between switches, bridges or routers. It allows a device to interact with other STP-aware devices on the network to ensure that only one path exists between any two stations on the network. The STP technologies (MSTP/RSTP/MRSTP) provide link failover capability to the access switches connected to the IP cameras or storage devices.

Video Transmission Control

Video transmission control describes how to avoid unwanted packet flooding to ensure video quality and to manage network devices efficiency.



Performance Features of the Solution

- Suitable for multi-site, large scale businesses
- Multicast that reduces bandwidth usage
- Internet Group Management Protocol (IGMP) snooping v1, v2, v3 that avoid unwanted packet flooding
- Secure VPN tunnel
- Backup storage center with 10 Gigabit connectivity

Multicast

Multicast delivers IP packets to a specific group of hosts using IP multicast, which meets the one-to-many transmission needs more efficiently. With multicast, data is transmitted smartly by sending video data from a single device to multiple receivers simultaneously; this significantly reduces bandwidth usage and is suitable for IP surveillance with increasing IP cameras and application clients, including the monitor or storage center and remote monitoring terminals such as PCs or notebooks. With multicast technology, multiple locations in different IP networks can simultaneously monitor or store while network bandwidth remained optimized.

IGMP Snooping

IGMP snooping enables a Layer 2 switch to dynamically learn the members of IP multicast groups; the switch can then forward multicast traffics to ports that are members of those multicast groups. When a switch receives multicast traffics destined for the multicast groups it does not know, the switch either forwards the traffic to all ports or discards them altogether (depending on the switch and/or the switch configuration). IGMP snooping generates no additional network traffic and allows a switch to handle multicast traffics more efficiently and effectively.

Product at a Glance

With a ZyXEL Enterprise Switching solution, IP surveillance operators can deliver professional surveillance service with stable IP networking to fit a customer's individual needs. ZyXEL offers a range of interoperable products.

Switches

Unmanaged

ES1100-16P
16-port FE Unmanaged PoE Switch

ES1100-8P/ES1100-16P

The ZyXEL ES1100-8P and ES1100-16P 8/16-port FE Unmanaged PoE Switch are designed for SMBs to boost business network performance and efficiency. The Series provides not only plug-and-play simplicity for high-bandwidth connectivity, but also N-way auto-negotiation to connect network counterparts with the highest possible data speed and to activate duplex mode automatically. They are ideal for typical noise-sensitive office environments for its superior energy efficiency and Ethernet connectivity.

Key Features

- Non-blocking, wire-speed transmission
- IEEE 802.3az compliant
- IEEE 802.3x flow control supported
- IEEE 802.1p CoS supported
- IEEE 802.3af PoE

GS1100-10HP
8-port GbE Unmanaged PoE Switch with GbE Uplink

GS1100-8HP/GS1100-10HP

The ZyXEL GS1100-8HP and GS1100-10HP are ideal solutions for instant Gigabit connectivity in office environments demanding silent operation and better energy efficiency. Both of them support the IEEE 802.3at PoE Plus standard providing up to 30 watts per PoE port. With power-saving functions, Gigabit Ethernet and a fanless design, the GS1100-8HP and GS1900-10HP provide plug-and-play simplicity for high-bandwidth network applications.

Key Features

- Non-blocking, wire-speed transmission
- IEEE 802.3az compliant
- Fanless design for silent operation
- IEEE 802.3x flow control supported
- IEEE 802.3at PoE Plus standard with 30 W per port
- Two SFP ports support for easy long-distance deployments (GS1100-10HP)

Smart Managed

GS1900-24HP
24-port GbE Smart Managed PoE Switch

GS1900-8HP/GS1900-10HP/GS1900-24HP/GS1900-48HP

The ZyXEL GS1900-8HP/10HP/24HP/48HP provides flexible Gigabit connectivity through its 8 to 48 ports designed for Power over Ethernet connections. They comply with IEEE 802.3af and 802.3at standards to offer connections for both 15.4-watt IEEE 802.3af devices and 30-watt IEEE 802.3at devices without restriction of power socket. With the friendly, intuitive step-by-step wizard and the built-in Web-based browser, the GS1900-8HP/10HP/24HP/48HP helps users to have enjoyable experience from plug-and-play usage and easy configuration.

Key Features

- Easy browser-based switch management
- Gigabit speed and various port connectivity options
- Extra SPF slots to facilitate long-distance deployments (GS1900-10HP/GS1900-24HP/GS1900-48HP)
- Complies with IEEE 802.3af and IEEE 802.3at PoE standards

GS1920-48HP
48-port GbE Smart Managed PoE Switch

GS1920-24HP/GS1920-48HP

The ZyXEL GS1920-24HP and GS1920-48HP are ideal for securing Fast Ethernet and Gigabit connectivity over a Power over Ethernet connection. They comply with IEEE 802.3af and 802.3at standards, and offer access security, advanced prioritization and traffic-monitoring capabilities. With IPv6 support for smooth migration to future standards, the GS1920-24HP and GS1920-48HP are suitable for fulfilling SMB network needs with cost-effective, valuable frameworks.

