

## Replacing Asynchronous Transfer Mode (ATM) Networks with Raptor Networks Technology, Ether-Raptor Switching Systems

Why do users still operate ATM networks?

Edwin Hoffman CDO

## OVERVIEW

Why do users still operate ATM networks, when networking systems abound that are faster, less expensive, and require less rack space? ATM technology still has better control of Quality of Service (QoS) to allow sensitive applications such as video and voice, and more modern applications, such as storage/IP to be delivered with the minimum of latency variation and no distortion (data loss). In addition, ATM technology provides a more robust connectivity solution for resilient networks.

So why are users looking at replacing their ATM networks at all? ATM as a technology did transcend the original popular bandwidths of the day with OC-3 at 155 Mbps, OC-12 at 622 Mbps, and even OC-48 at 2.5 Gbps. The problem is, and has always been, the cost of implementation. ATM switch devices are always more expensive than Ethernet switches. ATM Network Interface cards are often several magnitudes more expensive than even Gigabit Ethernet network interface cards. ATM technology, as an enterprise solution, has failed and its only placement today, is in Telecomm infrastructure.

## SO WHAT TO REPLACE IT WITH?

First let us discuss why ATM was chosen as an enterprise level transport media. The first “real” reason is that it was, and is, a very deterministic transport medium. In addition, its control of QoS was far better than the very best Ethernet switches. Also the OC-3 speed of 155 Mbps was the fastest choice on the market until Gigabit Ethernet came along. Therefore, it became a good choice against Ethernet and Fast Ethernet, providing cost was not the real issue.

The Gigabit Ethernet switch came along and rang the bell for the final round of ATM V Ethernet. Gigabit Ethernet rapidly became price competitive because it was several times faster than the ATM networks.

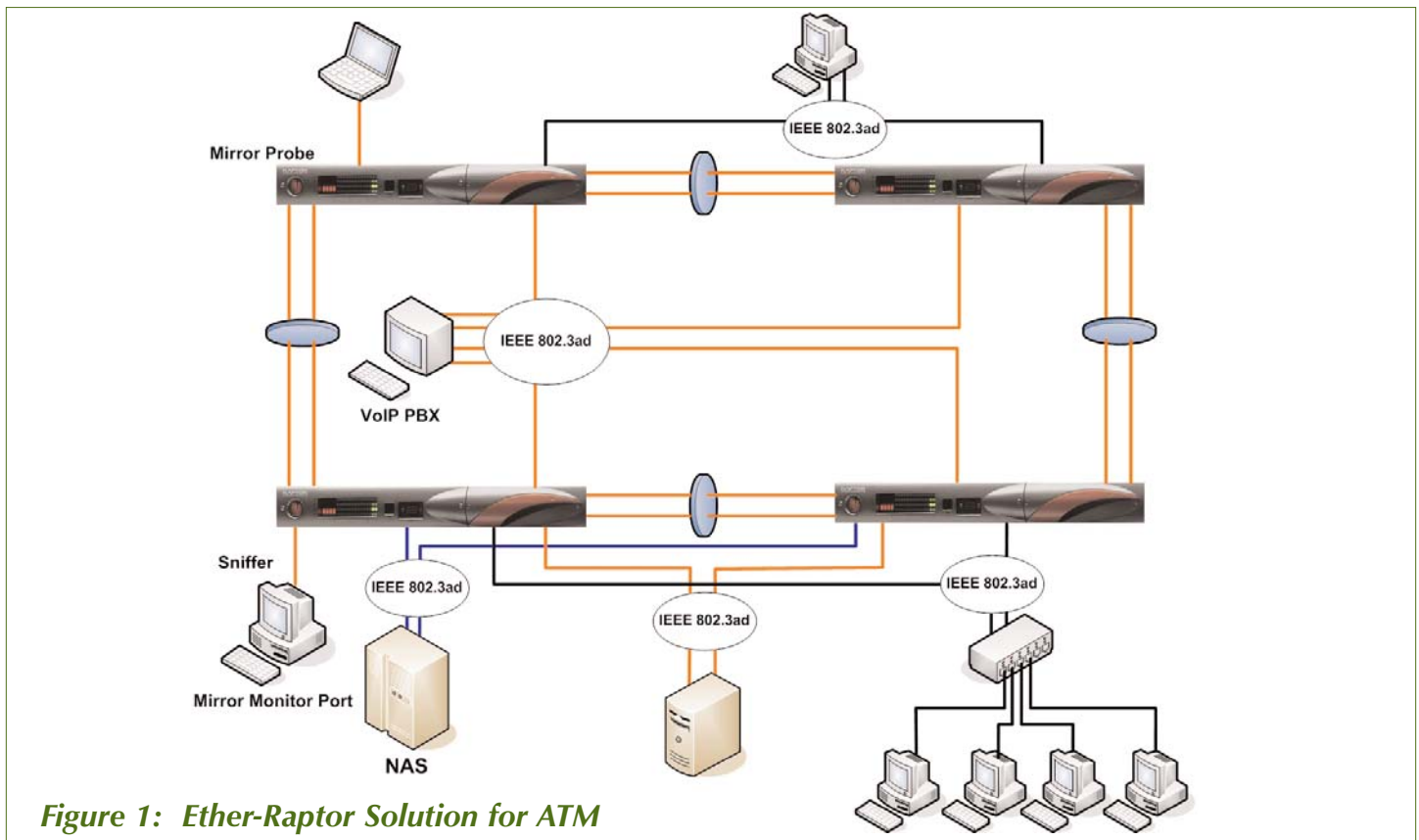
With the introduction of LAN Emulation to support various applications, ATM technology began to be “seen” as a more difficult technology to implement. The lack of ATM support in many peripherals also contributed toward the enterprise customers turning away from ATM.

