



University of Zurich  
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# An Integrated Accounting and Charging Architecture for Mobile Grids

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Third International Workshop on Networks for Grid Applications  
San Jose (CA), USA

October 2, 2006

# Key Issues

- Wide IP adoption
  - Unified wired/wireless service range
  - Standard interfaces
  - Service aggregation
- Trend of Mobile Grids
  - Resource coordination across domains (VO)
  - Pervasive access
  - Commercial focus

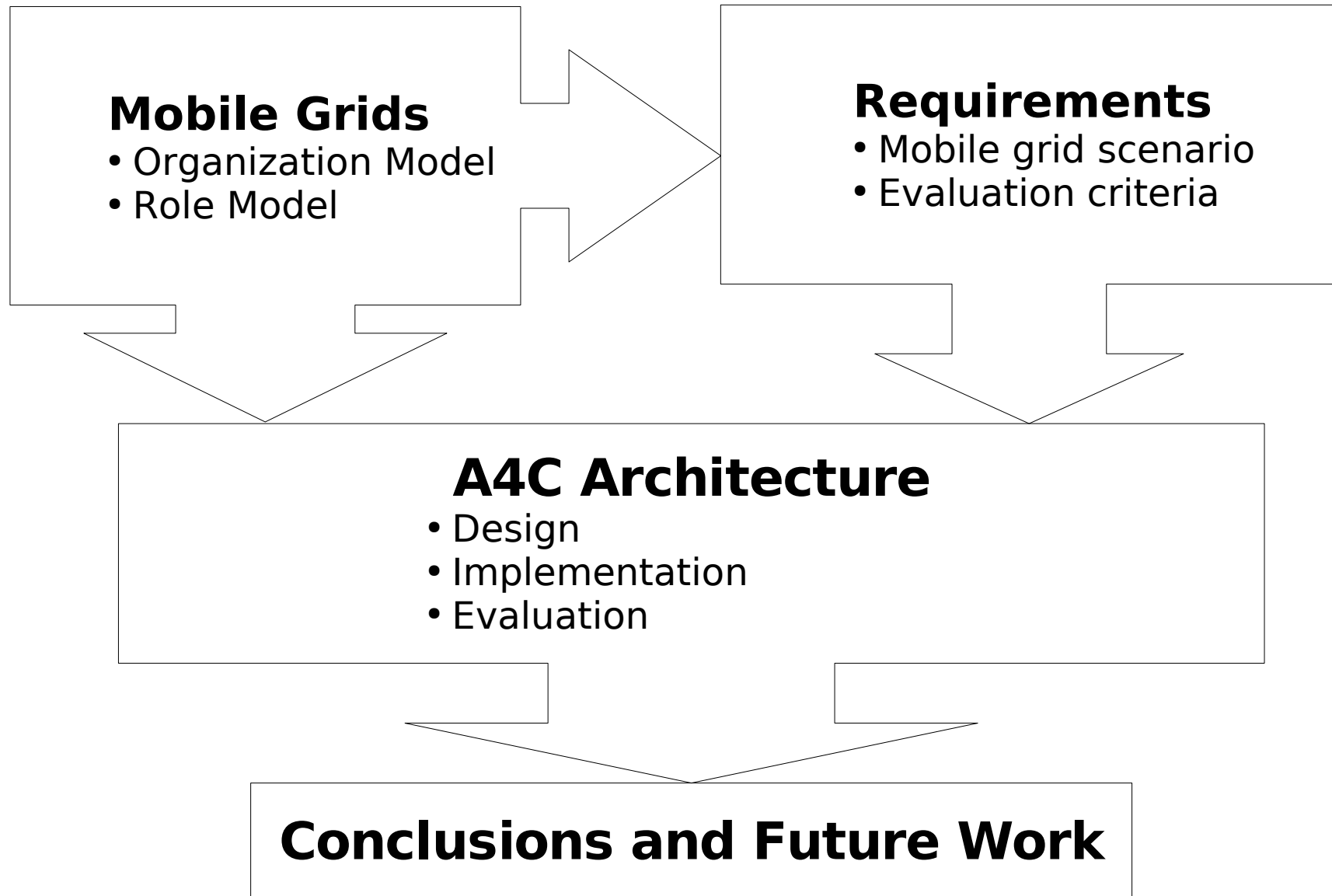


**Accounting and charging mechanisms for mobile grid services in a multi-provider setting**

**→ Integrated grid middleware infrastructure**

# Main Approach

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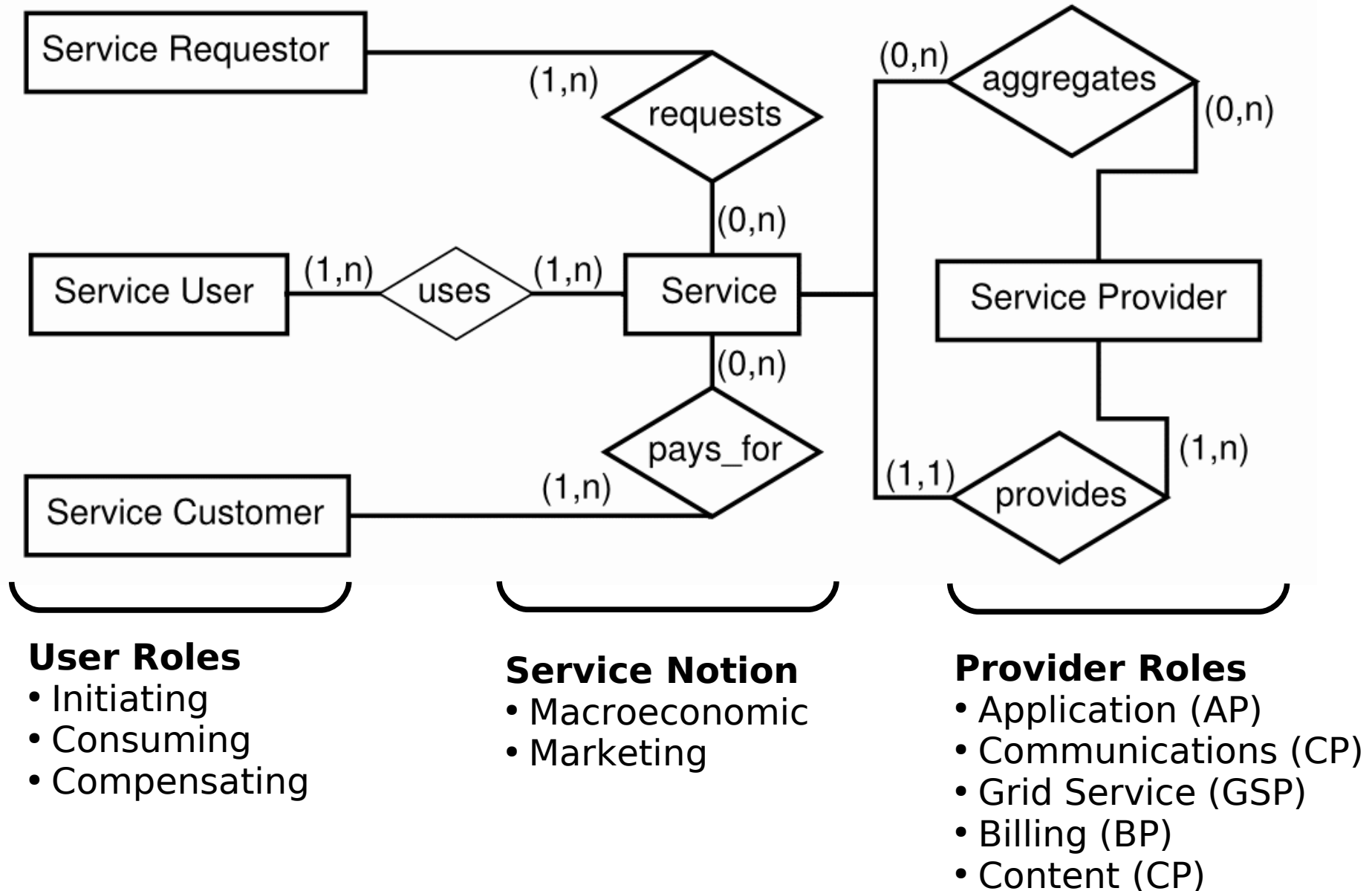
# Mobile Grid: Organization Model

