Washington DC upgrades transportation network

Washington DC, the US capital, continues to face massive challenges in the management of its traffic and transportation. The 70 square mile (180km²) city includes 1,500 miles (2,400km) of public roads, more than 7,000 intersections, 1,600 traffic signals and hundreds of CCTV cameras.

The DC Department of Transportation (DDOT) manages and maintains transportation infrastructure in the DC area. Its responsibility is to ensure that people, goods and information move efficiently and safely, with minimal adverse impact on residents and the environment.

The DDOT was looking for a solution that would allow it to support the bandwidth required for new applications and devices, such as new controllers' smart sensors and, specifically, an emphasis on video. The challenge was to gradually advance the current twisted copper pair-based network with minimal impact on everyday traffic, as well as to ensure scalability and enable future migration to fiber. The platform selected was also expected to significantly cut management costs by minimizing the number of service call-outs and relying more on remote management from the DDOT traffic operation center (TOC).

The right solution

After a thorough analysis and evaluation of multiple solutions, the DDOT selected Actelis Networks.

Actelis offers an advanced and robust ITS platform that meets the need for a faster communication network. The devices assimilate information from multiple video streams and smart sensors to enable on-the-fly adjustments and alignment of the city's traffic flow. "Our continuous partnership with Actelis during the last few years has enabled us to significantly and gradually enhance the DC ITS network with minimal impact on traffic, while keeping within budget," notes Harvey Alexander, division signals and ITS maintenance manager at DDOT. "The Actelis solution is future proof. It allows growth and scalability with bonded copper as well as integrated migration to fiber if required."

Actelis smartly uses the existing copper infrastructure, offering more than 10Mbps per pair and over 100Mbps with eight bonded pairs, even at very long distances of up to 30,000ft (9,100m), supporting backhauling of multiple streams of high-quality video. The advanced bonding mechanism enables growth to support the city's growing number of CCTV and signalized intersections. The ability to bond pairs offers high reliability and redundancy, ensuring that a network connection is extremely resilient and can sustain even multi-failure scenarios.

The Actelis portfolio, which includes ML600/D, ML500/D hybrid access devices and ML2300/ML230 high-density aggregators, can be flexibly used to accommodate various network scenarios. The portfolio offers the scalability to support more intersections as well as the ability to support increased bandwidth per intersection. All devices are hybrid, offering a mix of bonded copper and GIGA Ethernet interfaces over fiber.

At the DDOT centralized TOC, real-time information from CCTV cameras and sensors is constantly analyzed to ensure all traffic signals, across all intersections, are synchronized. The Actelis MetaAssist EMS management system, installed in the TOC, plays a crucial role in this regard, allowing full remote control along with easy troubleshooting and network-wide monitoring. The increase in TOC-centric activities improves efficiency and considerably decreases the time required for typical day-to-day activities, including service call-outs. In addition flexibility is improved, enabling the TOC to quickly and efficiently respond and adjust the network according to events in the DC area.

The Actelis platforms are hardened and designed to maintain integrity in cold and hot weather, rain and snow – and even during lightning storms. The system offers a high level of security by employing data scrambling and advanced 256bit encryption. All management traffic is protected as well, using SSHv2 and SNMPv3.

Left: **Actelis Networks's ITS solution was chosen by the DC Department of Transportation to improve its road networks and mobility**

Need to know

Benefits of the Actelis ITS solution include:

- Managed ethernet switches
- Use readily available copper
- Hybrid fiber-copper power
- Optimized for video
- Flexible topologies, power over Ethernet (PoE)
- Advanced cyber security