Key Features

- Smart managed switch with essential L2 features
- High 375-watt power budget
- Supports ZON Utility and Smart Connect to facilitate easy network initialization and management
- Robust network availability
- Rigorous access protection to secure the network

XS1920-12
12-port 10GbE Smart
Managed Switch

XS1920-12

The ZyXEL XS1920-12 contains ten (10) 10GBASE-T ports and two (2) SFP+ combo ports for flexible deployments. It is ideal for SMB to migrate Gigabit network to 10GbE by offering both copper and fiber connectivity and handle increasing data and applications with investment-protection, such as video streaming and IP surveillance.

Key Features

- Flexible 10G connection to 10G servers and network storage through both copper and fiber
- ZyXEL One Network experience enables simple network management and maintenance
- Upgrade the network with investment-protection
- Robust features to ensure network availability

Layer 2 and Layer 2+ Managed

XGS2210-52HP*
48-port GbE L2 PoE Switch
with 10 GbE Uplink

XGS2210/GS2210 Series

The ZyXEL XGS2210/GS2210 Series are fully featured Layer 2 Gigabit access switches designed to meet these converged data, video and voice networking needs. The Series comes in 8-, 24-, 28-, 48- and 52-port models with a combination of PoE and non-PoE, as well as Gigabit (GS2210 Series) and 10 Gigabit (XGS22100 Series) uplink options. The PoE models comply with the IEEE 802.3af PoE and 802.3at PoE Plus standards and provide a high PoE power budget.

Key Features

- Fully managed Layer 2 switching solution
- Comprehensive network protections
- High power budget of 375 W (XGS2210-28HP/52HP; GS2210-24HP/48HP) and 180 W (GS2210-8HP)
- IEEE 802.3at PoE Plus standard

** XGS2210 series is available in Q2 2016.*

XGS3700/GS3700 Series
24/48-port GbE L2+ Switch

XGS3700/GS3700 Series

The ZyXEL XGS3700/GS3700 Series are advanced Layer 2 Plus (Layer 3 Lite) Gigabit managed switches perfect for data center access, SMB core/aggregation, and mission critical PoE applications. The Series consists of eight (8) models including 24- and 48-port configurations, PoE and non-PoE models, as well as 1GbE (GS3700 Series) and 10GbE (XGS3700 Series) uplink options.

Key Features

- Full Layer 2 feature set with Layer 3 features including static routing, policy-based routing, VRRP and ECMP support desktop connectivity
- Hot-swappable power supply and fan modules
- Internal redundant power supply design
- Provides up to 30 W per port with IEEE 802.3at PoE Plus compliance
- High PoE power budget up to 1000 W

Layer 3 Managed

XGS-4528F
24-port GbE L3 Switch
with 10GbE Uplink

XGS-4528F/XGS-4526

The ZyXEL XGS-4500 Series comprises of intelligent Layer 3 Gigabit Ethernet switches that are specially designed to deliver profitable Ethernet services. With high-performance switching functionalities suitable for triple-play services (Internet data exchange, Web surfing, IPTV and VoIP telephony) the XGS-4500 Series enables integrated and value-added IP services. The ZyXEL XGS-4500 Series offers wire-speed flow control that classifies and prioritizes the incoming packets according to the predefined QoS policies that meet requirements of service providers.

Key Features

- Advanced L3 routing protocols (OSPF, VRRP)
- Multilayer (L2/L3/L4) ACL for security protection and traffic optimization
- IGMP, IGMP snooping, DVMRP and MVR support
- Port security and enhanced 802.1X port authentication

Accessories

■ **PoE12-HP**

The PoE12-HP is a single-port PoE device in which both high power and data can be delivered to other PoE devices (PD) via a single CAT-5 Ethernet cable without extra power supply. The PoE12-HP supports power budget up to 30 W.

Key Features

- Install anywhere taking advantage of PoE technology
- Simple installation for IEEE 802.3at-compatible wireless LAN APs or IP cameras
- Up to 100 m coverage via CAT-5 Ethernet cables

Security Protection

Unified Security Gateway

Next Generation USG Series
Unified Security Gateway

■ **Next Generation USG Series**

ZyXEL's Next Generation Unified Security Gateways offer businesses robust, user-aware security all in one package. They offer anti-malware and effective policy enforcement with a wide range of mechanisms such as anti-virus, anti-spam, VPN, content filtering, IDP, firewall and application intelligence. The all-in-one design with an integrated WLAN controller helps businesses minimize management efforts and total cost of ownership (TCO), while maximizing network security.

