



Akogrimo – Business Models and Charging for Grid Services

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Access to Knowledge through the Grid in a Mobile World

Work in Progress!

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Outline



- Project Overview
- Business Models for Mobile Grids
 - Mobile Dynamic Virtual Organizations (MDVO) Views
 - Scenario
- A4C — Technology for Charging MDVO Services
 - Challenges
 - Architecture
 - Grid Service Interfacing
- Summary and Preliminary Conclusions
- Future Work

Project Overview

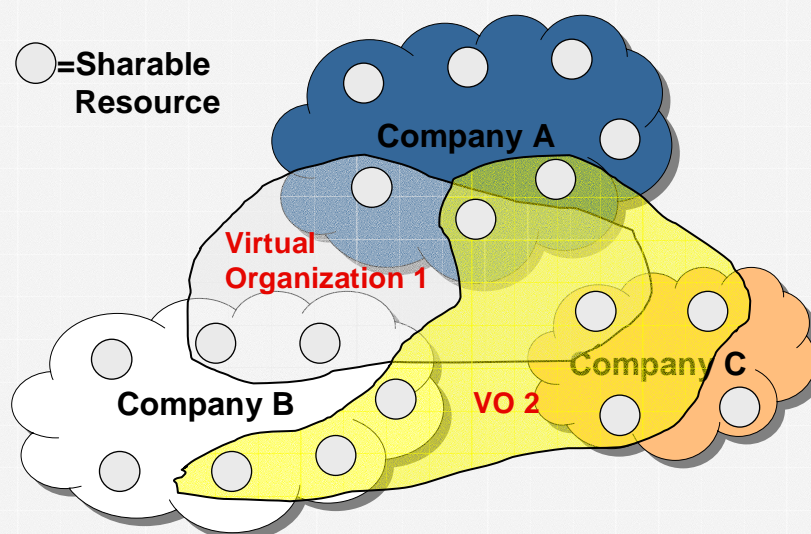


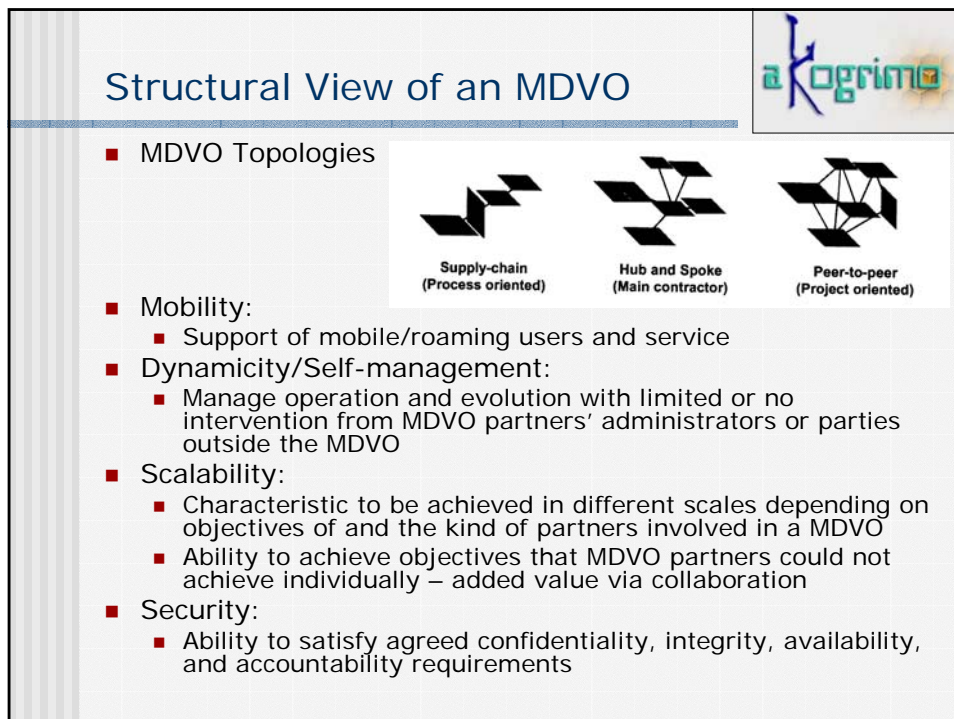
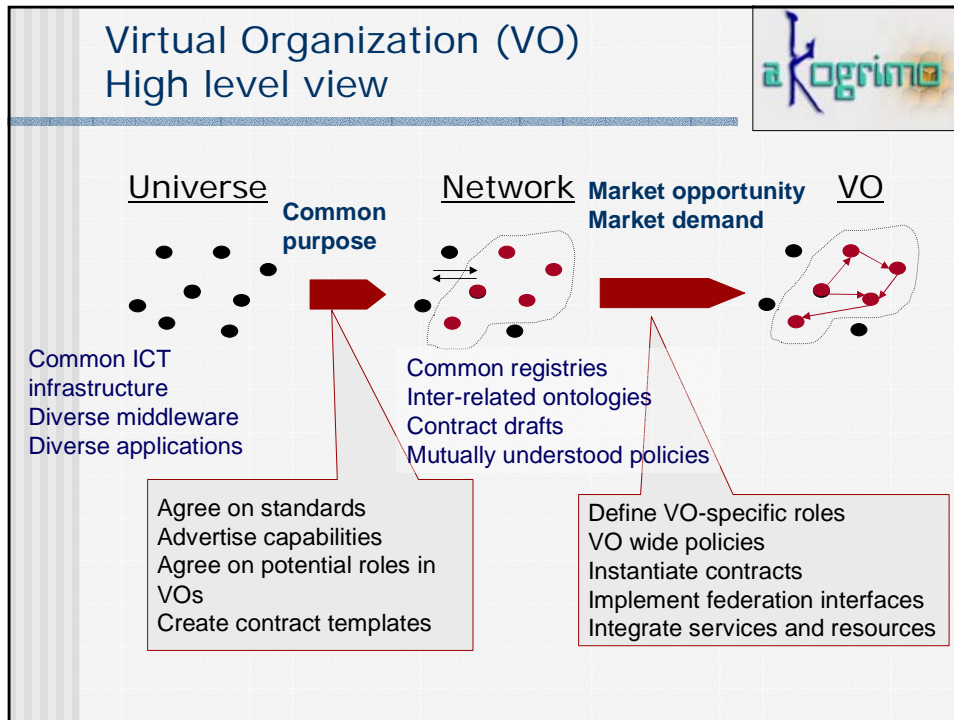
- **Akogrimo:**
 - Blueprint and architecture for a NGG
 - Mobile Internet and IPv6