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- Service grid as basis
  - Virtual Organization (VO)
  - Multi-domain service provisioning
- Mobility drives dynamics
  - Mobility support (device, user, session)
  - Context (device, user)
  - Adaptive business processes
  - Dynamic organizational composition

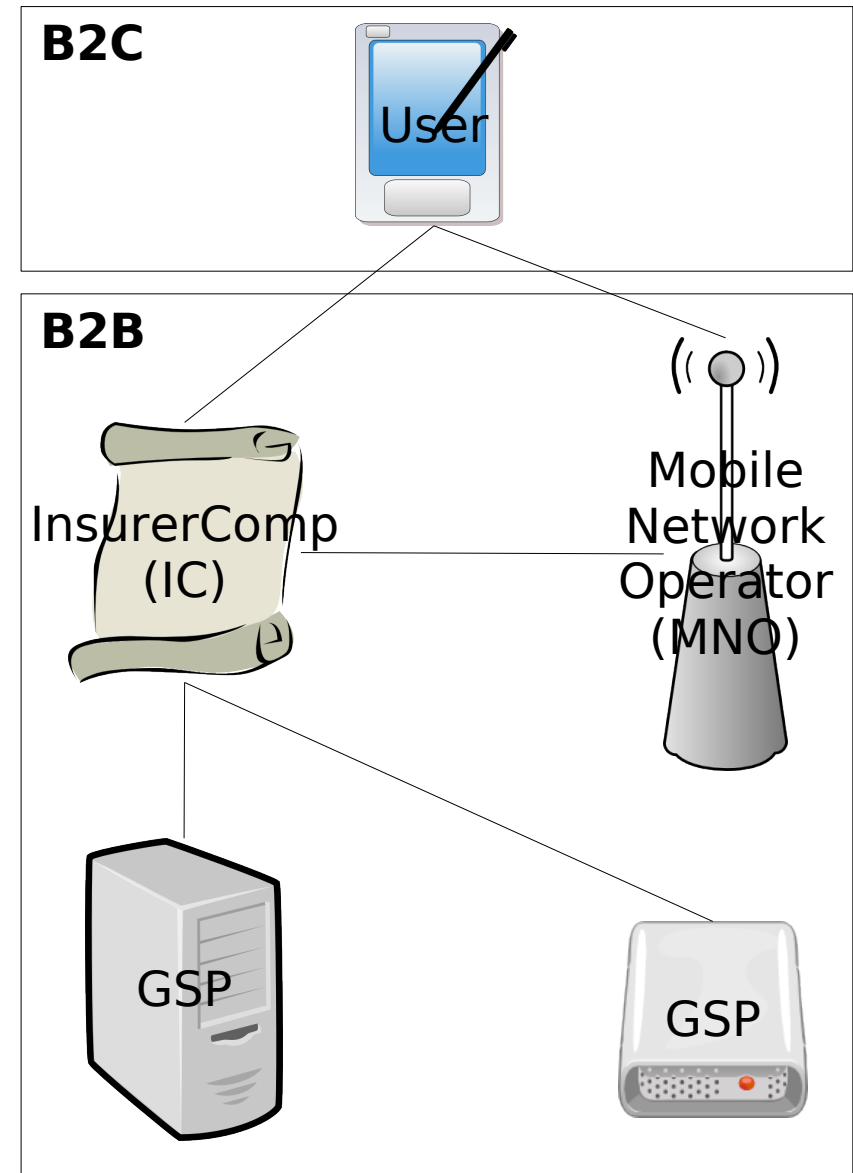
**Mobile Dynamic Virtual Organization (MDVO)**

# Mobile Grid: Role Model



# Requirements: Mobile Grid Scenario

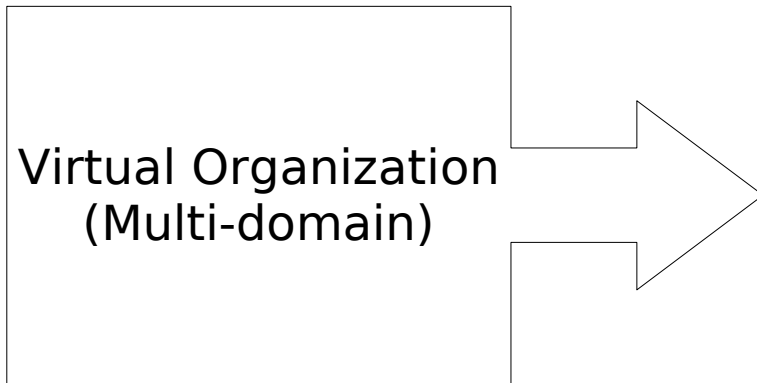
- Mobile Grid Scenario
  - Heart monitoring device
  - Health status
  - Patient records
- Actors
  - MNO (system integration)
    - Communications
    - Billing
  - IC (marketing)
    - Application
    - Content



