Project Information

IP Network Monitoring for Quality of Service Intelligent Support

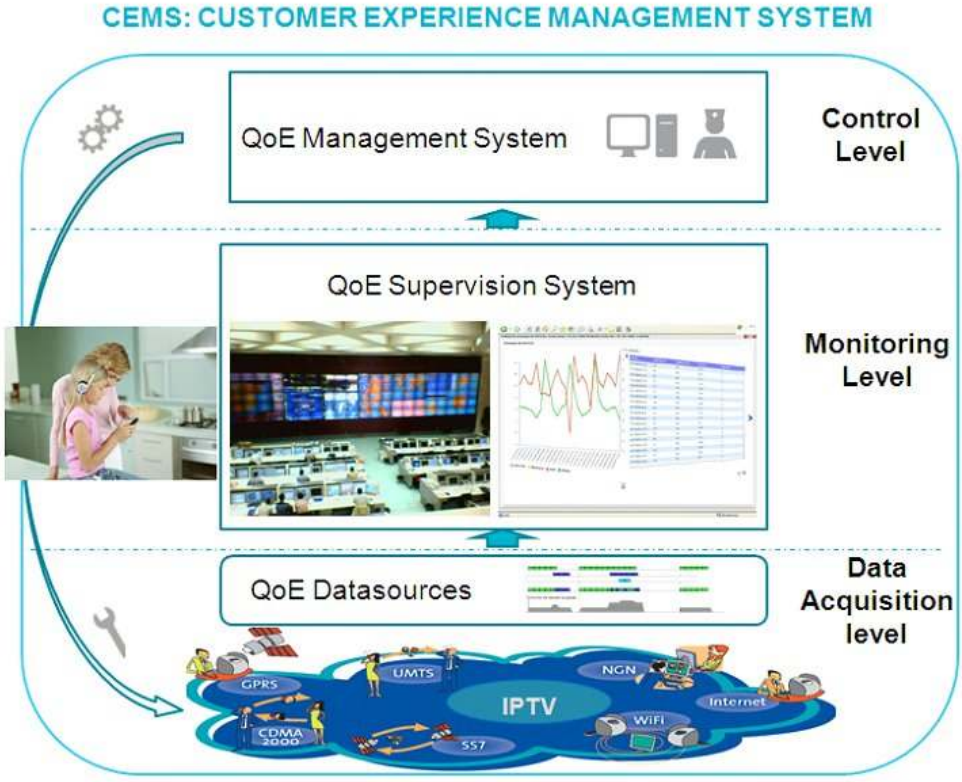
The focus of IPNQSIS is to develop continuous monitoring systems to study the behaviour of Quality of Experience (QoE) through the analysis of network and service performance and their impact on end customers.

Main focus

The uppermost novelty of IPNQSIS is that both the customer perception and network performance will be taken up as the main driver for building a complete Customer Experience Management System (CEMS). The QoE will be fed from multi-technology network devices, such as probes, that will be developed and evaluated in the project. Deep packet and deep flow inspection techniques will be applied to monitor and analyze IP traffic in access networks in order to propose new techniques for distribution of multimedia content for cost-efficient solutions to maintain acceptable levels of QoE. In summary, algorithms, and measurements devices will be developed and tested to provide feedback to the control system. Furthermore, cognitive software will be developed to combine QoE-QoS correlation analysis with network operation and traffic modelling studies. All these elements constitute the Customer Experience Management (CEM) architecture that is the main outcome of this project.

Approach

Starting from the definition of the requirements for a monitoring architecture based on QoE measurements, IPNQSIS will design and implement all the elements required to build a network management



IPNQSIS

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Project ID: CP7-009

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Partners:

Acreo AB, Sweden
Alcatel-Lucent España SA, Spain
Alkit Communications, Sweden
Diseños y Consulting de Electrónica y comunicationes, S.A., Spain
Ericsson AB, Sweden
EXFO NetHawk, Finland
Broadcom Networks, Spain
Indra Sistemas SA, Spain
Institut Telecom, France
IP-Label Newtest, France
Lund University, Sweden
Naudit High Performance Computing and Networking, S.L., Spain
PPO-Yhtiöt Oy, Finland
Procera Networks, Sweden
Softtelecom, Spain
Vierling Communication, France
VTT Technical Research Center of Finland, Finland
University Paris Est Creteil, France

Co-ordinator:

Antonio Cuadra-Sánchez
Indra Sistemas SA
E-mail: acuadra@indra.es

Project Website

www.celticplus.eu/projects/celtic-proojects/call7/IPNQSIS/ipnqsis-default.asp

system rooted in the traffic monitoring and service supervision system. This performance will be improved by means of enhanced hardware and software elements and the tools to monitor QoE from QoS measurements developed in the project. That is, the major outcome of IPNQSIS project will be the requirements, design and an implementation of a Customer Experience Management System (CEMS) composed of three different layers: Data sources (i.e. probes), Monitoring Component and Control Module.

The structure of IPNQSIS is implemented on a classical formal pattern from system specification to prototype final implementation including use-cases identification. Besides from two transversal work packages, namely WP1, for general project management and WP7, for dissemination and standardization issues, the structure of the project IPNQSIS aims the final objective of building a prototype up: WP2 establishes the system requirements, WP3 deals with traffic modelling and WP4 with network behaviour analysis. WP5 that actually tackles the data sources and control module that constitutes the prototype implementation. Finally WP6 performs the integration and testing of the prototype by developing several use cases.

Main results

The major results from IPNQSIS will be:

- The analysis of the relation between QoS and QoE parameters and how they can be used to supervise the network so that strategies or policies can be developed to maintain the expected quality
- The introduction of improved traffic measurement software and hardware probes that operate at different levels, ranging from the network core to the end -user applications.
- The creation of routing repositories that can benefit further simulations and data traffic analysis to implement strategies that maintain the required quality.
- The definition of an intelligent network management system that is fed from measurements obtained by traffic monitoring and routing repositories data.
- The provision of traffic modelling studies of IPTV and video services

All these developed elements (design, software and hardware) will contribute to build up network control prototypes that will serve as a network monitoring proof-of-concept rather than a complete network operation system due to the limited resources and the obvious restrictions to control real commercial networks. The prototypes will either just alert about QoE degradation and will propose users restrictions to the implied service or changes in the operational mode to the service provider as a “warning”, or execute simple control tasks, such as enabling access control policies, or implementing traffic differentiation from modified flows.

Impact

It is important to note that the QoE becomes more and more crucial for Telco market as it’s broadly accepted that customer ARPU (Average Revenue Per User) can only be increased by launching value added services such as IPTV (Standard Definition and High Definition), Video On Demand or Catch up TV.

The impact of IPNQSIS spans network operators and service providers in order to obtain SLA more efficiently since they will have both a set of standard parameters (and measurement techniques) for QoS, and a tool to use them so that QoE requirements can be established. Inter-operator and operator-service provider as well as their relationship with end users will be clarified. Besides, a differentiated approach to QoS by applications will be enabled.

Market agents, scientific institutions and governments will have access to tested traffic modelling in a disaggregated scenario, within a convergent network. These results can then be used for further studies, network marketing or even regulation purposes.

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe’s competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

Celtic Office

c/o Eurescom, Wieblinger Weg 19/4,

69123 Heidelberg, Germany

Phone: +49 6221 989 405, e-mail: office@celtic-initiative.org

www.celtic-initiative.org

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