SATINE Project: Exploiting Web Services in the Travel Industry

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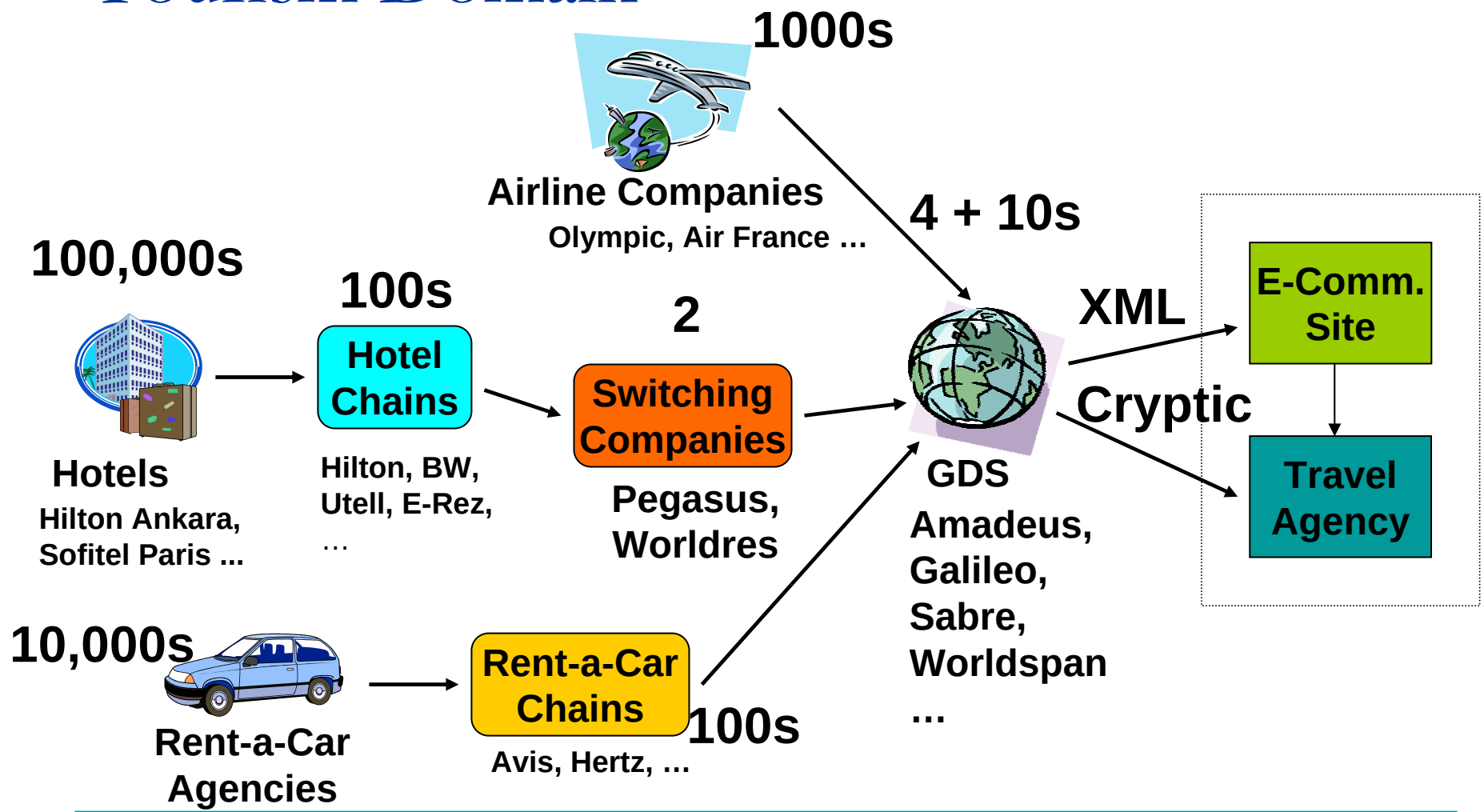
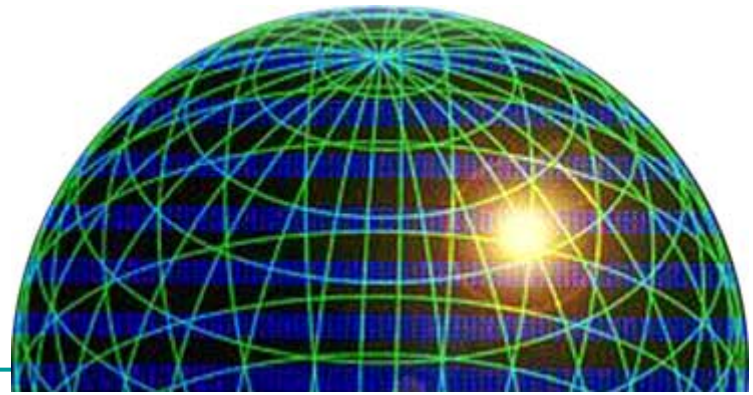
METU-SRDC

