



Accelerate Everything

Application Note :: Campus Services/Security

Actelis Provides One Network for Security and Campus Applications

With the need for the utmost in security, coupled with the never-ending demand for campuswide data services, the biggest challenges being faced by educational institutions is how to quickly and cost effectively deploy a campuswide network. Ethernet over copper is proving to be a phenomenal solution for the education sector, consolidating all security, data, video and voice services over a converged, secure and cost-effective infrastructure. With most schools and colleges already owning the copper wires within their campuses, Actelis' comprehensive Ethernet over copper portfolio offers the perfect solution for powering a single, scalable, and yet inexpensive broadband network. Actelis' product line seamlessly, and without compromise, brings all locations and functions together, while leaving money in the budget for other school needs.

Security has leapt up the agenda for most campuses in the wake of recent tragedies in the United States and elsewhere around the world. These events have highlighted the need for rapid response teams to execute a campuswide lock down and monitoring solution. At the same time, growing use of multimedia and distance learning is increasing dependence on high-speed networks for educational purposes. The Internet is blurring the distinction between learning and entertainment, making it desirable to give students a single high-speed point of access in their dormitories through which they can access educational content, class syllabuses, email, even television. The same internal network can also provide access points in libraries, refectories and other communal places around the campus. Most schools have limited budgets for new services, so the fact that Actelis is inexpensive to deploy, with no need to trench new fiber, is a strong selling point. Equally importantly, the platform provides a single infrastructure that reduces significantly the ongoing costs of management, and yet by supporting bonding of multiple copper pairs, is highly scalable. Bandwidth can increased

incrementally and inexpensively as demand grows or new applications are deployed.

Campus Security

Recent attacks on students within their campuses have turned security overnight from a "nice to have" option into an "absolute requirement." As a result, security has become the top deployment priority for many educational institutions. One challenge is that security involves many devices of different types distributed widely across the campus. These include video surveillance cameras both on the perimeter and within buildings for early detection of intruders, as well as lock down devices such as door or window locks and alarms. Many of these locations lie beyond the reach of fiber or coaxial cable, and wireless networks are not sufficiently reliable and fail to provide guaranteed coverage at all parts of the campus. By leveraging the existing copper infrastructure that extends throughout the campus, security devices can be connected easily and quickly wherever they are.

Furthermore, the same copper network can be used to backhaul video to one control center serving all security devices, making it easier to respond to emergencies through near-instantaneous surveillance and subsequent rapid execution of lock-down procedures. With the ability to remotely lock down an entire campus from one location translates to critical time saved, providing the assurance of safety that students and staff naturally expect inside their campuses.

In some cases incidents will first be notified by phone rather than detected automatically by a surveillance system. Support for emergency VoIP phones are becoming essential via a secure network that is itself protected against failure. Reliability of the circuits is crucial, which is facilitated at several levels by Actelis' Ethernet in the First Mile (EFM) products. Firstly, Actelis supports bonding of up to 16 individual pairs, enabling bandwidth to be scaled up

Requirements

- High speed, secure connections between campus facilities
- Using existing copper infrastructure
- Extend Ethernet services campuswide
- Rapid deployment, and must be installed quickly
- Converge disparate network systems

Equipment

- ML600 EADs series
- ML2300 aggregation switches in point-to-multipoint
- MetaASSIST™ management system

Benefits

- High performance, low cost to deploy
- Rapid deployment, up and running quickly
- Utilize existing copper facilities equals lower cost to implement
- Highly secure data, video, voices transport to/from all points in the network
- Modernizes communications infrastructure

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to 100 Mbps per circuit, while protecting against failure of any single pair. Actelis complements this physical level of redundancy with features that protect against component failure within the ML systems.

