



# Daidalos

.. radically improve usability of European telecommunication technologies by integrating mobile and broadcast communications and following a user-centered, scenario-based approach to deliver ubiquitous end-to-end services across heterogeneous technologies ..

**Amardeo Sarma**



# IP Daidalos – Consortium



Telco Operators



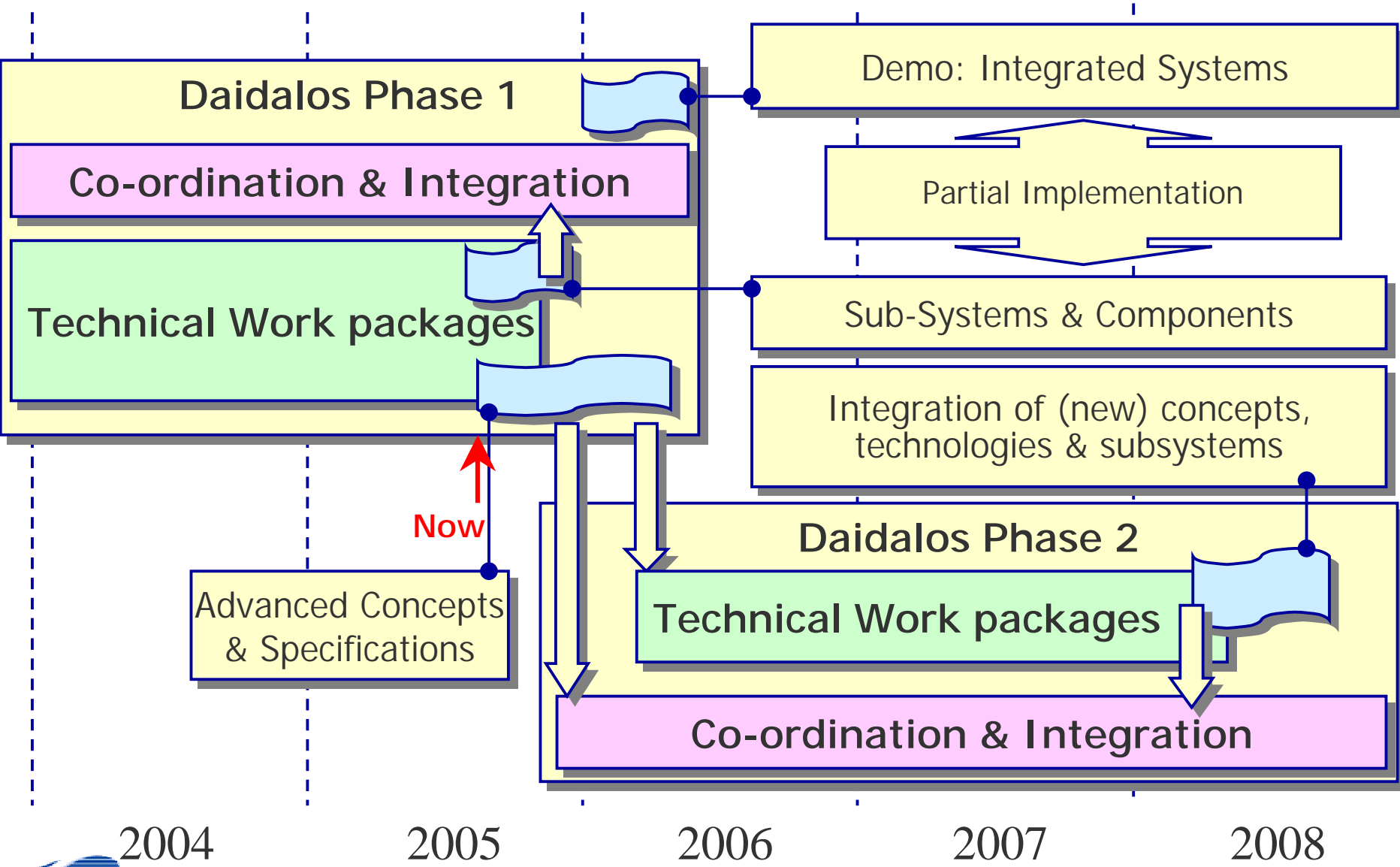
Industry, SME



Research labs, academia



# Daidalos – Overall Schedule



2004

2005

2006