Overall Information Flow in Tourism Domain



Current Technology in Travel Information Systems: GDSs

- Currently, travel information services are dominantly provided by Global Distribution Systems (GDS)
- All the airlines, many hotel chains and car rental companies list their inventory with major GDSs
- A GDS gives its subscribers pricing and availability information for multiple travel products like flights
- Travel agents, corporate travel departments, and even Internet travel services, subscribe to one or more GDSs
- The GDSs get their revenue from the booking fees that these organizations pay
- The leading GDSs today are
  - **Sabre,**
  - **Galileo,**
  - **Amadeus, and**
  - **Worldspan**



Disadvantages of GDSs

- GDSs are legacy systems and suffer from the following problems:
  - Mostly they rely on their own private networks
  - GDSs are mainly for human use
  - They have difficult to use cryptic languages
  - A request to the system usually involves more than one interaction with the person on the terminal
  - Furthermore, GDSs have limited speed and search capabilities
  - **It is difficult to interoperate them with other systems and data sources**
  - Furthermore, GDSs raise their booking fees annually

Standard Based Interoperability in the Travel Domain: Open Travel Alliance (OTA)

- The travel industry has formed a consortium called the Open Travel Alliance (OTA) to provide for interoperability
- OTA is producing XML schemas of the message specifications to be exchanged between the trading partners
- These messages include:
  - availability checking,
  - booking,
  - rental,
  - reservation,
  - reservation canceling and modifying,
  - query services for service details and quality,
  - insurance quote request for all of the hotel, airline, vehicle sectors as well as, etc.

Web Services in Travel Industry

- A few early adopters have started to develop OTA based Web services

Sabre Travel Network Sabre and DATALEX Datalex are among the first companies to develop OTA based Web services.

- Sabre Web Services provide all the functionality needed to sell travel
- Galileo also provides a Web service based solution and claims to have cut down the development time by %80

