

## Foreword

### Next Generation Network and Service Management

According to the ITU-T<sup>1</sup> a Next Generation Network (NGN) can be defined as “a packet-based network able to provide Telecommunication Services to users and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent of the underlying transport-related technologies”. The aim is to enable users with unfettered network access along with access to competing service providers, and services of their choice. NGNs are also expected to support generalized mobility which will allow consistent and ubiquitous provision of services to users.

In the same way that new NGN architectures are evolving, the approaches to managing these networks and the services they provide must also evolve. Therefore, looking five, ten or more years ahead, management systems must evolve to meet the needs of next generation of communications networks and services. This means that traditional approaches to network and service management may be insufficient to meet the new requirements of these networks and services, and the design of network management architectures must be reconsidered in light of new developments in this area.

Researchers working on this subject have put effort into addressing open issues like:

- Evolution of NGN networks;
- QoS (Quality of Service) provisioning;
- Network and System Interoperability;
- NGN operational security policy and guidelines;
- Generalized mobility;
- Service capabilities and architectures.

This special issue of *Annals of Telecommunications* aims at providing the reader with articles that cover key aspects of next generation network and service management. These articles can also serve as state-of-the-art references on the latest undertaken developments.

Six peer-reviewed research articles were selected for publication which are:

- *Sensor-based Architecture for QoS Provisioning and Fast Handoff Management in WLANs*, by Sonia Waharte, Jin Xiao and Raouf Boutaba - David R. Cheriton School of Computer Science, University of Waterloo, Ontario, Canada;
- *A Service-oriented Admission Control Strategy for Class-based IP Networks*, by Solange Rito Lima, Paulo Carvalho and Vasco Freitas - Computer Communications Group, University of Minho, Department of Informatics, Braga, Portugal;
- *Integrated Service Creation Environment for Open Network Services*, by Sang Ki Kim, Young Mee Shin, Cho Rong Yu, Seung Hwa Chung, Byung

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<sup>1</sup> ITU-T Recommendation Y.2001 – “General overview of NGN” (12/2004)

Sun Lee - Electronic and Telecommunications Research Institute (ETRI), Korea;

- *Towards Semantic Web-based Management of Security Services*, by Félix J. García Clemente, Gregorio Martínez Pérez, Andrés Muñoz Ortega, Juan A. Botia and Antonio F. Gómez Skarmeta - Departamento de Ingeniería y Tecnología de Computadores, Departamento de Ingeniería de la Información y las Comunicaciones, University of Murcia, Spain;
- *Design and Implementation of Web Services-based NGOSS Technology Specific Architecture*, by Mi-Jung Choi and James W. Hong - Department of Computer Science and Engineering, POSTECH, Korea; Taek Ju - Department of Computer Science, Keimyong University, Korea; Dong-Sik Yun - KT Network Technologies Labs, KT, Korea;
- *A Novel IPv6 Traceback Architecture Using COPS Protocol*, by Syed Obaid Amin, Muhammad Shoaib Siddiqui and Choong Seon Hong - Department of Computer Engineering, School of Electronics and Information, Kyung Hee University, Korea.

In the first article the authors present a new sensor-based resource management architecture for enhanced QoS provisioning and handoff management in WLANs. Through theoretical analysis and simulations, they show that the framework can maximize bandwidth utilization while satisfying applications QoS requirements, and significantly reduce handoff latency.

The authors of the second article describe and specify a lightweight distributed admission control (AC) model based on per-class monitoring feedback for ensuring the quality of distinct service levels in multiclass and multidomain environments.

The third article describes an integrated service creation environment (SCE) to reflect the trend of network evolution towards an open network environment. The SCE provides multiple service programming tools to support various users' background, a mash-up toolkit for IT domain, a simulation-based validation tool, a run-time adaptation tool, and a personalized service provisioning environment.

The authors in the fourth article highlight the main ideas behind a semantically enriched specification of security policies, and go on to describe an automated process for performing conflict detection on these policies in a policy-based management system.

The fifth article provides details of the design and implementation of a Web Services-based TSA (Technology-Specific Architecture) in accordance with the architectural principles of TNA (Technology-Neutral Architecture) and the performance evaluation of the proposed system. The authors suggest that the work can be used as a guideline for anyone planning to develop a Web Services-based NGOSS (New Generation Operations Systems and Software) TSA.

Finally, the authors in the sixth article propose a novel on-demand traceback architecture for IPv6 networks using COPS (Common Open Policy Service) and a novel packet marking scheme. They provide a complete underlying protocol details required for traceback support in IPv6 networks.

With this special issue the guest editors hope that the readers can use the research presented to develop new solutions and contribute the challenge of bringing to reality the Next Generation Network concept as well as its related Service Management.

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