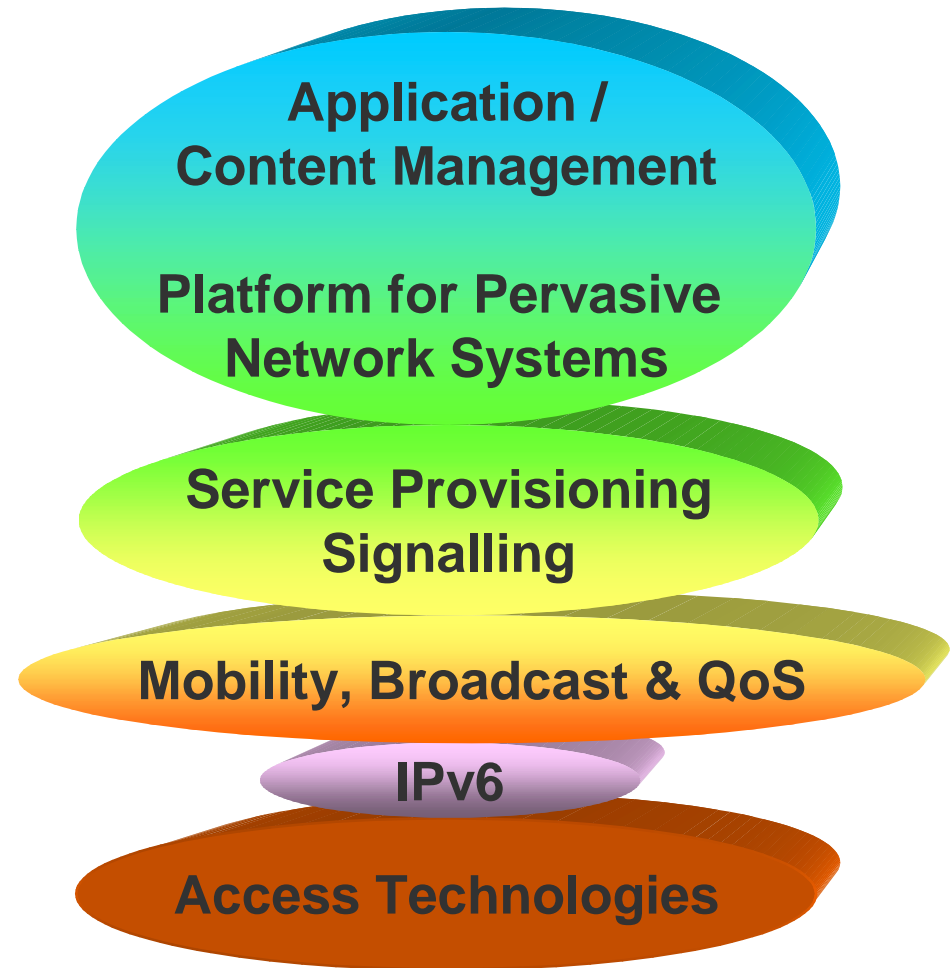
2007

2008

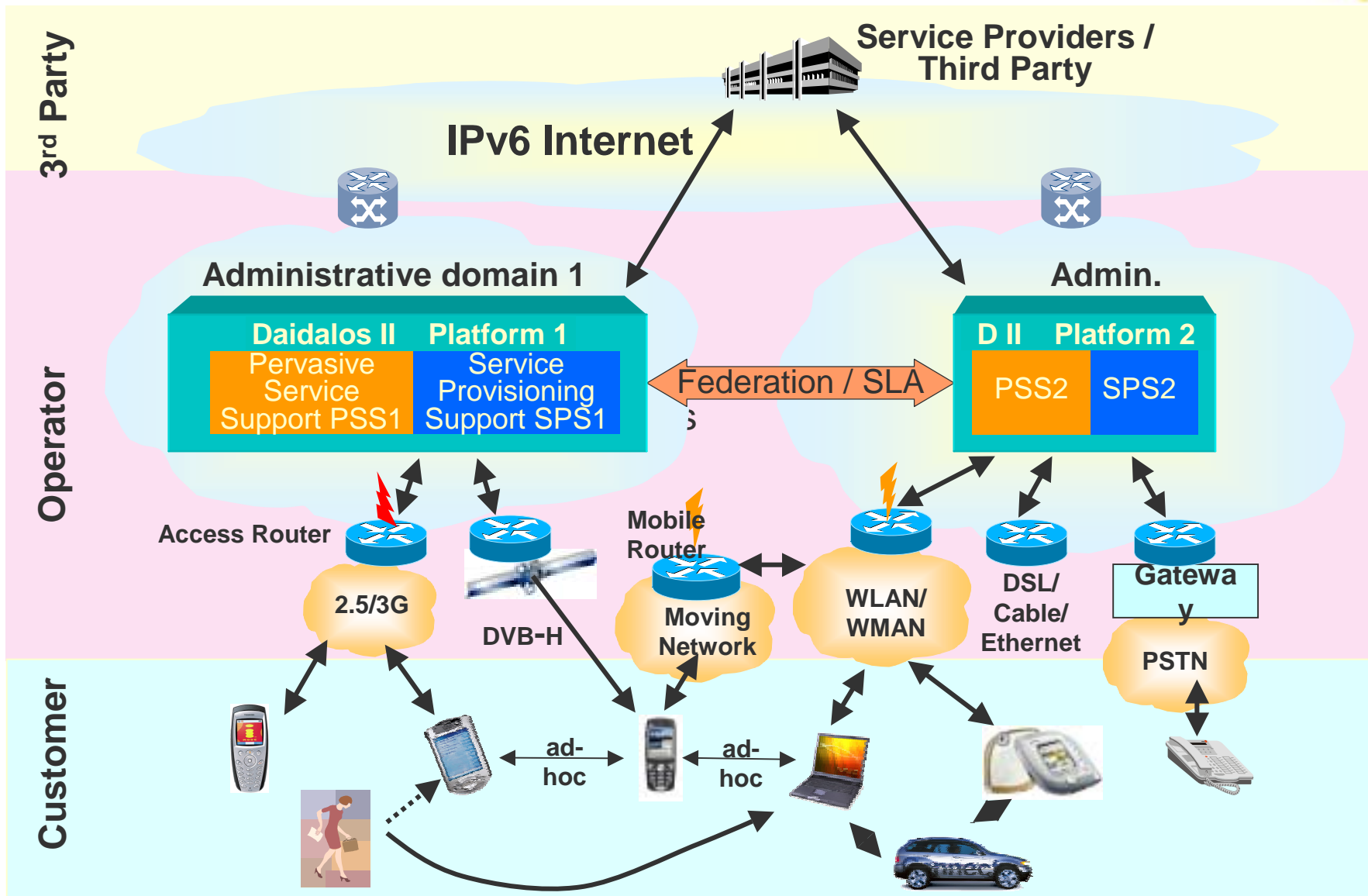
# Daidalos - Overview



- Integrate complementary, heterogeneous network technologies to provide pervasive and user-centred access to these services
- Design, prototype and validate infrastructure and components for end-to-end services
- Develop optimised signalling for communication and management support in these networks
- Demonstrate results via user-centred and scenario-based development of technology.



