Service-Oriented Distributed Communities in Residential Environments

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I. Motivation

- Evolutions in Internet Access
  - Core Equipment: the Residential Gateway
  - Shift in Services
    - From Broadband Access
    - To High Level Services
      - Voice, Video over IP
  - Perspective
    - Multi-Provider Services
      - Breaking the access provider's monopoly
    - End-User Control
      - Factor of success for equipments

I. Motivation

- Virtual Communities
  - Driven by Centers of Interest
  - Existing communities
    - Data publication
      - P2p, communication software
    - Data and Code Sharing
      - Development, Collaborative Work
    - Resource Sharing
      - Data and Calculus Grid
  - Service-Oriented Communities
    - Bridge the gap between various communities

I. Motivation

- Objectives
  - Prospective Work
  - Define a language for representing the behavior of a Service-Oriented Community

Service-Oriented Communities

- Summary
  - I. Motivation
  - **II. Service-Oriented Communities**
  - III. Community Behavior
  - IV. Conclusions

II. Service-Oriented Communities

- Overview
  - Use Cases
  - Global Architecture
  - The Residential Gateway
  - Interactions between Users

II. Service-Oriented Communities

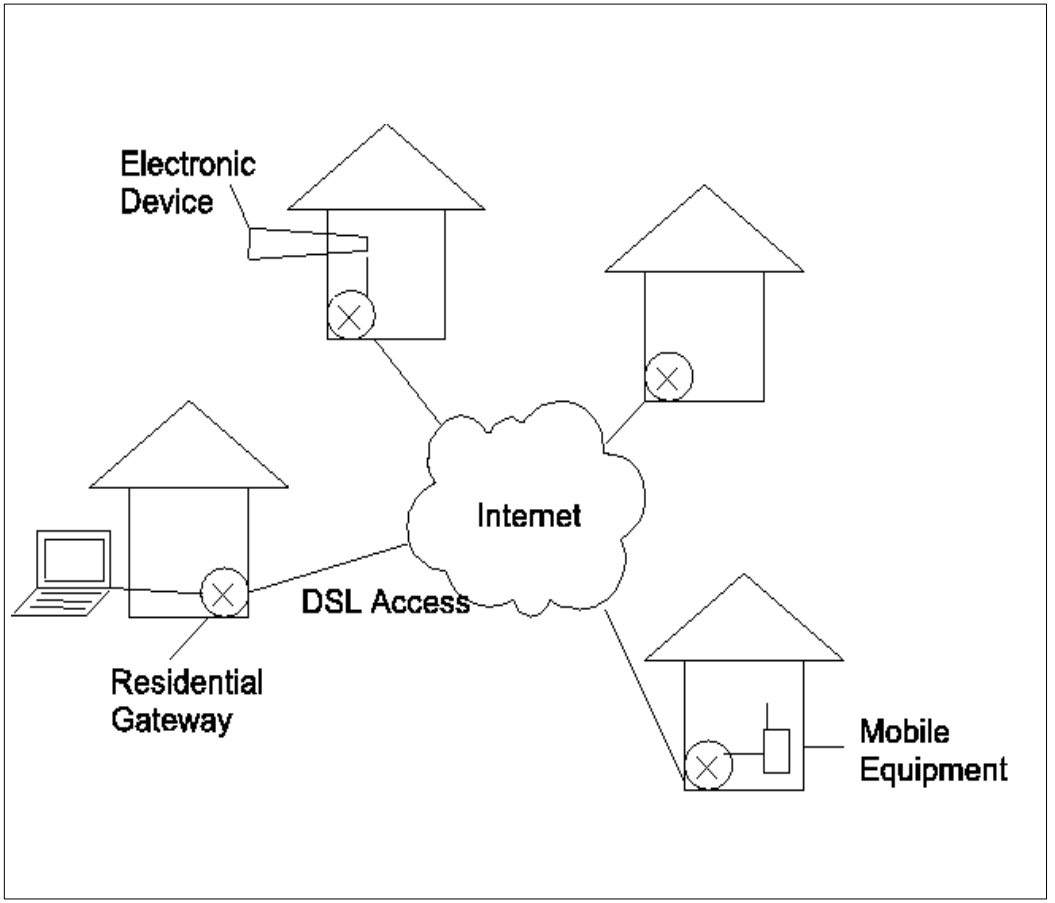
- Use Cases
  - Distributed photo albums
    - Large amount of Private Data
    - Sharing parts of the photos with friends
  - Web servers
    - Could be p2p:// URLs
  - Distributed forums
    - Local forum
    - Distribution of threads if popularity grows
  - User Defined
    - Any kind of convenient or innovative services

