Fuego Core

SN14. Middleware for Mobile Data Communications and Synchronization

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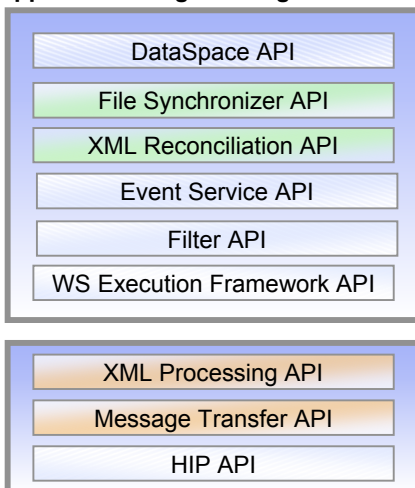## Project Objectives 2002-2006

- **To specify and implement efficient data communications and synchronization services for mobile computing**
- Work areas: efficient XML interchange, event-based computing, XML-aware data synchronization
- Funded by Tekes and industry partners
- Open source software available at hoslab.cs.helsinki.fi
- Homepage: www.hiit.fi/fuego/fc

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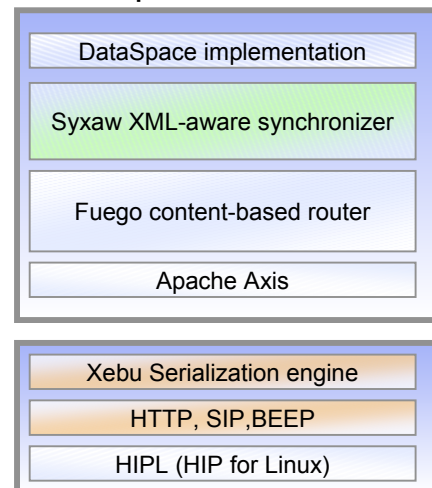
XML-aware File Synchronization

- Idea: set up shared data spaces by *linking* directory trees on different devices to each other
- Data always available and writable. Optimistic share model
- Framework for reconciling concurrently modified XML data by three-way merging
- Designed for limited bandwidth and high latency
- Simple HTTP GET/POST synchronization protocol
- Very few network roundtrips → GPRS-friendly
- Efficient XML-based model for directories
- Implementation integrates with existing file systems in a nondisruptive manner

Application Programming Interfaces

- DataSpace API
- File Synchronizer API
- XML Reconciliation API
- Event Service API
- Filter API
- WS Execution Framework API

- XML Processing API
- Message Transfer API
- HIP API

Implemented Services

- DataSpace implementation
- Syxaw XML-aware synchronizer
- Fuego content-based router
- Apache Axis

- Xebu Serialization engine
- HTTP, SIP,BEEP
- HIPL (HIP for Linux)

Event System

- Scalable distributed event framework for mobile computing
- The Fuego event router consists of two parts: access server functionality with buffering and handover support for mobile clients, and extensible routing core for distributed operation
- New data structures for efficient content-based routing: poset-derived forest and the weakly merging forest
- Rendezvous-based mobility support for fast handovers and subscription topology updates
- Dataspace for filter-based collection tracking

XML Messaging

- Improving XML-based messaging for mobile devices
- Message service: Asynchronous one-way and two-way messaging with a variety of message exchange patterns
- XML Processing API: Streaming processing of messages with included support for typed data
- Message format: Compact and simple binary representation compatible with XML
- Protocol: Two-way messaging with small overhead and awareness of mobility

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