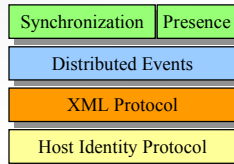# Fuego Core

Middleware for Mobile Wireless Internet

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Project Objectives 2002-2004

- **to specify the set of *fundamental enabling middleware services* for mobile applications on future mobile environments**

Synchronization	Presence
Distributed Events	
XML Protocol	
Host Identity Protocol	

- to implement two research prototypes and participate in relevant standardizing forums (W3C, IETF, OMG, OMA)
- Work areas: Adaptive Applications, Mobile Distributed Information Base, Reconfigurable Services, and Mobility, Multi-homing, and Cryptographic Host Identification
- Funded by Tekes and industry partners

Event-based Systems: Rendezvous-Notify

- Scalable distributed event framework for mobile computing based on a distributed data structure
- Constant or near constant cost in terms of messages for event channel subscription and management using linear hashing
- Support for disconnected operation and mobility. Efficient event session handover between event servers
- Cost model for accessing event servers and using sessions. Simulation and formal verification is used to validate the proposed approach

XML Protocol

- How can XML Protocol (SOAP) be used in wireless communication?

- Main problems with SOAP: XML verbose so bandwidth-heavy, HTTP and underlying TCP bad in high-latency networks
- Discard XML; compress messages suitably, either generically or XML-specifically (such as binary XML)
- Discard HTTP; replace with persistent connections and asynchronous one-way messaging? Negotiation of parameters only once; compact protocol headers

Synchronization: a mobile distributed file system

- Disconnected operation
- Designed for limited bandwidth and high latency
- Simple HTTP PUT/GET-like synchronization protocol
- Special support for XML files
  - Optimized storage of XML
  - Three-way merge for data, automatic reconciliation
- Ad-hoc file sharing: any device may share files to any other device
- Implementation layers on top of existing file system in a nondisruptive manner
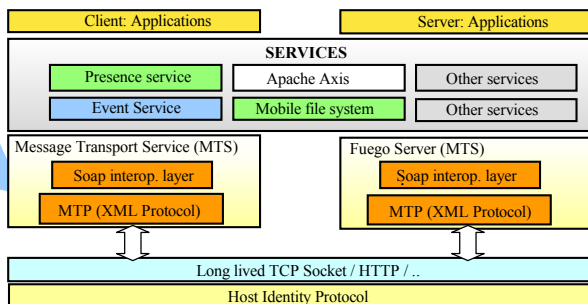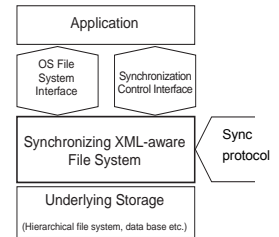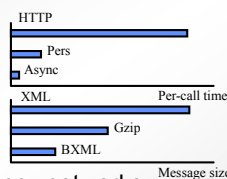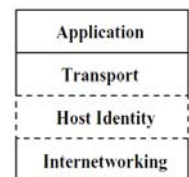

Ubiquitous Presence

- Electronic systems provide abundant and possibly sensitive information about users: location, activity, availability, etc.
- Conflicting goals – privacy, usability, and utility
- Presence information is a great advantage in collaboration tools. Embedding presence information in applications like email, messaging and telephony
- Using a presence component for single-point management, privacy control, and transparency in distribution
- Middleware services to replace separate presence/IM clients. Multiple standardization efforts: XMPP, SIMPLE, WV, PAM, IMPP, LIF

Host Identity Payload (HIP)

- A research protocol to provide multihoming, mobility and security in one architecture
- A new Host Identity layer between internetworking and transport layers
- Based on a new cryptographic address space where the Host Identities of the hosts (public keys) can be stored in DNS
- Authentication of hosts is achieved with "Base Exchange" to avoid DoS
- Four interoperable implementations: HIIT, Ericsson, Boeing and IndraNet
- Similar to MobileIP, SCTP and LIN6

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