



Application Note :: Military

Ethernet Over Copper Gives Military Secure Networking

Military operations need secure dedicated broadband connectivity for base areas and in the field. While wireless communications may be used at the front line, operational services need backhauling over fixed lines into core systems via secure links that guarantee performance, availability and confidentiality. Meanwhile, back at the base, intrusion protection is of paramount importance, particularly for overseas deployments. This, in turn, requires secure and reliable links so that surveillance devices, such as perimeter cameras, can be monitored safely from central control points. Speed of deployment is also vital, particularly in the field of operations, since communication links often need to be set up and torn down at short notice. Such field links must also be rugged and protected from environmental insults, such as heat or lightning strikes. Cost effectiveness is crucial, especially where military budgets have been strained to the breaking point by recent commitments.

Given the fast evolving nature of many military networks, fiber is rarely a cost-effective option, while wireless is not sufficiently reliable or secure for backhauling, leaving copper as the principle physical medium. The Actelis Networks® product line of ML600 Ethernet Access Devices (EADs) is well suited to meet these challenging requirements, being inexpensive to deploy, with no need to place new fiber-optic lines. Equally importantly, the ML600 EADs provide a single Ethernet-based infrastructure that reduces significantly the ongoing costs of management, and yet by supporting bonding of multiple copper pairs, is highly scalable. Bandwidth can be increased incrementally and inexpensively as demand grows, or new applications are deployed.

Security

It almost goes without saying that security is the most important requirement for a military network—whether at the base or field of

operations. Levels of availability, ruggedness, resistance to tampering, and protection against eavesdropping need to be even higher than for most other government applications. In particular, the hallowed “five 9s” availability, equating to about five minutes of downtime a year, is adequate for most agencies, but even this is unacceptable for some military applications. For example, it may be necessary to execute lockdown procedures in the event of an emergency or when an intrusion is detected. With lives potentially depending on communications working quickly and successfully, absolute network availability and reliability is essential.

Secure backhaul is especially important, both in the field and at base. In the field it provides the vital umbilical cord linking central command and control systems with wireless-based battle operational systems. At base camp, secure and reliable backhaul is needed to connect perimeter security video cameras and other intrusion protection devices into central monitoring systems. In some cases fiber has been used for such backhauling, while in other cases low-speed, copper-based systems have been deployed. But the latter are running out of steam for modern military applications that involve ever more video and high-resolution images.

The best solution involves exploiting existing copper infrastructure using Actelis’ field-proven and award-winning series of ML600 EAD systems, which are capable of meeting stringent requirements for security, ruggedness and availability. Crucially, an ML600 EAD can drive a single network platform, meeting all data, voice and video communications needs for a military unit.

An important aspect of the ML600 EAD platform is its support for channel bonding, which underpins three crucial functions for a military network. First, it enables bit rates to be scaled up by recruiting additional copper pairs—up to a maximum of 16 pairs for 100 Mbps throughput. Secondly, it protects

Requirements

- High speed, secure connections
- Using existing copper infrastructure
- Economical alternative to fiber
- Quick, easy deployment and management

Equipment

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

Benefits

- High performance, low cost
- Quick, easy to deploy
- Utilize existing copper facilities
- Highly secure transport
- Fiber-like qualities



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against failure of individual copper pairs, since the network can reconfigure itself around the remaining pairs in the bonded circuit. Thirdly, it protects against eavesdropping, since data is split between the constituent pairs of a circuit during transmission, making it harder to tap the whole link successfully and reconstitute the data.

Protection against eavesdropping is further enhanced by Actelis' support for the SSH2 (Secure Shell) protocol, defined by the Internet Engineering Task Force within the SNMP (Simple Network Management Protocol) standard. This provides secure encrypted connections between clients and servers, with the ability to authenticate users. SSH2 has emerged as a powerful and flexible tool enabling military agencies to harness the power of encryption for secure communications.

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 military personnel, which can include much needed entertainment during long spells of posting.

Other Applications

The Actelis series of ML600 EADs can support all services, including video, voice and data, and is quick to deploy. These are two big pluses for military networks, particularly in the field where rapid installation and ease of management are essential. They also translate into big cost savings in deployment and ongoing management of the platform, while making it easier to introduce new multimedia applications that combine voice, video and data. The fact that all data can be backhauled over a single platform makes it easier to implement integrated security, controlling and monitoring remote devices, such as video cameras.

It is important to emphasize that while the Actelis platform can support all services within a site, the network can be segmented into different workgroups or applications via VLAN technology. The ability to partition the infrastructure into secure VLANs that are in effect separate networks means that military sites can adopt a single platform with the confidence that users can only access their own applications and data.

Why Actelis?

The Actelis family of ML600 EADs has already been successfully deployed in military networks around the world, both at base and in the field. The ability

to exploit the existing copper infrastructure for fiber-like performance and availability, with immunity against environmental insults, such as lightning strikes, combined with scalability and support for all applications and devices, enables the platform to meet demanding military requirements. Speed to deployment is also vital, and by using the existing copper to deliver high-bandwidth services, military organizations can immediately establish secure broadband links that can support voice, data and video applications in a matter of minutes.



Actelis Networks' award-winning product line of ML EADs and Aggregation Switches.

For more information, visit Actelis.com

The Actelis ML2300 Ethernet aggregation switch can be used for Point-to-Multipoint links, typically in an operations or control center, while the ML600 series (ML620, ML630, ML640, ML650, ML680) provides on-site Ethernet access. Longevity is also important, and the Actelis ML600 systems can be continually upgraded via software without having to replace components. Also important is the ability provided by the Actelis platform to maintain consistent performance across lines of varying quality, especially vital in field operations and foreign countries where standards may be lower.

The Actelis ML platform meets the requirements for security, ruggedness, high availability, speed to deployment, flexibility, and ease of management required for military networks. It provides fiber-like performance and scalability over existing copper infrastructures, and is tolerant of the varying wiring standards and qualities likely to be encountered in remote locations and in the field.



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