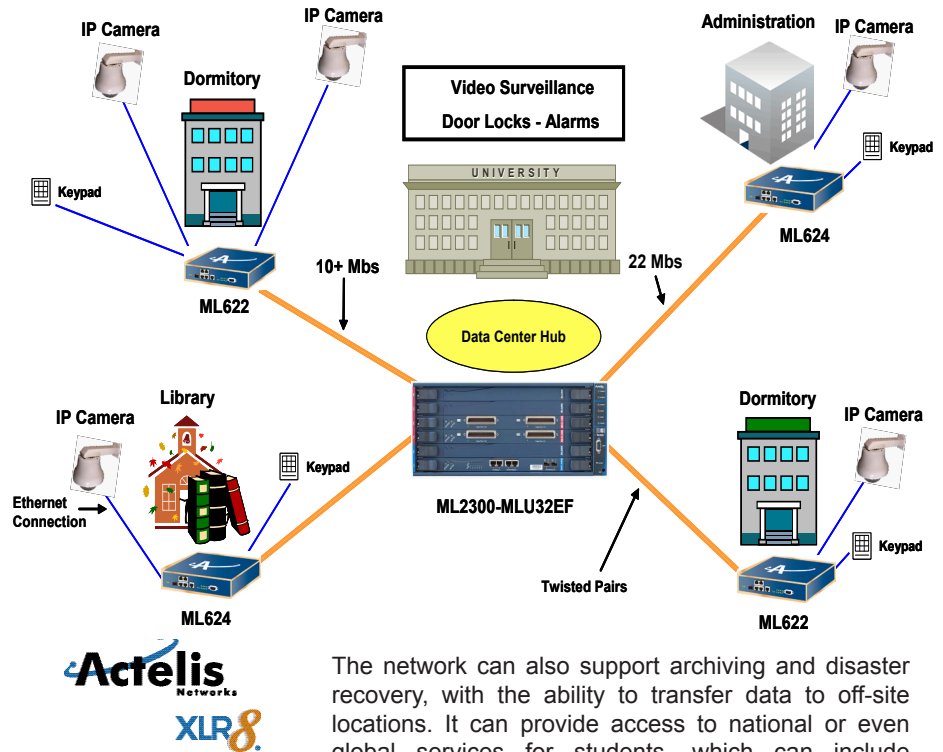
These features are illustrated in the diagram showing security and the pivotal role played by the Actelis platform in the campus communications network. The main data center is located in the headquarters building, with the communications hub for the whole campus based on an Actelis point-to-multipoint ML2300. This, in turn, radiates out to various campus sites and functions over the copper network, supporting a variety of speeds. In this example there is a 22 Mbps circuit connecting the data center hub to the administration building, which would be over four bonded-copper pairs. On the other hand, the circuit between the data center hub and the dormitory is running at 10+ Mbps, which would require just two bonded pairs. The diagram also shows how the network could be used to implement lock down in the central building and potentially elsewhere, as well as managing and monitoring surveillance video cameras.

Other Applications

One great strength of a campus copper infrastructure, powered by the Actelis ML platform, is the ability to carry all services, including video, voice, and data, as well as backhaul traffic for campus WiFi hotspots, while connecting all faculties, dormitories and functions. The platform is capable of uniting previously distinct systems onto a common platform, providing universal campuswide access to all applications. Until now, many campuses have had separate systems for the various business, arts and science faculties, which has become an increasing handicap given the growing inter-disciplinary nature of many school and college courses. This has led to demand for common access to systems from all parts of the campus.

Another highly valuable facet of Actelis' products are their ability to provide consistent levels of performance across widely varying network topologies and different grades of copper. The platform can cope with the significant variations in quality and layout of copper pairs across different campuses. Actelis has achieved this by adding a number of additional features, over and above the standard specifications, to improve the Quality of Service (QoS) and reliability of Carrier Ethernet Over Copper™, catering for variations in signal quality. Actelis also manufactures repeaters that enable the network to span even the largest campuses without any drop in bandwidth or reliability. This full coverage avoids the need for expensive trenching of fiber, and means all communications requirements for both students and staff can be met by a single network.

Bandwidth can be delivered to each location according to need, since the Actelis platform allows bit rate to be scaled in convenient increments by bonding additional pairs into a circuit. This means that bit rates in the range 5 Mbps to 100 Mbps per connection can be supported.



The network can also support archiving and disaster recovery, with the ability to transfer data to off-site locations. It can provide access to national or even global services for students, which can include entertainment as well as education. There are already IPTV services dedicated to students in some countries, for example, accessed from dormitories over campus networks.