Prof. Burkhard Stiller

Computer Engineering and Networks Laboratory, TIK
Swiss Federal Institute of Technology, ETH Zurich
Gloriastrasse 35
CH - 8092 Zurich
Switzerland

URL: *www.tik.ee.ethz.ch/~stiller/*
E-mail: *stiller@tik.ee.ethz.ch*

Biography

Prof. Dr. Burkhard Stiller received his diploma degree in computer science and his doctoral degree from the University of Karlsruhe, Germany in October 1990 and February 1994, respectively. From January 1991 until September 1995 he has been a Research Assistant at the Institute of Telematics, University of Karlsruhe, being on leave in 1994/95 for a one-year EC Research Fellowship at the University of Cambridge, Computer Laboratory, England. From November 1995 until July 1999 he was with the Computer Engineering and Networks Laboratory TIK, Swiss Federal Institute of Technology ETH Zurich, Switzerland as a Research Associate and Lecturer for multimedia communications. Since August 1999 he is an Assistant Professor at the same institution in the area of Communication Middleware, where he is the co-head of the communication systems group.

Research Interests

Aside from a number of project management tasks and participation in national research projects of Germany, Switzerland, and the United Kingdom, Burkhard Stiller's primary research interests include architectures for multimedia communication subsystems, charging and accounting methods for the Internet, pricing schemes, Quality-of-Service (QoS) models, resource reservation, mobile communications and AAA (Authentication, Authorization, and Accounting), transport protocols, and tele-teaching.

The main objectives for reserach work on *charging packet-based network services and technology* are based on initial TIK contributions in this field, cover the Swiss projects CATI (Charging and Accounting Technology for the Internet) and ANAISOFT (Advanced Network and Agent Infrastructure for the Support of Federations of Workflow Trading Systems) as well as the 5th Framework European Union project M3I (Market Managed Multi-service Internet) and encompass the following ones. Within end-systems communication middleware needs to offer proper mechanisms to perform service-oriented charging in support of high-quality Internet transport services and content provisioning. Concerning the customer care side in addition, advanced middleware will hide the end-user completely from technological details, such as Integrated or Differentiated Services Internet, but will offer customer-oriented value-added services.

Once appropriate mechanisms are in place, efficienctly implemented, and flexible enough to back the wide range of services, the price setting for services and content needs to be investigated. They need to cover usage-sensitive approaches dealing with market-driven situations, competitive offers, and highly dynamic pricing schemes to identify user reaction and behavior depending on service prices. The characterization of demand and utilities, in a flow-based and aggregated fashion, and cost modeling will form the basis for incentive compatible and efficient pricing models applicable in a multi-provider Internet. Finally, the interconnection of Internet Service Providers (ISP) opens the area on handling, designing, and maintaining Internet Service Level Agreements (SLA). As traditional telecommunication SLAs can not be applied directly, a set of adapted and newly designed technical functions, buisness-oriented information, and contractual data need to be established for the interconnection of ISPs.

Major contributions on research work on *mobility and AAA (Authentication, Authorization, and Accounting)* work, mainly in the context of the 5th Framework European Union project Moby-Dick encompass the following areas. To define, implement, and evaluate an IPv6-based mobility-enabled end-to-end QoS architecture starting from the current IETF's (Internet Engineering Task Force) QoS models, Mobile-IPv6, and AAA framework requires a common architecture integrating QoS, IPv6 mobility, and AAA (out of the separate architectural approaches for each component currently provided by the IETF) with respect to wireless issues. The architecture in a testbed will comprise UMTS (Universal Mobile Telecommunications System), IEEE 802.11 Wireless LANs (Local Area Netorks), and Ethernet. In case the existing applications or the underlying architectures do not provide what is required, the necessary modification will be undertaken.

In addition, the definition of a suitable charging concept which will enable permanent mobile IP based sservices on a large scale, which is a strong requirement related to AAA, but currently not a formally established topic within the IETF.

Recent Publications

M. Karsten, J. Schmitt, B. Stiller, L. Wolf: *Charging for Packet-switched Network Communication - Motivation and Overview;* The Computer Communications Journal, March 2000, Vol. 23, No. 3, pp 290-302.

B. Stiler, P. Reichl, S. Leinen: *Pricing and Cost Recovery for Internet Services: Practical Review, Classification, and Application of Relevant Models;* Netnomics - Economic Research and Electronic Networking, September 2001, Vol.3, No.2, pp 149-171.

B. Stiller, J. Gerke, P. Reichl, P. Flury: *A Generic and Modular Internet Charging System for the Cumulus Pricing Scheme;* Journal of Network and Systems Management, September 2001, Vol.3, No. 9, pp 293-325.

B. Stiller: *A Survey of Charging Internet Services;* in "Management Aspects of IP", IEEE Book Series in Telecommunications Network Management, S. Aidarous, T. Plevyak (edts.), November 2001, to appear.

P. Reichl, B. Stiller: *Edge Pricing in Space and Time: Theoretical and Practical Aspects of the Cumulus Pricing Scheme;* 17th International Teletraffic Congress (ITC 2001), September 23-27, 2001, Salvador da Bahia, Brazil, to appear.

R. Haas, P. Droz, B. Stiller: *Distributed Service Deployment over Programmable Networks;* 12th IEEE/IFTP International Workshop on Distributed Systems: Operations and Management (DSOM 2001), Nancy, France, October 15-17, 2001, to appear.

Hasan, J. Jähnert, S. Zander, B. Stiller: *Authentication, Authorization, Accounting, and Charging for the Mobile Internet;* The Mobile Summit, September 10-12, 2001, Barcelona, Spain, to appear.