

ATM and Internet over Satellite Networks

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Telecommunications networks are evolving rapidly in response to the complex and stringent requirements of the provisioning of new services. Internet and asynchronous transfer mode (ATM) networking technologies are foundations for these services. Satellite communications networks can be integral to the newly emerging national and global information infrastructures provided the issues of interoperability of satellite and terrestrial networks are resolved. There are, however, major challenges for seamless provisioning of ATM and internet services over a hybrid satellite and terrestrial wireline network. These challenges arise due to the fact ATM and Internet standards have been designed to work well over fiber networks. There are inherent differences between satellite and fiber networks in terms of bit error rates, bit error distribution, delay, and available bandwidth.

Major issues related to Asynchronous Transfer Mode (ATM) and Internet protocols working efficiently and providing high quality of service over satellite links and networks are discussed. Specific technologies which have been developed to address these issues are presented. They include adaptive coding, header and payload compression, Transmission Control Protocol (TCP) Proxy, bandwidth on demand, configurability of modulation, predictability of bandwidth requirements, management of traffic and cell delay variation, and provisioning of different quality of service commitments to the different types of traffic. These technologies have now been embodied in COMSAT Laboratories' products, namely ALA 2000, ALE 2000, CLA-IP and Linkway 2000.