# Daidalos Platform

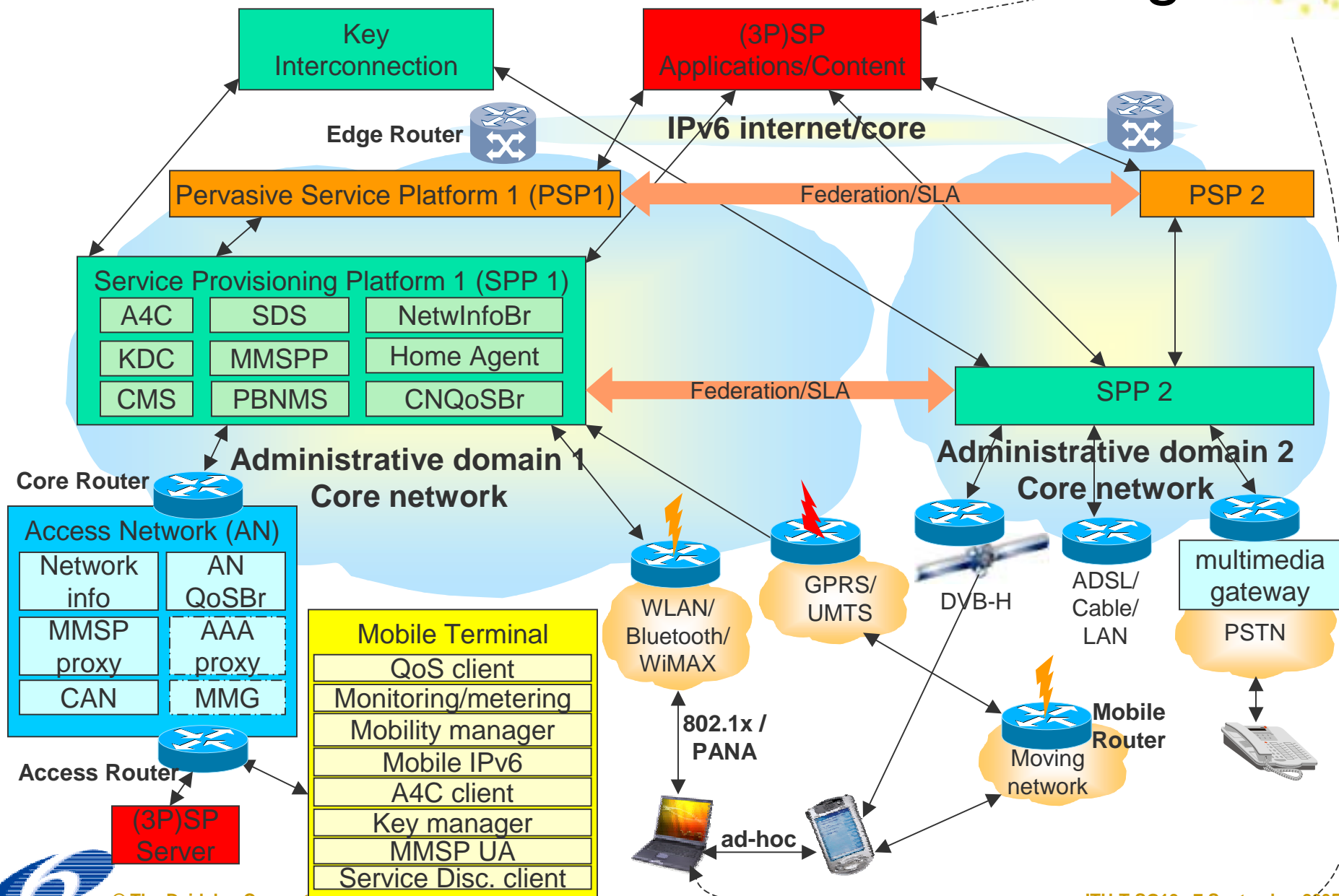


# Daidalos Key Concepts



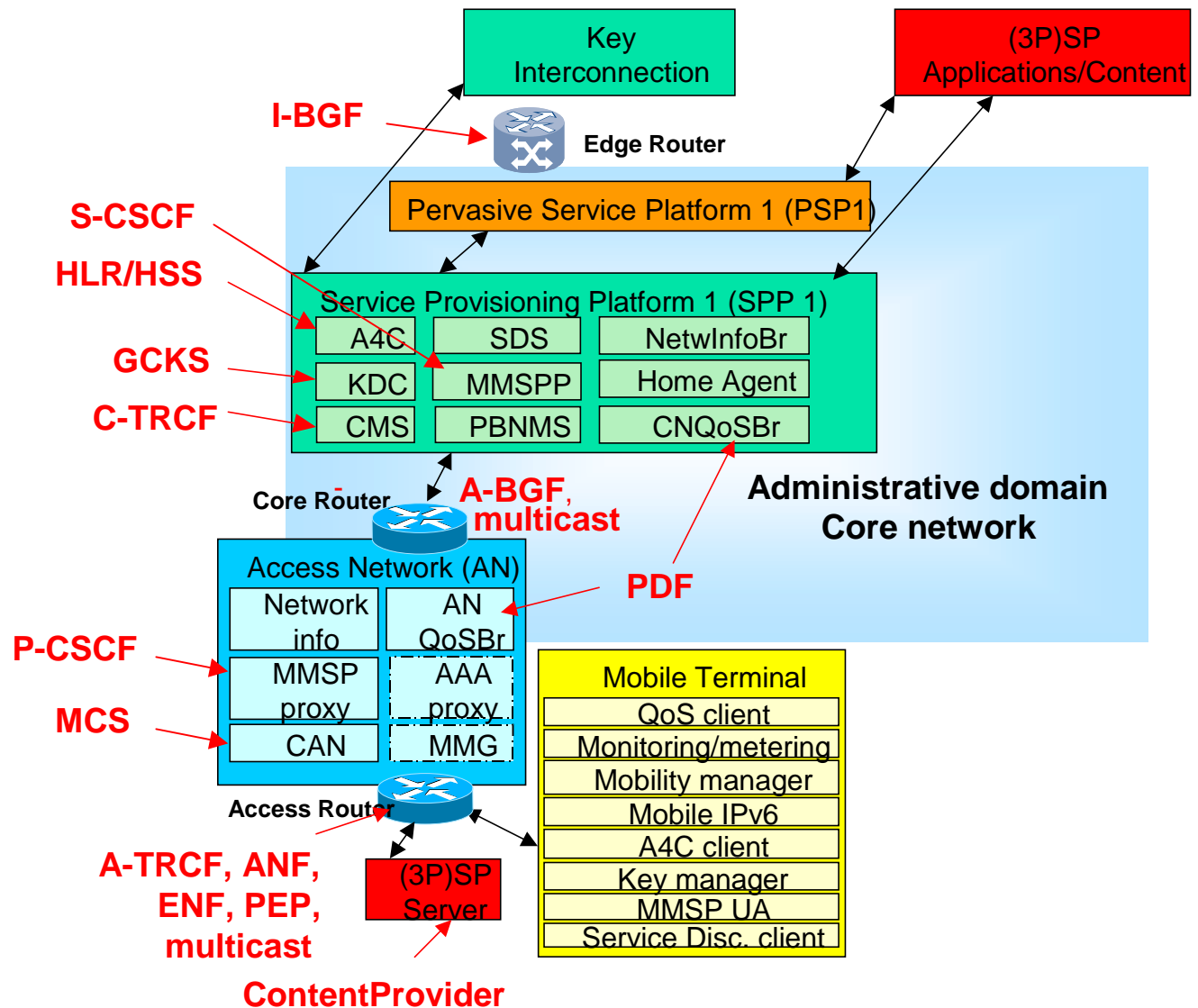
- ▶ **Key innovation and guiding concepts:**
  - **MARQS** (Integrating Mobility Management, AAA, Resource Management, QoS and Security)
  - **VID** (Virtual Identities – personalisation at all levels)
  - **USP** (Ubiquitous and Seamless Pervasiveness – includes context awareness),
  - **SIB** (Seamless Integration of Broadcast – both technology and service levels)
  - **Federation** (in terms of multiple market players, “*comperation*”: competitors in cooperation”)
- ▶ **Overall integration aspects of these concepts**

