



# THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering

*Seminar*

## **Service Overlay Network Capacity Adaptation for Profit Maximization**

by

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**The Chinese University of Hong Kong**

### Abstract

We consider Service Overlay Networks (SON) that lease bandwidth with Quality of Service (QoS) guarantees from a multitude of Internet Autonomous Systems, through service level agreements (SLA) with Internet Service Providers (ISP). This bandwidth is used to establish SON links and deliver end-to-end QoS for real time service connections. The leased bandwidth amount influences both the admitted traffic and network cost, affecting the network profit. This gives the network operator the opportunity to optimize the profit by adapting the network resources to changing traffic and SLA costs conditions. We propose a novel approach that maximizes the network profit based on traffic measurements and SLA cost changes. The approach uses an economic model that integrates the network routing policy with the adaptation of the SON link capacities. While performing the adaptation of leased bandwidth, the connection blocking constraints are also maintained. The proposed adaptive optimization approach is based on a reward maximizing routing policy derived from the Markov Decision Process theory although it can be applied to other routing policies. Analytical models as well as simulation of a measurement based implementation of the proposed models are used to evaluate the performance of the proposed approach.

### Biography

Zbigniew Dziong received his M.Sc. and Ph.D. degrees from the Warsaw University of Technology, Poland, both in Electrical Engineering. After graduation he was with the Warsaw University of Technology as an Assistant Professor. During this period, he was on sabbatical leaves at the Centre National d'Etudes des Telecommunications, Paris, France, and at the Department of Communication Systems, Lund Institute of Technology, Sweden. From 1987 to 1997 he was with INRS-Telecommunications, Montreal, Canada, as a Professor. From 1997 to 2003 he worked for Performance Analysis Department at Bell Labs, Lucent Technologies, Holmdel, New Jersey, USA. Since 2003 he is with École de technologie supérieure (University of Quebec), Montreal, Canada, where he teaches on both undergraduate and graduate level as an Associate Professor.

Zbigniew Dziong is an internationally recognized expert in the domain of performance, protocol, architecture and resource management for data, wireless and optical networks. He participated in research projects realized for many leading companies including Bell Labs, Nortel, Ericsson, and France Telecom. His research achievements are documented in over 100 scientific publications and 14 patents and patent applications. He won the prestigious STENTOR Research Award (1993, Canada) for collaborative research in the domain of resource management for broadband networks. His monograph "ATM Network Resource Management" (McGraw Hill, 1997) has been used in several universities for graduate courses. Currently he is engaged in several research projects supported by industry and government agencies.

**\*\* ALL ARE WELCOME \*\***

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