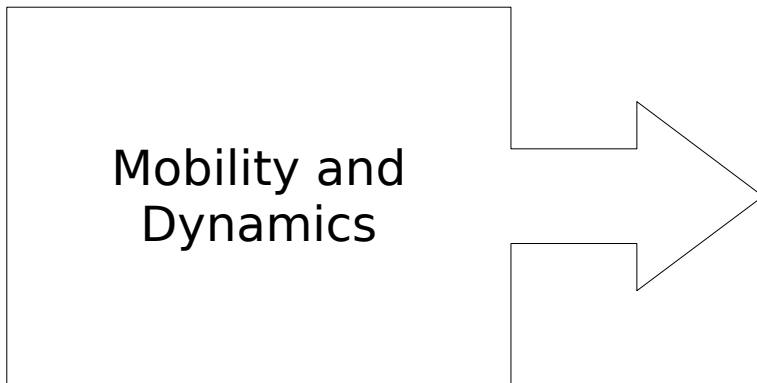
— Contractual agreement

# Requirements: Evaluation Criteria

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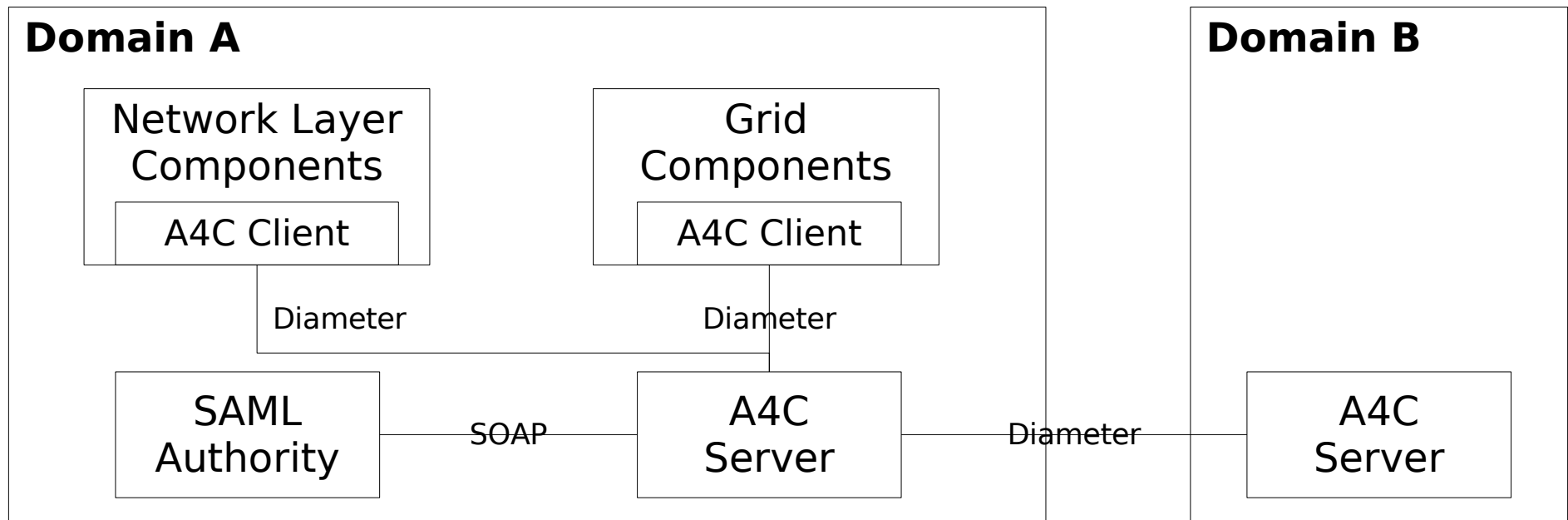