# Federation and Service Provisioning





# IMS view on Daidalos architecture

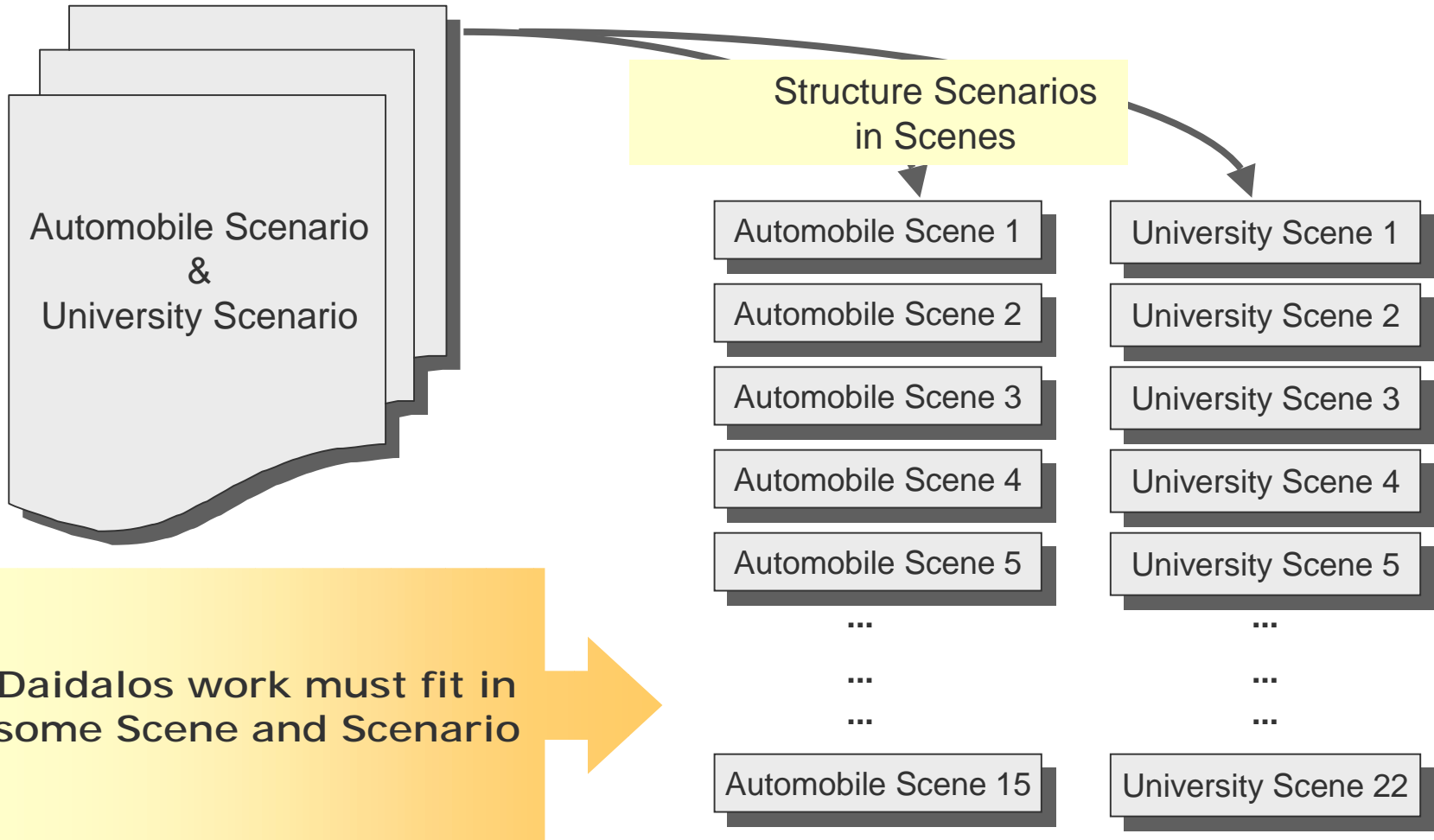






# Daidalos: Scenarios are the red line

Structured in Scenes



# Example: Daidalos Automobile Scenario



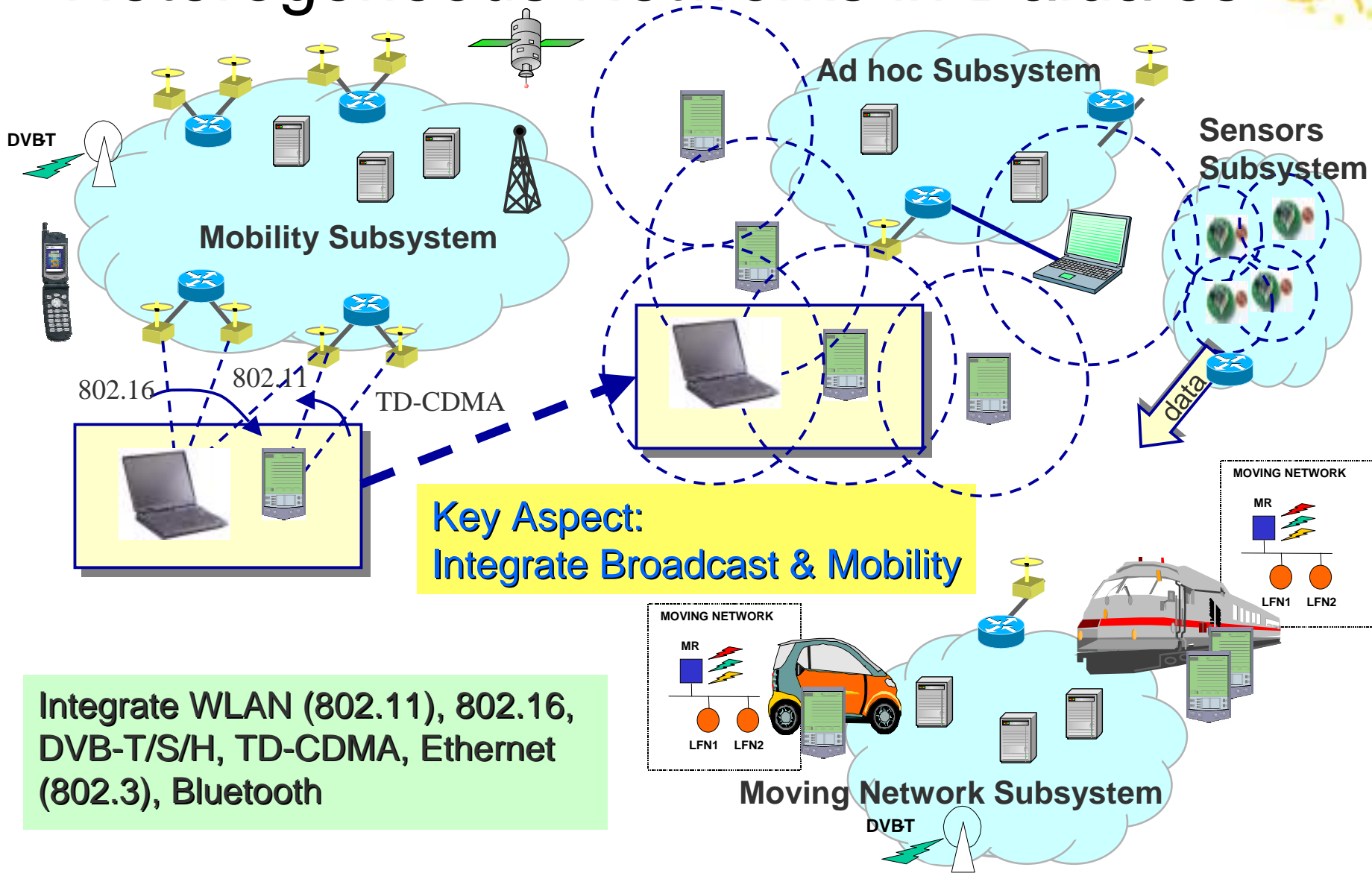
## Building blocks

- ▶ Access to personal information and services inside & outside the vehicle.
- ▶ Locating and detecting presence.
- ▶ Service and content adaptation based on QoS across operator boundaries.
- ▶ Session mobility between terminals (incl. Vehicles)
- ▶ Sensor networks for road and hazard warnings
- ▶ Broadcast services for entertainment, inter-vehicle safety, and regional traffic information services



