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Abstract: Brief introduction of EU-MESH

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Introduction

• EU-MESH: Enhanced, Ubiquitous, and Dependable Broadband Access using MESH Networks

• EU-MESH (FP7 ICT, project no. 215320) is a 30 month collaborative project which started January 2008, and is funded by the European Commission under Call 1 of ICT (Information and Communication Technologies) in FP7 (7th Framework Programme), targeting the objective “The Network of the Future” of Challenge 1: Pervasive and trusted network and service infrastructures.

• EU-MESH's goal is to develop, evaluate, and trial a system of software modules for building dependable multi-radio multi-channel mesh networks with QoS support that provide ubiquitous and ultra-high speed broadband access.

• Web site: http://www.eu-mesh.eu
The EU-MESH Consortium

1. Foundation for Research and Technology – Hellas (FORTH), GR: **Coordinator**
2. National Research Council (CNR), IT
3. Technical University Berlin, DE
4. SUPSI, CH
5. Budapest University of Technology & Economics (BME), HU
   - SME, wireless mgmt software
6. Proximetry Poland, PL
   - Systems integrator/manufacturer
7. Thales, FR
8. Hellenic Telecommunications and Telematic Applications Company (FORTHnet), GR
9. Ozone, FR

EU-MESH Data Plane Architecture
Architecture model of the node

Cross layer Architecture

EU-MESH cross layer architecture is based upon Proximity AirSync platform
Project Objectives

Project Objective #1
Channel Assignment
Access, channel & power control algorithms for interference reduction

Project Objective #2
Routing
QoS and opportunistic routing algorithms

Project Objective #3
Auto-Configuration
Location-aware automated (re)configuration procedures

Project Objective #4
Mobility
Procedures for seamless mobility

Project Objective #5
Security
Secure routing and handover; intrusion detection and mitigation

Experiments

- Flow splitting experiment
- Channel assignment in metropolitan network
- Anomaly-based intrusion detection
- Hybrid Channel Access for Interference Mitigation in WLANs
- Route and Gateway Selection
- Rate Adaptation Experiment
- Coverage area approximation using mobile users
- Fast Client Authentication
- Secure (multi-path transport) Routing
- Seamless Vertical handover (including WiFi and WiMAX)
Channel access functions in EU-MESH nodes

- Auto-configuration
- Channel assignment
- Seamless handover optimization
- Seamless horizontal handover
- Secure routing
- Gateway Aggregation

Trails
OZONE’s networks for trials

Zone 1, Paris city center, 12 Lampposts deployed, backhaul through Wireless links.
OZONE/Proximetry wifi mesh network (Centre Pompidou, Paris)

Forthnet’s networks for trials

Forthnet MESH Network at Heraklion  Network operational model
### Trails deployment details

<table>
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<tr>
<th>Components</th>
<th>TRIALS</th>
<th>OBJECTIVES</th>
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<td><strong>OZONE's museum network</strong></td>
<td>Mikrotik S32 Routerboard, CM9 Wifi Cards, Dual Band Omni-antennas</td>
<td>Emphasize the proof of concept of the solution within a fully operated network. (TRIAL A.1)</td>
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<td>Demonstrating that the functionality of the routing with the security extension proposed in [Eu-Mesh D5.1] has the same level as without security extension (TRIAL A.5)</td>
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<td>Indoor network are subject of many unpredictable interferences. This will stress the need of efficient channel assignment to improve the network performances. (TRIAL A.2)</td>
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<td><strong>OZONE's lampposts network</strong></td>
<td>Mikrotik S32 Routerboard, CM9 Wifi Cards, Dual Band Omni-antennas</td>
<td>Investigation of seamless handover with cross-layer mechanisms (TRIAL A.3)</td>
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<td>Optimization of seamless handover based on WOptMo improvements (TRIAL A.4)</td>
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<td><strong>Forthnet's ADSL network</strong></td>
<td>ADSL modem (Thomson ST 536 v6 PSTN), Multi-radio mesh router (mini-ITX GW2358-4)</td>
<td>Evaluation of performance gains of channel assignment under real conditions in an operated outdoor network. (TRIAL B.1)</td>
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<td>Aggregation (TRIAL B.2)</td>
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### Future Contributions

- EU-MESH trails and experiments will be completed by end of June 2010
- EU-MESH is planning to submit contributions to IEEE 802.21 meeting in July 2010, in San Diego, addressing the following:
  - Use cases
  - Lessons learned with heterogeneous mesh networks
  - Recommendations

Please contact Walter Buga (Proximetry) with question and suggestions at wbuga@proximetry.com