Simplicity

Secure, Internet-able, Mobile Platforms LeadIng CItizens Towards simplicitY

The Simplicity Project and related standards activities

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The Simplicity Consortium

1) **RadioLabs (I) (Co-ordinator)** http://www.radiolabs.it/
2) **DoCoMo Communications Lab Europe (D)** http://www.docomolab-euro.com/
3) **Lancaster University (UK)** http://www.lancs.ac.uk/
4) **University of Munich (D)** http://www.uni-muenchen.de/
5) **National Technical University of Athens (GR)** http://www.ntua.gr/
6) **Siemens AG (D)** http://www.siemens-mobile.com/mobile
7) **Siemens Business Services (D)** http://www.sbs.siemens.com
8) **TriaGnoSys (D)** – spin-off of DLR - http://www.triagnosys.com/
9) **Telecom Italia (I)** http://www.telecomitalia.it/
10) **VTT (FI)** http://www.vtt.fi/
11) **Siemens Austria (AT)** www.siemens.at/

Rationale

- **Systems beyond 3G and pervasive computing may lead to**
  - **an increasing number of services**
  - **based on different devices, and**
  - **different network access technologies**

- **End-users may have to deal with heterogeneous services and devices**
- **Network operators may have to deal with the complexity of a multi-access networking environment**
- **It is essential to simplify**
  - **creation and customisation of the user communication space**
  - **adaptation of services to terminal characteristics and user preferences**
  - **orchestration of network capabilities**

Classes of Problems & Simplicity Approach

- **Problems:**
  - **Network / connectivity**
  - **Service access, service configuration**
  - **Usage of multiple devices (usability / reconfiguration)**
  - **Selection of services appropriate to specific locations**
  - **Triggering of home/building/public-space functionalities and other "non-communications" functions (e.g. remote control)**
- **Each of the these problems has its own solutions**
  … but can we put "all" solutions together ?
- **The ideal solution should be "cross-devices" and "OS independent", able to address "all" the classes of problems**
- **The IST Simplicity Project considers a migration path starting from *current* terminal and services… *simplifying* the user access to existing technology**

The Simplicity End-User Viewpoint

- **Definition of a personalized profile to be used for several services/transactions on different terminals**
- **The profile resides in a Simplicity Device**
  - **hardware or software**
- **The user plugs the SD into a terminal, customizing terminal, services and networks**
  - **different users using the same laptop will see different working environments;**
  - **the same user using different terminals will see the same personalized working environment (adapted to the characteristics of the terminal);**
  - **users will be able to suspend and resume running applications/sessions**
  - **users will enjoy automatic selection of services appropriate to specific locations and triggering of home/building/public-space functionalities**

Scenario

Simplicity Device

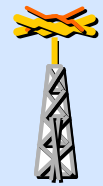
PC

PDA

Web Pad

Laptop

802.11
Bluetooth
GPRS
UMTS
InfraRed
...
Software Defin.
... 4G ...



Radio Bases

Access Points

Printers

Entertainment devices

The Brokerage Framework

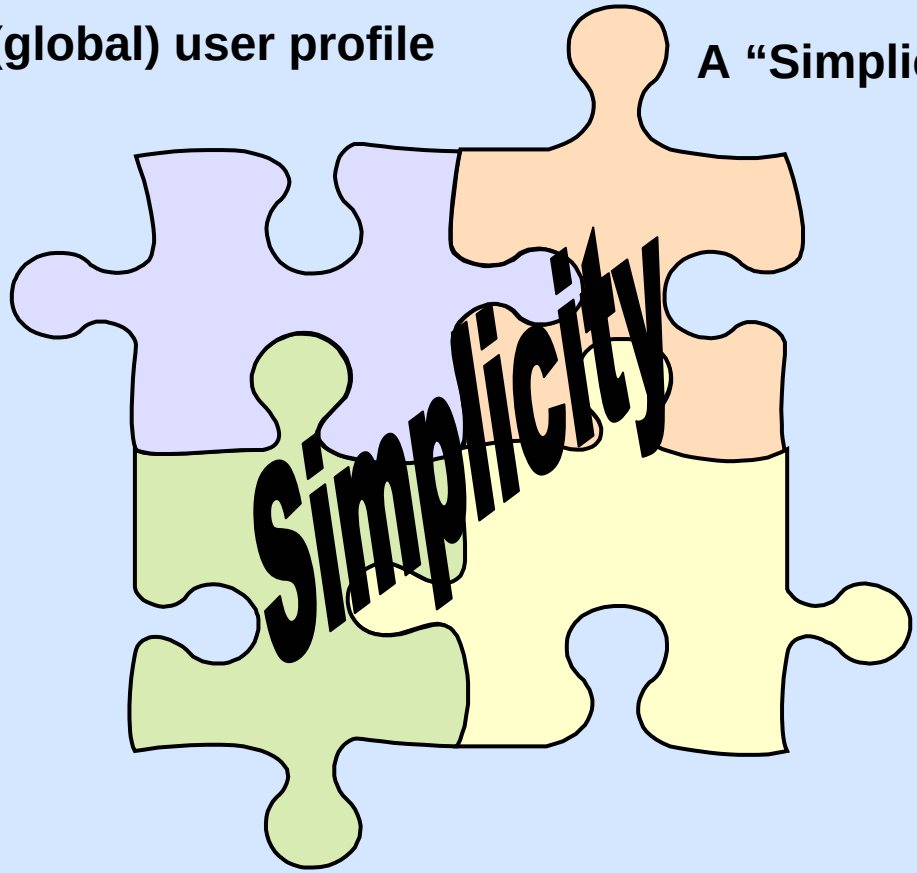
- **The Terminal Broker**
  - manages the interaction between the SD and the terminal
  - caters for user interaction with the overall Simplicity system
  - allows terminal capability discovery, adaptation to the networking environment, service discovery and adaptation, access to services

