DESIGN AND IMPLEMENTATION

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This issue presents two papers related to different aspects of application servers in communication networks.

Traditional communication system hardware and software architectures were based on resource intensive implementations that separated the control and data planes, and were built using special-purpose ASICs and hardware platforms, and proprietary operating systems. The ongoing miniaturization of communication systems, driven particularly by the demands placed by the explosion of wireless mobile data, requires new paradigms to reduce cost, size, and power while increasing capacity and scalability.

The article by Mohammed Khawer presents design strategies for application server design in next-generation operating systems. Based on an open source OS and a powerful multicore processor with hardware acceleration, the article describes design considerations for a system that combines the control and data planes within a single processor to reduce system cost of materials. As future system designs delve further into this relatively new territory for communication system implementation, the considerations explored in this article will serve as a guidepost for the implementation of these systems.

Multiuser conferencing systems with multimedia (audio, video, etc.) have become hugely popular. In particular, the number of participants associated with such events has been increasing exponentially in recent years, enabled by network capacity and cheap hardware. The Internet Engineering Task Force (IETF) has worked on frameworks for conferencing for over 10 years (e.g., the XCON framework). An important aspect of these is the Floor Control Protocol (FCP), which manages access to shared resources by multiple participants within such a conference.

The article by S. P. Romano describes an implementation of Binary Floor Control Protocol (BFCP), an IETF protocol that meets the requirements of FCP. The article gives a historical perspective of the motivation for and development of BFCP. It then describes a specific Web 2.0-based implementation, UMPIRE, of a moderation platform based on BFCP. The author also walks the reader through a sample call flow using an illustrated example. Finally, a lessons learned section gives an educational summary of the author's experiences with FCP since the initial work in the IETF.

BIOGRAPHIES

VIJAY K. GURBANI [M'98] (vkg@bell-labs.com) is a Distinguished Member of Technical Staff in wireless research at Bell Laboratories, Alcatel-Lucent. He holds a B.Sc. in computer science with a minor in mathematics and an M.Sc. in computer science, both from Bradley University, and a Ph.D. in computer science from the Illinois Institute of Technology. His current work focuses on peer-to-peer networks, Internet multimedia session protocols, and anomaly detection in such protocols. He is the author of over 50 journal papers and conference proceedings, five books, and 16 IETF RFCs. He is currently Co-Chair of the Application Layer Traffic Optimization (ALTO) Working Group in the IETF, which is designing a protocol to enable abstract network information to be provided to applications through a well defined API. He holds four patents and has 10 applications pending with the U.S. Patent Office. He is a Senior Member of the ACM, and a member of the IEEE Computer Society and Usenix.

SALVATORE LORETO [M'01, SM'09] (salvatore.loreto@ieee.org) holds an M.Sc. in computer engineering and a Ph.D. in computer networking, both from Napoli Federico II University, and an M.B.A. from Bocconi University, Milano. Currently, he works as a master researcher at Ericsson Research Finland. He has made contributions to Internet transport protocols (e.g., TCP, SCTP), signal protocols (e.g., SIP, XMPP), VoIP, Unified Communication, 3GPP IP Multimedia Subsystem (IMS), HTTP2, WebSockets, and web technologies. He is also an active contributor to the IETF, where he has coauthored several RFCs and Internet drafts. Currently he is serving within the IETF as Co-Chair of several Working Groups in the application and real-time application areas. For the IEEE Communications Society, he serves as a Design and Implementation Series Co-Editor and an Associate Technical Editor for *IEEE Communications Magazine*.

RAVI SUBRAHMANYAN [SM'97] (ravi_subrahmanyan@mac.com) is with Butterfly Network Inc., where he is involved in the architecture and design of next generation medical imaging devices. He previously worked on image sensor design at Invisage, image processing and video compression technologies at Immedia Semiconductor, and was a systems and ppplications engineering manager at National Semiconductor Corp. He was also with AMCC in Andover, Massachusetts, where he was involved in the design of communications ICs and multi-core PowerPC CPUs. He has participated in ITU-T and ATIS standards bodies on topics related to timing and synchronization in communications networks, most recently working on synchronization over packet networks. His interests are in product strategy and planning, high-speed and custom design for high-performance ASICs, image and signal processing, and communications network synchronization and architectures. He received M.S. and PhD degrees in electrical engineering from Duke University, and his B.Tech. degree (also in EE) from the Indian Institute of Technology, Bombay. He has 50 publications including conference presentations and papers in refereed journals, including invited talks at IEEE conferences such as the European Solid State Device Research Conference, International Shallow Junction Workshop, and the Workshop on Synchronization in Telecommunications Systems. He also has 20 issued or pending patents. He has served on various conference committees, including GLOBECOM and ICC, since 2008, and has been involved with ComSoc's TAOS TC since 2008, where he served as Vice-Chair, chaired the SAC-ANS track at GLOBECOM 2012, and was a presenter at the ComSoc Webinar on Next Gen Synchronization Networks held in October 2012.