**QOSIPS**

Quality of Service and Pricing Differentiation for IP Services

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### QoS issues

Historically, IP networks are based on the “best effort” traffic management scheme, which let no other solution but over-provisioning to offer some guarantees of Quality of Service (QoS) to users.

Recent Developments in IP routing technology allow Network Service Providers (NSP) to provide customers with differentiated Class of Service (CoS). However passing from CoS to QoS, i.e. to guaranty latency, jitter and loss is and will remain painful in IP networks.

### Pricing issues

Virtual Private Networking (VPN) over a collective (private or public) IP network infrastructure is being widely used by enterprises; it is forecasted that in 5 years, nearly every enterprises will use this technology to interconnect headquarters, facilities, branch offices, nomadic employees, etc.

Such a wide market will require a structured service definition (Service Level Agreement) along with a clear and understandable pricing differentiation.
Our Mission Statement

Develop innovative technologies for supporting Quality of Service management, service differentiation and price setting of Internet Protocol Network Service Providers.

Design, implement, test and evaluate an integrated system (software, hardware and methodology) that performs the following functions:

1. Provide exhaustive, non-intrusive and accurate measurement of real-time QoS of user’s traffic packets without injection of test packets in the network.
2. Support customer’s profiling (through classification of customer “real traffic and use of QoS oriented services) as an innovative way of generating service differentiation.
3. Support the pricing of QoS oriented services such as QoS oriented Service Level Agreement, per application or/and per destination prioritisation, pay-per-use, pay-per-class of service, or global prices packaged per customer type, etc.

Two Main Modules

In order to achieve these three main functions, the QOSIPS system will be composed of two main modules:

The Quality Module will aim at ...

- Real-time Measure of all real-time QoS parameters
  - Real metrics (one-way delay, jitter, loss)
  - Accurate, exhaustive, non intrusive measure
  - Multiple views: network and users global VPN, not only local access points

The Pricing Module will aim at ...

- Constructing Demand models describing the NSP’s pricing problem.
- Optimising the NSP’s portfolio of S.L.A. with respect to:
  - Q.o.S.and Differentiated services
  - Customer segmentation
  - Competitor offering
  - Strategic constraints such as image, market share, price positioning
- Computes sales, revenue & profit forecasts

Deliverables

The QOSIPS system will include both software, hardware and methodology.

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Benefits of the QOSIPS System for IP NSPs

Real-time measure of QoS

A more accurate measure of real-time QoS. The Quality Module of QOSIPS should provide the NSP with a measurement system which is:

- Exact: real time user’s traffic packets are the object of the measure;
- Accurate (approximately 1 to 10 µs i.e. one order of magnitude below Service Level Specification and application sensitivity);
- Exhaustive: each packet can be measured;
- Non intrusive: no injection of test packets in the network.

Service Differentiation

A better understanding of customer profile/behaviour as well as a more innovative way of generating service differentiation. QOSIPS should help the NSP to:

- Classify customers’ traffic and use of QoS oriented services;
- Understand the actual sensibility of users about real-time network characteristics;
- Help the CoS to QoS bridging;
- Find out trends in order to anticipate network engineering actions and service provisioning;
- Better use the capacity of their network without degradation of the QoS.

Pricing of QoS

A better understanding of pricing issues. The Pricing Module should help the NSP to:

- Manage the complexity generated by the multiplication of differentiated services;
- Make a trade-off between possible services;
- Pre-assess commercialised impact of their offers before these offers are even commercialised;
- Simulate the impact on their sales of competitors' prices moves and/or introduction of new products;
- Compute the optimum set of prices which optimise profit and/or sales within the strategic constraints of the NSP.

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The QOSIPS Consortium

The consortium comprises a balanced mix of expertise:

- Two leading European Universities:
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- Two fast growing high technologies companies:
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- And an innovative IP Network Service Provider:
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