- **The Network Broker**
  - supports the download of policies to terminals and SDs
  - manages different access technologies and networking alternatives
  - selects the most convenient way for the user to communicate and to benefit from available services
  - handles profile transfers
  - may use the information contained in the SD for network configuration
  - use policy-based technologies to orchestrate and adapt network capabilities, taking into account user preferences, terminal characteristics and network status

and if all pieces fit together …

A (global) user profile

A “Simplicity Device” (SD)



- Complexity is handled by a middleware that adapts communication technologies and service platforms to user service needs
- User interaction is limited to special decisions
- High Level Re-Configurability

Automating decisions (policy based approach)

How to connect the SD to devices and services

Research directions

- User Profile definition and handling
- User (and SD) tailored applications and API
- Middleware tools for high layer re-configurability
- Network planning and dimensioning as a function of customers profiles (stored in the SD)
- Services and resources (including access networks) discovery and selection, as a function of SD profiles and of current network status
- Dynamic network (auto)configuration and resource allocation as a function of users' profiles, collected users' statistics, observed current users' behaviour, users' location, and current network status
- Flexible authentication mechanisms
- Seamless service accessibility through heterogeneous and independently-owned network infrastructures
- Simplicity aware network management, and related policies

Standardization

- **What to standardize**
  - **User profile**
  - **Bluetooth profile**
  - **Ontology**
- **Where**
  - **Cooperation with Wireless World Research Forum (WWRF) currently on-going**
  - **….**

Simplicity User Profile – “SUP”

- **3GPP Generic User Profile makes no assumptions about the content of the profile, limiting itself to the definition of its structure (“open framework”)**
- **Our implementation of the context model cannot conform entirely to the 3GPP Generic User Profile, because the standard is still under development and some documents have the state of a draft**
  - **Simplicity will define a Simplicity User Profile based on the 3GPP GUP**
  - **the SUP structure is realized in XML and it is composed of linked XML instance documents (SUP Profile Component)**
- **SUP-Device Component**
  - **probably based on a UAProf Schema by the WAP Forum**
  - **describe hardware elements (mobile devices, presentation devices, terminals)**
  - **translated from RDF schema into a XML schema; easy automatic conversion from UAProf document into a SUP device profile.**
- **SUP-User Component**
  - **probably based on the Liberty Alliance Project “Personal Profile”**
- **SUP-Service and SUP-Network Components**
  - **probably based on the information model proposed in Simplicity**

Simplicity Profile for Bluetooth

- **Proposed Scenario:**
  - **Simplicity services (authentication, personalization, billing, security, …) become *automatically* available to the user via the Bluetooth device**
  - **Goal: standardization of a set of functions (Simplicity Profile for Bluetooth) that makes the Bluetooth device able to realize which surrounding terminals allow the execution of this automatic procedure**

- **Bluetooth device is a possible implementation for the SD**
  - **Possible solution: SIM + BT phone**
  - **Very good from the point of view of user acceptance**
    - **Users already trust their SIM to store sensitive identity and charging data**
    - **Users usually carry their mobile phones wherever they go!**
  - **Possible variations: Flash Memory instead of SIM**

- **Relationship with Bluetooth SIM Access Profile**
  - **Higher level functionalities rather than APDU exchange**
  - **Not necessarily SIM-based**

Simplicity Ontology Definition

- Given a domain, its ontology forms the heart of any system of knowledge representation for that domain
- “Ontologies include computer-usable definitions of basic concepts in the domain and the relationships among them”
- W3C has specified the Web Ontology Language (OWL) - an extension of Resource Description Framework (RDF) to provide a standard way to express ontologies
- The Simplicity project can contribute to the definition of an OWL ontology related to its domain, providing a definition of users, services, devices, networks and their relationships

Thank you for your attention

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