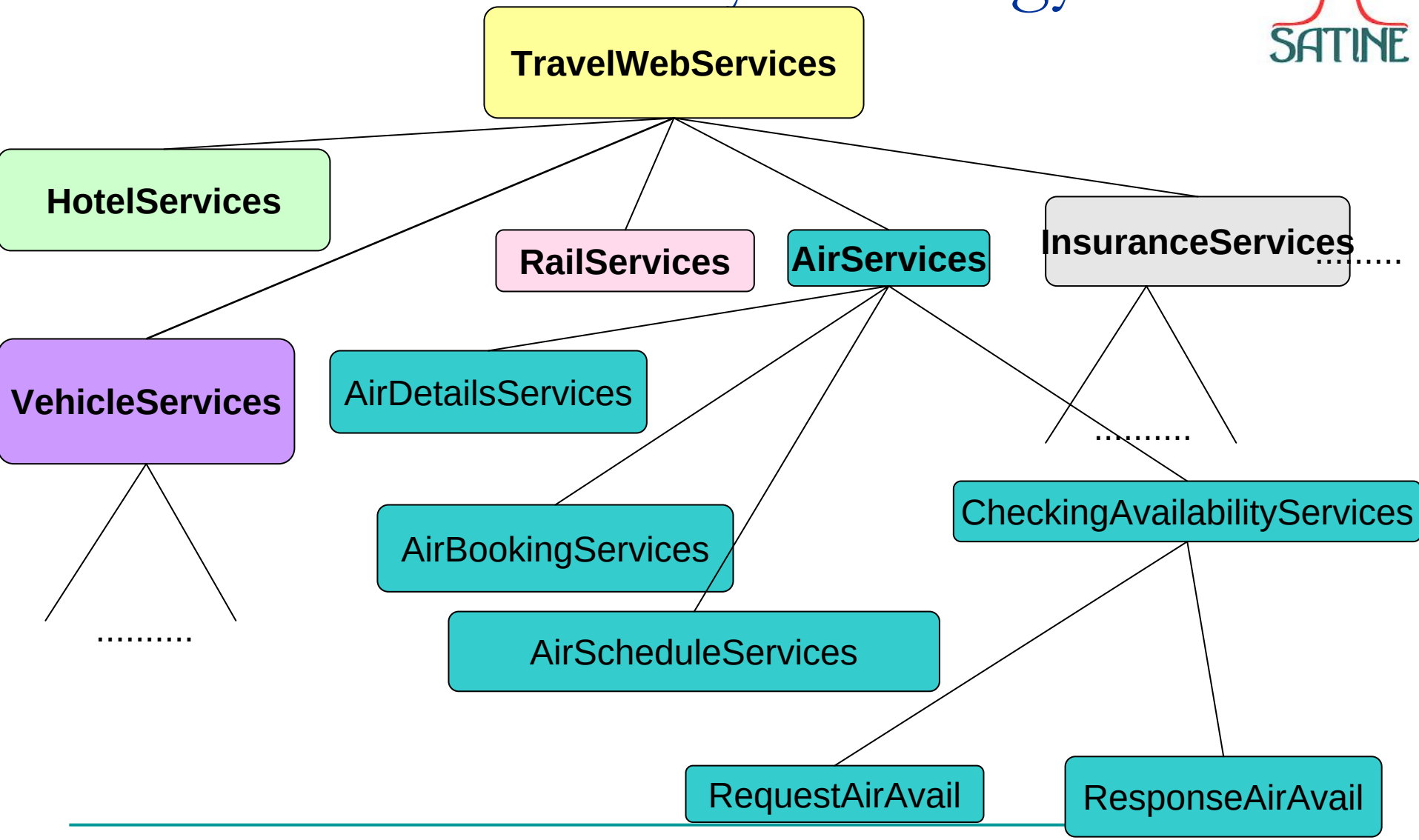
What Satine Contributes?

- **Semantic-based Interoperability**
  - Not every travel company can be OTA compliant
  - The interoperability of all sorts of Web services can better be addressed at the semantic level through ontology mapping
  - Semantics is necessary for the discovery of travel Web services
  - Semantics is necessary for the discovery of Web service registries
- **Peer-to-peer technology for semantic based discovery:**
  - For the discovery of Web services
  - There could be Web services not registered to any service registry but simply made available through a Web site
  - Providing a mechanism to facilitate the automated discovery of such services is also needed

