



# MAGNET

My personal Adaptive Global NET

## Context Management Framework for MAGNET Beyond

Workshop on *Capturing Context and Context Aware Systems and Platforms* at  
the IST Mobile & Wireless Communication Summit, Myconos, June 2006

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### About MAGNET Beyond

**MAGNET Beyond** is a continuation of the MAGNET project. MAGNET Beyond is a worldwide R&D project within Mobile and Wireless Systems and Platforms Beyond 3G. MAGNET Beyond will introduce new technologies, systems, and applications that are at the same time user-centric and secure. MAGNET Beyond will develop user-centric business model concepts for secure Personal Networks in multi-network, multi-device, and multi-user environments. MAGNET Beyond has 32 partners from 15 countries, among these highly influential Industrial Partners, Universities, Research Centres, and SMEs.

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## Overview

- Personal Networks (PNs)
- Use of context in PNs
- Requirements for Context Management Framework in PNs
- Conceptual Architecture
- Context from the OSI Layers
- Security/Privacy Aspects
- Conclusion & Outlook

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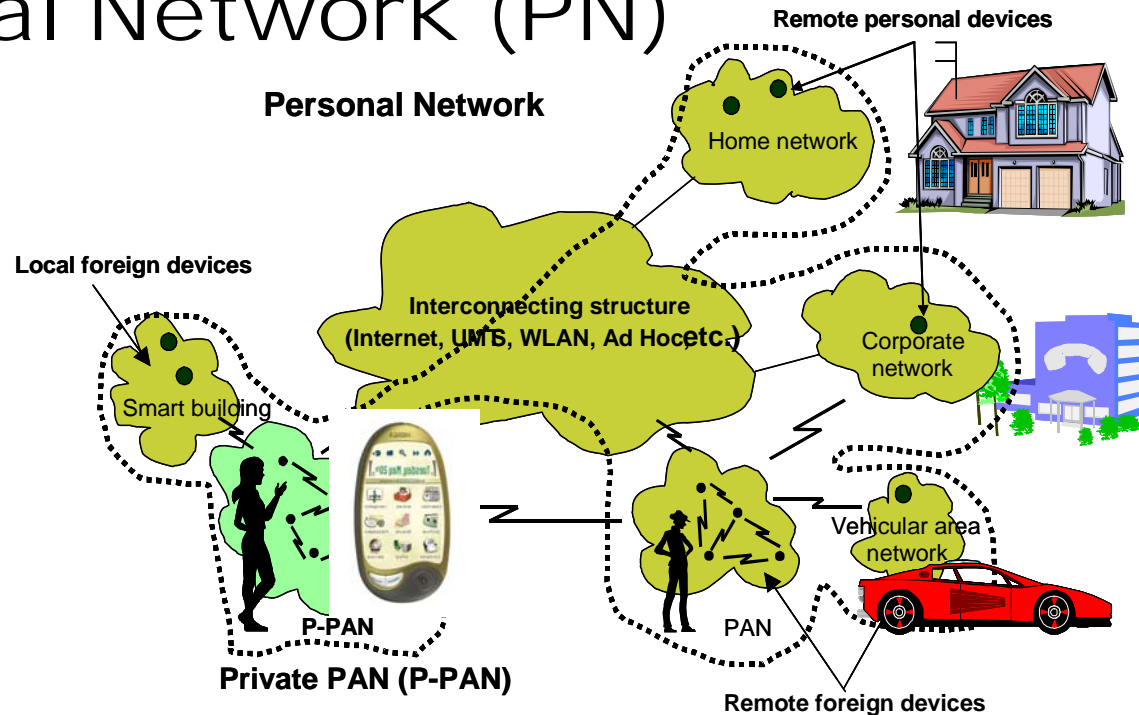
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## Personal Network (PN)



## PN Federation: sharing of certain services and resources with other PNs

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# Use of Context in Personal Networks

## Motivation

- **Personalization** and **context-awareness** of applications and services
- **Proactive** support of mobile users
- Relevant context: user profile, physical environment, network
- PN provides **secure basis** for gathering and processing context information

## Challenges

- Dynamicity
- Heterogeneity
- Size (esp. with respect to PN federation)

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# MAGNET Beyond Use Cases

## A. Nomadic@work

1. Context-aware service discovery
  - journalist has to make a trip to cover a story
  - goal: finding services available at destination (based on *location*, *preferences*)
2. Context-aware service provisioning
  - journalist is streaming video
  - goal: laptop *battery low* → notification, propose/initiate switch to PDA