- **Mobile Dynamic Virtual Organizations:**
 - Concept to implement business models
 - E-health, disaster and crisis management

- **A4C (Authentication, Authorization, Accounting, Auditing, and Charging):**
 - Personalized access to services "everywhere, anytime using any type of access"
 - Security models for MDVOs, creation and management of dynamic trust domains
 - Support for revenue generation

Virtual Organizations (VO) Super High Level view





A4C Challenges for Grid Services



Authentication and Authorization

- Single Sign-on for grid services and network access/service
- Integration with local security solutions
- User-based trust relationships
- Manageability: Identity management, policy management, and key management

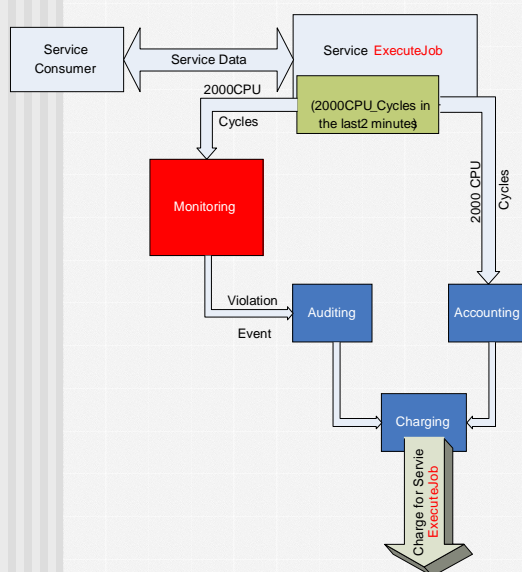
Accounting and Auditing

- Define parameters to be metered and accounted for
- Secure logging of audit information

