First International ICST Conference on
Mobile Networks and Management

MONAMI 2009

Conference Program

13 – 14 October 2009

Athens, Greece

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Welcome to MONAMI 2009

It gives us great pleasure to welcome you to the First International ICST Conference on Mobile Networks and Management (MONAMI) being held in Athens, Greece. MONAMI 2009 aims at bringing together top researchers, academics, and practitioners specializing in the area of Mobile Network Management.

Multiaccess and resource management, mobility management, and network management have emerged as core topics in the design, deployment, and operation of current and future networks. Yet, they are treated as separate, isolated domains with very little interaction between the experts in these fields and lack cross-pollination. MONAMI 2009 offers the opportunity to leading researchers, industry professionals, and academics around the world to meet and discuss the latest advances in these areas and present results related to technologies for true plug-and-play networking, efficient use of all infrastructure investments, and access competition. The aim of the forum is to disseminate the latest innovative mobile network solutions for increased competition and cooperation in an environment with a multitude of access technologies, network operators, and business actors.

Athens is an extraordinary city, the capital of Greece, and one of the oldest cities in the world, home of the renowned Acropolis and the Parthenon. It offers ample opportunities for visiting monumental ancient sites, museums (including the new Acropolis museum), and art galleries. Visitors can enjoy good food in a vast array of restaurants and tavernas, ranging from the traditional to the experimental modern cuisine. Athens also has an excellent nightlife with great diversity in entertainment offerings. We hope that in addition to the fruitful participation in the conference you will have the opportunity to sample some of the Athenian attractions and learn more about Greece and its history.

We look forward to seeing you in Athens!

On behalf of the organizing committee,

Kostas Pentikousis
MONAMI 2009 General Chair
VTT Technical Research Centre of Finland

Welcome Message from the Technical Program Chairs

MONAMI 2009 is covering a range of topics in mobile networks and their management that are currently of high interest in the wireless research area. In particular multiaccess networks, along with the associated resource management issues, self organizing network management architectures, and service provisioning have emerged as core topics in the design, deployment and operation of current and future networks. After a thorough peer review process, eight submissions were selected based on their relevance to the scope of the conference workshop and their technical merit. These will be orally presented during the Athens conference sessions and are included as full papers in the MONAMI 2009 proceedings. Further, five short papers, reporting work in progress, will complement the program and are also included in the proceedings. All papers will be presented in a single-track format, which fosters active participation from the attendees.

We acknowledge the vital role that the Technical Program Committee members and referees played during the review process. Their efforts ensured that all submitted papers received a proper evaluation. In addition to the oral presentations of the selected papers, the conference program includes a keynote speech by Professor Antonio Puliafito on "Managing Heterogeneous Wireless Technologies: Objects Tracking and Services Development". The conference will open with a tutorial on "Mobility and Multiaccess in Emerging Internet Architectures"by Dr. Kostas Pentikousis. Finally, the conference program includes a panel session on "Energy Efficiency in Mobile Multiaccess Networks" moderated by Professor Symeon Papavasileiou.

We expect all these to trigger fruitful discussions making the conference a very active forum, which will foster future cooperation between the participants.

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Abigail West

Dietrich Zeller

Program at a Glance

Tuesday 13 October 2009

Time			
8:30 - 9:00	Registration		
9:00 - 9:30		Opening Ceremony: Welcome address, Logistics	
9:30 - 10:00		Tutorial: Mobility and Multiaccess in Emerging Internet Architectures	
10:00 - 10:30		by Kostas Pentikousis	
10:30 - 11:00			
11:00 - 11:30		Coffee Break	
11:30 - 12:00		Tutorial: Mobility and Multiaccess in Emerging Internet Architectures	
12:00 - 12:30		(cont.)	
12:30 - 13:00		Lunch	
13:00 - 13:30			
13:30 - 14:00			
14:00 - 14:30		Session 1: Handovers in Multiaccess Networks	
14:30 - 15:00			
15:00 - 15:30			
15:30 - 16:00		Coffee Break	
16:00 - 16:30		Session 2: Context and Connection Management	
16:30 - 17:00			
17:00 - 17:30			
17:30 - 18:00			
20:00 -		Conference Dinner	