- Single sign-on
- Security
- Multi-domain/multi-service accounting and charging



- Robustness
- Roaming and mobility
- Deployment

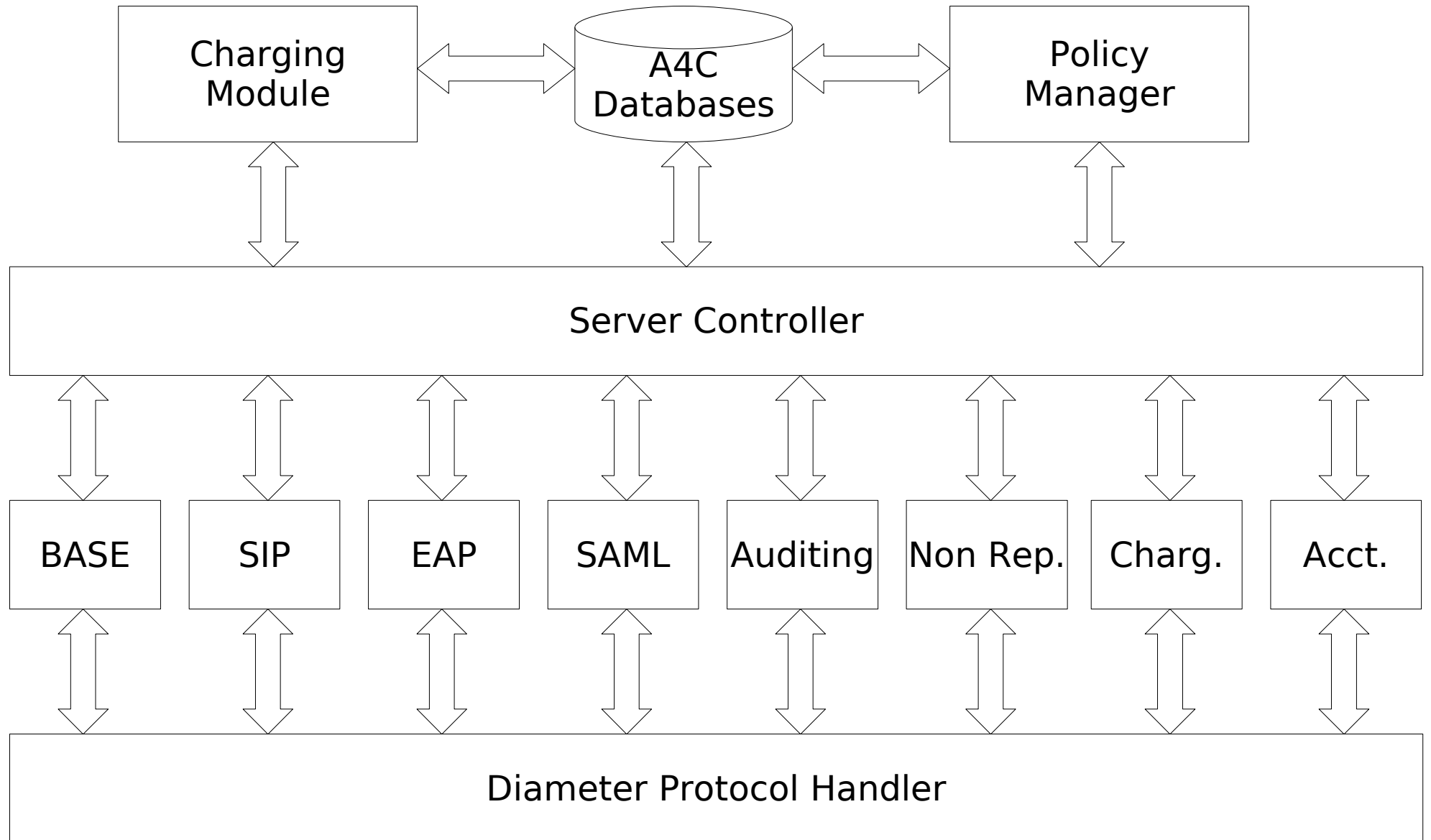
# A4C Architecture: Design



