

Invited paper

Energy consumption targets for network systems

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Abstract

Followed by related development activities in Japan, comprehensive investigation on energy consumption in ITC industry is presented. Photonic network has more important role in mobile networks than in fixed networks.

Extended Abstract

This paper presents the current energy consumptions and the future targets in 5 telecommunication segments: fixed network service, network node (routers/switches), data centers, mobile network service, and home networks. Photonic network technology is important to the energy reduction of metro/core network, but advance CMOS technology is still effective for that of metro/core edge routers. It is also emphasized photonic technology will contribute more to the energy reduction of radio access networks than that of fixed network services. Under this assumption, the project "Development of Next-generation High-efficiency Network Device Technology" was launched last year by NEDO (New Energy and Industrial Technology Development Organization), Japan, targeting the power consumption issue in the network-related technology area. There are two main technologies: Dynamic Optical Path-Switching (DOPS), and high-efficient edge router technology. The target of DOPS is configured with 172Gbps integrated OTDM (Optical Time Division Multiplexing) NICs. Optical backplane is investigated for a high-speed and power efficient data transmission in backplane of routers and switches. Two electrical circuit technologies are investigated: advanced CMOS process technology to support 40Gbps/ch operations, and superconductive single flux quantum (SFQ) circuit which operates at a more than 100-GHz clock frequency with less than 1 μ W power consumption per gate.

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CV

Tohru Asami received B.E. degree in 1974 and M.E. degree in 1976 from Kyoto University and Ph.D. in 2005 from University of Tokyo. Since 1976, he has been working at KDD/KDDI R&D Laboratories in several research areas as a researcher of network management. In 1985, he developed an accounting system for the semi-commercial Internet gateway for Japanese academic societies in cooperation with of UUNET, EUNET, etc. From 2001 to 2005, he was C.E.O. of KDDI R&D Labs. Inc., and since 2006 he has been in Dept. of Information and Communication Engineering at The University of Tokyo.