Wednesday 14 October 2009

Time			
8:30 - 9:00	Registration		
9:00 - 9:30		Keynote: Managing Heterogeneous Wireless Technologies:Objects Tracking and Services Development	
9:30 - 10:00		by Antonio Puliafito	
10:00 - 10:30		Session 3: Future Internet	
10:30 - 11:00			
11:00 - 11:30	Coffee Break		
11:30 - 12:00		Session 4: Wireless Networking	
12:00 - 12:30			
12:30 - 13:00		Lunch	
13:00 - 13:30			
13:30 - 14:00			
14:00 - 14:30		Panel: Energy Efficiency in Mobile Multiaccess Networks	
14:30 - 15:00		Moderated by Symeon Papavassiliou	
15:00 - 15:30		Panelists: Oliver Blume, Kostas Pentikousis, and Charalabos Skianis	
15:30 - 16:00	Coffee Break		
16:00 - 16:30		Session 5: Algorithms and Applications	
16:30 - 17:00			
17:00 - 17:30		Closing Ceremony	

MONAMI 2009 Keynote Speech

Wednesday 14 October 2009, 9:00 – 10:00

**Managing Heterogeneous Wireless Technologies:
Objects Tracking and Services Development**

**Professor Antonio Puliafito
University of Messina, Italy**

Abstract—During the last decade technology was mainly dominated by solutions targeted to improve communication among people (personal computers, mobile phones, PDA, social networks). The trend is now slightly changing in the sense that information exchange is now requested also with objects, animals and plants, thus creating a more complex reference scenario generally known as the Internet of things, i.e. the paradigm that embodies the data interchange between objects. This technology shift is taking place in several areas making always more evident the need of information "anytime" and "anywhere". The ability to respond to such needs, and hence to generate business, depends very much on the timely identification and location of objects and on the prompt management of the events they generate.

RFID technology, and its logical extensions such as Sensor Network, GPS, WiFi, are well fitted to identify people and objects without any human intervention, and to understand their specific functioning state. The availability of a middleware layer hiding the details of different RFID and wireless technologies is fundamental to exempt the programmer from details, thus enabling him/her to focus on the development of the specific application. Furthermore, the use of a *Service Oriented Architecture (SOA)* and of *Extensible Messaging and Presence Protocol* (XMPP) make the middleware flexible, scalable, allowing to reduce costs and to ease the process of integration with company information systems (CRM, ERP, Data Warehouse, etc.). The Internet of things may benefit a lot from the existence of such a middleware. New services will be easily developed and objects interaction will be strongly enhanced. Developing applications in the area of mobility, which can locate objects, animals and people, by following their movements, will benefit from the adoption of RFID systems that can immediately detect the occurrence of different types of events.

This talk will approach the problem of how the design of an event-based middleware for the management of RFID systems can be organized in order to make the Internet of things a reality. We will point out our architecture and implementation choices. Then we will introduce WhereX®, which is a specific RFID middleware made by Inquadro Srl, that can simply and very effectively manage events generated by different types of remote sensing devices. We will show how WhereX can be used in developing several kinds of applications ranging from document management, to asset management, to safety

monitoring integrating and successfully managing heterogeneous wireless technologies including RFID and sensor networks.

Biography—Antonio Puliafito is a full professor of computer engineering at the University of Messina, Italy. His interests include parallel and distributed systems, networking, wireless and GRID and Cloud computing. During 1994-1995 he spent 12 months as visiting professor at the Department of Electrical Engineering of Duke University, North Carolina - USA, where he was involved in research on advanced analytical modelling techniques. He is the coordinator of the Ph.D. course in Advanced Technologies for Information Engineering currently available at the University of Messina and the responsible for the course of study in computers engineering. He was a referee for the European Community for the projects of the fourth, fifth and sixth Framework Program and he is currently acting as a referee also in the seventh FP. He has contributed to the development of the software tools WebSPN, MAP and ArgoPerformance, which are being used both at national and international level.

