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Invited paper

Power efficiency of optical versus electronic access networks

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Abstract

Based on a model of a typical operator network we have compared the power consumption of different broadband access technologies and architectures especially DSL, FTTN + VDSL and FTTH. Even though power management improves the performance there is still clear advantage of FTTH with respect to energy efficiency.

Extended Abstract

The consumption of electrical energy evolves into a major challenge of the information and communication industry. From a general point of view this has two aspects, firstly a commercial one, because electrical power is a strong factor of OpEx (operational expenditures) and secondly the contribution to the global emission of carbon oxygen. Statistics of the energy consumption of huge provider networks show a clear dominance of access and data centre infrastructure. Due to the scaling of access networks by the number of users connected to the network the access technology and access architecture have an enormous impact in operator's network energy consumption. Additionally the rollout of broadband infrastructure increases the energy consumption per customer because of the broadband technology itself and various active components in home networks Different technologies like xDSL, FTTx, Docsis and wireless can be seen in access, usually the installation decision is based on CapEx considerations. Based on a model of a typical operator network we have compared the power consumption of different broadband access technologies and architectures especially xDSL, FTTN + VDSL (incl. power management) and FTTH. Even though VDSL power management improves the performance there is still clear advantage of FTTx with respect to overall energy consumption.

Andreas Gladisch

In 1986 Andreas Gladisch received the Dipl.Ing. Degree from the Technical University of Ilmenau in "Theory of Electrotechniques". From 1986 to 1990 he was engaged in research on coherent optical communication and optical frequency control at Humboldt University Berlin, where he received the PhD in Optical Communication. He joined the Research Institute of Deutsche Telekom in 1991. In 1996 he became the head of the research group "Management and Control of Optical Networks" and in 1999 he got the responsibility for the department "Network Architecture". Since 2007 He is head of the unit "Next generation Broadband Systems"of T-Systems ES. He was involved in several European Research Projects about optical and multi layer networks (for example Photon, Meton, Moon, Lion) He is project manager of projects dealing with the migration of Deutsche Telekom transport network especially the migration of SDH and WDM, including the development and assessment of different network scenarios and technologies. Andreas Gladisch is member of ITG and IEEE and he has authored or co-authored more than 90 national and international technical conference or journal papers respectively.