

**Department of Mathematical Information Technology
University of Jyväskylä**

SERAMON

Adaptive Service Aggregation in IP Mobile Networks

Alexandru Murgu

**Tel. +358-14-602757
Fax. +358-14-602731
Email: murgu@julia.math.jyu.fi**

September 2002

Title of Project: *SERAMON - Adaptive Service Aggregation in IP Mobile Networks*

Project Leader: Alexandru Murgu

Research Place: Department of Mathematical Information Technology
University of Jyväskylä

Summary of Project Status

1. Results

- Heterogenous user population characterizing the present available services is considered in mobile IP networks in terms of QoS / CoS differentiation.
- Adaptive multi service management is based on the dynamic estimation of built-in features of user populations on a long-term basis (trends on traffic samples and similarities). IP service management reformulated to detect statistical traffic abrupt changes of QoS and class of service parameters.
- The existing dynamic tradeoff between the IP resources and service flexibility is encoded via entropy aggregation towards the implementation of IP session control mechanisms.

2. Reports/Papers

- [1]A. Murgu, "Fuzzy Aggregation of Input-Output Service Level Dynamics in Multimedia Networks", in *Advances in Computer Cybernetics, Vol. XI*, G.E. Lassker (ed.), pp. 54-62, 2002.
- [2]A. Murgu, "Multicalls Service Dynamics Replication Using Evolutionary Selection Games", in Proc. of 10th Intern. Symp. on Dynamic Games, ISDG-2002, St. Petersburg, Russia.
- [3]A. Murgu, "Fuzzy Successive Averaging method in Multistage Optimization Systems", in Prof. of Intern. Joint Conf. on Neural Networks, IJCNN-2001, Washinton, D.C., USA.
- [4]A. Murgu, "Minimum Cross Entropy Control in Stochastic Switching Systems", in Proc. of Intern. Symp. on Information Theory, ISIT-2001, Washington, D.C., USA.
- [5]A. Murgu, "Switching Envelope Analysis for Statistical Aggregation of Traffic Flow Batches, in Proc. of 9th Intern. Symp. on Dynamic Games, ISDG-2000, Adelaide, Australia.

3. Future Research Issues

- *QoS adaptivity* of network to respond to different requirements of multimedia communications (voice, data, video, web).
- *aggregating addresses at the coreservers* (used in unicasting); multicast addresses are aggregated to encapsulated the multicast addresses contain the location information on group members; *aggregation schemes* for aggregate addresses either through a group identifier approach or an interface approach.
- *interface approach*: addresses aggregated at the interface to allow group members and address allocation to be totally random.

Keywords: Stochastic Services, Mobile IP Networks, Maximum Entropy Aggregation.