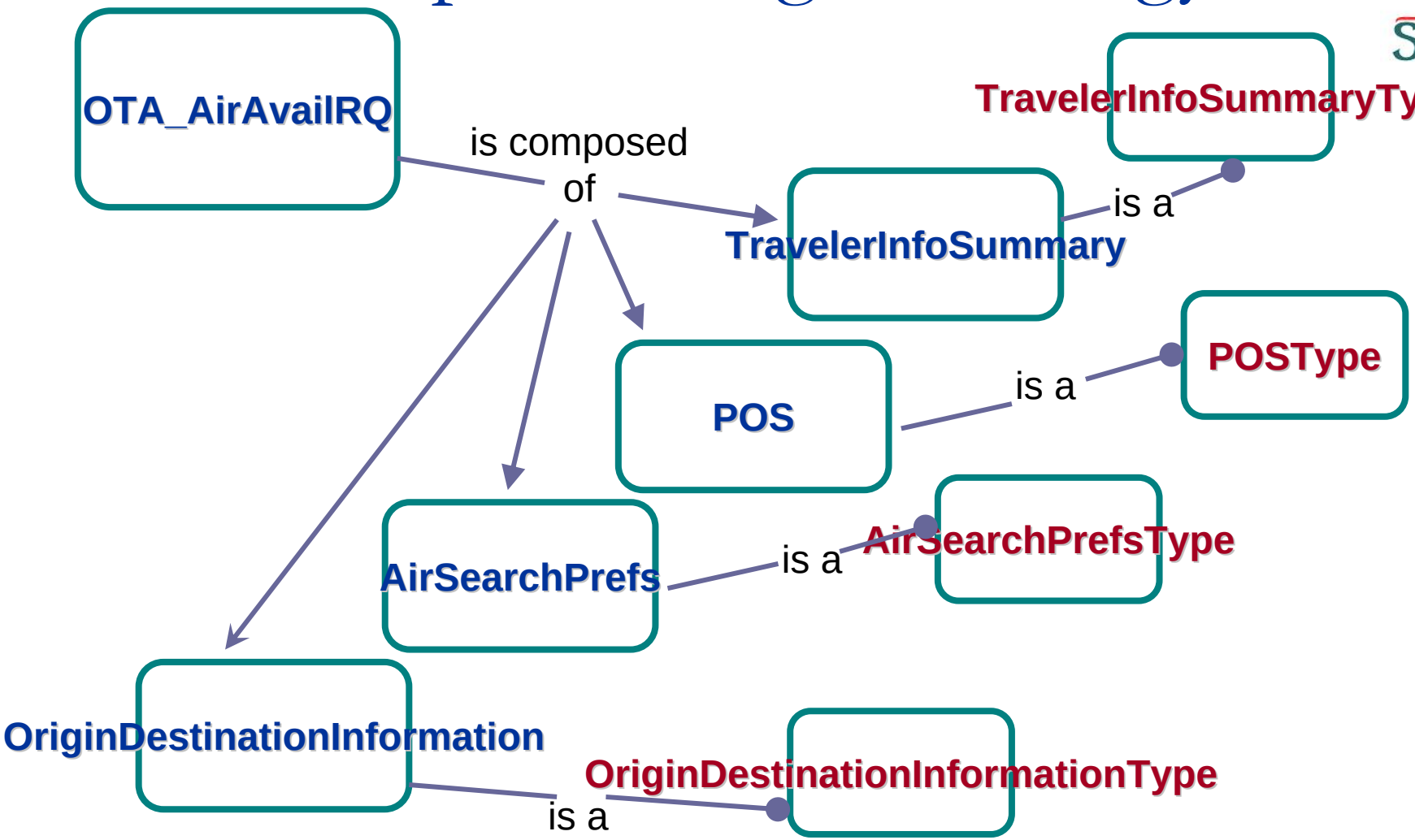
Service Semantics in Travel Domain

- We need domain specific ontologies!
- Generic service semantics can be defined through DAML-S (later OWL-S) upper ontology
- However some other properties of the services depend on the application domain
- To facilitate the discovery of the Web services, there is a need for an ontology to describe service functionality in the domain