Dr. Puliafito is co-author (with R. Sahner and Kishor S. Trivedi) of the text entitled "Performance and Reliability Analysis of Computer Systems: An Example-Based Approach Using the SHARPE Software Package", edited by Kluwer Academic Publishers. He is currently the director of the RFIDLab, a joint research lab with Oracle and Intel on RFID and wireless, the director of the Centre on Information Technologies Development and Their Applications (CIA), the vice-president of the Consorzio Cometa whose aim is to enhance and exploit high performance computing. From 2006 to 2008 he acted as the technical director of the Project 901, aiming at creating a wireless/wired communication infrastructure inside the University of Messina to support new value added services (winner of the CISCO innovation award). He is also the responsible for the University of Messina of two big Grid Projects (TriGrid VL, http://www.trigrid.it, and PI2S2, http://www.pi2s2.it) funded by the Sicilian Regional Government and by the Ministry of University and Research, respectively. He is currently a member of the general assembly and of the technical committee of the Reservoir project, an IP project funded from the European Commission under the seventh FP to explore the deployment and management of IT services across different administrative domains, IT platforms and geographies. He is the scientific director of Inquadro s.r.l., a spin-off company of the University of Messina whose main business is RFID and its application both in public and private sectors.

MONAMI 2009 Tutorial

Tuesday 13 October 2009, 9:30 – 12:30

Mobility and Multiaccess in Emerging Internet Architectures

Kostas Pentikousis
VTT Technical Research Centre of Finland

Abstract—Popular mobile devices now ship with several integrated wired and wireless network interfaces. As multiaccess devices proliferate, we move closer to a network environment that is often referred to as "beyond 3G". In B3G, the next frontier lies beyond seamless mobile connections within the same access technology. Instead, users will soon expect to be globally reachable round the clock and "best-connected" as well. In order to select the best possible connectivity option (anytime, anywhere), mobile devices and access networks will have to work together, thus enabling users to make the most of all available options. This tutorial thoroughly reviews recent developments in mobility and multiaccess technologies. After motivating the need for novel mechanisms to meet the challenges from the emerging network environment, we introduce the long-awaited Media Independent Handover Services standard (IEEE 802.21) and present a blueprint for its implementation in GNU/Linux. Finally, we introduce recent developments in the so-called clean-slate Internet architecture design space, presenting new paradigms, and elaborating on their impact on mobility and multi-access.

Biography—Kostas Pentikousis is a Senior Research Scientist at VTT Technical Research Centre of Finland, the foremost multidisciplinary applied research organization in Northern Europe. He holds a Ph.D. in computer science from the State University of New York at Stony Brook (2004). He received his B.Sc. and M.Sc. degrees in computer science from Aristotle University of Thessaloniki (1996; summa cum laude; ranked first) and State University of New York at Stony Brook (2000), respectively. Since 1996, he has been working in R&D positions in both industry and academia. He has been involved in several contract and joint research projects, including the EU-funded Ambient Networks, WEIRD, and 4WARD, and the Future Internet program of the Finnish Strategic Centre for Science, Technology and Innovation in the field of ICT (TIVIT).

Dr Pentikousis has published more than seventy academic papers and book chapters in areas such as network architecture and design, mobile computing, applications and services, local and wide-area networks, and simulation and modeling. He presented several tutorials on these topics, most recently at the Future Internet Summer School (FISS) at the University of Bremen and the Sixth IEEE International Symposium on Wireless Communication Systems (ISWCS). He is currently working on information-centric networking concepts and systems and is particularly interested in energy-efficient future Internet architectures designed for mobility and multiaccess. Dr Pentikousis was an ERCIM Fellow in 2005 and is a member of IEEE, ACM, ICST, and TEK, the Finnish Association of Graduate Engineers.