Presence detection for automobile mobility applications

# Heterogeneous Networks in Daidalos



Integrate WLAN (802.11), 802.16, DVB-T/S/H, TD-CDMA, Ethernet (802.3), Bluetooth






# Example for MARQS – Terminal Mobility

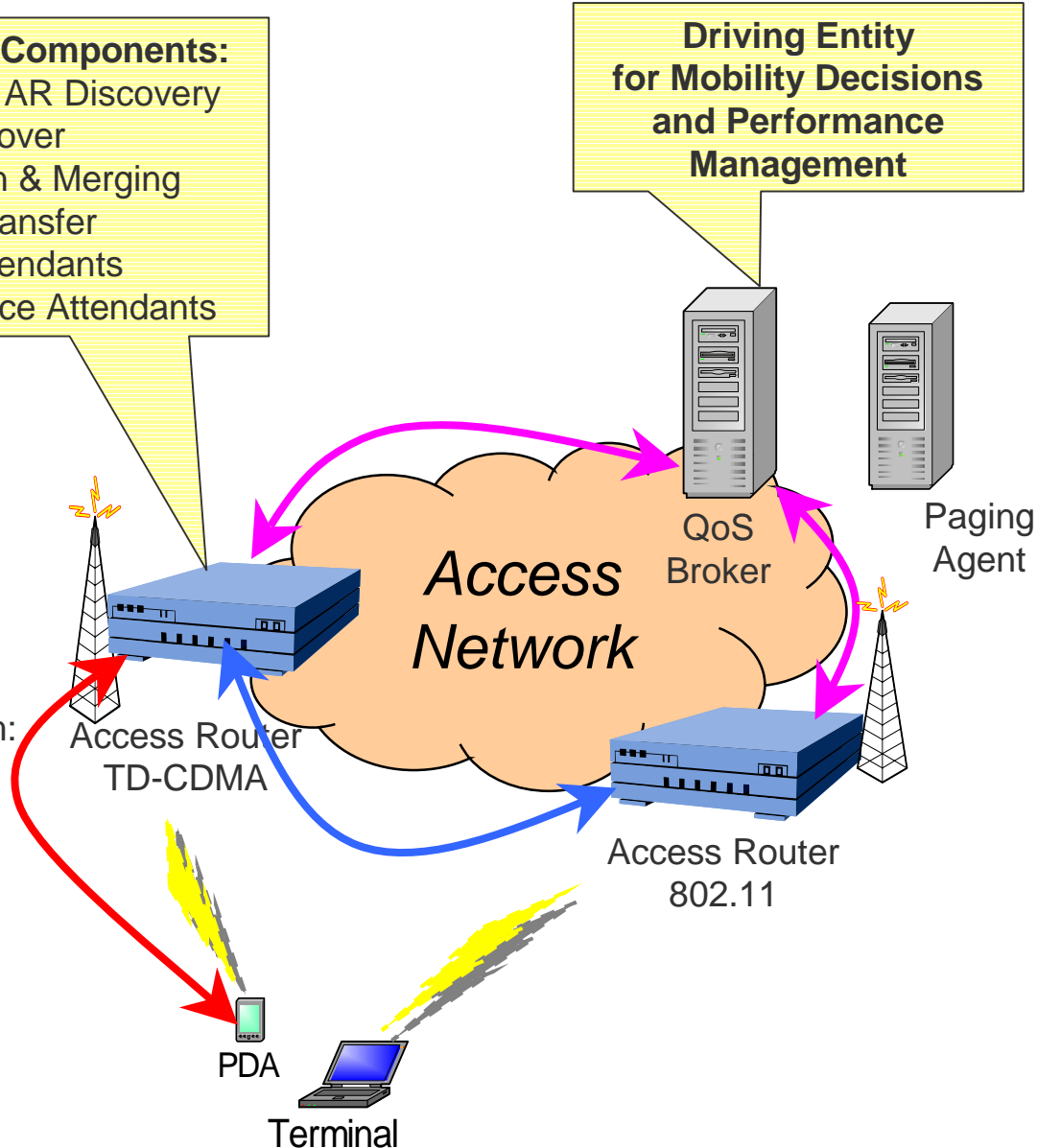


**Functional Components:**

- Candidate AR Discovery
- Fast Handover
- Duplication & Merging
- Context Transfer
- Paging Attendants
- Performance Attendants

**Driving Entity for Mobility Decisions and Performance Management**

-  Inter Access Router communication: **CARD** and **Context Transfer Protocol**
-  Communication between Access Routers and QoS Broker via **COPS** <sup>1)</sup> for mobility reasons
-  Communication on the Wireless Medium: **Fast Handover** and **CARD** messages exchanged



<sup>1)</sup> Common Open Policy Service protocol



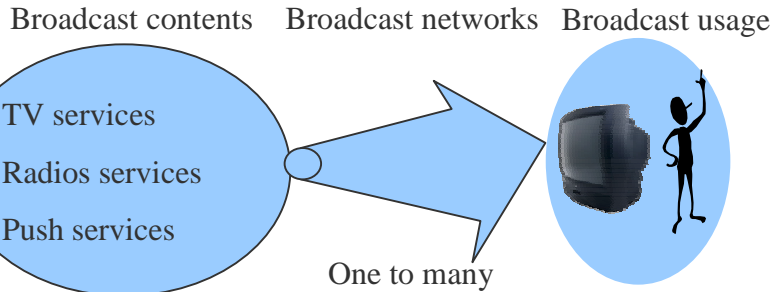
# SIB: Seamless Integration of Broadcast



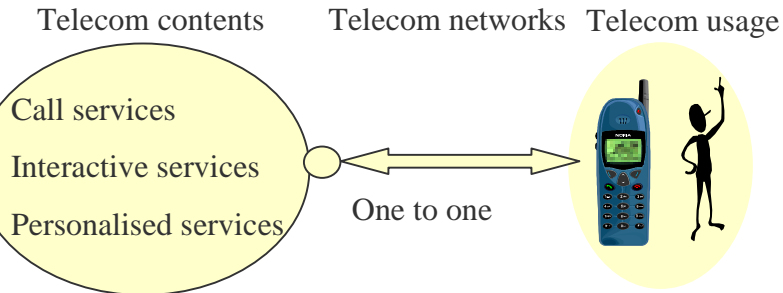
→ The integration of different ("opposite") worlds