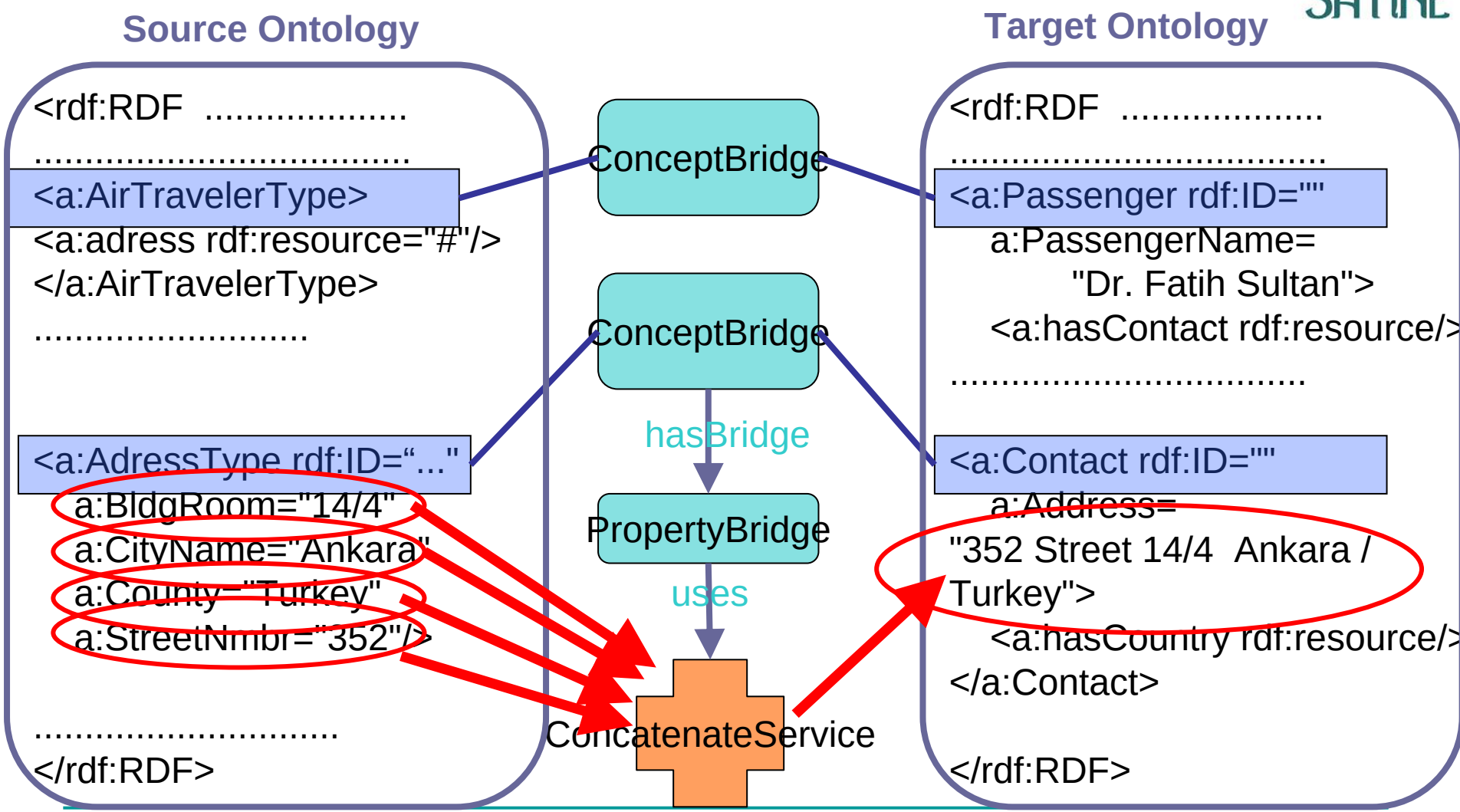
Service Functionality Ontology



An Example Message Ontology



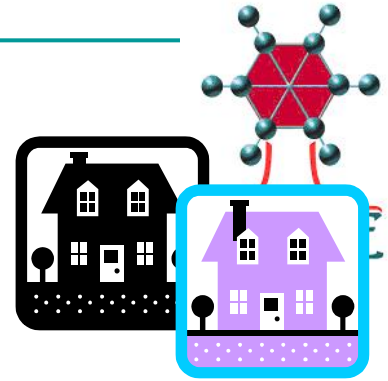
Ontology Mapping through MAFRA



Overview

Travel Service Requester

Service Registry hosting Hotel services



