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Wireless Mesh and Sensor Networks: Paving the way to the future or yet another ….??

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Call for Papers
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== Workshop Co-chairs ==
Dr. Neeli R. Prasad, Center for TeleInFrastruktur (CTIF), Aalborg University, Denmark,
np@es.aau.dk
Dr. Paulo T. De Sousa, Head of Sector, Internet of the Future, in the Directorate-General Information Society, European Commission, Paulo.Desousa@ec.europa.eu
Dr. Charalabos Skianis, University of Aegean, Greece, skianis@iit.demokritos.gr

== Scope ==
Wireless systems for industry have mostly used cellular-style radio links, using point-to-point or point-to-multipoint transmission. Traditional wireless formats have liabilities in industrial applications. These include rigid structure, meticulous planning requirements, and dropped signals. In contrast, wireless mesh networks are multihop systems in which devices assist each other in transmitting packets through the network, especially in adverse conditions. You can drop these ad hoc networks into place with minimal preparation, and they provide a reliable, flexible system that can be extended to thousands of devices. Having said that, there are several challenges facing successful outdoor wireless municipal mesh ("muni-mesh") network deployments, namely:

- Lack of viable business case/ Return Of Investment (ROI)
    - Who pays for the CAPEX, OPEX including maintenance and services?
    - Will muni-mesh be an outdoor wireless network for all or a closed network only for public safety e.g. law-enforcement agency, ambulance, fire fighters, etc. where ROI is implicitly justified.
- Challenge from competing outdoor technologies (Licensed versus unlicensed technologies)
    - Limited muni-mesh deployment todate
        - Muni-mesh is data centric network which competes against mobile data through CDMA2000 EV/DO, GPRS/EDGE/WCDMA
        - Licensed WiMAX (802.16e 2005 standard) with high RF power, controlled interference, QoS and mobility support
- Deployment challenges and lack of key application supports
    - Lack of voice support due to following issues:
        - Quality metrics for latency, jitter, packet loss, roaming time, need to be re-evaluated for mesh
        - What levels of service (codecs) should it be designed for?

- What factors determine the voice capacity of the mesh and how do they interact?
- Technical challenges
  - Access is currently granted per VLAN or per AP basis
    - Access must be made more intelligent to take into account the end-to-end availability of resources
  - Voice packet handling (QoS)
    - The existing MAC features (packet discard, rate-shifting, etc.) apply only to access link. A mesh has to support QoS aware resource control
  - Overload prevention
    - In a shared spectrum environment is always a concern which ties in with QoS and Call Admission Control
  - Management/controls are needed to optimize voice over mesh?
  - Wireless local positioning systems with high 3-D resolution and real time ability
    - Methods: based on FMCW radar, UWB, receive strength, ultrasonic waves, etc.
    - Applications: smart factories, automatic guided vehicles, interactive guiding&mapping, guiding of disabled people, etc.
    - Synergies and coexistence with WLAN systems
    - Integration and power issues
    - Smart antennas

Wireless mesh networks (WMNs) and wireless sensor networks (WSNs) are two emerging wireless technologies which will have important impact in the future. In fact, the significance of WSNs places them among the most important technologies in the 21st century.

Few of the qualities of these networks:
- A Self-Configuring and Self-Healing Network
- Redundancy and Scalability
- Distributed nature
- Diagnostic Monitoring

On the other hand, there are still many key challenges:
- Role of passive versus active sensors
- CPU computation operations versus power consumption
- Self-learning, self-adapting capability of such tiny modes

== Important Dates ==
Paper submission deadline: July 30, 2007
Notification of acceptance: September 30, 2007
Camera-ready paper due: October 1, 2007

===Paper Submission===

Technical papers describing original, previously unpublished research, not currently under review somewhere else, are solicited. Submissions should include abstract, keywords, e-mail address of the corresponding author. The length of the papers should be limited up to 6 pages in standard IEEE camera-ready format (double-column, 10-pt font). Papers should be submitted electronically in PDF format on http://edas.info/newPaper.php?c=5126& .
For information contact Neeli R. Prasad (np@es.aau.dk), Paulo T. De Sousa, (Paulo.Desousa@ec.europa.eu) and Charalabos Skianis, (skianis@iit.demokritos.gr). Submission of a paper should be regarded as an undertaking that, should the paper be accepted, at least one of the authors must register and attend the workshop to present the work. All papers will be peer reviewed and the comments will be provided to the authors. All accepted papers will be published in workshop proceeding by IEEE Communications Society and IEEE Digital Library.

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