OmniRAN
Overview and status

2012-11-13
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OmniRAN

• OmniRAN discussed in 802.16 HetNet study group since March 2012
  – IEEE 802 tutorial in July 2012
• OmniRAN defines generic network side interfaces for access networks based on IEEE 802 technologies
• What does OmniRAN stand for?
  – Open mobile network interface for omni-Range Area Networks
• It addresses all IEEE 802 access technologies including IEEE 802.3!
Legacy Communication Networking

• Close relationship between user terminal, access network and service provider
  – Single interface in terminal
  – Single access network topology
  – Single operator
    • single entity (operator, IT department) controls complete service chain

• Operators with long-term experience in networking
OmniRAN for Heterogeneous Networks

• User-Terminals have to support
  – multiple network interfaces
    • e.g. Cellular, IEEE 802.3, IEEE 802.11, …
  – multiple access network topologies
    • e.g. IEEE802.11 in residential, corporate and public

  – multiple network subscriptions
    • e.g. multiple subscriptions for same interface

• Generic solution to cope with complexity
OmniRAN for Emerging Networking Markets

- Many more (huge) networks are coming up by everything gets connected
  - e.g. SmartGrid, HomeAutomation, Car, …
- Many new markets for IEEE 802 access technologies
  - e.g. factory automation, in-car communication
- New deployments often suffering by the same old networking issues
  - e.g. service control, security, provisioning
  - new operators lacking long-term experience
- Generic solution to foster market growth
Scope of OmniRAN

• Network detection and selection
  – Finding the most appropriate network when multiple networks are available
• Setting up the access link
  – Scope of individual IEEE 802.xx specifications
• Authentication
  – Framework, based on IEEE 802.1X
• Setting up the e2e communication link
  – Authorization, Service management
• Management of user data connection
  – mobility support to maintain connectivity
• Usage and inventory reporting
  – accounting, monitoring, location
Additional functions for large scale networks

• Subscription management
  – Adding new users to a network
  – Maintaining subscriptions
    • e.g. renewal, change, termination

• Management of terminals
  – Initial configuration of new terminals
  – Provisioning and update of policies
OmniRAN Architecture Overview

Core Network
exposing R2, R3, and R5

802.3 AN
802.11 AN
802.15 AN
802.16 AN
802.20 AN
802.22 AN
Other AN

802.3 MS
802.11 MS
802.15 MS
802.16 MS
802.20 MS
802.22 MS
Other MS

AN = Access Network, exposing R3 and R4
MS = Mobile Station

R5
R3
R2
R4
R13
R11
R15
R16
R120
R122
R1x

The Internet
OmniRAN Interfaces

- **R1**: Access link, *technology specific*
- **R2**: User & terminal authentication, subscription & terminal management
- **R3**: Authorization, service management, user data connection, accounting, monitoring
- **R4**: Inter-access network coordination and cooperation, fast inter-technology handover
- **R5**: Inter-operator roaming control interface

*Specification work can be done in sequence!*
OMNIRAN-3GPP SaMOG

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- Work at the 3GPP SaMOG groups and OMNIRAN can be complementary
  - OMNIRAN would need to define how the Trusted Non-3GPP network behaves according to requirements from 3GPP
  - Work can be done for both network and terminal sides
  - The use of OMNIRAN can open the door to the use of more IEEE 802 technologies as part of the operator’s RAN in a managed way
What OmniRAN would provide to 3GPP

- SaMOG is defining a gateway controlling the Trusted Non-3GPP network by the EPC

- OmniRAN would provide an interface (R3) to which 3GPP would be able to reference.
  - Expanded beyond IEEE 802.11/802.16
Relation to other standardization activities

- There are plenty of related standardization activities
  - WFA Hotspot 2.0
    - solving the networking issues for IEEE802.11
  - WiMAX Forum
    - Mobile WiMAX network specifications
  - 3GPP
    - interworking with non-3GPP technologies
    - OmniRAN group could provide the interface for network oriented liaisons to IEEE 802.
  - IEEE1905.1
    - integration of multiple access technologies in home networks
  - SmartGrid, IoT and M2M
    - many activities somehow touching the topic
  - ...
    - there may be even many more related activities
How to proceed?

• There are benefits to work on OmniRAN in IEEE 802.
• Further analysis necessary to define the missing pieces to enable broader ecosystem for IEEE 802 networks
• Discussions need involvement across all IEEE 802 WGs.
• Proposal: Establish IEEE 802 EC Study Group on OmniRAN this week.