## B. Magnet.care

1. Emergency call for a diabetic
  - diabetic needs to monitor *blood sugar level* and adapt doses of insulin accordingly
  - goal: notify user if blood sugar level is outside given range
2. Remote monitoring
  - keep *history of blood sugar level* and make available to doctor
  - goal: update remote history, make available to doctor on request/specified interval

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## Requirements for Context Management Framework in PNs

1. Adding, maintaining and removing context information
2. Efficient access to context information
3. Adaptation to changing context sources
4. Scalability
5. Handling of missing and ambiguous context information
6. Support of context-triggered events
7. Standardized context format
8. Security & Privacy

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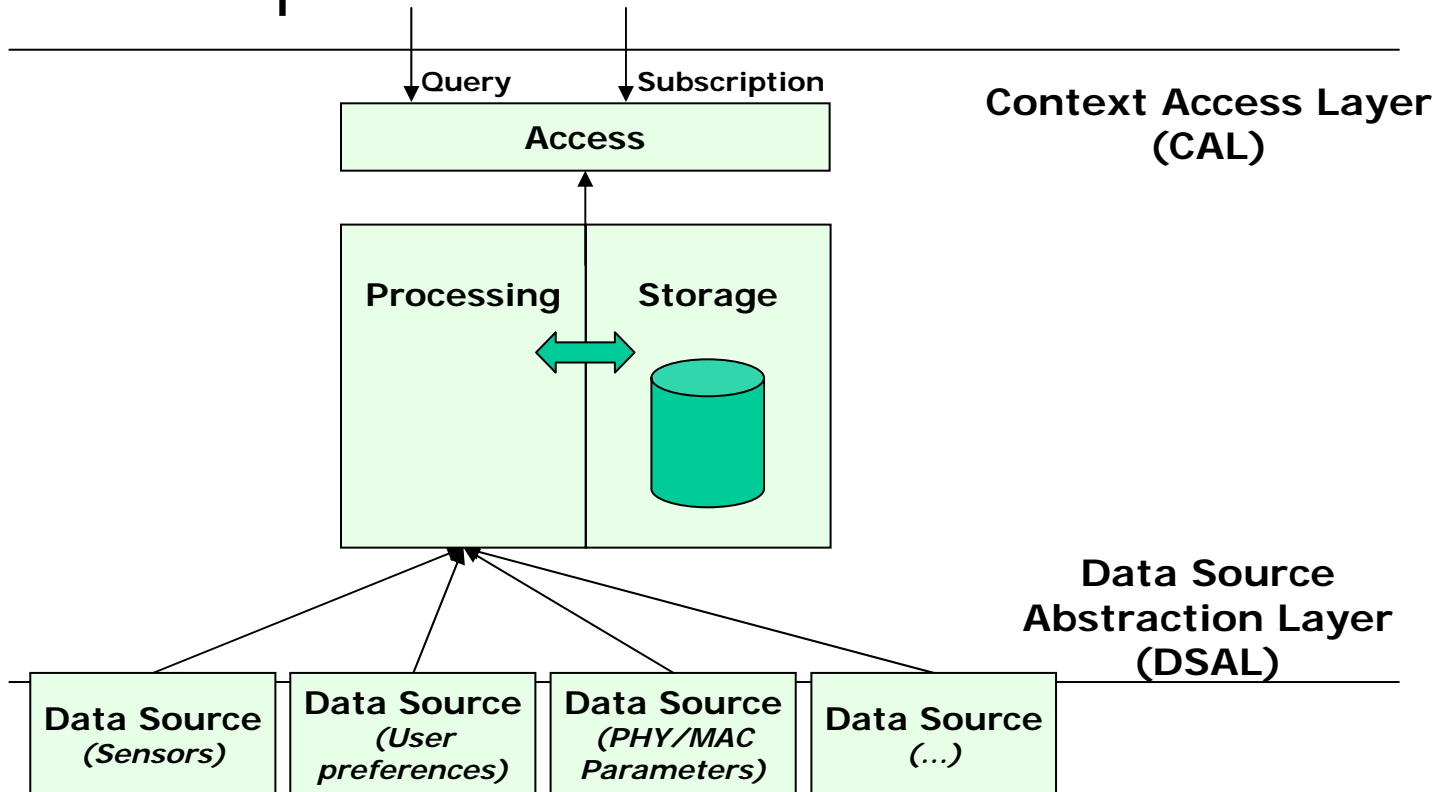
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# Conceptual Architecture



