

# D-Link is Digitizing Schools in India



## EXECUTIVE SUMMARY

<b>Customer</b>	KITE
<b>Industry</b>	Education
<b>Location</b>	Kerala, India
<b>Challenge</b>	Network Design for 50 Schools
<b>Solution</b>	DGS-1210, DGS-1024, D-Link Fiber & Copper Cabling
<b>Results</b>	Study materials are now easier to disseminate to branch campuses

The Kerala Infrastructure and Technology for Education (KITE) organization was tasked with bringing school IT infrastructure in the Indian state of Kerala up to international standards, with the goal of making the quality of teaching materials more consistent statewide by enabling easier sharing from local and centralized servers.

## Result

Thanks to D-Link's infrastructure, 200 classrooms in Kerala have been transformed into Smart Classrooms. Teachers in every school have access to high-quality materials from headquarters, and teachers are able to share their own improvised teaching aides with other teachers.

## Challenge

This project required network design for 50 different schools across the state. D-Link, which had already implemented IT solutions for 3,000 schools and 60,000 classrooms in India, partnered with the Kerala State Electronics Development Corporation (KELTRON) to survey these 50 sites, and implement solutions.

## Solution

D-Link provided both fiber cabling for the backbone, and copper cabling for the local networks. Where fiber connectivity was needed, the DGS-1210-28 Smart Managed Switch was used, which provides four SFP uplinks, which was double the number that the competition was able to offer in a comparable switch class.

When fiber wasn't needed, the DGS-1024C Unmanaged Switch was used, with offers 24 x 10/100/1000 Gigabit ports, combined with an energy-efficient fanless design.

## Products & Services

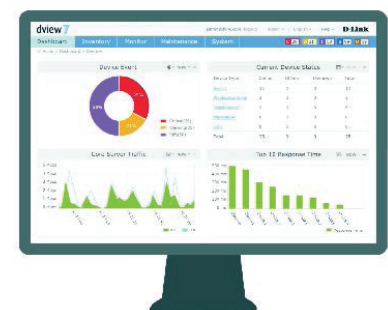
- DGS-1210-28 Smart Managed Switch.
- DGS-1024C Unmanaged Switch
- D-View Monitoring Software



DGS-1210-28



DGS-1024C



D-View

# An Unbeatable Network Infrastructure Solution to Support CCTV Requirements in Schools in Delhi



## EXECUTIVE SUMMARY

<b>Client</b>	Public Works Department, The Government of the National Capital Territory of Delhi
<b>Industry</b>	Education
<b>Location</b>	India
<b>Challenge</b>	High capacity, secure switching across 1,000 sites and integration with 150,000 cameras
<b>Solution</b>	Powerful switches to ensure high reliability, loop-free networks with no bottlenecks
<b>Results</b>	A greater level of security for students and staff, with live feed viewing for parents.

The Public Works Department in Delhi is responsible for many aspects of local government, including administration over schools. To better ensure student safety, create peace of mind and instill security throughout all school property, they decided to install CCTV across all school properties. They partnered with D-Link to execute their vision for safer schools.

## Challenges

The project was mammoth in scale, with systems required in over 1000 schools, each with around 200 cameras across the city of Delhi. The resulting total was around 150,000 cameras, all needing to be connected under a single network infrastructure.

## Solutions

At the data center, the DGS-3630 Series was selected to handle the core switching duties. With so many cameras constantly streaming footage, the bandwidth requirements were huge. However, with 10 Gigabit uplinks to the network, there is adequate switching capacity to keep data flowing smoothly round the clock and no bottlenecks.

With such a complex network comprising many nodes, the potential for switching pathways to become convoluted and loops forming, in turn creating network paralyzing loops is a real possibility. Other features such as Loopback

Detection and Spanning Tree Protocol (STP) guard against potential loops forming, for higher network reliability.

At the access layer, a combination of DGS-1210 Series Switches in different port options were deployed. With PoE support, cameras can be directly connected to the switches and have all their power requirement needs met without needing a power supply.

Important security features such as IP-MAC Port Binding (IMPD) and Access Control Lists protect the network safe by disallowing unauthorized users to access the network, be it criminal activity or just a mischievous student.

## Results

A network infrastructure and the 150,000 cameras were successfully deployed across all the schools. The result was better safety for staff and students. Meanwhile parents who like to keep a close eye over their children can view live feeds, making sure they are studying hard.

## Products & Services

- DGS-3630-28PC/INMI Layer 3 Stackable Managed PoE Gigabit Switch
- DGS-1210-28P/ME Gigabit PoE Metro Ethernet Switch
- DGS-1210-10P/ME Gigabit PoE Metro Ethernet Switch



DGS-3630-28PC



DGS-1210-28P



DGS-1210-10P

## Deployment of LAN & Wi-Fi connectivity with Surveillance infrastructure in the Govt. College



### EXECUTIVE SUMMARY

Customer	National Institute of Electronics & Information Technology – NIELIT
Industry	Education
Location	India (Tamil Nadu)
Challenge	To re-vamp the existing infrastructure with 10G backbone along with wi-fi connectivity & surveillance solution.
Solution	Provided complete end to end solution with strong switching solution along with seamless W-Fi connectivity & cameras for the classrooms and Realtime streams
Results	Feature rich, robust Wi-Fi network for Improved customer infrastructure reliability and redundancy for seamless video streaming and connecting to National Knowledge Network (NKN)
Project Revenue	INR 45 lacs / USD 47k

National Institute of Electronics & Information Technology, formerly known as the DOEACC Society, is a society that offers information technology training at different levels. It is associated with the Ministry of Electronics and Information Technology of the Government of India. Being a Government College, through a GEM (Government E - marketplace) requirement was published for re-vamping the college and provide a complete 10G infrastructure with wi-Fi connectivity and surveillance solution.