II. Service-Oriented Communities

- Use Cases
  - Advantages for the user
    - User Control
    - No storage restriction for users
    - Extensibility of the Gateway
      - USB storage device
      - User's PC
  - Advantages for the Gateway Provider
    - Resource sparing for the service provider
    - Per service billing

II. Service-Oriented Communities

- Global Architecture
  - Broadband Connectivity
  - Based on the Residential Gateways
    - Interface between Internet and the Home Network
    - Central node for service providing
  - Supports PCs, Mobile Equipment, Electronic Devices
    - Various Accesses
    - Various Services

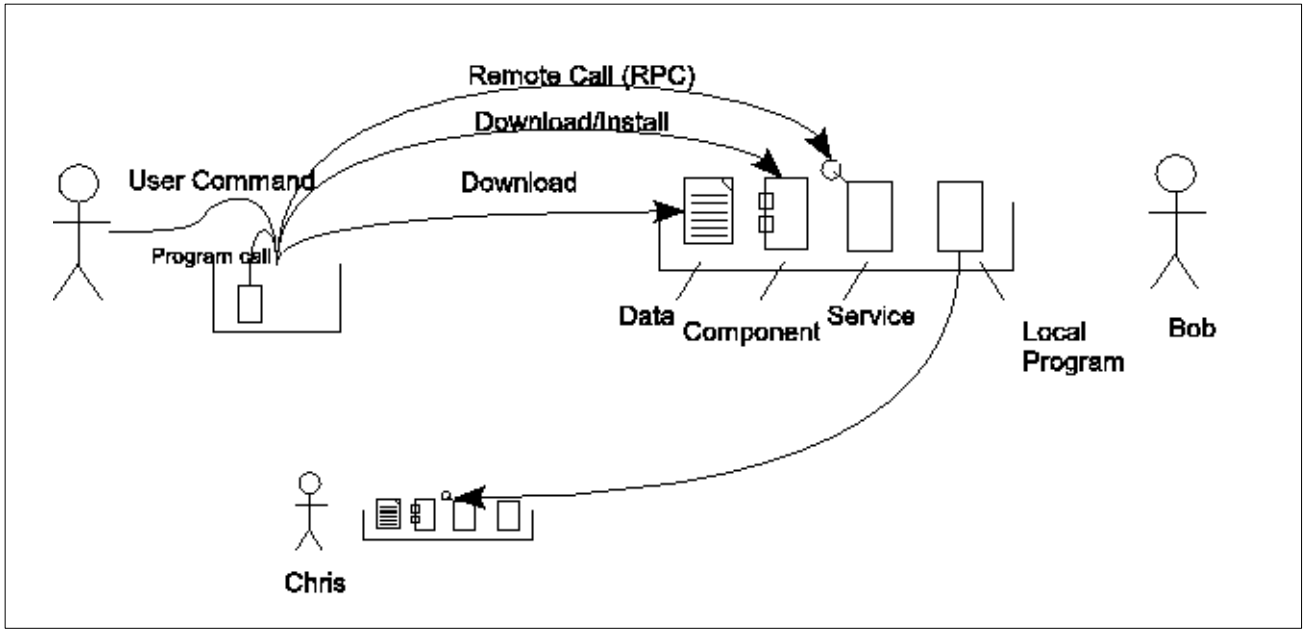


II. Service-Oriented Communities

- The Residential Gateway
  - Access Gateway
    - Network Level
  - p2p network
    - Data sharing
    - Scalability
  - Component Platform (OSGi)
    - Execution Environment
    - Local or remote Access

