P05: Technical University Berlin - TUB (Germany)

Description of expertise & activities

Enjoying a strong background in analysis and performance evaluation of telecommunication networks, over the last ten years Telecommunication Networks Group (TKN) at TUB has been focusing on developing high performance architectures and protocols for optical metropolitan area WDM networks. We have developed and extensively analyzed single- and multi-hop network architectures and the associated protocols based on Arrayed Waveguide Gratings (AWG). Additionally, we have proposed and studied the RINGOSTAR, which is an evolutionary performance upgrade of optical ring networks. More recently, we have been considering asynchronous optical packet/burst switching networks with a particular emphasize on optimizing the operation and performance of the network through better management of traffic. Ongoing work deals partly with traffic related issues including modeling and shaping of traffic as well as developing new reservation mechanisms for burst switching networks. Additionally, we investigate the complementary approaches, which include different multiplexing schemes such as the hybrid of packet/burst switching and circuit switching.

Another focus of TKN over the last years has been in the area of the design and analysis of MAC protocols for wireless systems and mobility support. Previous work included, e.g., the performance evaluation of MAC schemes for radio over fibre based wireless networks in the 60 GHz band. Originally considered as a “wireless last mile” for rural areas, the system architecture was also applied to support roadside vehicular communication. Focus has been set to elaborate load balancing schemes within the (distributed) radio cell controlled by a single, centralized MAC. Additionally, an approach to enable seamless mobility support within a single-frequency radio over fibre domain has evolved within this work.

Tasks within BONE

WP22	GMPLS/MPLS/IP integration & migration issues: impact on design, control and management schemes for IP-driven next-generation optical networks
WP23	- intelligent technologies and design challenges for wireless access in networks in motion - control plane and signalling algorithms and protocols for networks in motion
WP24	- Optical Packet Switching: adaptation issues, packetization, traffic shaping asynchronous-synchronous - Polymorphic networks: comparison between Optical Burst/Packet Switching and Optical Circuit Switching - Traffic models

Key personnel

Prof. Dr.-Ing. Adam Wolisz received his degrees (Diploma - 1972, PhD - 1976, Habilitation - 1983) from Silesian University of Technology, Gliwice, Poland. After a period with Polish Academy of Sciences (until 1990) and GMD-Fokus, Berlin (1990-1993), he has joined in 1993 Technische Universität Berlin where he is chaired Professor for Telecommunication Networks and Executive Director of the Institute for Telecommunication Systems. He is also Adjunct Professor at the Dept. EE&CS, University of California, Berkeley. His research interests are in architectures and protocols of communication networks. Recently he is focusing mainly on wireless/mobile networking and sensor networks.