MONAMI 2009 Panel Session

Wednesday 14 October 2009, 14:00 – 15:30

Energy Efficiency in Mobile Multiaccess Networks

Abstract—Climate change and reducing the carbon footprint of all human activities are currently a megatrend in politics and technology. While it is true that ICT contributes an increasing part to global energy consumption and greenhouse gas emissions, on the other hand, ICT can be leveraged to reduce the impact of other industries in climate change through the adoption of modern technologies and applications, such as, teleconferencing, remote monitoring, improved logistics and supply chains, and eLearning. According to estimates, "the Internet" may by consuming more than 900 TWh annually. The total electricity use for servers world-wide in 2005, including cooling and auxiliary equipment, was roughly 123 TWh, while direct electricity consumption was 61 TWh. Previous efforts to improve energy efficiency focused on different network architecture components, aiming in particular at increasing the operational time of battery-powered devices. Today, however, industry and academia are taking a more holistic approach and, as a result, "Green ICT" has emerged as an important area in research, development, and deployment of telecommunication networks. The panelists will start the discussion on this important topic with three introductory presentations on trends in Green ICT, focusing on mobile and wireless communications. After that, there will be time for an extended discussion with the audience.

Moderator

Symeon Papavassiliou, National Technical University of Athens, Greece

Panelists

Oliver Blume, Alcatel Lucent Bell Labs, Germany

Kostas Pentikousis, VTT Technical Research Centre of Finland, Finland

Charalabos Skianis, University of Aegean, Greece

Speaker Biographies

Oliver Blume studied physics at the University of Hamburg, Germany, and holds a Dr.-Ing. degree in electrical engineering from the Technical University of Hamburg-Harburg (2000). He is working at Alcatel-Lucent Bell Labs in Stuttgart (formerly Alcatel Research & Innovation) as Senior Research Engineer in the Radio System Optimization department. Oliver has been working in the area of Integrated Optics and optical communication systems and since 2003 in the area of wireless communications. His research interests are in wireless communications, multi-radio resource management, and IP mobility protocols. Currently he is engaged in research on energy efficiency of radio communication systems. He participated in several EU and national research projects, like Ambient Networks, Wigwam and ScaleNet. Currently he is preparing the EU-FP7 project EARTH on Energy Efficiency, which is led by Alcatel-Lucent and will start in the beginning of 2009. He has published numerous papers both from Bell-Labs and from

cooperative projects. In 2009 he has been appointed as member of the Alcatel-Lucent Technical Academy (ALTA).

Kostas Pentikousis is a Senior Research Scientist at VTT Technical Research Centre of Finland. He studied computer science at Aristotle University of Thessaloniki (B.Sc. 1996) and State University of New York at Stony Brook (M.Sc. 2000, Ph.D.2004). Dr Pentikousis has published extensively in different areas of computer science and is currently working on information-centric networking concepts and systems. He is particularly interested in energy-efficient future Internet architectures designed for mobility and multiaccess.

Charalabos Skianis (Senior Member IEEE) is currently Assistant Professor in the Department of Information and Communication Systems at the University of the Aegean in Samos, Greece. He holds a PhD degree in Computer Science, University of Bradford, United Kingdom and a BSc in Physics, Department of Physics, University of Patras, Greece. His work is published in journals, conference proceedings and as book chapters and has also been presented in numerous conferences and workshops. He acts within Technical Program and Organizing Committees for numerous conferences and workshops (e.g., IFIP Networking 2006, IEEE Globecom 2006, IEEE ICC 2006) and as a Guest Editor for scientific journals (e.g., IEEE Networks magazine). He is at the editorial board of journals (e.g., IEEE Wireless Communications), a member of pronounced professional societies (senior member of IEEE) and an active reviewer for several scientific journals. He is an active member of several Technical Committees within the IEEE ComSoc [TC CSIM-vice chair; TC ComSoft; TC II], and member of IEEE BTS; IEEE TVT and IEEE CS. He is currently a Technical Manager for FP7-ICT VITAL++ and a partner representative for FP7-ICT HURRICANE.

Technical Papers

Tuesday 13 October 2009, 14:00 – 15:30

Session 1: Handovers in Multiaccess Networks

Session Chair: Symeon Papavasileiou (National Technical University of Athens)

Handovers for Ubiquitous and Optimal Broadband Connectivity among Cooperative Networking Environments

Lambros Sarakis and Georgios Kormentzas (National Centre for Scientific Research "Demokritos", Greece)

Abstract—The handover function is a key enabler for seamless mobility and service continuity among a variety of mobile/wireless access technologies supporting IP connectivity. The paper focuses on the key research challenges regarding inter-system handover operations among various radio cooperative networking environments (3G, WLAN, WiMAX and DVB) that are going to formulate future/near future business cases for both broadcasters and telecom operators in the context of a Fixed-Mobile Convergence (FMC) communications environment. In this context, relevant efforts from the IETF, IEEE 802.21, IEEE 1900.4, 3GPP and DVB are reviewed and incorporation of the IEEE 802.21 functionality inside the mobility management protocol stack is discussed.