Key Features

- VPN connectivity — for secure remote access
- Firewall — stops attacks and controls traffic
- Anti-virus — provides comprehensive, real-time protection
- Anti-spam — detects and blocks spams accurately
- Content filtering — screens access to non-business related or malicious Web sites
- Intrusion Detection Prevention — against attacks from the Web
- Application intelligence and control — prioritize and block applications to prevent bandwidth abuse
- Integrated WLAN controller — enables centralized authentication and access management of multiple APs

Feature Matrix

Edge PoE Switch

Model	XGS3700-48HP	XGS3700-24HP	GS3700-48HP	GS3700-24HP
Product picture				
Switch class	Layer 2+ Managed	Layer 2+ Managed	Layer 2+ Managed	Layer 2+ Managed
Port Density				
10/100 Mbps	-	-	-	-
10/100 Mbps PoE	-	-	-	-
100/1000 Mbps	-	-	-	-
100/1000 Mbps PoE	48	24	48	24
Gigabit SFP	-	-	4	4
10 Gigabit SFP+	4	4	-	-
Dual-personality Gigabit (SFP/RJ-45)	-	-	-	-
Performance				
Switching capacity (Gbps)	176	128	104	56
Forwarding rate (Mpps)	131	95	77	41.7
MAC addresses table	16 K	16 K	16 K	16 K
Power over Ethernet				
Standard compliance	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af
Total PoE power budget (watt)	Single PSU 460 W Dual PSU 1000 W	Single PSU 460 W Dual PSU 1000 W	Single PSU 460 W Dual PSU 1000 W	Single PSU 460 W Dual PSU 1000 W
Green Features				
Fanless	-	-	-	-
IEEE Energy Efficient Ethernet	Yes	Yes	Yes	Yes

Model	XGS2210-52HP	XGS2210-28HP	GS2210-48HP	GS2210-24HP	GS2210-8HP
Product picture					
Switch class	Layer 2 Managed	Layer 2 Managed	Layer 2 Managed	Layer 2 Managed	Layer 2 Managed
Port Density					
10/100 Mbps	-	-	-	-	-
10/100 Mbps PoE	-	-	-	-	-
100/1000 Mbps	-	-	-	-	-
100/1000 Mbps PoE	48	24	48	24	8
Gigabit SFP	-	-	2	-	-
10 Gigabit SFP+	4	4	-	-	-
Dual-personality Gigabit (SFP/RJ-45)	-	-	4	4	2
Performance					
Switching capacity (Gbps)	176	128	100	56	20
Forwarding rate (Mpps)	128	95.2	74	41.7	14.9
MAC addresses table	16 K	16 K	16 K	16 K	16 K
Power over Ethernet					
Standard compliance	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af
Total PoE power budget (watt)	375	375	375	375	180
Green Features					
Fanless	-	-	-	-	-
IEEE Energy Efficient Ethernet	Yes	Yes	Yes	Yes	Yes

Model	GS1920-48HP	GS1920-24HP	GS1900-48HP	GS1900-24HP	GS1900-10HP
Product picture					
Switch class	Smart Managed	Smart Managed	Smart Managed	Smart Managed	Smart Managed
Port Density					
10/100 Mbps	-	-	-	-	-
10/100 Mbps PoE	-	-	-	-	-
100/1000 Mbps	-	-	24	-	-
100/1000 Mbps PoE	44	24	24	24	8
Gigabit SFP	2	-	2	2	2
10 Gigabit SFP+	-	-	-	-	-
Dual-personality Gigabit (SFP/RJ-45)	4	4	-	-	-
Performance					
Switching capacity (Gbps)	100	56	100	52	20
Forwarding rate (Mpps)	74	41.7	74	39	14.9
MAC addresses table	16 K	16 K	8 K	8 K	8 K
Power over Ethernet					
Standard compliance	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af
Total PoE power budget (watt)	375	375	170	170	77
Green Features					
Fanless	-	-	-	-	Yes
IEEE Energy Efficient Ethernet	Yes	Yes	Yes	Yes	Yes

Model	GS1900-8HP	GS1100-10HP	GS1100-8HP	ES1100-16P	ES1100-8P
Product picture					
Switch class	Smart Managed	Unmanaged	Unmanaged	Unmanaged	Unmanaged
Port Density					
10/100 Mbps	-	-	-	8	4
10/100 Mbps PoE	-	-	-	8	4
100/1000 Mbps	-	-	4	-	-
100/1000 Mbps PoE	8	8	4	-	-
Gigabit SFP	-	2	-	-	-
10 Gigabit SFP+	-	-	-	-	-
Dual-personality Gigabit (SFP/RJ-45)	-	-	-	-	-
Performance					
Switching capacity (Gbps)	16	20	16	3.2	1.6
Forwarding rate (Mpps)	11.9	14.9	11.9	2.4	1.2
MAC addresses table	8 K	8 K	8 K	8 K	1 K
Power over Ethernet					
Standard compliance	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3at, 802.3af	IEEE 802.3af	IEEE 802.3af
Total PoE power budget (watt)	70	130	75	130	64
Green Features					
Fanless	Yes	Yes	Yes	-	Yes
IEEE Energy Efficient Ethernet	Yes	Yes	Yes	Yes	Yes

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