ThruLink™ Drives ITS Cost Savings

Singapore's Intelligent Transport System

Background

Singapore's LTA (Land Transport Authority) is responsible for Singapore's highways, roadways and railways. In 2006, it instigated 'Junction Electronic Eyes' (J-Eyes), a project that would provide electronic surveillance of road traffic and dynamic information to drivers. Now in full operation, the intelligent transport system helps to keep traffic flowing, reduce congestion and provide motorists with updated traffic information, making journeys safer and more pleasant.

During the first phase of the project, 273 analogue cameras were installed across the city. The cameras were fed into encoders and digital streams were transmitted over optical leased lines back to the central control room. However the ongoing cost of those connections proved to be very expensive.

The Challenge

It was decided to find a solution that would allow the leased lines within the intelligent transport system to be replaced by a more cost-effective alternative. As the transmission system was IP based, the LTA proposed to use the public broadband system simply by deploying DSL routers at each camera location.

During initial testing, the encoders at the camera locations would not connect to the NVRs back at the control centre (Network Video Recorders). Following investigation it was found that the UPnP (Universal Plug and Play) packets used to enable the encoders to configure with the NVRs have a TTL (Time To Live) of 1 meaning that as they passed over a network, the first hop would 'kill' the packet as it decremented the TTL to zero. While it's possible to accommodate this on a LAN (Local Area Network), this wouldn't work on a WAN (Wide Area Network) because the data packets would need to make several hops between source and destination. Without any customisation of the encoders, it meant that dedicated leased lines would still be required for every video stream.

The Solution

The solution was to install a KBC standard capacity ThruLink (THLK-S) at each camera and then high capacity ThruLinks (THLK-HC) at the control centre.

The diagram overleaf shows the set-up of the Thrulink system. The ThruLink devices create hardware VPNs (Virtual Private Network), from the cameras to the control centre, so as far as the data packets are concerned, they remain on one LAN from end-to-end even though they may make several hops en route. This allows the IP system to operate regardless of the type of network between the encoders and the NVRs.

Outcome

KBC's ThruLink allowed the IP system to operate across the public broadband network and the LTA dramatically lowered their ongoing communication costs by removing leased lines. Based on current leased line costs, it is estimated that the ThruLink system paid for itself in under 6 months.

Thanks to the reduction in operating costs and their confidence in the system's operational quality, LTA have continued to expand the system. Today, approximately 800 cameras are connected by ThruLink via the public broadband network. The Thrulink units encrypt the data traffic to ensure that the LTA video streams remain secure over the public network and redundancy is provided by the high capacity ThruLink units at the control room to ensure continuous system operation.

Benefits

End User	Installer
✓ Significant reduction in annual transmission costs	✓ Enabled the IP CCTV system to operate across a WAN
✓ Data streams sent securely through the public network	✓ Straightforward, rapid deployment
✓ No licence costs or contract terms	✓ No requiement for specialist IT knowledge
✓ Low maintenance costs	✓ Simple ongoing maintenance (secure, remote access capability)
	✓ Hardened field units

'...it is estimated that the ThruLink system paid for itself in under 6 months.'

KBC

data delivered

www.**kbcnetworks**.com

Intelligent Transport System over WAN using KBC ThruLink

Control Room

Primary 1-50
Secondary 51-100
THLK-H
Router

Primary 51-100
Secondary 1-50
THLK-H
Router

Firewall

WAN

Camera Location

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

Multiple Cameras

Camera Location

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

Multiple Cameras

Camera Location

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

THLK-S2
Client Mode
ThruLink
IP Camera
DSL Router

Multiple Cameras

Multiple Locations