### Challenge

To re-vamp the existing infrastructure of copper & Fiber solution with strong 10G Backbone. Also integrating with third party firewall for the National Knowledge Network (NKN) was another major challenge.

### Solution

D-LINK provided a complete switching infrastructure with 10G switches terminated with NKN (National Knowledge Network) which provided backbone to an internal network.

Complete Hands on Experience was provided to students on bandwidth testing on 10G Switches. Also, Wireless Access points & Controller were Installed for students to experience roaming features with live streaming,

IP Surveillance installed on all class rooms & at common areas also to educate students on retrieval & playback functionality. NMS was also provided for Health check up with alerts.

Layer 3 10G Copper and 10G Fibre switch was deployed for seamless connectivity along with redundancy features between storage & servers.

#### 24-Port Layer 3 Stackable 10 Gigabit Managed Switch: DXS-3400-24TC & DXS-3400-24SC

- High-performance switch delivering wire-speed 10-Gigabit switching, routing, and ultra-low latency
- 20 x 10GBASE-T ports in case of Copper and 20 x SFP+ ports in case of fiber
- 4 x 10GBASE-T/SFP+ Combo ports
- Physical stacking with up to 4 devices per stack
- Layer 2+ static routing / RIPv1/v2/ng
- Optional Layer 3 dynamic routing / OSPF
- Data Center Bridging (DCB) features
- Hot-swappable power supplies and fan modules

#### 28-Port Layer 3 Stackable Managed Gigabit Switch: DGS-3630-28TC

- High performance, flexibility, fault tolerance, and advanced software features for SMBs, SMEs, large enterprises, and ISPs.
- 20 x 10/100/1000BASE-T ports
- 4 x Combo 10/100/1000BASE-T/SFP ports
- 4 x 10G SFP+ ports
- 6 kV surge protection on all RJ-45 access ports
- Switch Resource Management (SRM) for flexible management of system resources
- Redundant Power Supply (RPS) support
- MPLS L2VPM/L3 VPN support
- Full L3 routing protocol support including OSPF, BGP, and ISIS for IPv4/IPv6
- SDN-enabled switch, compatible with OpenFlow 1.3

Layer 2 POE & non POE switches was deployed for Backbone network, AP's & IP camera integration.

#### Gigabit Stackable Smart Managed Switch with 10G Uplinks Layer 2: DGS-1510-28P & DGS-1510-52

- Flexible 10 Gigabit connectivity for SME and SMB

environments.

- 24 x 10/100/1000BASE-T PoE ports
- 2 x Gigabit SFP ports
- 2 x 10G SFP+ ports
- Layer 2 management and security with Layer 3 capabilities
- Static Routing and MSTP
- 193 W PoE budget in case of PoE switch

Wi-fi user authentication through controller to monitor student's activity

#### Wireless Controller: DWC-2000

- Centralized wireless LAN manager designed for campus, hospitality, and medium-to-large enterprise environments.
- D-Link's DWC-2000 Unified Wireless Controller is a cost-effective wireless management solution suitable for large Access Point deployments. Capable of managing 64 Unified Wireless Access Points out of the box, it provides a reliable, secure, self-healing, scalable wireless network suitable for education, hospitality and businesses of any size.

#### Dual-Band 802.11n/ac Wave 2 Unified Wireless Access Point: DWL-6620AP

- Next-generation connectivity for medium to large-scale Wi-Fi networks
- Embedded D-Link Smart Antenna helps to ensure a reliable connection and optimized
- wireless user experience
- Centrally managed by D-Link Unified Wireless Controllers, up to 32 virtual access points may be created from a single access point
- Flexible QoS with Wi-Fi Multimedia (WMM)
- IEEE 802.3at Power Over Ethernet (PoE) enables installation in hard to reach locations
- UL2043 certified housing
- MU-MIMO technology increases wireless network capacity and overall throughput
- Band steering for efficient traffic management
- Two Gigabit Ethernet LAN ports supporting Link



IP Surveillance installed on all class rooms & at common areas also to educate students on retrieval & playback functionality.

#### 2 MP Full HD Day & Night Varifocal Enhanced Outdoor Dome Network Camera: DCS-F4622E

- 2MP varifocal enhanced camera
- 1920 X 1080 @30fps
- IR distance up to 20m
- Varifocal lens 2.8-12mm
- Outdoor application - IP66

#### 4MP Day & Night Outdoor Varifocal Bullet Network Camera: DCS-F4724

- 4MP varifocal camera
- 2592 X 1520 @30fps
- IR Range up to 25m
- Motorized lens 2.8-12mm
- Outdoor application - IP66

#### 32CH Professional Network Video Recorder (NVR): DNR-F4432

- HDMI/VGA Output 920X1080/60Hz
- Audio I/O & Alarm I/O
- H.264/MPEG Camera Input
- Live 16 CH with 4Playback Channel

## Result

D-Link with its 10G switching solution along with wireless architecture delivers feature rich, robust solution for Wi-Fi network connectivity which shall improve customer infrastructure reliability & redundancy. Also, seamless video conferencing was provided with our 10G backbone to the leadership team.

## Product & Services:

Layer 3 10G Switch: DXS-3400 series & DGS-3630-28TC



Layer 2 PoE Switch: DGS-1510-28P



Layer 2 Non-PoE Switch: DGS-1510-52



Wireless Solution: Access point: DWL-6600AP & Wireless Controller: DWC-F2000



IP Surveillance: DCS-F4622E/ DCS-F4724/ DNR-F4432



NMS: D-View 7