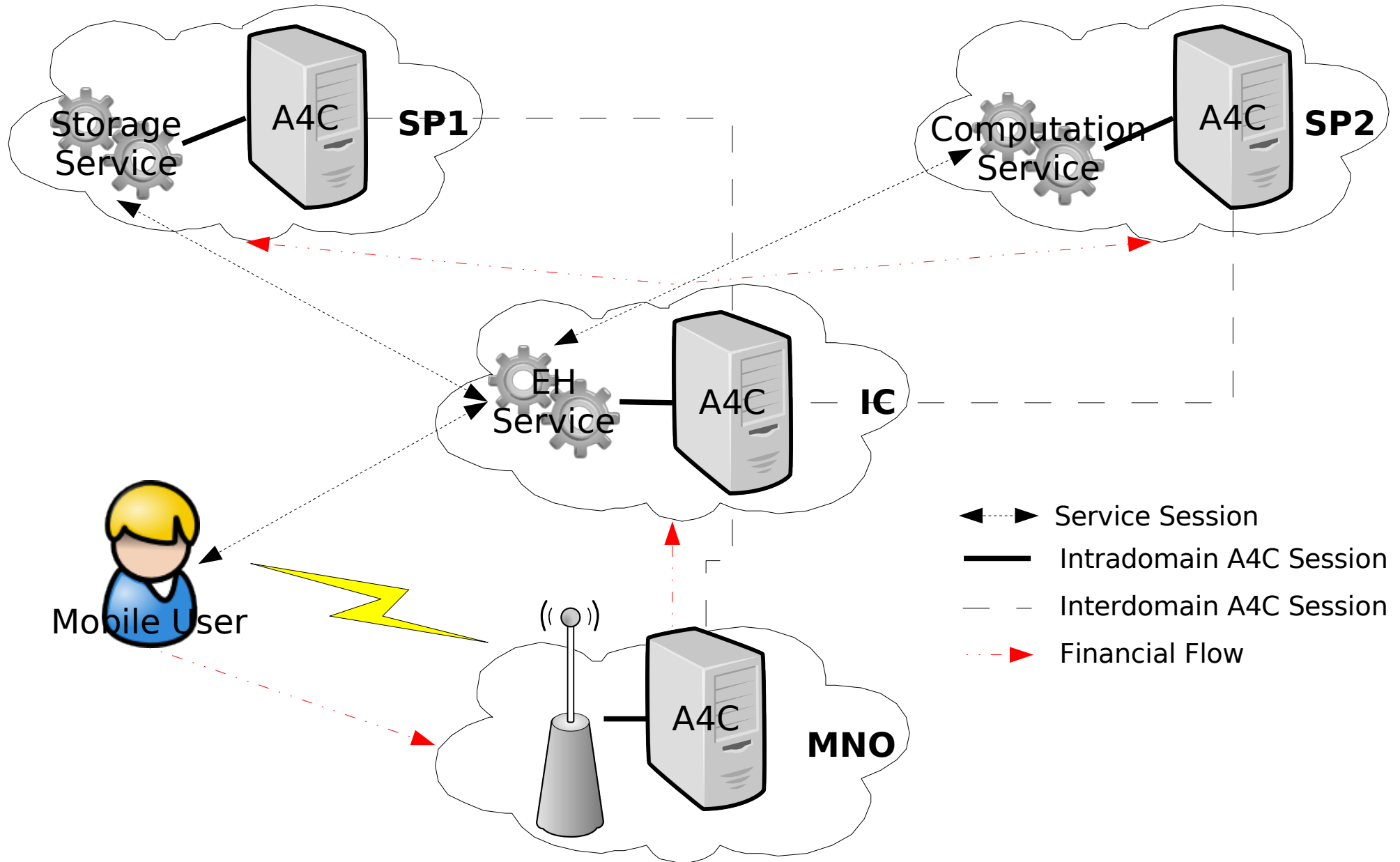
- Network and grid integration
- IETF AAA architecture
- Diameter applications
- Attribute value pairs (AVP)
- Service/accounting session mapping
- QoS parameters