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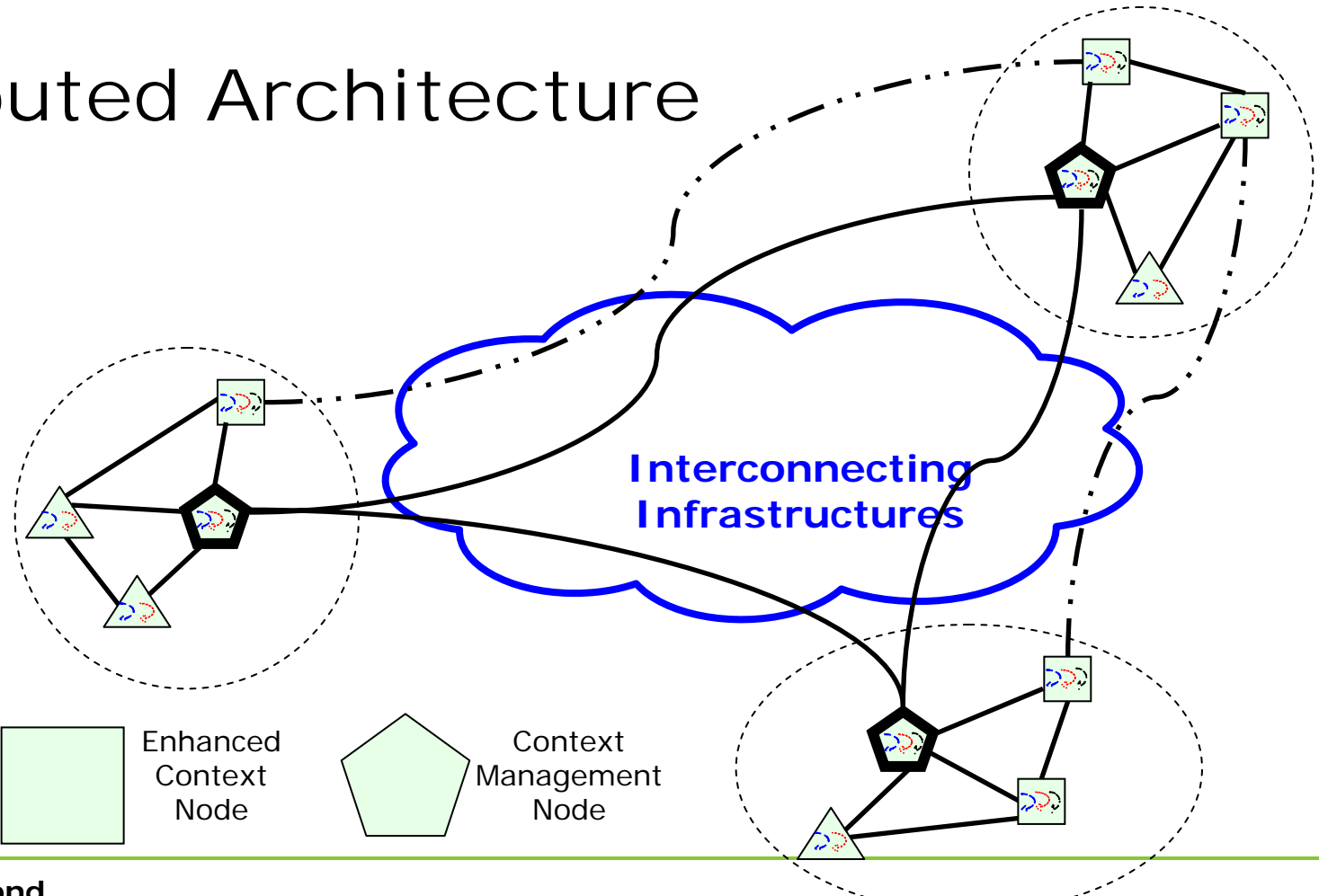
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## Distributed Architecture



