FOREWORD

Special Section on Internet Technology IV

The digital information and communication infrastructure as empowered by Internet technology has already become a major part of the infrastructure platform of people's daily activities and of working environment. The information and communication networks until the late 1990's has not provided a broadband, always-on communication environment to end users. Recently, a new type of information infrastructure using the native Internet technology such as ADSL and wireless LAN, has begun to deployed significantly. The Internet is now mutating toward a new stage, which is a broadband and ubiquitous computing over the native Internet environment. The digital transmission technology to interconnect the digital devices to the Internet has been drastically changed in these days. This is "No-more dial-up," i.e., so called the "native Internet" has been emerged and deployed. As well as the native Internet deployment, Internet has been introduced broadband communication and always connected environment. More than mega-bits-per-second communication bandwidth has been available in residential and hot-spot areas, as well as in the offices. As the result, the Internet becomes the digital communication platform internetworking all of digital devices using wide variety of digital transmission technologies.

From the beginning of Internet research activity in 1960s to the end of 21st century, the digital devices connected with the Internet has been basically computers. However, in these days, non-computer devices, such as information appliances, home appliances or automobile, are going to be connected with the Internet. The Internet has been always modified its protocols and experienced some mutations, in the past. However, we well-know and realize that we have to preserve the "end-to-end architecture," in order to preserve the development and mutation of the Internet. In order to preserve the "end-to-end architecture," we develop the IP version 6 (IPv6) via the significant technical investigation and discussion since the middle of 1990's. Now, the IPv6 is going to be widely accepted by the industry and to be deployed.

The Internet has been still grown more than exponentially in terms of the number of nodes, network and traffic volume. This means that the Internet technologies has been always fighting with the scalability. Here, the scalability is not only quantitative, but is also qualitative. Recent Internet has to provide wide variety of communication quality for each users, since every communication has been integrated into the Internet. In the Internet, it seems that the requirement from the operational network has been always challenging to the hardware and software technologies to solve the specific issue at every moment of time. The growth of the Internet and the introduction of new technologies and requirements emerge new technical challenges to us. For example, some of recent serious issues for the Internet would the robustness against the DoS (Denial of Service) by malicious users or the serious supporting of mobile nodes and networks.

The research, development and deployment of Internet technologies is based on a kind of positive closed and spiral feed back system. Internet protocol suit has been always modified, based on the operational experiences at the live Internet. This means that the Internet technologies are highly engineering oriented. Actually, a lot of Internet researchers and engineers do not believe the new technology without "running code." A lot of research and development related with the Internet is based on the operational experiences, and the new technologies are evaluated and appreciated by the Internet community itself.

Based on the above observation, this special section is focusing on the practical works related with the Internet technologies. Our paper accepting policy is; we accept the paper, when the work is very worth for the Internet community, even when it does not have the detailed analysis and evaluation. This particular special section accommodates 33 papers, that should satisfy the above criteria. We have received more than 70 paper submissions, from various countries, such as China, Taiwan or Korea.

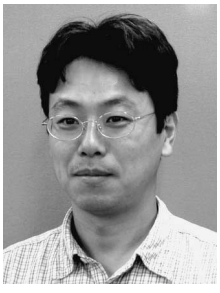
Hiroshi Esaki, Guest Editor-in-Chief

Hiroshi Esaki *(Member)* received the B.E. and M.E. degrees from Kyushu University, Fukuoka, Japan, in 1985 and 1987, respectively. And, he received Ph.D. from The University of Tokyo, Japan, in 1998. He has jointed Toshiba Corporation, where he has engaged in the research of ATM systems. From 1998, he has worked for The University of Tokyo as an associate professor, and has worked for WIDE project as a board member. He has been at Bellcore in New Jersey (USA) as a residential researcher from 1990 to 1991, and has engaged in the research on high speed computer communications. From 1994 to 1996, he has been at CTR (Center for Telecommunications Research) of Columbia University in New York (USA) as a visiting scholar. He is currently interested in a high speed Internet architecture, including MPLS technology, a mobile computing, and IPv6.

Naoaki Yamanaka *(Member)* graduated from Keio University, Japan where he received B.E., M.E. and Ph.D. degrees in engineering in 1981, 1983 and 1991, respectively. In 1983 he joined Nippon Telegraph and Telephone Corporation's (NTT's) Communication Switching Laboratories, Tokyo Japan, where he was engaged in research and development of a high-speed switching system and high-speed switching technologies for Broadband ISDN services. Since 1994, he has been active in the development of ATM base backbone network and system including Tb/s electrical/optical backbone switching as NTT's Distinguished Technical Member. He is now researching future optical IP network, and optical MPLS router system. He is currently a senior research engineer, supervisor, and research group leader in Network Innovation Laboratories at NTT. Dr. Yamanaka is Technical Editor of IEEE Communication Magazine, Broadband Network Area Editor of IEEE Communication Surveys, and was Editor of IEICE Transaction as well as TAC Chair of Asia Pacific Board at IEEE Communications Society. Dr. Yamanaka is an IEEE Fellow.