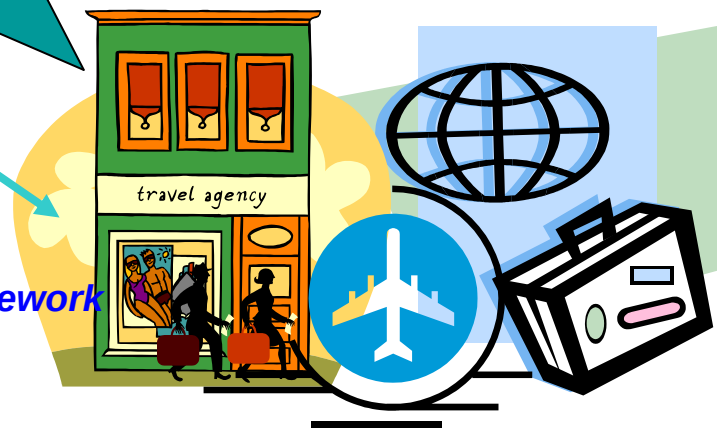
Small Hotels not registered to GDSs

Not connected to each other

SATINE

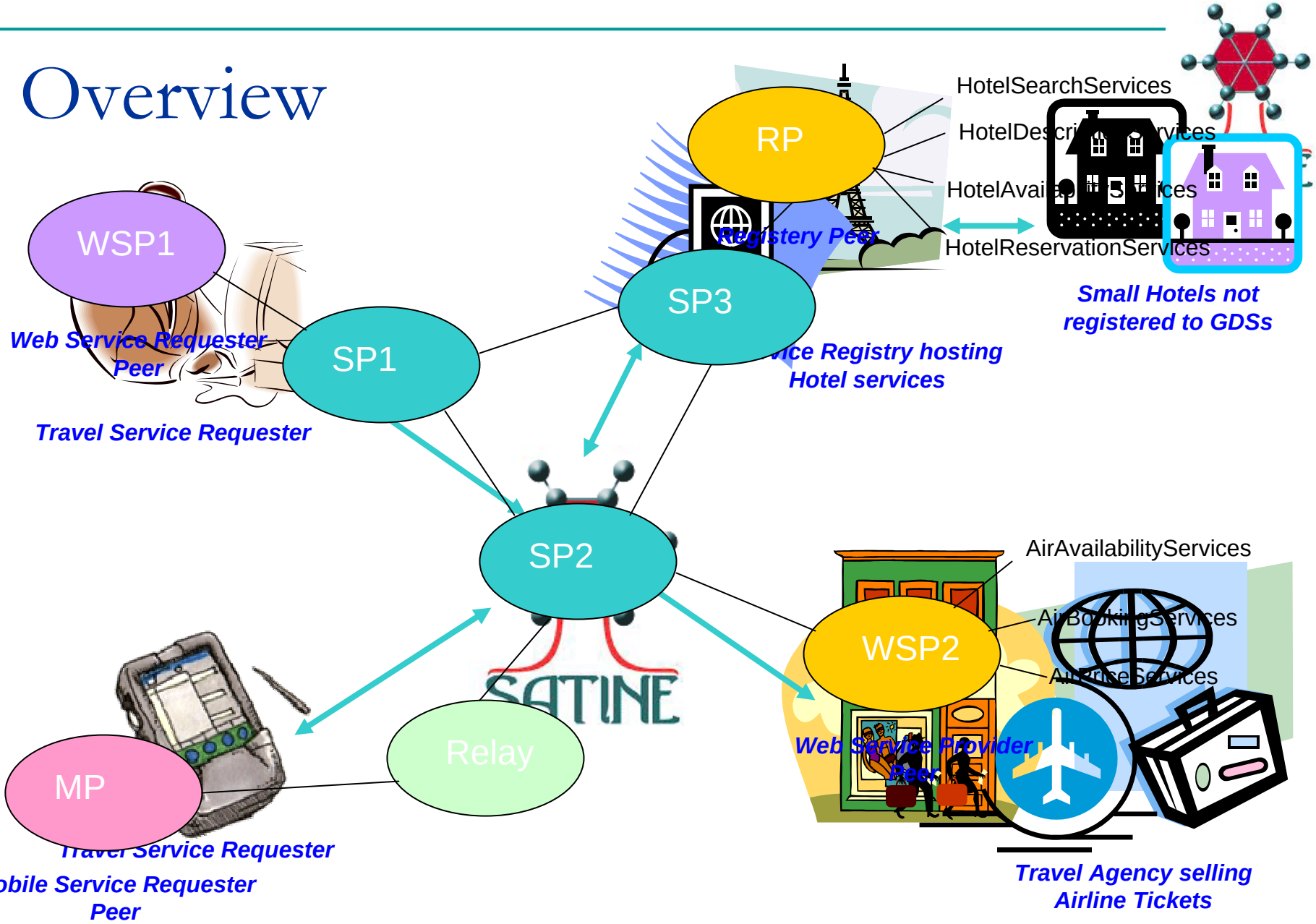
semantic-based interoperability framework for the tourism industry

