

# **The Mobility Project**

**Building network of  
web-servers for exchange of  
data on student mobility**

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# Agenda

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- Real life scenarios (motivation)
- History and current state of the project
- Technologies
- Plans and conclusions

# Real life scenario - 1

## University of Warsaw

- **December-January:**
  - Start of the **recruitment** for outgoing mobility
  - **List of offers** (coming from international agreements) is available for students on the web

INTRODUCTION

TESTS

EXAM REPORTS

EDITING COURSES

EXAMS  
REGISTRATION

POSTULATES

GIVING OPINIONS

STUDENT MOBILITY

▶ coordinated faculties

 ▶ Faculty of  
 Mathematics,  
 Informatics, and  
 Mechanics
 

- ▶ signed agreements
- ▶ unsigned agreements
- ▶ assign outgoing mobility
- ▶ assigned outgoing mobilities
- ▶ study programmes
- ▶ mobility offers
- ▶ enrollments
- ▶ recommendation templates

 ▶ my commissions  
 ▶ my opinions

SURVEYS RESULTS

## Coordination of Erasmus student mobility

 at the faculty/unit: **Faculty of Mathematics, Informatics, and Mechanics** [\[select another\]](#)


This page displays **Signed bilateral agreements** that fulfil following criteria:

- have status other than 'unsigned' or 'under negotiation'
- terms and conditions of the agreement are linked to following unit: **Faculty of Mathematics, Informatics, and Mechanics**
- terms, conditions and the agreement itself are still valid,
- terms, conditions and the agreement itself come into effect within a year.

### FILTER OPTIONS

Status: Id: Country: Institution name: Erasmus code: From: To: 

CLEAR FILTERS

APPLY

### Signed faculty/unit agreements

Showing first 30 table entries ... [show more](#) | [show all](#)

No.	Country	Erasmus code	Institution name	Qualifications stage	Id	From	To	Options
1	(in Polish) Austria	A WIEN01	Universität Wien	podpisana	517/E/XII06	2007-07-01	2010-09-30	<a href="#">details</a>
2	(in Polish) Dania	DK ODENSE01	Syddansk Universitet	podpisana	659/E/II07	2007-07-01	2010-09-30	<a href="#">details</a>
3	(in Polish) Dania	DK KOBENHA01	Kobenhavns Universitet	podpisana	214/E/XI06	2007-07-01	2010-09-30	<a href="#">details</a>
4	(in Polish) Dania	DK ARHUS01	Aarhus Universitet	podpisana	193/E/XI06	2007-07-01	2010-09-30	<a href="#">details</a>
5	(in Polish) Francja	F PARIS013	Université Paris Nord (Paris XIII)	podpisana	282/E/XI06	2007-07-01	2010-09-30	<a href="#">details</a>
6	(in Polish) Francja	F PALAISE01	Ecole Polytechnique	podpisana	521/E/XII06	2007-07-01	2010-09-30	<a href="#">details</a>
7	(in Polish) Hiszpania	E VALENCI01	Universidad de Valencia	podpisana	462/E/XII06	2007-07-01	2010-09-30	<a href="#">details</a>
8	(in Polish) Hiszpania	E BARCELO02	Universitat Autònoma de Barcelona	podpisana	654/E/II07	2007-07-01	2010-09-30	<a href="#">details</a>
9	(in Polish) Niemcy	D SAARBRU01	Universität des Saarlandes	podpisana	283/E/XI06	2007-07-01	2010-09-30	<a href="#">details</a>
10	(in Polish) Niemcy	D MUNCHEN01	Ludwig-Maximilians-Universität München	podpisana	464/E/XII06	2007-07-01	2010-09-30	<a href="#">details</a>
11	(in Polish) Niemcy	D DARMSTA01	Technische Universität Darmstadt	podpisana	540/E/I07	2007-07-01	2010-09-30	<a href="#">details</a>
12	(in Polish) Szwecja	S UPPSALA01	Uppsala Universitet	podpisana	202/E/XI06	2007-07-01	2010-09-30	<a href="#">details</a>
13	(in Polish) Portugalia	P LISBOA02	Universidade de Lisboa	podpisana	995/E/II08	2008-07-01	2011-09-30	<a href="#">details</a>
14	(in Polish) Wielka Brytania	UK ABERDEE01	University of Aberdeen	podpisana	972/E/I08	2008-07-01	2011-09-30	<a href="#">details</a>
15	(in Polish) Wielka Brytania	UK EDINBUR01	The University of Edinburgh	przedłużona	1130/E/X08	2009-07-01	2011-09-30	<a href="#">details</a>