Ethernet switches are considered to have poor QoS capabilities when compared to ATM, a proven fact time and time again, but Ethernet is much simpler to implement, has lower total cost of ownership, and does not require that the IT staff learn new systems and management platforms.

**RAPTOR NETWORKS SOLUTION**

Raptor Networks Technology, Inc. has a product family that more closely addresses these major issues for ATM users. Ether-Raptor Layer 2/3/4-7 switches contain technology that allows a “unit level” redundancy to exist, where an aggregated group (IEEE802.3ad) can operate over a number of hardware platforms. In addition, the Ether-Raptor family can form resilient network topologies, which can repair failed links faster than ATM can. The Ether-Raptor family also has more extensive QoS facilities, with traffic classes, bandwidth allocation (absolute and Min/Max), and policing of traffic streams. Ether-Raptor is a family of high-density, Gigabit Ethernet, and 10-Gigabit Ethernet switching systems that support Raptor Adaptive Switch Technology (RAST™). RAST allows us to perform these small miracles of IEEE 802.3ad over multiple hardware units while enabling a very fast, self-healing, ring-type topology to exist.

In Figure 1, we see an ATM replacement scenario that is a working alternative to an ATM network. Now we come to the problem of implementation. ATM networks rarely go down, in many cases if the implementation requires any major cutover with downtime, it is unacceptable. For this reason any implementation strategy needs take into account the cutovers between the ATM network and the replacement technology. Most ATM installations will want (and need) a measured, item-by-item, cutover scenario. This document discusses one specific way to arrange the cutover with the minimum amount of disruption and downtime. The four ER-1010s form a highly-resilient, ring topology. With “unit level” redundancy, using IEEE802.3ad, Raptor Networks Technology, Inc. created a network with high-availability, which can meet and exceed 99.999% uptime.



**Figure 1: Ether-Raptor Solution for ATM**

Because the Ether-Raptor family did not support ATM interfaces, the challenge was finding a way to keep the ATM networks up and operational, while devices were cut over to the Ether-Raptor network. They needed to “see” the ATM side of the network. Raptor Networks Technology, Inc., in partnership with another group, designed a cutover solution that is guaranteed to make implementation easy by allowing all systems to remain operational during the cutover procedure.

The Raptor Networks solution uses an ATM/Ethernet Gateway that connects to the ATM network and converts the ATM cells into Ethernet frames using LAN Emulation. This technology has been used for several years and is a highly accepted method of operation. The ATM/Ethernet Gateway communicates with the Ether-Raptor network using standard 10/100 Ethernet connections.

Devices connected to the ATM network must have single/dual (dual if dual attach is used) Gigabit Ethernet NIC cards installed (with IEEE802.3ad support for dual attach), and retain the ATM NIC cards they presently have. Once this is accomplished, the customer sequence can begin. Raptor Networks Technology, Inc. recommends the use of the 2-, 4-, or 6-port family of Gigabit PCI/PCIx cards (Raptor Networks RN2/RN4/RN6). If the customer has an existing ATM-to-Ethernet gateway/switch, such as a FORE ES 3810/4810, it is acceptable, and it would be even better if such a device supported 802.3ad link aggregation for redundancy.

As needed, and at a time of the user's choosing, each device can be connected to the Ether-Raptor network. When connections are established, the ATM connections can be removed. The fact that the Ether-Raptor network is passing data between itself and the ATM network, ensuring that all devices can “see” each other and establish their new links will prove to the customer that their network has been completely cut over to an Ether-Raptor network and their former ATM/Ethernet Gateway can be decommissioned.

## **SUMMARY**

With the ability to emulate ATM's most-needed features, and the smooth implementation process both Raptor Networks Technology, Inc. and Digital Networks Product Group have developed, replacing your ATM installation is no longer the nightmare it could have been.

**Corporate Headquarters: 1241 E. Dyer Road, Suite 150 Santa Ana, California 92705**

**Phone: 949-623-9300 / Fax: 949-623-9400 / Web: [www.raptor-networks.com](http://www.raptor-networks.com) / E-mail: [info@raptor-networks.com](mailto:info@raptor-networks.com)**

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