There is an ever increasing volume of data communication across networks. In order to accommodate higher levels of network traffic, the search for better network technologies has ensued. This essay will compare Ethernet with Asynchronous Transfer Mode (ATM) across several criteria: bandwidth, scalability, interoperability, and quality of service. By comparing these technologies on these dimensions, organizations can determine whether to adopt one technology over the other.

BANDWIDTH

A consideration for comparing Ethernet to ATM is bandwidth. The basic transfer rate of Ethernet is 10 Mbps. However, with greater bandwidth needs, Ethernet has been extended over the years to carry 100 Mbps. In fact, with the advent of Gigabit Ethernet, it is able to transport 1000 Mbps of data. ATM was proposed in 1988 to replace Ethernet. At the time, Ethernet’s transfer rate of 10 Mbps was quickly becoming obsolesced by the ever increasing demands for broadband technology. ATM’s basic transfer rates were more than double that of Ethernet, at 25 Mbps. Moreover, ATM also offered 155 and 622 Mbps data rates. However, timely upgrades to Ethernet, have far surpassed the rate of data transfer of ATM. Gibabit Ethernet is nearly double the transmission rate provided by ATM at 622 MBPS. The difference between these two transfer rates closes further if one considers that packet headers take up more bandwidth when using ATM than when using Ethernet. Not surprisingly, Ethernet comprises 80% of all local area network (LAN) installations, making it the most popular LAN technology today (Mickelsson, 1999).

SCALABILITY

Whether a technology can scale to meet networking needs is another consideration when comparing Ethernet to ATM. Ethernet was originally just a LAN technology, whereas ATM can be used to transmit information across LANs, MANs (metropolitan area networks), and WANs (wide area networks). ATM was specifically developed to span all three levels of network with the same protocol, completely eliminating the need for gateways and routers. However, this has not materialized. Although ATM has proven to be useful in the WAN space, Ethernet has grown into MAN environments and is even being considered for use over WANs (Mickelsson, 1999).

INTEROPERABILITY

Another comparison point between Ethernet and ATM is interoperability. The different versions of Ethernet work well together, with Gigabit Ethernet being based on the original Ethernet technology. In this way, LANs that have been using Ethernet technology can continue to do so while the larger networks are upgraded to Gigabit Ethernet. This is not the case for ATM (Mickelsson, 1999). Since many networking applications have been build for traditional LANs, which use Ethernet, applications would have to be changed to accommodate ATM. Alternatively, LAN Emulation applications (or LANE) would need to be used in order to allow LAN networks to remain intact while using ATM. This, however, eliminates any sophisticated features that ATM offers.

QUALITY OF SERVICE

Ethernet and ATM can also be compared on their quality of service. ATM’s major strength is an established standard for quality of service. ATM offers for levels of service: Constant Bit Rate, Variable Bit Rate, Unspecified Bit Rate, and Available Bit Rate (Mickelsson, 1999). Unfortunately, because of the lack of standardization in other aspects of the network, the quality of service can deviate from the standards which were established. Moreover, not all networks support all service levels offered by ATM. As for Ethernet, there are no explicit standards for quality of service, perhaps due to Ethernet LANs having traditionally provided enough bandwidth to obviate the need for quality of service standards. Another issue with Ethernet LANs adopting some standards of quality of service is that they would be dependant on WAN service, which is mostly uses ATM.

CONCLUSION

The competition between Ethernet and ATM continues. Ethernet continues to dominate LANs and ATM is firmly rooted in WANs. Giving consideration to bandwidth, scalability, interoperability, and quality of service will be increasingly important as network needs become more demanding. Migrating from one technology to the other would be a huge undertaking and investment which should only be done after comparing these two data communication technologies thoroughly.

REFERENCES

Mickelsson, T. (1999). ATM versus Ethernet. Retrived from <http://www.tml.tkk.fi/Opinnot/Tik-110.551/1999/papers/07ATMvsEthernet/iworkpaper.html>