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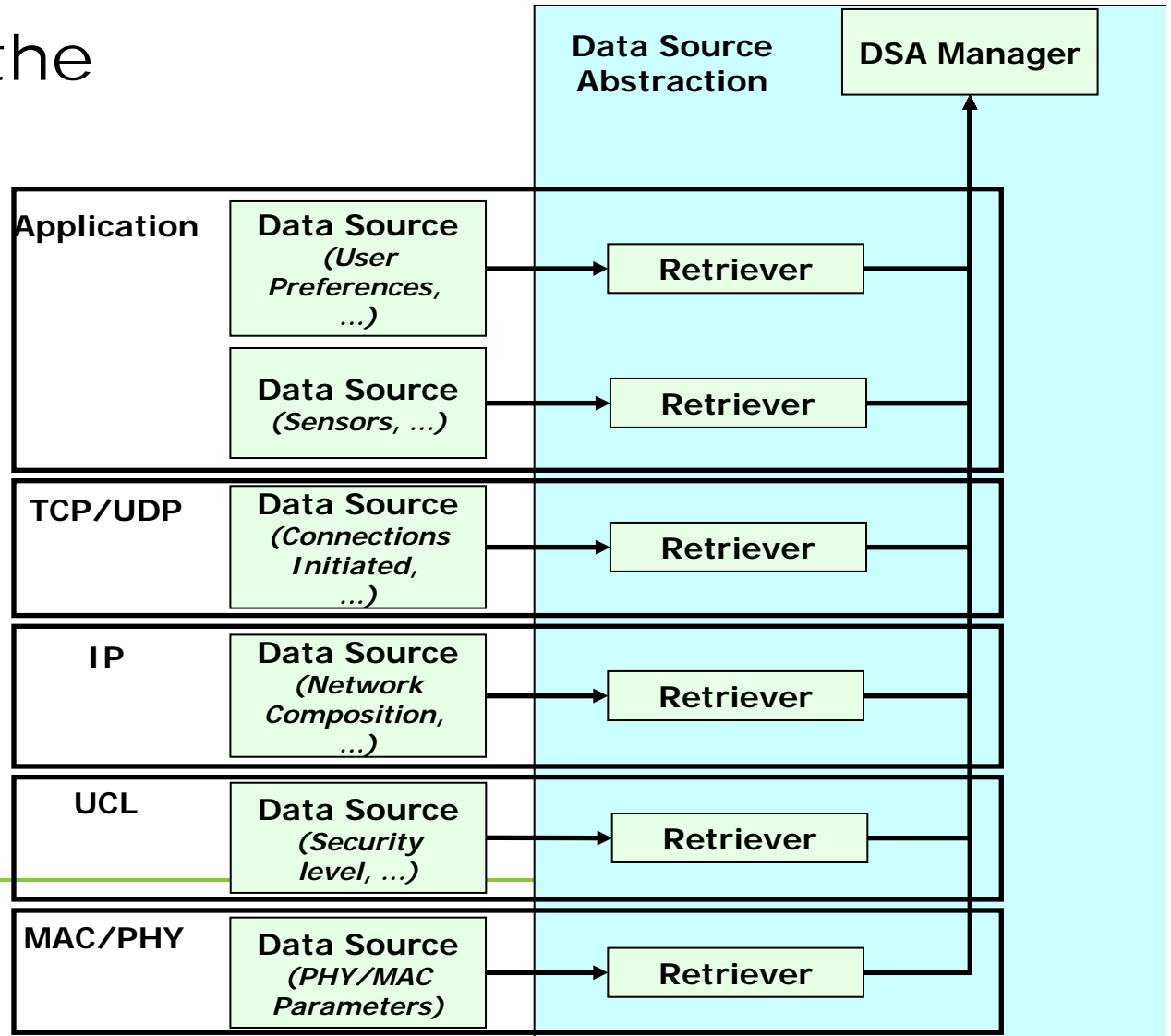
## Context from the OSI Layers

Importance of network context

- mobility of the user
- dynamic changes in available networks

Example: network layer:

- neighboring nodes
- communication capabilities
- e.g. for network selection (user context for general strategy)



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## Security/Privacy Aspects

- Privacy of paramount importance, especially when sharing information (PN federation)
- Privacy attribute for context data (**always**, **check**, **ask**, and **never**)
- Anonymity (where applicable) and non-disclosure of sensitive context data can be enforced by encryption mechanisms.
- User can specify security for nodes
  - security level (assign security level to accessing node)
  - access control level (assign access level to accessed node)
- Personalized access control of any context information request throughout personal network/federation

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## Conclusion

- Context information in Personal Networks
  - secure basis for context gathering and processing
  - personalization
  - proactive services for mobile users
- Distributed Context Management Framework
  - accessing distributed context information (query/response & subscribe/notify)
  - gathering context information (data source abstraction layer)
  - processing context information
  - storing information

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## Outlook

- Refine architecture and extend to PN Federation
- Design and implement context management framework
- Validate based on
  - MAGNET Beyond pilot services
  - use for management of PN/PN federation

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Thank you for your attention!

Do you have questions?

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