II. Service-Oriented Communities

- Interactions between Users
  - Data publication
  - Software publication
  - Services Publication



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III. Community Behavior

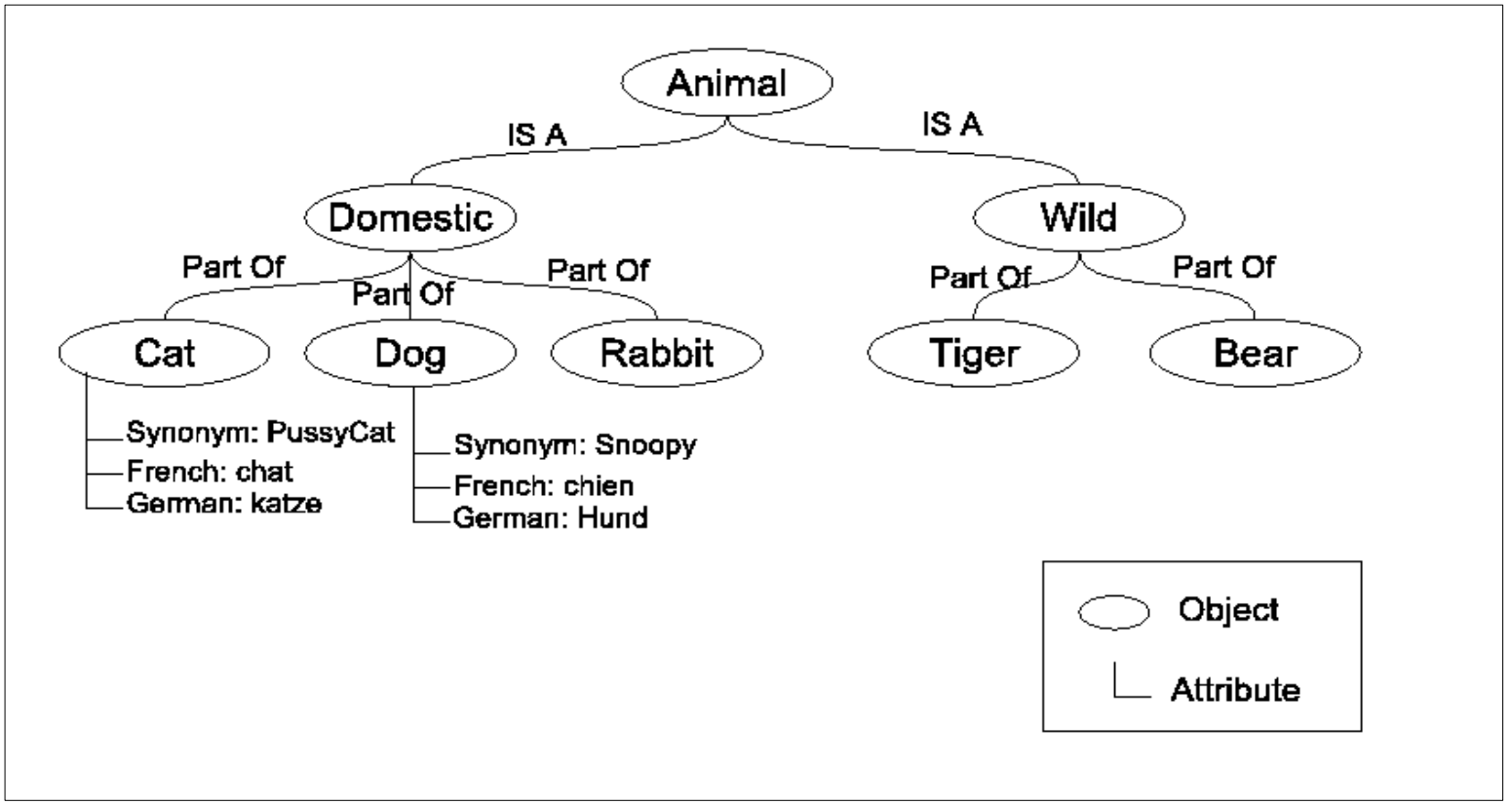
- Overview
  - Distributed Communities
  - Life Cycle of a Community
  - Use Scenarios

