CELTIC
Telecommunication Solutions
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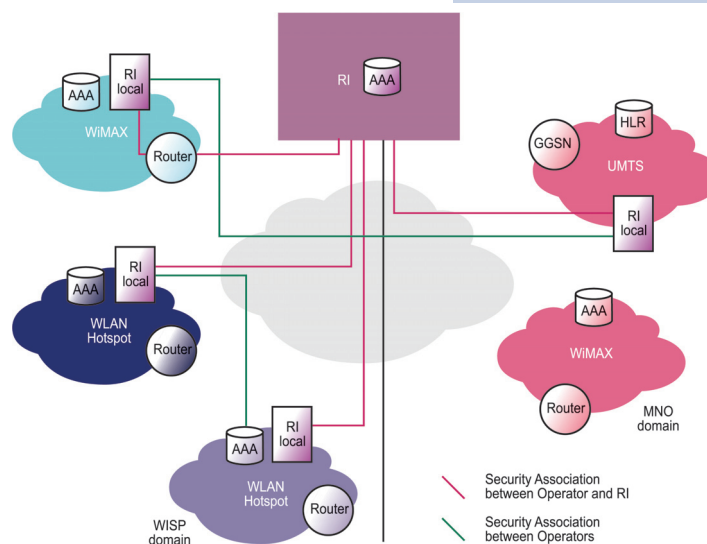# Secure Interworking of Mobile & Wireless Networks

SeiMoNeT

Seimonet

SEIMONET delivers a Roaming Intermediary platform for WLAN/ mobile inter-operability and roaming. The project proposes a new architecture for secure billing and authentication across heterogeneous networks, intelligent preferred network selection, presence-based routing of telephony events and context-based management of user sessions, such as supporting handoff of telephony calls between WiFi/ WiMAX and GSM.

The routing-decision and network selection criteria are based on operator and user preferences, price, bandwidth, connection needs and roaming agreements between the visited and home operator.

The project offers a secure inter-operator roaming solution, integrating all different AAA (Authentication, Authorisation, Accounting) methods, either proprietary or standard. The solution hides the differences between AAA technologies from the operators, especially if local hotspot networks with proprietary authentication schemes are to be combined with mobile networks that comprise (U) SIM based authentication.

Main focus

The main focus of the project is to provide a mechanism enabling the seamless mobility of the user between WLAN and GSM environments in terms of access, voice and data session mobility and session handoff. That includes preferred WLAN network selection and seamless authentication, presence-based call routing for mobile terminated calls, seamless handover without user interaction between a mobile device and a laptop, all under a one-bill charging model. This means, the user is charged by one operator only, either the cellular operator or the wireless provider, depending on the ownership of the platform.

Distributed Roaming Intermediary Architecture Approach

The project supports WiMAX as a step towards NGN (Next Generation Networks), which is considered 3.5G in its 802.16d version, and complete with 4G as 802.16e.

Approach

The project includes the implementation of a Roaming Intermediary (RI) platform, which is to be installed at the home service provider, enabling the "one bill" functionality and service synergies, as described above.

The general design is for a global network of roaming intermediary platforms, installed at cellular operators, wireless service providers and third parties, connected via standard interfaces, in order to support inter-working between service providers that do not maintain any roaming relations. The different platforms will be able to assist each other with information related to new service providers, which are defined in a regional or local database only, not accessible to all network members.

The implementation contains a global database of operators and service providers and their inter-relation information, such as roaming agreements, roaming partner preferences, QoS information and AAA schemes, whether they use proprietary or standard schemes.

The implementation incorporates a roaming presence database, which provides presence and location information for subscribers, based on monitoring the signaling links (in case of GSM) or receiving information from a client installed on the laptop (in case of WLAN). The presence server functions as an enabler for the call routing and handoff services, providing availability and location information for both GSM and WiFi/WiMAX networks.

The project deals with the implementation of a handoff mechanism between a mobile device and a PC-based terminal, such as a laptop. The handoff process between different terminals should support high standards in terms of performance and mobility in order to meet the criteria of a seamless handoff.

Main results

The project delivers the integrated Roaming Intermediary (RI) platform, an infrastructure enabling interoperability and roaming functionality, such as:

1. WLAN network selection assistance for the end user
2. WLAN AAA seamless access via multiple service providers, combining GSM operators and WISPs (Wireless Internet Service Provider)
3. Presence-based call routing
4. Call setup from a WLAN device, routed via the GSM network
5. Seamless handoff between a mobile device and a WLAN terminal that supports mobility
6. Charging model for the integrated WLAN/GSM session, enabling one bill for the home operator.

Impact

The new Roaming Intermediary (RI) platform is required by mobile and wireless networks in order to be extended beyond the core mobile network into related wireless domains, such as WiFi, WiMAX and fixed-mobile-convergence. Data and voice services for both the office and home environments will be provided via several terminals and providers. The user will have multiple access options, billing relationships and many user profile elements aggregated, generated and leveraged. The need for global coordination and interoperability management will increase as will the type of networks and access methods.

In fact, the consortium will expand the standard concept of roaming from networks towards multiple devices, environments and personal modes. The Roaming Intermediary platform will act as the convergence point for service providers delivering presence and location based services and may play an important role in the IP/non-IP hybrid networks scenario.

About CELTIC

CELTIC is a European research and development programme designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. CELTIC is the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 5 years, from 2004 to 2008

Cluster budget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from the telecommunications industry, universities, research institutes, and local authorities from 33 countries

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