Youki Kadobayashi *(Member)* received his Ph.D. degree in Computer Science from Osaka University in 1997. He is currently an Associate Professor in the Graduate School of Information Science, Nara Institute of Science and Technology, Japan. His research interests include content internetworking, overlay networks, quality of services in the application-layer, middleware security, and secure operating systems.

Kaori Maeda *(Member)* received the B.L.S.E. from Hiroshima University in 1982 and Ph.D. degrees from Kyushu Institute of Technology in 1999. She worked at Faculty of Engineering, Hiroshima University from 1982 to 1989 and at Radiation Effects Research Foundation from 1989 to 1994. She has been a Research Associate at Information Processing Center, Hiroshima City University since 1994. She is currently an Associate Professor. Her current interests are in the area of computer networks and multimedia communications. She is a member of the IPSJ and JSISE.



Kenichi Nagami *(Member)* received the B.S. degree from Chiba University, Japan, in 1990 and M.S. degree from Tokyo Institute of Technology, Japan, in 1992. He received Ph.D. from Tokyo Institute of Technology, Japan, in 2001. In 1992, he joined Research and Development Center, Toshiba Corporation where he has been working on communication system. From 2002, he works for INTEC NetCore Inc. as chief scientist. He is interested in Internet technology, such as routing, MPLS and IP version6, and a network monitoring technology.

Motonori Nakamura *(Member)* graduated from Kyoto University, Japan, where he received B.E., M.E., Ph.D. degrees in engineering in 1989, 1991 and 1996, respectively. From 1994 he was an assistant professor at Ritsumeikan University. From 1995 he was an associate professor at Kyoto University. From 1996 he was an associate professor at Graduate School of Kyoto University. From 1999 he was associate professor at Center for Information and Multimedia Studies, Kyoto University. Currently he is an associate professor at Academic Center for Computing and Media Studies, Kyoto University. He is a board member of WIDE Project. His research interests are message transport network, high-speed broadband data transport system, network communication, next generation Internet and super computing.

Koji Okamura *(Member)* received B.S. and M.S. degrees in Computer Science and Communication Engineering from Kyushu University, Japan in 1998 and 1990, respectively. From 1990 to 1993, he was a Researcher of MITSUBISHI Electronic Corporation, Japan. From 1993 to 1996, he was a Research Associate at the Graduate School of Information Science, Nara Institute of Science and Technology, Japan. From 1996 to 1998, he was a Research Associate at Computer Center, Kobe University, Japan. In 1998, he received Ph.D. degree in Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan. Since 1998, he has been an Associate Professor at Computer Center, Kyushu University, Japan. His research interests include Internet and next generation Internet, multimedia communication and processing, multicast/IPv6/QoS, human communications over Internet, and active networks.

Atsushi Shionozaki *(Member)* received the B.E. degree in electrical engineering, and the M.S. and Ph.D. degrees in computer science from Keio University in 1990, 1992, and 1995, respectively. In 1995, he joined Sony Computer Science Laboratories, Inc., in Tokyo, Japan, where he worked on resource reservation protocols, QoS control, and reliable multicast all based on IP. He is currently a senior staff researcher at Sony Electronics in San Jose, CA and a researcher in residence at the Stanford Networking Research Center, Stanford University, CA. His research focuses on ubiquitous mobile computing, namely host mobility protocols and transport mechanisms for wireless networks. Dr. Shionozaki is a member of ACM and the WIDE Project.

Suguru Yamaguchi *(Member)* received the M.E. and D.E. degrees in computer science from Osaka University, Osaka, Japan, in 1988 and 1991, respectively. From 1990 to 1992 he was an Assistant Professor in Education Center for Information Processing, Osaka University. From 1992 to 1993, he was with Information Technology Center, Nara Institute of Science and Technology, Nara, Japan, as an Associate Professor. From 1993 to 2000, he was with Graduate School of Information Science, Nara Institute of Science and Technology, Nara, Japan, as an Associate Professor. Currently, he is a Professor with the Graduate School of Information Science, Nara Institute of Science and Technology, Nara, Japan. He has been also a member of WIDE Project, since its creation in 1988, where he has been conducting research on network security system for wide area distributed computing environment. His research interests include technologies for information sharing, multimedia communication over high speed communication channels, network security and network management for the Internet.