# A4C Architecture: Implementation



# A4C Architecture: Evaluation (1)



# A4C Architecture: Evaluation (2)

- Single sign-on
  - SAML ID tokens
  - Accounting record format
- Security
  - TLS
  - IPSec
  - SAML ID tokens
- Multi-domain/multi-service accounting and charging
  - Unique session IDs
  - Service hierarchies
  - Diameter
- Robustness
  - Redundant A4C servers
  - Parallel A4C sessions
- Roaming and mobility
  - SAML ID tokens
  - Roaming-aware A4C applications
- Deployment
  - Widely adopted Diameter
  - Diameter extensions
  - Deployment of A4C servers and SAML authorities needed

# Conclusions and Future Work



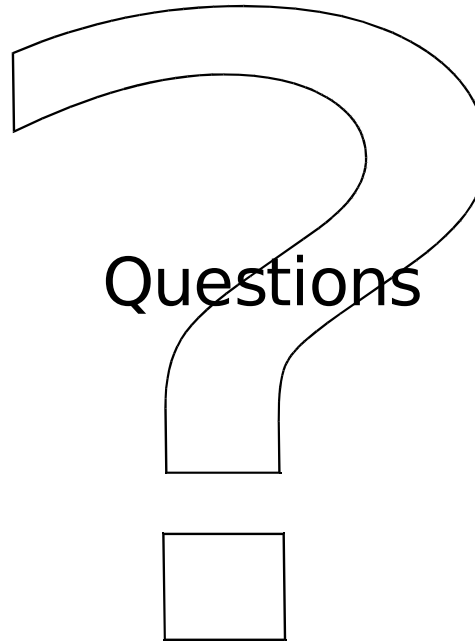
**① Integrated, standards-based accounting and charging infrastructure for mobile grids**

**② Accounting and charging support for services across domains while preserving user anonymity**

**③ Future work to integrate financial clearing provider**

# Thank you

for your attention!



<http://www.mobilegrids.org>



<http://www.csg.unizh.ch>

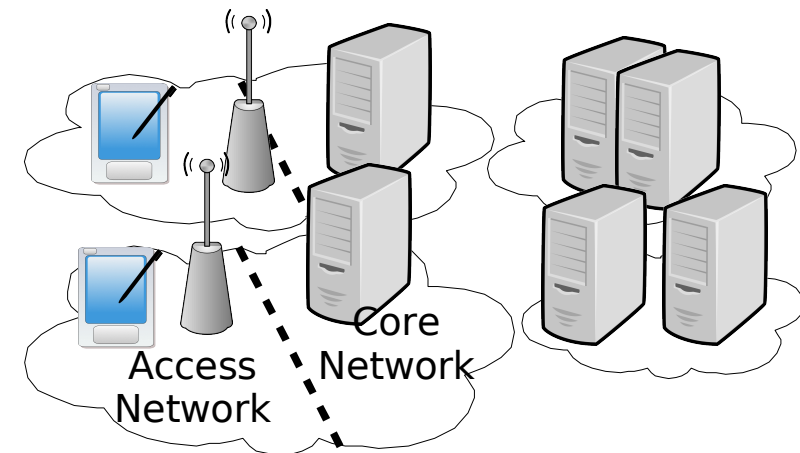
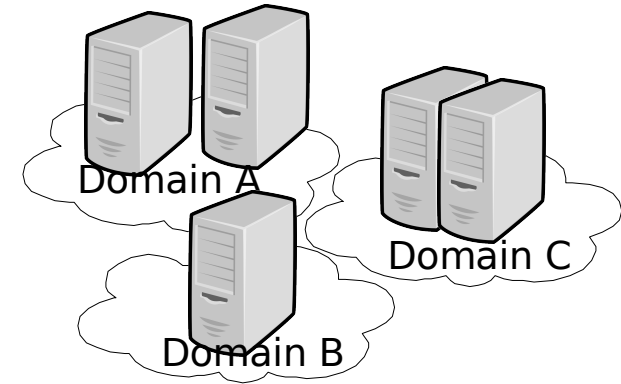


# Backup



# Mobile Grid: Grid Evolution

- Computational and Data Grids
  - High-performance computing
  - Research-oriented
- Service Grids
  - Virtualization of resources
  - Across administrative domains
- Mobile Grids
  - Commercial orientation
  - Higher-level resource coordination
  - Pervasive access



# Mobile Grid: Organizational Model