OpenMIH, an Open-Source Media-Independent Handover Implementation and its Application to Proactive pre-Authentication

Yoann Lopez and Eric Robert (THALES Communications, France)

Abstract—Enabling a seamless experience for mobile users while dealing with multi-access networks is a great challenge for wireless access providers. Towards this goal, the IEEE 802.21 Working Group is elaborating the needed mechanisms and the standardization effort has led to a Media Independent Handover Services (MIHS) framework that is now ready for deployment. However, no public implementation of those mechanisms is available yet. This paper presents OpenMIH, an implementation of MIHS and an illustrative scenario for proactive pre-authentication using off-the-shelf components for authentication. In particular, it demonstrates how network selection and handover preparation can be leveraged by such an implementation.

Bandwidth sensitive adaptation of applications during MRM controlled multi-radio handover

Oliver Blume, Jens Gebert and Manuel Stein (Alcatel-Lucent Bell Labs, Germany)
Dmitri Sivchenko, and Bangnan Xu (Deutsche Telecom / T-Systems, Germany)

Abstract—In heterogeneous radio access networks mobile terminals can dynamically change their radio access not only between access points but also between different radio access technologies (RATs). We present a network based Multi-Radio Management (MRM) for seamless control of inter-RAT mobility. Access Selection can be triggered by a change of radio channel quality, by the start of an application or by system load and handover is executed by enhanced MobileIPv6. Dynamic adaptation of the IMS services, e.g. adaptation of IPTV to the available bandwidth, is realized by triggering additional mid-call SIP signaling between communicating parties so that Quality of Experience (QoE) can be significantly improved. The described MRM and dynamic adaptation of IMS services are validated by a prototypical implementation in an integrated demonstrator.

Tuesday 13 October 2009, 16:00 – 18:00

Session 2: Context and Connection Management

Session Chair: Oliver Blume (Alcatel-Lucent Bell Labs)

An Autonomic Connection Management Mechanism based on Mobile Terminal

Xiuli Zheng, Yuhong Li, and Xiubin Zhuang (Beijing University of Posts and Telecommunications, China)

Abstract—This paper proposes an autonomic connection management mechanism for multi-homed mobile terminals. The knowledge repository and the case-based reasoning technique are used to enhance the autonomicity of the connection management. The multi-criteria handoff decision is the core of the mechanism. Analytic Hierarchy Process (AHP) and Simple Additive Weighting (SAW) are combined to make the handoff decision. Simulation results and performance analysis show that the proposed mechanism works well in the heterogeneous wireless access network environment.

Context-aware Connectivity and Mobility in Wireless Mesh Networks

Ricardo Matos and Susana Sargento (University of Aveiro, Portugal)

Abstract—Wireless Mesh Networks (WMNs) have shown a high-potential to fulfill the requirements of the Next Generation Networks (NGNs). Although mobility management is crucial to develop large-scale WMNs, the heterogeneity of today's Internet will imply a context-aware architecture in the future to optimize the users' experience. Network virtualization, as a mean to share and isolate resources, can be used as an element to construct different types of virtual networks (overlays), each one optimized for a certain specific type set of contexts: security, mobility, Quality of Service (QoS), cost, preferences. In this paper, we present a context-based aware multi-overlay architecture that enables a user to connect to the WMN that best fits its requirements and approaches. W, and we show concentrate on how to build such an architecture: how a user can move maintaining its requirements through the re-configuration of overlays, and how context can be mapped, organized and distributed in the network nodes. We also discuss the entities and the complexity of this architecture.

