Title: Performance of TCP/IP Over ATM Networks
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Publisher: Artech House
Year: 2000

Foreword

The four key features introduced by ATM to the networking world are: traffic management, quality of service, signaling, and service integration. ATM has sophisticated traffic management designed specially for the high-speed networks. ATM has feedback and negotiation mechanisms that allow throttling traffic sources without loss. All other competing technologies either have no traffic management or at best have loss-based mechanisms. For very high-speed networks, loss based techniques can lead to long delays and huge losses. ATM also has several service classes designed specifically for various quality of service (QoS) requirements. Delay sensitive and delay insensitive traffic is queued and serviced separately. Providing QoS requires mechanisms for the users to specify to the network their traffic pattern and QoS requirements. This is known as signaling. Finally, ATM was designed primarily to allow data, voice, and video integration so that telecommunications providers (voice networks) could move easily into the data market.

ATM design was, however, dominated by the telecommunications carriers and equipment vendors. As a result, some of the design decisions were although ideal for voice may not have been optimal for data. The selection of the cell size is a prime example. Today (year 2000), ATM is used extensively in the carrier networks. Most of the big telecommunications carriers have switched their core network to ATM. By some estimates over 80% of the Internet traffic already passes through ATM networks. However, ATM has failed to reach the desktop. The enterprise networks are still primarily data oriented with voice and video coming in slower than projected. This has given competing technologies enough time to develop their own traffic management, quality of service, signaling, and service integration mechanisms. Today, we are all busy developing these mechanisms for TCP/IP and Ethernet. The mechanisms developed for ATM have an important impact on these developments since directly or indirectly the research and knowledge developed for ATM can be used, enhanced, and optimized for these other technologies that were designed initially primarily for data.

The reality today is that TCP/IP is predominant in the enterprise networks while ATM is in the core telecommunications networks. This scenario may change tomorrow. But, the performance of TCP/IP traffic over ATM networks is key to getting the most out of the networks as they exist today.

A number of books have been published which describe the techniques to interconnect TCP/IP and ATM. This book by Hassan and Atiquzzaman is unique in the sense that it deals with the performance issues of interconnecting TCP/IP and ATM. The books starts with brief descriptions of TCP/IP, ATM, schemes for transporting TCP/IP over ATM, and then goes into in-depth discussion of the issues that affect the performance of running TCP/IP over ATM. The need for mobility has given rise to a strong interest in being able to access the Internet over wireless satellite links. The last chapter of the book discusses the enhancements to enable TCP over long delay satellite links. The material presented in the book is very up to date and would be relevant to both researchers and developers of TCP/IP over ATM equipment to be used in the Next Generation Data Networks.

The book is an excellent reference book for seniors and graduate students. The book can also be very beneficial both for practitioners and scientists in the field of networking. This will serve as a definitive text on TCP/IP over ATM networks.

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