

ATM Technology is a Viable Solution for the Defense Industry

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The article, "Why Fiber Channel is Poised to Replace MIL-STD-1553," published in the December issue stated that ATM has not yet adapted to harsh environments and is a high-power consuming, expensive and emerging technology. CETIA would like to share its perspective on this premise.

ATM technology, initially developed for telecommunications applications, has extended well beyond its original market roots. The defense industry is increasingly choosing ATM technology as a viable solution to its networking applications needs. Evidence of this evolution is the significant success CETIA is achieving with their ATM product sales in the defense industry. For example, CETIA's PMC-ATM Network Interface Cards (NICs) are being embraced by defense industry applications, as well as by the more traditional telecommunication applications. System integrators and the military have purchased CETIA's CPMC-ATM for applications including real-time sensor systems and sonar applications. A key consideration in choosing an ATM adapter by the design engineer is its low-power consumption, suitable for convection-cooled environments found in avionics applications. Even in large programs where Fiber Channel was initially selected for avionics upgrades, ATM technology is currently under evaluation by avionics integrators for its future implementation.

ATM is not a "power consuming" technology, as suggested in the December article. The IEEE P1386/P1386.1 standard specifies that the power consumption of a PMC card should not exceed 7.5W. Due to the use of high-performance and high-power consuming ASICs and memory, this PMC power limit is easily violated by high-speed NICs. For example, Fiber Channel cards require a 1.6A (typical value)/5V electrical supply and consumes 8W. On the other hand, the new generation of 155Mbps ATM chips, like the IDT77211 (NICSTAR), is able to conform to the IEEE standard. CETIA's PMC-ATM 155Mbps board consumes less than 6W



when transmitting and receiving data at high speeds, making the design of a PMC-ATM board much more adaptable within harsh environments.

The statement in the article says that ATM technology is still an emerging technology for LAN environments is somewhat erroneous. ATM technology is a viable and established solution in the commercial market. According to *Strategie, Telecom et Multimedia Magazine* (STM, No. 79, Jan. '98), ATM accounted for 10% of the total worldwide router shipments. Although this was far less than Ethernet (55%) and Fast Ethernet (25%) shipments, ATM did however, out-ship FDDI which represented only 3% of the total worldwide router shipments. The high demand in the North American market for telecommunication systems has shown that the ATM market is an active one and ATM products are well positioned technologically and price-wise to satisfy this growing demand.

ATM is now an affordable technology. The telecommunications market has had a strong and positive influence on the price of ATM equipment. Depending on the physical connection required, the cost of ATM network cards has continuously declined over the past few years. In 1997, a PCI/PMC 25Mbps card could be purchased for under \$200. In addition, the price of a PCI/PMC 155Mbps card was well below the \$1,000 (USD) price range, and was even lower than FDDI and Fiber Channel options.

It should be pointed out, however, that these price comparisons are somewhat skewed by the fact that the cost of an ATM system already includes one of the switches needed for setting up a system. An ATM-based system also does not share bandwidth between the terminals, as in the case of a FDDI or FC-AL system. Therefore a full bandwidth 25Mbps, 12 terminal ATM network composed of 12 ATM 25Mbps ports, IBM8285 switches and an ATM-25UTP adapter costing about \$1,200 USD, can outperform a 100Mbps shared bandwidth, 8Mbps/port FDDI solution. Even when a higher available bandwidth solution is required, a full bandwidth ATM 155Mbps over Multimode Fiber Optics within a 58 terminal network (composed of an IBM8265 ATM switch and PMC-ATM 155MMF) is more cost effective with a price tag of about \$2,000 USD. This is still far below the price of a shared 1Gbps bandwidth Fiber Channel solution.

Overall, ATM technology is now a mature enough technology to be successfully used in military applications. ATM provides:

- A High Performance Solution
- Affordability
- Hardware
- Dynamic Switching for Bursty Traffic
- Class-of-Support for Multimedia
- Scalability in Speed and Network
- Common LAN/WAN Architecture
- Opportunities for Simplification on VL Architecture
- International Standard Compliance

ATM is indeed a well-positioned technology for defense and telecommunications applications.

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