

Program for the Easy Wireless workshop

Budapest, July 5, 2007

The program for the EW workshop is divided into 4 sessions: 1) Tools, Methods, and Performance, 2) Service Continuity, 3) Quality of Service (QoS), and 4) Demonstrations. The first 3 sessions will have technical presentations from the research work in the project and invited presentations from related projects. After the workshop, the presentations and the abstracts will be published as the workshop proceedings.

Agenda 09:00 – 16:45

- 09:00 Introduction to Easy Wireless and the workshop, *Frederik Vermeulen*
- 09:10 Session 1 – Tools, Methods, and Performance, *Chair: Jarmo Prokkola*
 - 09:10 1.1: QoS Provisioning in Mobile Ad-Hoc Networks,
Hans van den Berg (TNO)
 - 09:35 1.2: QoS Measurements Methods and Tools,
Jarmo Prokkola (VTT)
 - 10:00 1.3: Network Performance under Mobility in Ad Hoc Networks,
Roland de Haan (U of Twente)
- 10:25 Break
- 10:40 Session 2 – Service Continuity, *Chair: Carlos García-Rubio*
 - 10:40 2.1: Handover with mSCTP,
Carlos García-Rubio (University Carlos III of Madrid)
 - 11:05 2.2: Fast Handoff for Streaming Multimedia in WLAN,
Bart Jooris (IBBT)
 - 11:30 2.3: Cross Layer Routing in Ad Hoc Networks,
Erlend Larsen (UNIK)
 - 11:55 2.4: (Invited paper) Internet on Train – Architecture for Service Continuity,
Ingrid Moerman (IBBT)
- 12:15 Lunch
- 13:15 Session 3 – Quality of Service (QoS), *Chair: Ingrid Moerman*
 - 13:15 3.1: A Generic Architecture for End-to-End QoS in Heterogeneous Networks,
Johnny Choque (University of Cantabria)
 - 13:40 3.2: (Invited paper) A Pragmatic QoS Solution in Wireless Mesh Networks: The ADHOCSYS Approach,
Luca Leschiutta (Politecnico di Torino)
 - 14:05 3.3: Multi-Radio Multi-Channel Ad Hoc Networks,
Jan Stemerding (WMC)
- 14:30 Break
- 14:45 Session 4 – Demonstrations, *Chair: Erling Sandvik*
 - 14:45 Introduction to Demonstrations Session,
Erling Sandvik (Applica)
 - 14:50 Storyline and Technical Demonstrations,
Frederik Vermeulen (Televic)
 - 15:45 Open floor for viewing the individual demonstrations,
All
- 16:45 Workshop closing

Description of Sessions

Session 1 – Tools, Methods, and Performance:

This session is dedicated to tools and methods, which relate to QoS and service continuity including performance characteristics. Measurement and monitoring tools related to the EW project play a major part in this session. The main focus is on QoS measurement/monitoring tools, but network measurement tools are included as well. QoS measurement tools measure the network path behaviour from the perspective of a certain application, while network measurement tools focus on the pure network performance. This session includes also tools and methods, which are used for achieving, maintaining, and controlling QoS, etc.

The main purpose of the measurement tools in EW is to monitor the operation of the networks, find bottlenecks, and to verify that how the proposed and developed QoS methods work in reality. The tools can be categorized to passive and active tools. Passive tools measure the existing network traffic, while active tools generate the measured traffic themselves. Further categorization can be made to real-time or non-real-time tools. The EW project has developed advanced tools for both passive and active monitoring of network traffic and associated QoS in different parts of the heterogeneous network, forming a multi-point measurement system. In addition, new innovative traffic control solutions have been developed.

Session Chair: Jarmo Prokkola (VTT)

Session Committee: UNIK – University Graduate Center, University of Twente

Session 2 – Service Continuity:

In this session, seamless service continuity solutions adopted in the EW project are presented. The 3GPP defines seamless service continuity as a handover between two wireless networks without user intervention and with minimal service disruptions (i.e., packet loss, etc.). Seamless service continuity across wireless networks is still an unsolved problem. Standards like UMA (Unlicensed Mobile Access) provide access to typical cellular (GSM/GPRS) services from WLAN/Bluetooth networks, but it does not guarantee the continuity of a previously established service (e.g., a videoconference or a video streaming) while transitioning from one network to the other.

In the EW project we concentrate on multimedia services continuity (video and audio streaming and conferencing) when transitioning between WLANs and GPRS/UMTS, There are several mobility management proposals with pros and cons, and with many open issues. Network layer solutions resulted in a complex architecture and heavy protocol, especially route optimization procedure suffers from a large overhead; moreover, as the registering procedure may take a long time, many packets will be lost. Transport layer solution is mainly targeted for client-server services, in which the client initiates the session with a fixed server; for supporting peer-to-peer services, they must be used along with an additional location management scheme. Application layer solutions are too specific to a certain application. 3.5 layer solutions need to make changes in the operating system kernel which means updating practically all applications that in some form use the Internet; in addition, a change of this magnitude has never before been attempted, and the architecture of the layers has remained the same for decades. However, we must point that approaches used in different layers often complement rather than exclude each other.

In the EW project we propose solutions for this problem in three different scenarios: the home/office, public transportation systems, and ad hoc and mesh networks. We integrate all these solutions in a common architecture, but at the same time fulfil the needs and peculiarities specific for each application area.

Chair: Carlos García-Rubio (University Carlos III of Madrid)
Committee: WMC, University of Twente

Session 3 – Quality of Service (QoS):

In this session, QoS solutions developed in the EW project will be presented.

In the EW project, a number of protocols and mechanisms needed for end-to-end QoS provisioning for wireless multi-media communications over heterogeneous networks have been studied. Particular attention is paid to deployment of the QoS mechanisms in mobile ad hoc networks (MANETs). An end-to-end QoS signalling mechanism has been proposed based on the work going on in the Next Step in Signalling (NSIS) Working Group within IETF. Enhancements/extensions of routing protocols in MANETs (such as cross-layer design, transmit power control, multicast and multi-path routing) have been developed in order to improve network performance and to support QoS provisioning. IEEE 802.11 MAC layer mechanisms have been investigated, such as the QoS differentiating capabilities of IEEE 802.11E EDCA and the occurrence of performance bottlenecks that may occur in relay nodes due to radio resource sharing.

Chair: Ingrid Moerman (IBBT)
Committee: TNO, University of Cantabria

Session 4 – Demonstrations:

This session contains the different EW demonstrations showing mobility, service continuity and QoS in different scenarios, while monitoring the performance in real-time. The 3 scenarios are: (i) A train scenario, (ii) An emergency ad-hoc networking scenario, and (iii) A digital home and office scenario. The three scenarios will be connected together via a common story line.

(i) The train scenario will demonstrate session continuity and QoS for a passenger with a WLAN terminal: walking in and out of a train and through the train, while the train is connected to the infrastructure via 3G when moving between stations, and via WLAN when the train arrives a station. (ii) The emergency ad-hoc networking scenario will demonstrate QoS and mobility service continuity in the context of emergency ad-hoc networks. The demonstration story will follow a disaster. After discovery of the disaster a small network is formed which is then scaled to a larger network, which then becomes interconnected to the infrastructure. Continuous accurate QoS monitoring is performed during the operation. (iii) The digital home and office scenario will demonstrate seamless service continuity and end-to-end QoS across heterogeneous (WLAN/cellular) wireless networks with continuous real-time QoS monitoring. This can be used both in a home and an office setting.

Chair: Erling Sandvik (Applica)
Committee: NetHawk, Televic, Thales Norway, Thales Netherlands, Telefonica I+D