MONASIDRE

Network and Services Management in context of heterogeneous Radio Access Networks

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B3G is happening

• *Beyond 3G*: efficient integration of heterogeneous Radio Access Technologies (RAT) including cellular, broadcast and WLAN
B3G has various flavours

- Efficient integration of heterogeneous Radio Access Technologies
- Common Core Network
  - Unified Authentication, Mobility Management, Billing, etc
- Little effort was devoted to really help the Service Provider and the Network Operator

MONASIDRE fills this gap!
A Network Operator needs

- Simple and efficient exploitation of its (heterogeneous) infrastructure
  - Uniform management tool
- Better use of available spectrum
  - 3G auctions
- Scalability, open management platform
  - To « plug and play » new RAT
A Service Provider needs

• Fully benefit from the RAT complementarity
  – Adapt the content to the system capacity, users’ context

• Simple service management
  – Resource provisioning (delayed services)

• Simple interworking with NO
  – Single contract (SLA)
MONASIDRE Scope

(Distributed) Service and Network Management System

- Terminal Stations
- UMTS
- WLAN
- DVB-T
- IP-based Fixed Network
- Service (and Content) Providers

NO

SP
Management architecture

- Efficient and **unified** management of heterogeneous RAT

2 levels of functions

- Radio technology Independent
- Radio technology Dependent
Management architecture

- Efficient and unified management of heterogeneous RAT
  - Resource optimisation
  - Distributed platform with component communications

2 kinds of functions
Management architecture

- Monitoring and Assessment and Service Provider mechanism Interworking - MASPI
  - Identify new conditions (requirements) in the service area
  - Interwork with SP, network elements and other MASPIs

- Resource Management Strategies - RMS
  - Provides the optimisation functionality

RAT-Independent

RAT-Dependent

Communication

Optimisation

MASPI-RATIP

RMS-RATIP

MASPI-RATD

RMS-RATD
Examples of use (I)

- Traditionnal management
  - Single technology
  - Mono-operator
  - Only optimization of its own resource
Examples of use (II)

- Multi-operators scenario
  - Cooperative management platforms
  - Each platform is specialized in a specific technology (U, H, D)
  - SP request handled by several technology when appropriate

- Virtual operator scenario
  - Only owns the independent part
  - Collaborates with traditionnal NOs

VO = Virtual Operator
U = UMTS
H = WLAN
D = DVB-T
Technologies used

• Formal description, overall design and specification
  – UML
• Graphical user interfaces
  – JAVA
• Optimization algorithms, simulations, etc…
  – C/C++ (Windows, Linux)
• Distributive platform - objects communication
  – CORBA
• Policy based management architecture
  – COPS
Conclusion

• Despite all coming technological improvements, management is still be needed, especially radio resource management
• A Beyond 3G compliant management architecture has been defined and developed
  – Flexible and evolutive, compliant with different business models
  – Specification taken from actors (SP, NO, users) requirements
• Our design allows:
  – Unified SP interaction with various NOs
  – Bandwidth / network sharing, subcontracting between NOs
  – Resource optimization
  – Policy based management
• Prototype platform build on
  – CORBA, Windows, Linux