## Broadcast environment

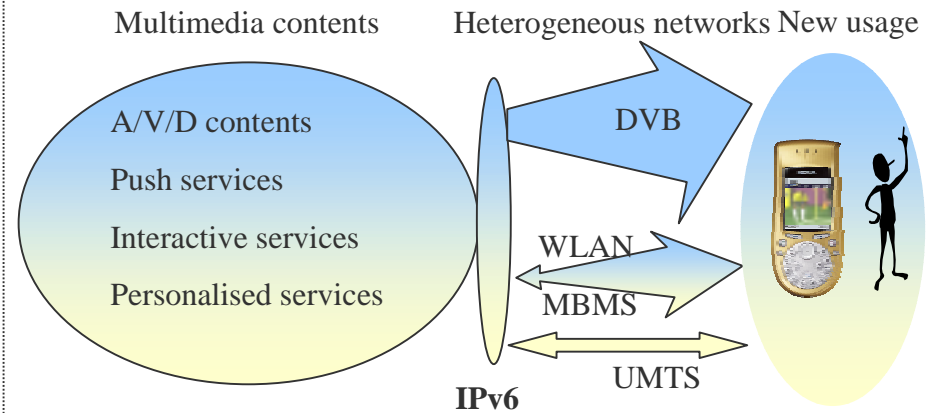


## Telecom environment

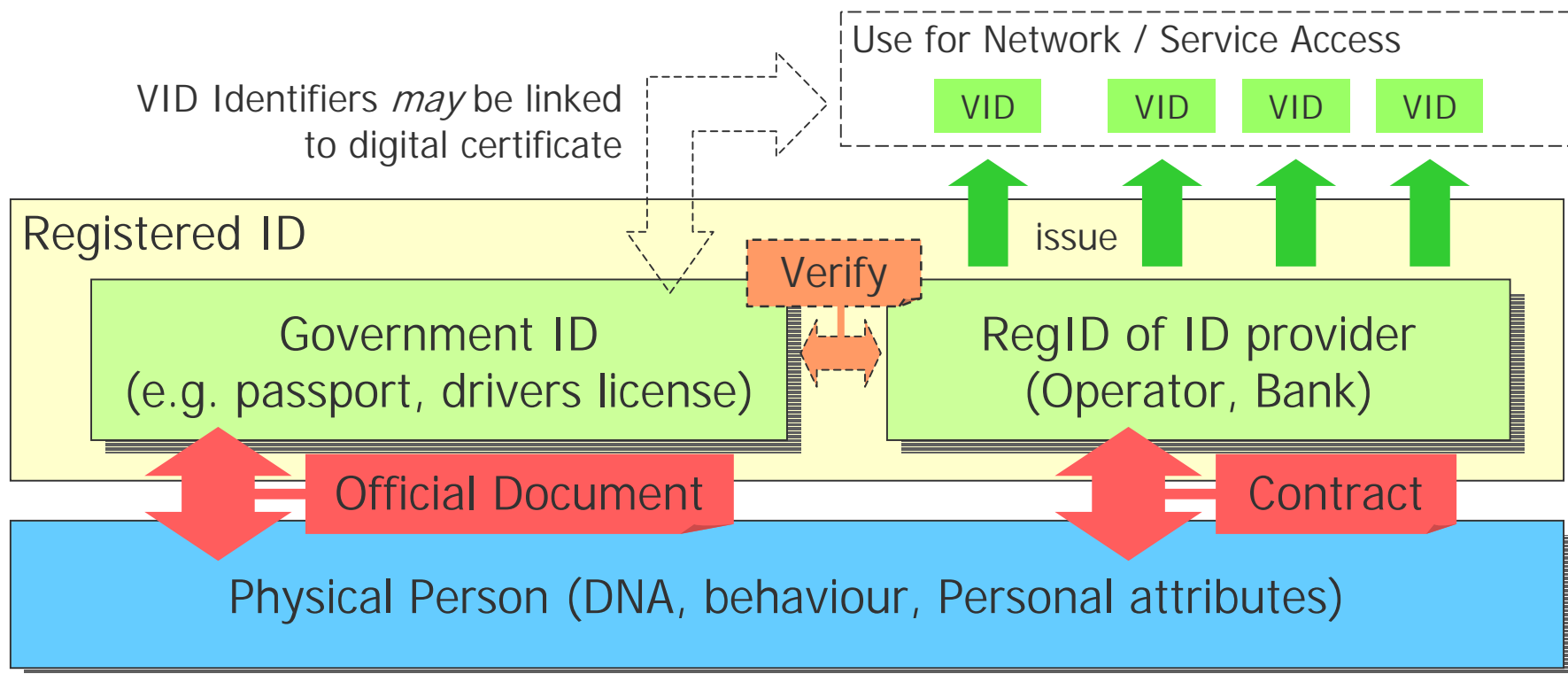


INTEGRATION

## DAIDALOS environment



# Daidalos Virtual Identity Concept



- VIDs are used for federation between domains as provider identifiers
- VIDs are used for both network and service access, as well as content
  - May be extended to other domains, e.g. gaining entrance to building
  - ID token that contains VID Identifier + encrypted artefact for A4C is used

# VID related Issues



- ▶ **RegID**: the user identifier used by operator (or bank or government office) for contract (identifier in home A4C)
- ▶ **Virtual Identity (VID)** – is a representation of the user's attributes within the system. It contains an identifier together with additional information like a profile, credentials, usage trace, etc.
- ▶ **VID Identifier**: a string that serves as an alias for a user, also called **pseudonym**, e.g. bart@daidalos
- ▶ **IDToken**: token used to authenticate with certain VID Identifier

## VID providers

- Their asset is customer trust and customer relationships
- Operators, banks and credit card companies may compete in future
- They may or may not offer services or network access