III. Community Behavior

- Distributed Communities (1/4)
  - 'Group of people sharing resource around common centers of interest'
  - Concrete Definition of a Community
    - Meta-data representing the centers of interest
      - Keywords
      - Or Ontology (formal hierarchy of keywords)
    - Replicated among all members
  - No central node

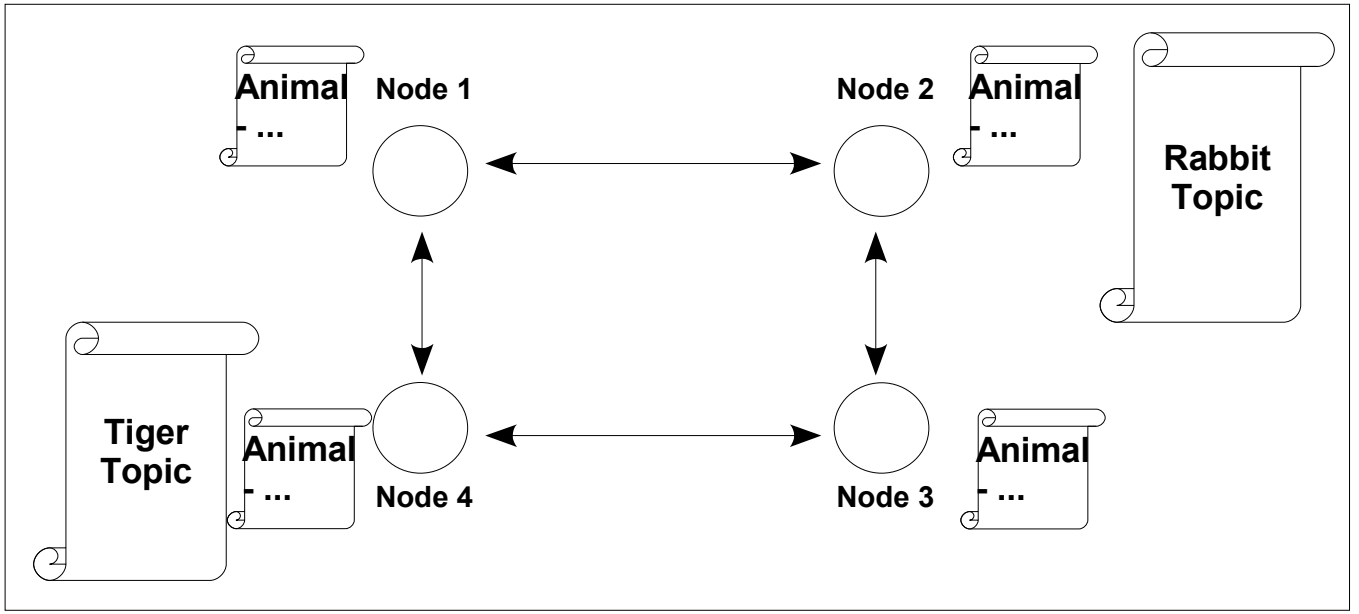
III. Community Behavior

- Distributed Communities (2/4)
  - Example of Meta-data as an Ontology



III. Community Behavior

- Distributed Communities (3/4)
  - Concrete Definition of a Community



III. Community Behavior

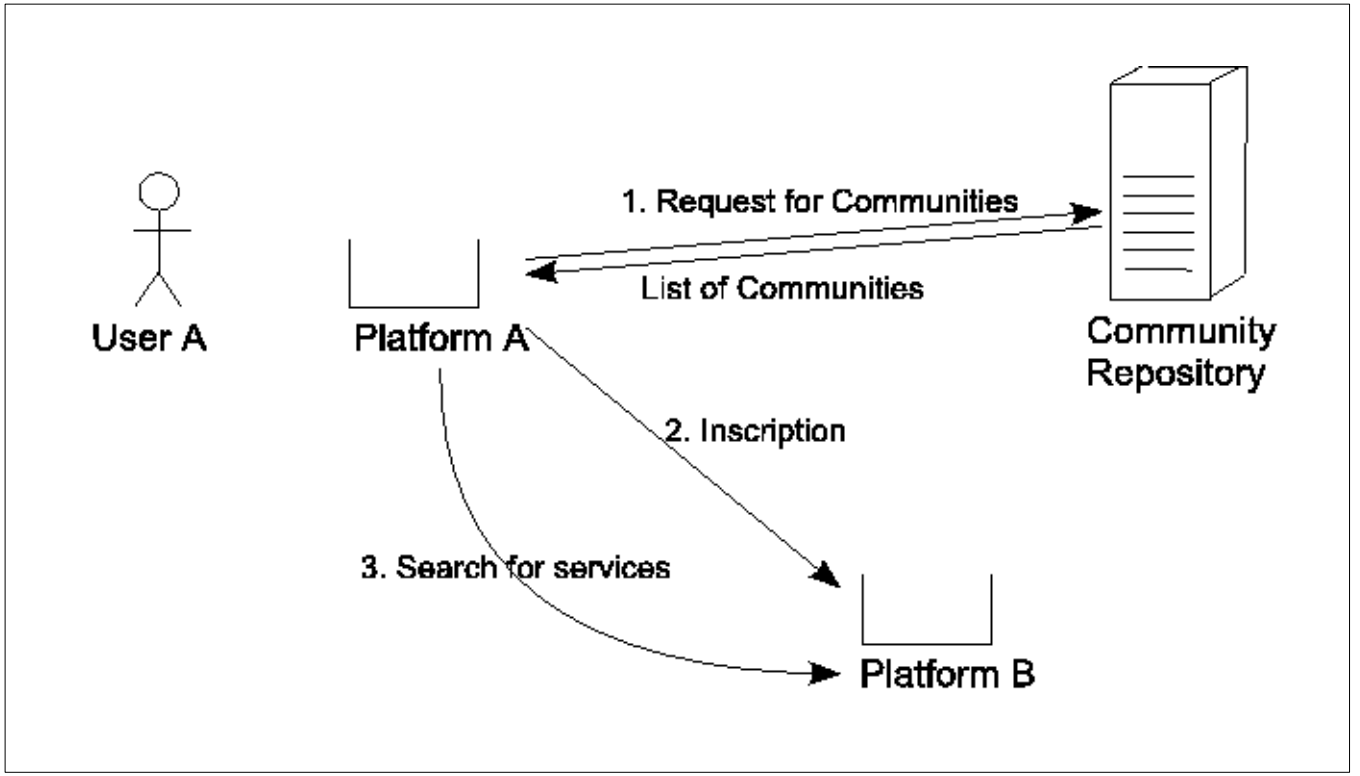
- Distributed Communities (4/4)
  - Totally decentralized
    - from the view point of active members
  - Entry point needed
    - Member of the community
    - Community Repository

III. Community Behavior

- Life Cycle of a Community (1/3)
  - Creation
    - When a user exists that provide services and data
    - When Community Meta-data are defined
    - Publication (or not) on a Community Repository
  - User joining a Community
    - Search and Join a Community
    - A user who joins the community is said to be 'active'

III. Community Behavior

- Life Cycle of a Community (2/3)
  - User Joining a Community



III. Community Behavior

- Life Cycle of a Community (3/3)
  - User withdrawing from the Community
    - Gateway shutdown
    - Or Resource withdrawal
    - See 'User disconnection'
  - Destruction of the Community
    - Community owner
      - Kill the community
    - Or Heart-beat probe by the Community Repository
      - No more members

III. Community Behavior

- Use Scenarios
  - User connection
  - User looking for resources
  - User adding resources
  - Extension of the Community Meta-data
  - Removal of resources
  - User Disconnection

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V. Conclusions

- Contribution
  - End-User Control over the Home Gateway
  - Extension of the concept of Communities
    - Semantic-driven resource sharing
    - Services
- To Be Done
  - Specification of the proposed language
  - Integration of services in Communities
  - Trust between members of the Community

Questions ?

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