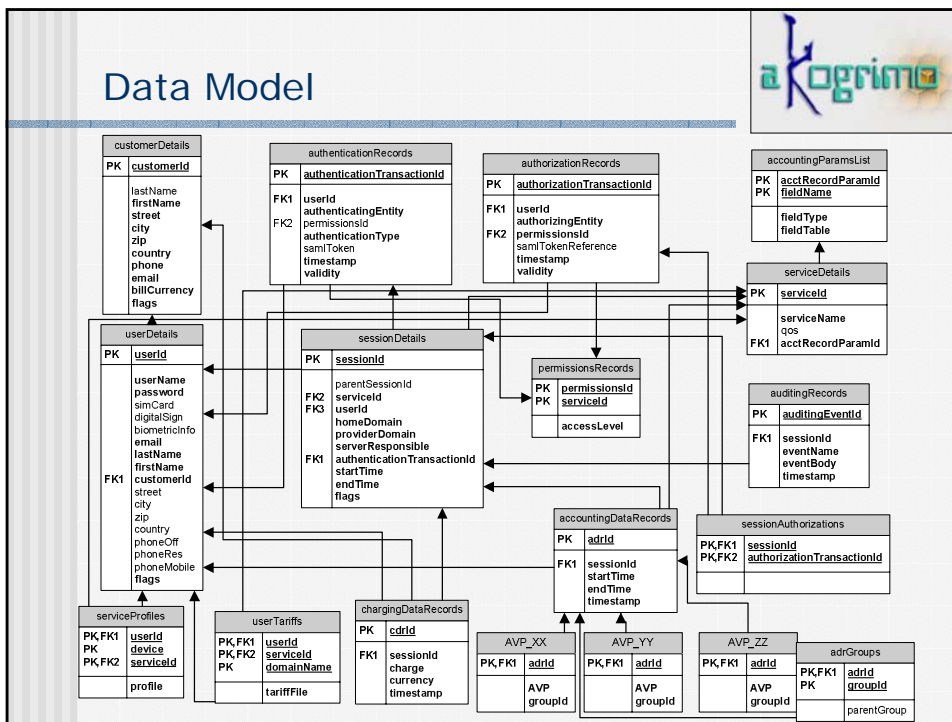
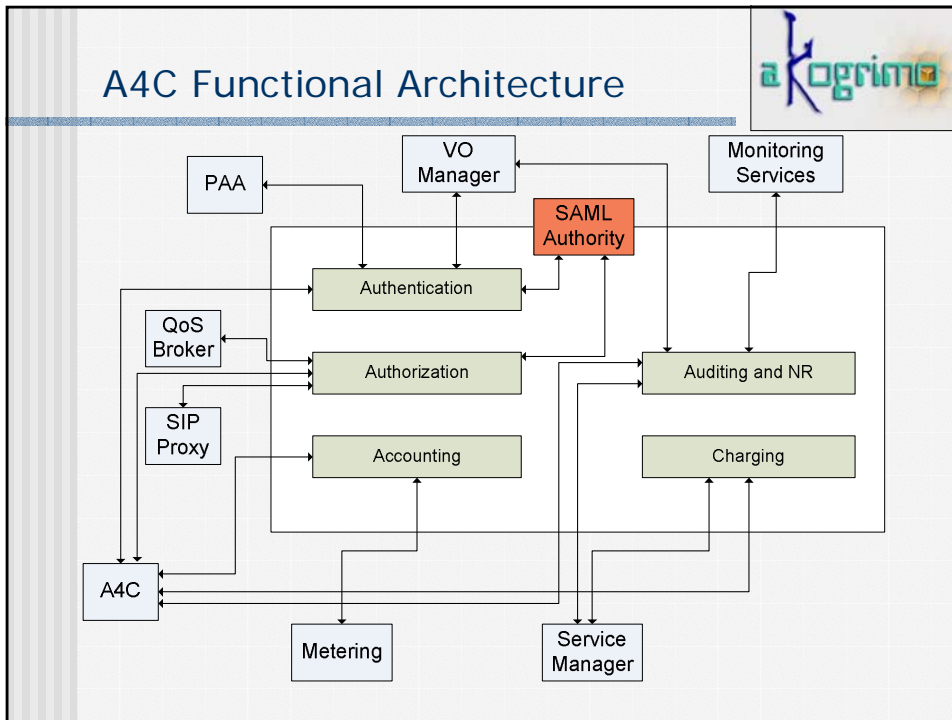
Charging and Pricing

- Define parameters to be charged for
- Integrate multiple pricing schemes from different players
- Unified Billing: Grid services and network transport

Accounting, Auditing, and Charging Process

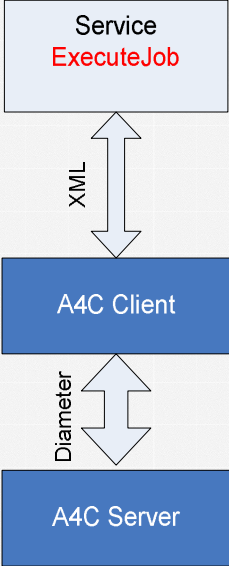


- Every service needs to implement a meter for the parameters it wishes to account for
- The meter will feed the accounting and monitoring (external to A4C) components
- All the accounting records and audited events generated in a service session will be fed to the charging component
- According to the charging scheme the service charge is calculated and added to a user's monthly bill