Travel Service Requester

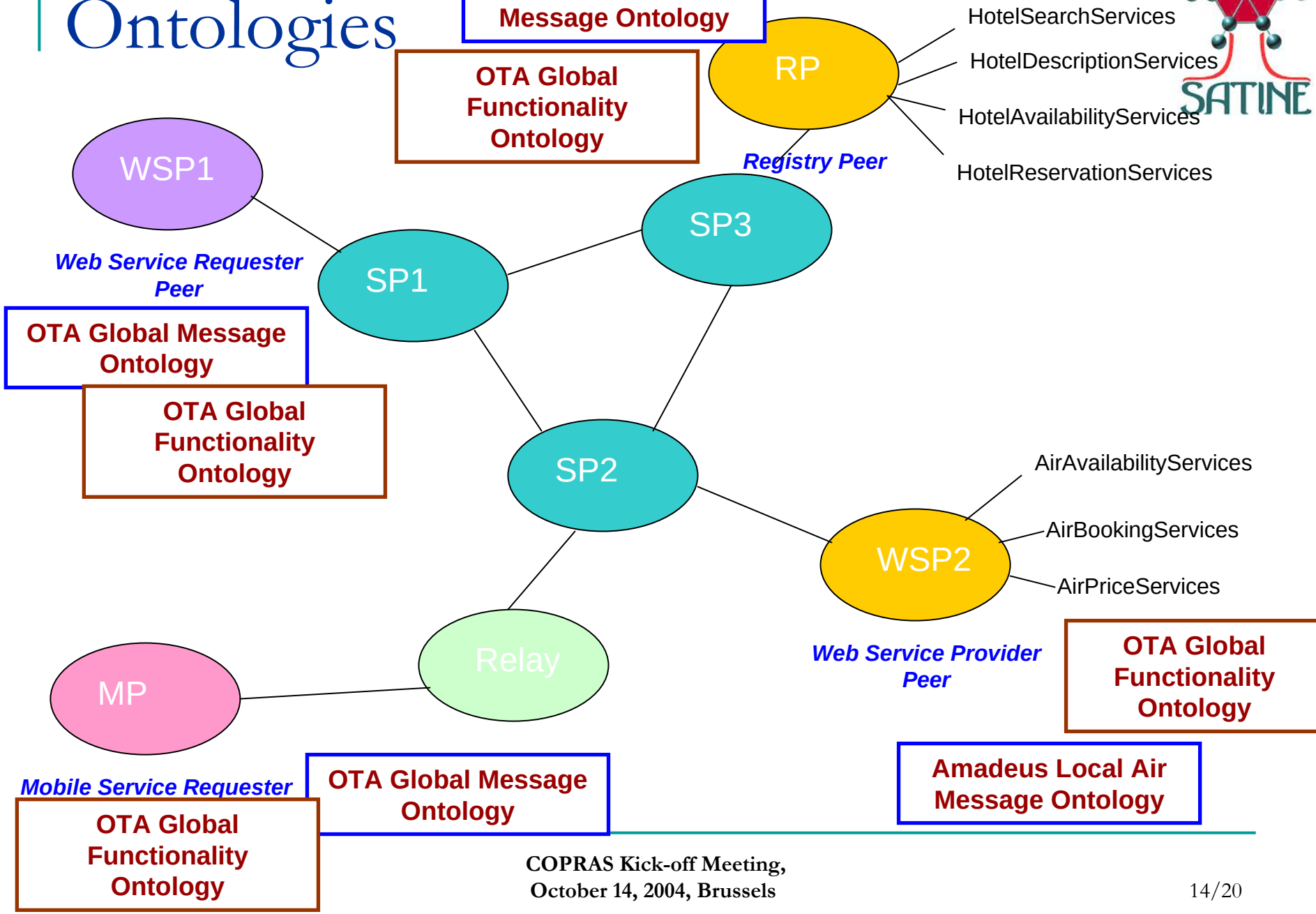


Travel Agency selling Airline Tickets

Overview


RP
HotelSearchServices
HotelReservationServices
Registery Peer
WSP1
SP1
SP3
SP2
Web Service Requester Peer
Travel Service Requester
Small Hotels not registered to GDSs
Hotel services
AirAvailabilityServices
WSP2
Relay
MP
Web Service Provider Peer
Travel Service Requester
Mobile Service Requester Peer
Travel Agency selling Airline Tickets

Ontologies


Amadeus Local Hotel Message Ontology
OTA Global Functionality Ontology
RP
HotelSearchServices
HotelDescriptionServices
HotelAvailabilityServices
HotelReservationServices
Registry Peer
WSP1
Web Service Requester Peer
SP1
SP3
OTA Global Message Ontology
OTA Global Functionality Ontology
SP2
AirAvailabilityServices
AirBookingServices
AirPriceServices
WSP2
Web Service Provider Peer
OTA Global Functionality Ontology
Relay
MP
Mobile Service Requester
OTA Global Message Ontology
OTA Global Functionality Ontology
Amadeus Local Air Message Ontology

SATINE Contributions to Standards: Already Achieved

- A Proposal for a standard is submitted to OASIS ebXML Registry Semantic Content Management Subcommittee (SC) entitled:

- "Enhancing ebXML Registries to Make them OWL Aware"

- Authors: Asuman Dogac (METU, Turkey), Yildiray Kabak (METU, Turkey), Gokce B. Laleci (METU, Turkey), Carl Mattocks (CheckMi, USA), Farrukh Najmi (Sun Micro Systems, USA), Jeff Pollock (Network Inference, USA)