Dissemination of Anonymised Context Information by extending the DCXP Framework

Stefan Forsström, Victor Kardeby, Jamie Walters, Roger Norling, and Theo Kanter (Mid Sweden University, Sweden)

Abstract—The increasing ubiquity of context aware services and systems has been primarily underpinned by the use of centralised servers employing protocols that do no scale well for real time distribution and acquisition of neither sensor data nor dependent services. Any shift from this generic sensor framework mandated a new thinking where sensor data was capable of being propagated in real time using protocols and data models which serve to reduce unnecessary communication overhead. DCXP is proposed as an alternative architecture for the real time distribution of context information to ubiquitous mobile services. As a P2P based distributed protocol, it inherently poses the challenge of user anonymity across the system. In this paper we briefly present DCXP along with further work to enable the anonymised dissemination of sensor information within the architecture. Such a solution would have a negligible impact on the overall scalability and performance of DCXP.

Alternative Enhancement of Associativity Based Routing (AEABR) for Mobile Networks

Barbaros Preveze (Cankaya University, Turkey) and Aysel Şafak (Başkent University, Turkey)

Abstract—This study proposes an alternative enhancement for the Enhanced Associativity Based Routing (EABR) method which is a derivation of ABR (Associativity Based Routing) by relative speed and relative distance estimation using the received power strength (RPS) of the nodes. In this study, it is shown that EABR outperforms some other well known protocols. The performance of EABR is improved in terms of number of route reconstructions (RRC) and connected status percentage (CSP). Message overhead and bandwidth utilization is also investigated.

Wednesday 14 October 2009, 10:00 – 11:00

Session 3: Future Internet

Session Chair: Kostas Pentikousis (VTT Technical Research Centre of Finland)

Towards Automized Interconnection of Networks: Composition and Dynamic Negotiation of SLAs

Martin Johnsson (Ericsson AB, Sweden), Maria Ángeles Callejo Rodrígues (Telefónica I+D, Spain), Thi Mai Trang Nguyen (University of Paris, France), Petteri Pöyhönen (Nokia Siemens Networks, Finland), and Zohra Boudjemil (Waterford Institute of Technology, Ireland)

Abstract—The world of telecommunications shows clear trends towards increasing dynamicity; new types of networks, new types of applications, and also new types of businesses and business relations. At the same time, and partly due to the increase in dynamicity, operators and service providers, as well as other new type of players such as access aggregators seek to find new innovative architectures, methods and technologies to decrease the cost of operating and managing networks and services. This increase in OPEX is due not only to the increasing dynamicity but also due the ever increasing number of applications. This paper provides background and overview of the underlying issues, which then is used in order to describe concepts and technologies that could play a fundamental role in addressing and resolving those issues, both from recent as well as ongoing research. The paper ends with some conclusions, and with an outlook of issues that needs further studies in upcoming research activities.

Taxonomy for GP-Aware Mobility

Sérgio Figueiredo, Justino Lourenço, Rui Aguiar, and Augusto Neto (University of Aveiro, Portugal)

Abstract—We present a structured analysis for classification of diverse mobility schemes, resulting in a taxonomy for mobility in Future Internet systems. The different approaches discussed are based on the Generic Path (GP) concept, a unified framework for the transport of information, and all of them revolve around the existence of a binding between the user and the end-to-end path. Each of the schemes is mappable to real existing and envisioned scenarios, and cover a broad type of services, such as conversational, streaming or interactive ones. As a base to this structured analysis, the work introduces the concept of Generic Path Management Record (GPMR), a flexible record capable of storing relevant information for any type of path, at any level, such as throughput, delay SNR or even authentication parameters. Thereby, GPMR behaves as much more than a mobility tool, extending its usefulness to everything related to the Network Management universe.

