



Versatile communications technology supports a variety of services

Unless you are employed in the communications field, you might hear ATM and think cash machine. In fact, ATM stands for asynchronous transfer mode and is a LAN/WAN communications technology.

ATM is a connection-oriented, fixed-length, cell-based communications technology that supports a variety of transmission categories and quality of service parameters. It provides scaleable and effective transmission of voice, data and video over a variety of transmission medium in the LAN and WAN environments. I imagine you're thinking, "What the heck did he just say?" So let's go through this point by point.

ATM is connection-oriented.

Similar to a traditional voice call, the ATM switch establishes a connection called a virtual circuit for the duration of the call. These circuits can be nailed-up permanent virtual circuits — meaning that the connection is preconfigured and left connected and can be used anytime. The downside is that bandwidth is wasted when no traffic is being sent. ATM also uses semi-permanent virtual circuits that are set up and torn down as needed. This provides a more efficient use of bandwidth, but means that more thought must go into engineering the network for peak-loading periods.

ATM is cell-based.

Other communications technologies, such as traditional voice services, use circuit switching where there is a constant stream of voice traffic. Some data technologies like frame relay use variable length frames to send data across the network. ATM uses a fixed-length 53-byte cell — 48 bytes for payload (the

information) and five bytes for the header (signaling information, quality of service parameters). When data is cell-based, traffic becomes much more deterministic. So it can be more easily predicted and therefore more readily controlled in hardware versus software (the bottom line is faster processing). Some complain about the imposition of a header that consumes 10 percent of the total cell size and refer to it derogatorily as the ATM cell tax.

ATM supports a variety of transmission categories and quality of service parameters. Firstly, ATM defines five categories of service:

- 1) Constant bit rate (CBR), used for voice or data that requires guaranteed bandwidth
- 2) Variable bit rate-real time (VBR-RT)
- 3) Variable bit rate-non real time (VBR-NRT)
- 4) Available bit rate (ABR)
- 5) Unspecified bit rate (UBR), you get whatever is left over.

These categories of service are like guarantees that a user pays for. For instance, someone who sends voice needs guarantees of bit rate, so they may choose a CBR service. It guarantees that whatever bit rate you have subscribed to will always be available. Another user sending data traffic may choose UBR, to transmit the information on a best-effort basis — this service would be less expensive.

More and more service providers are using their quality of service to differentiate their offering to the public. It allows them to customize the service for each consumer. One consumer who transmits delay-sensitive voice, or real-time video over the network requires

guarantees of permissible cell delay. Another customer might only be sending e-mail traffic and so would not be as worried about delay. Each of these consumers would likely be paying different rates depending on their service level agreement, their contract for service category and quality of service parameters with their service provider.

ATM is scaleable.

This means that ATM supports many different bandwidths and the network does not have to be replaced to upgrade. Companies can simply add new, faster network cards etc. Rates scale anywhere from the kilobit to terabit range.

ATM supports the transmission of voice, data and video — unlike many technologies that suit only one type of traffic.

A variety of transmission mediums means that ATM can be transmitted over traditional copper wiring, fibre optic cable or even via wireless transmission facilities.

It would seem as though ATM can replace all other technologies in the WAN and LAN, although I doubt that will happen. There are many other technologies that are now catching up to ATM's high bandwidth, such as 10-gigabit ethernet. These technologies are complementary depending on the application. ■

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