- The proposal describes:
  1. How to represent OWL ontologies in ebXML registries
  2. How to process the additional OWL semantics through stored procedures
  3. Available at http://www.srdc.metu.edu.tr/webpage/publications.html

     2004-8: "Enhancing ebXML Registries to Make them OWL Aware"

SATINE Contributions to Standards: Plans

- We plan to submit an eBusiness semantically enriched Web services based interoperability platform proposal for the Travel Domain to:
  - **CEN/ISSS eBusiness Interoperability Forum (eBIF)**
  - **e-business Board for European Standardization (eBES)**

SATINE Contributions to Standards: Plans

- METU-SRDC commented on OASIS ebXML Registry Semantic Content Management SC Use Cases

- We proposed to develop an OWL-QL abstract syntax compliant Filter Query syntax for ebXML registries

SATINE Contributions to Standards: Plans

- We have developed:
  - A local ontology for Amadeus messages
  - A global ontology for OTA (Open Travel Alliance)
  - Used ontology mappings in accessing Amadeus Web services through OTA compliant messages
- Result:
  - Amadeus system can be reached through Web services without the need to know their message structures
- This work can be presented to OTA

SATINE Web Site

- Project Web site:

http://www.srdc.metu.edu.tr/webpage/projects/satine/

- **The code and the related papers are available from project Web site and from SourceForge**

Thank you for your attention!