Wednesday 14 October 2009, 11:30 – 12:30

Session 4: Wireless Networking

Session Chair: Theo G. Kanter (Mid Sweden University)

Topology-Aware Hybrid Random Walk Protocols for Wireless Multihop Networks

Vasileios Karyotis (National Technical University of Athens, Greece), Fabio Pittalà (University of Messina, Italy), Maria Fazio (University of Messina, Italy), Symeon Papavassiliou (National Technical University of Athens, Greece), and Antonio Puliafito (University of Messina, Italy)

Abstract—The proliferation of wireless multihop networks has made various operations, such as search and retrieval of distributed data a significant concern. Various methods have been proposed for performing such tasks efficiently, especially when all network nodes need to be visited at least once. Random walks are probabilistic approaches for performing the aforementioned operations effectively and with relatively small overhead compared to other typically-employed schemes, such as flooding. Recently, a hybrid random walk scheme has been proposed for increasing the desired performance, on the cost of additional consumed resources. In this work, we adopt the paradigm of hybrid random walk protocols and propose two novel hybrid schemes that exploit local topological information, aiming at further increasing the performance of random walk protocols in multihop networks. We consider different jump configurations of the hybrid random walk protocols and various degrees of mobility. Through analysis and simulation, the simple random walk model appears more appropriate for energy-constrained networks such as sensor networks, while the hybrid ones are more appealing for less energy-stringent, performance-oriented multihop networks, such as vehicular and mesh networks. The simple hybrid protocol occupies the middle ground, being appealing for ad hoc networks with medium to low node densities and average energy requirements.

Distributed Algorithm for Self Organizing LTE Interference-Coordination

*Ingo Karla (*Alcatel-Lucent Bell Labs, Germany)

Abstract—A novel generic distributed algorithm is presented, which assigns in a self organizing way resources to the cells in cellular networks under the constraints that resource restrictions need to be considered between the cells. The algorithm operates in a fully distributed way, running independently inside each base station without any central entity. It optimizes the resource assignment, is capable to resolve sub-optimal aspects as well as comprises methods to detect and resolve possible instabilities such as contradicting decisions like ping pongs of two neighbouring base stations. The algorithm is here applied for LTE inter-cell interference coordination and simulations have shown that this distributed algorithm is always capable to solve reliably the resource assignment task.

Wednesday 14 October 2009, 16:00 – 17:00

Session 5: Algorithms and Applications

Session Chair: Yoann Lopez (THALES Communications)

Design and Implementation of a Radio Access Selection Algorithm for Multi-mode Mobile Terminals

Alexandros Kaloxylos (University of Peloponnese, Greece), Fotos Georgiadis, Giannis Modeas, and Nikos Passas (University of Athens, Greece)

Abstract—Modern mobile terminals giving access to multiple radio access technologies at the same time allow users to select specific technologies and/or different operators for their services. This calls for an

automated radio access selection mechanism. In this paper we propose such a mechanism with several novelties: i) it enables terminals to build prioritized lists of target access networks independently for each of their active connections; ii) it aims to satisfy user preferences instead of providing a mere load balancing between networks; iii) it is designed to operate with two decision-making points (mobile terminal and core network), splitting the complexity of the overall process. We discuss the main functionality of the proposed mechanism, its prototype design in SDL and specific details of our test-bed implementation using open source tools.

Managing of Large Data Artifacts on Mobile Devices

Zdenek Slanina and Ondrej Krejcar (VSB Technical University of Ostrava, Czech Republic)

Abstract—Nowadays there is decreasing number of limitations during using commercial mobile devices for data transfer, wireless connectivity or mobile device tracking. The last item is main area of this work. The model of a radio-frequency based system enhancement for user's location and tracking is developed for mobile information systems. The experimental framework prototype uses a few wireless technologies to determine indoor and outdoor position as wireless network infrastructure, global position system (GPS) etc. User location is mainly used for data prebuffering and preload by information system server to PDA or mobile device. All data on the server are saved with its artifacts as the position in the building or outdoor area and used location technology respectively. The reason for prebuffering is high speed of application response when a large amount of data is needed to transfer by server to mobile client.

Conference Venue

National Technical University of Athens (NTUA)

The Conference will take place at the building of the Central Library which is part of NTUA campus located in Zografou area of Athens. The building of the Central Library is illustrated in the picture below (although it is not shown from the arrival side). The meeting rooms are on the ground floor of the Central Library building.

Central Library

Multimedia - Tele-education Rooms

Zografou Campus

Heroon Polytechniou 9

15780 Zografou

Greece

Map of Zografou Campus