Interfacing Grid Services

- Not every component is able to speak DIAMETER
- Grid components will access an A4C Client via XML or Web Services:
 - XML Authentication Messages
 - XML Accounting Messages
 - XML Auditing Messages
- Parameter set and SLA depends on Web Service/application

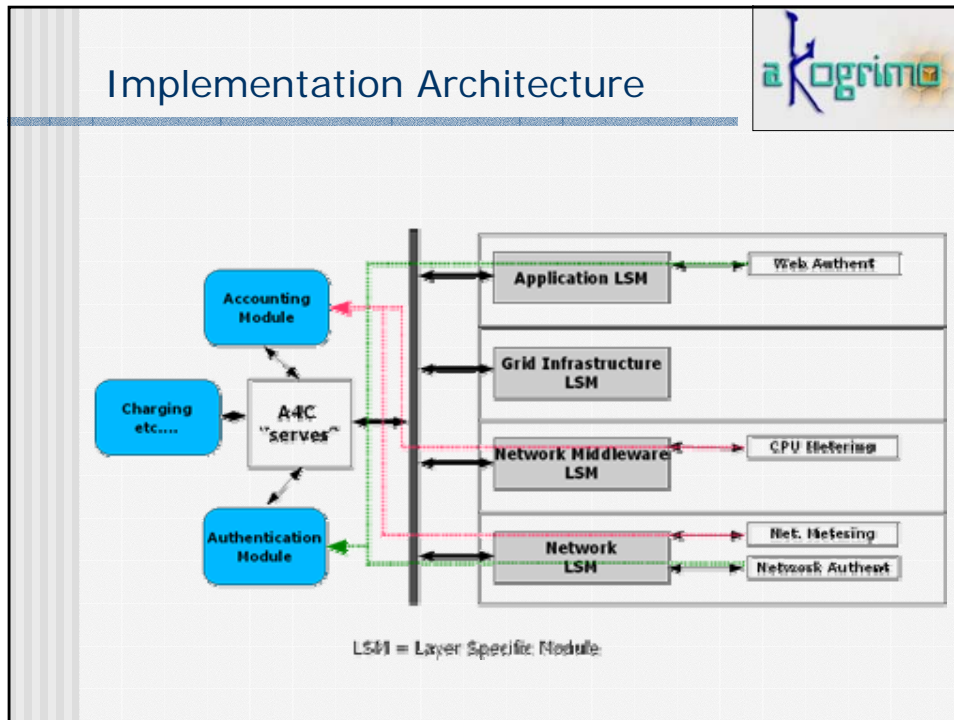


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            graph TD
            A[Service ExecuteJob] <-->|XML| B[A4C Client]
            B <-->|Diameter| C[A4C Server]
            
```

Current Grid Service Accounting Extensions

<ul style="list-style-type: none"> ■ TransferredData ■ CPUUsage ■ DiskUsage ■ StartTime ■ EndTime ■ HostName ■ JobName ■ MachineName ■ MemoryUsage 	<ul style="list-style-type: none"> ■ ProcessId ■ ProcessorCount ■ NodeCount ■ QueueName ■ ScratchUsage ■ StartTime ■ Status ■ SubmitHost ■ SwapUsage ■ TempUsage
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- ## Ongoing Implementation
- A4C Server
 - Based on OpenDiameter framework
 - Linux, C++
 - A4C Client
 - Linux, C++
 - Data Storage
 - MySQL database
 - Linux, C++
 - Standalone component
 - C++ interfaces for accessing data

Summary and Preliminary Conclusions



- A4C eases the merger of the Grid and Networking worlds.
- A4C will support the creation of diverse business processes by offering user access control and resource usage accounting across different administrative domains.
- DIAMETER is the right choice for an AAA protocol, although the client implementation in every service is not yet feasible!

Future Work



- Short term
 - Integration of grid authorization in A4C
 - Sample parameter set/SLA mappings
 - Exposing of A4C services as web services
- Medium term
 - Mobile Dynamic Virtual Organization awareness to be made explicit within A4C
 - Integration of a billing settlement entity



Thanks for your attention!

Questions?

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