Framework for Service Provisioning in Mobile Ad-Hoc Networks

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Outline

- Motivations
- Problem Statement
- Our Approach
- State of Our Work
Motivations

- Emergence of the self-organized (ad-hoc) communication paradigm
- Popularity of mobile devices
- Increasing number of new services in these ad-hoc environments

Research Issue: Service Provisioning in Self-Organized (Peer-to-Peer, Mobile Ad-Hoc) Networks
Problem Statement
Target Application Scenarios: MAG (Mobile Ad-Hoc Group) Services

- **On-line, distributed group games**
  - Device can join a virtual play-field
  - Sample gaming situations
    - Killing waiting time in a public place
    - On bus, train during traveling

- **Automatic collaboration support**
  - Collaborative work $\Rightarrow$ distributed software applications
  - Ad-hoc networking & service provisioning framework $\Rightarrow$ on-demand, automatic and quick service deployment and management
  - Sample situation
    - During project meetings
Logical/Chronological Sequence of Service Provisioning Functions

Service User

Service Provider

Nodes

Specifying & Description

Advertisement

Lookup

Request

Download

Installation, Configuration, Activation

(monitoring)

Maintenance, Reconfiguration, Termination

(synchronization if required)
Our Approach

Develop a generic service provisioning framework which integrates all the required functions

SIRAMON: Service provisioning framework for self-Organized Networks
Constraints of Ad-Hoc Environment

- Lack of permanent infrastructure and central management
- High level of heterogeneity
- High level of mobility
- Devices with limited resources
Design Goals

- Target application context is in self-organized networks
- Decentralized operation mode
- Comprehensive solution
- Transparency
- Robustness
- Flexibility
Assumptions

- The devices are capable of relaying packets on behalf of others
- Cooperative behavior from the participating devices
- Nodes may appear and disappear at any time without notice
- Each node has a unique address (identifier)
- All nodes are furnished with SIRAMON
- The required software of the service can be found on at least one network node
SIRAMON

Applications

Management Middleware

DeviceOS / HW

Service Indication
Environment Observer
Service Deployment
Service Management

Service Specification

SIRAMON

API towards Applications

Interface to other SIRAMON instances

API towards Device Resource Manager

Device Resource Manager
State of Our Work

- **Prototype Implementation**
- Joint international EU project within the frame of **E-Next**
  - **Topic:** Multi-Player Game Support in Mobile Ad-Hoc Networks
  
  *Actual Score:*
  
  5  **Sandra:** 1
  2  **Susanne:** 1
  0  **Sabine:** 1
  3  **Silvia:** 1
Thank you!