SLA E-negotiations, Enforcement and Provisioning in an Autonomic Environment

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THE VISION

Connected ISP’s core network

Selected Destination

VoIP ISP

Network ISP

VoIP ISP

VoIP ISP 1 - Broker

Selected Destination

VoIP ISP

VoIP Server

ISP 1

ISP 2

ISP 3

FEDERATION

End User

End User

End User

Mobile Users

Negotiation

Negotiation

Negotiation
**Nowadays Situation = Static**

**End-users**
- Static SLA configurations – no Customization
- Presume networking domain knowledge.

**ISPs**
- Manual SLA enforcement with pre-configured network and end devices and servers.
Users’ Requirements ➔ Dynamic

- Application Based User selection
  - SLA preference elicitation
- An “SLA Universal Language” to submit requests.
- GUI for:
  - Preference Elicitation
  - Negotiation
  - Easy configuration
- Potential for (e-)negotiations.
ISP\textsc{s’} Requirements $\Rightarrow$ Dynamic

- Negotiate and Manage thousands of SLAs $\Rightarrow$ increased levels of Flexibility and Automation
- Define SLAs as a lingua franca for automating
  - e-Negotiations with end-users and other ISPs
  - end-to-end provisioning e.g. Infrastructure, QoS etc
  - network configuration
Knowledge Management for Meeting the Requirements

- Explore ways for “handling” and “managing” Knowledge

- Knowledge **modeling, representation, formalization** and **visualization** for human and machine interaction

- Rule based declarative, **logic programming**
KNOWLEDGE MANAGEMENT REQUIREMENTS

- Representational Adequacy
- Inferential Adequacy
- Inferential Efficiency
- Acquisitional Efficiency
SLA e-Negotiation, Enforcement and Management
SLA REPRESENTATION

- Declarative rule-based approach
- Formalization of SLA specifications as logic programs

Advantages
- Closer to human understanding and natural language
- Extensibility
- Traceability
- Detect and resolve conflicting knowledge using Defeasible Logics
- Executable by a generic inference engine
USER SLA SELECTION

For the user the preferred SLA is based on:
- The applications he needs to deploy
- The access network
- The device hardware and software
- Application QoS versus the cost
- Service profiles that dynamically match Application layer Service Requirements
CHALLENGES AS CONCLUSION

- Domain **Modeling** through ontology engineering
- Improve communication of Business and lower layers through appropriate **Knowledge representation** and **Dynamic Mappings**
- Explore Ontologies for Communication and Web Services for Interfacing issues
- Enable Application Based preference elicitation and dynamic negotiation to mobile end-users
- **Dynamic Negotiations and Provisioning & Mobility**
- **Security issues in authentication and negotiation**
- **Cross Layer Identity Management**
MERCI POUR VOTRE ATTENTION!