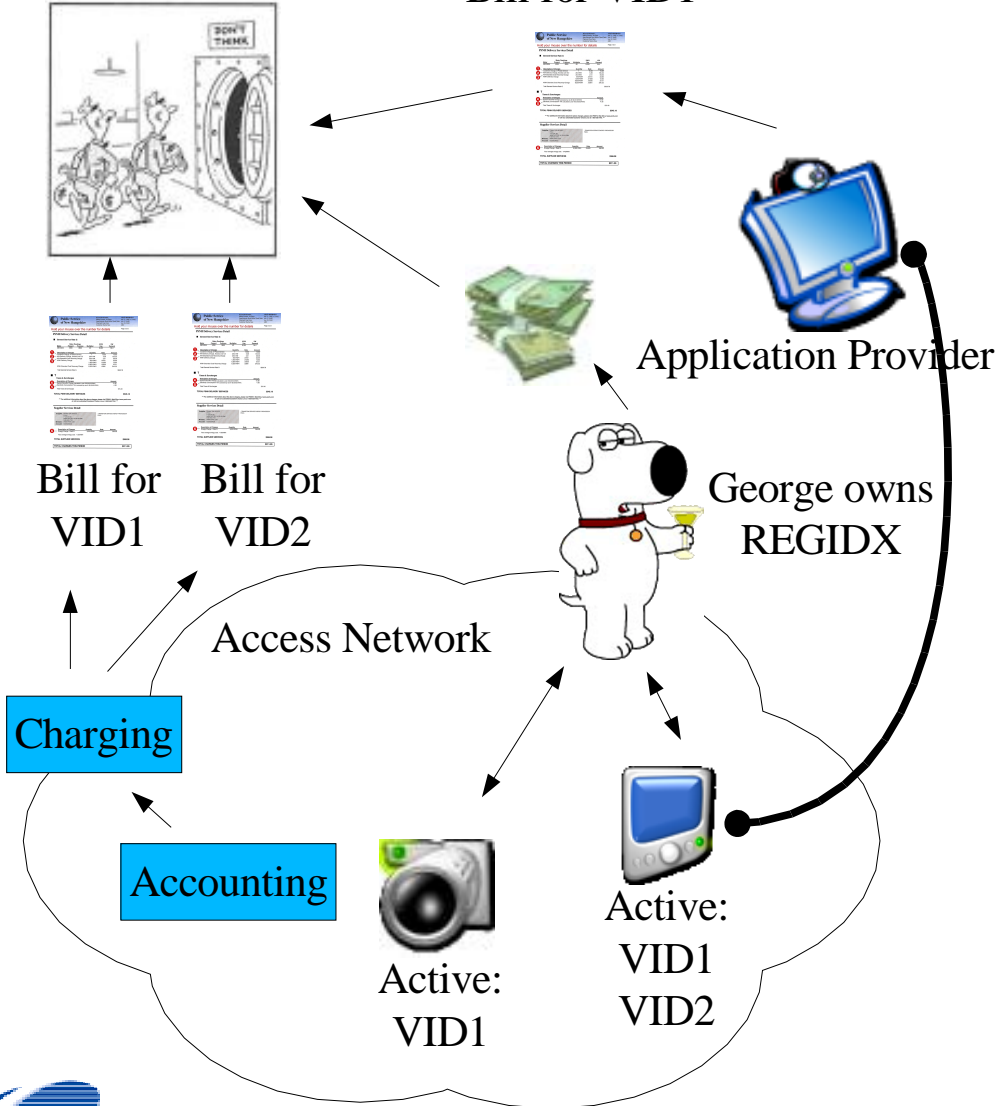


# Virtual Identities in Daidalos

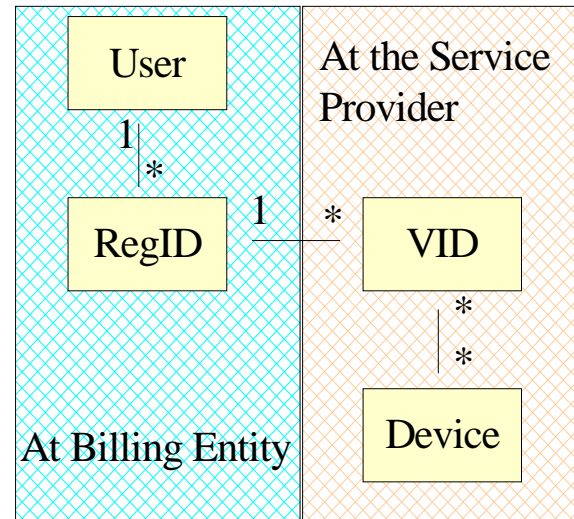


REGIDX: VID1, VID2

Bill for VID1



- ▶ The user knows his RegID and VIDs. These are his identifications in the legal system and the network, respectively.
- ▶ The Operator knows the service but not the User.
- ▶ The Billing entity knows the user but not the service.
- ▶ The user is protected from the both sides.



# Daidalos – Status and Outlook



## Status today

- ▶ Specification work in Phase I has been completed
- ▶ Implementation work is 90% complete
- ▶ Integration work at the subsystem level is advanced
- ▶ Several Daidalos publications in journals and conferences
- ▶ Contributions to standards, e.g. CARD, NEMO, Handover (IETF)
- ▶ Successful first Audit and Workshop in December 2004

## Outlook

- ▶ First Integrated “Nidaros” Demo will be shown in December 2005
- ▶ Daidalos II – due to start in January 2005, End December 2008
  - One of two project proposals in area with highest marks
  - Final negotiations ongoing



# Potential areas of interest for ITU-T



- ▶ **Overall NGN Architecture**
  - Pervasive devices, networks and services
  - FMC
  - Integration of mobility with broadcast
- ▶ **Federation allowing a dynamic market environment**
- ▶ **Mobility and QoS**
  - Device and Session (User) mobility, monitoring, fast handover
- ▶ **Identity Management, Security and AAA**
  - Virtual Identity concept applied across all layers
  - Single sign-on
- ▶ **Accounting and billing**
  - session based charging, flow based charging

**Daidalos: Evaluate benefits of becoming an ITU-T focus group**



# Possible Deliverables in 2006



- ▶ IP-based NGN Architecture
  - Full mobility and broadcast integration
  - Quality of Service and Resource Control
  - Identity Management
  - Federation for a dynamic market environment
- ▶ 2G/3G Transition to IP-based NGN Architecture
  - Migration strategies
  - One-number reachability
  - Roaming and handover
  - Inter-working components



# **Daidalos**

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