## Real life scenario - 2

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- **March:** Lists of nominations are ready, approved by departmental Erasmus coordinators
- **May:** Learning Agreement for each student is ready, approved by home and partner coordinators

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▶ Faculty of  
Mathematics,  
Informatics, and  
Mechanics▶ signed  
agreements▶ unsigned  
agreements▶ assign outgoing  
mobility▶ assigned  
outgoing  
mobilities▶ study  
programmes

▶ mobility offers

▶ enrollments

▶ recommendation  
templates

▶ my commissions

▶ my opinions

SURVEYS RESULTS

## Coordination of Erasmus student mobility

at the faculty/unit: Faculty of Mathematics, Informatics, and Mechanics [select another]

### Assigned outgoing student mobilities

PRINT THE LIST

 Polish
  English

SEND LIST TO COORDINATORS

 Polish
  English

→ export the list to file in CSV format

→ send e-mail to all 23 recipients from table below.

#### FILTER OPTIONS

Qualification stage: (all)

Status of mobility: Active

Mobility type: (all)

Status of LA: (all)

Academic year: 2010

Institution name: Erasmus code: Country: Granted no sooner than: Granted no later than: 

CLEAR FILTERS

APPLY

SELECTED STUDENT

OR

student's name

APPLY

Showing elements 1..23 (out of 23)

No.	Surname	Name	Country	Erasmus code	Institution name	Date of assignment	Acad. year	Mobility type	Status of mobility	Qualifications stage	Options
1	Baranowska Katarzyna		Niemcy	D MUNCHEN01	Ludwig-Maximilians-Universität München	2010-02-27	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
2	Bendowski Michał		Holandia	NL AMSTERDQ2	Vrije Universiteit Amsterdam	2010-02-24	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
3	Chapska Monika		Holandia	NL AMSTERDQ2	Vrije Universiteit Amsterdam	2010-02-12	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
4	Czeczko Artur		Francja	F PARIS013	Université Paris Nord (Paris XIII)	2010-03-02	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
5	Dudzik Krzysztof		Niemcy	D SAARBRU01	Universität des Saarlandes	2010-02-14	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
6	Falkiewicz Tomasz		Hiszpania	E LASPAL01	Universidad de Las Palmas de Gran Canaria		2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
7	Freus Oktawian		Portugalia	P PORTO02	Universidade do Porto	2010-02-25	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
8	Geras Krzysztof		Wielka Brytania	UK EDINBUR01	The University of Edinburgh	2010-02-24	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
9	Jarzębowski Przemysław		Wielka Brytania	UK EDINBUR01	The University of Edinburgh	2010-02-24	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
10	Jurek Michał		Niemcy	D MUNCHEN01	Ludwig-Maximilians-Universität München	2010-02-27	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement
11	Kacperski Andrzej		Dania	DK KOBENHA01	Kobenhavns Universitet	2010-02-24	2010	Studies	Active	Finished	<input type="checkbox"/> → view → learning agreement

EDITING COURSES

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- ▶ coordinated faculties
  - ▶ Faculty of Mathematics, Informatics, and Mechanics
    - ▶ signed agreements
    - ▶ unsigned agreements
    - ▶ assign outgoing mobility
    - ▶ assigned outgoing mobilities
      - ▶ learning agreement
        - ▶ **decision**
    - ▶ study programmes
    - ▶ mobility offers
    - ▶ enrollments
    - ▶ recommendation templates
  - ▶ my commissions
  - ▶ my opinions

SURVEYS RESULTS



Learning Agreement has been approved. It should be printed and signed (correspondence will ensue). Subsequent edition of the agreement is possible until its expiration date in USOSweb.

## In reference to

Student:	Michał Bendowski
Study program:	DZ-INF - Bachelor's degree, first cycle programme, Computer Science
Period of study:	I3 - Computer Science, 3rd grade
Term:	2009 - Academic year 2009/10

## General information

Decision number:	102582
Decision date:	2010-03-23
Decision type:	REPLACEMENT
Decision state:	<b>W</b> - to be completed modification deadline: <b>2011-03-15</b>
Stage of creation:	Accepted
Next period of study:	(no change)
Comment:	Porozumienie w sprawie programu zajęć (LA)

## External courses

No	Name	Term	Passed	ECTS	Language		Coordinator	Status	Options
Current <b>approved</b> course list									
1.	Logical Verification	2010L	NO	6.00	English	none / none	(unknown)	Z - approved	
	LAB WYK EGZ Educational institution: Vrije Universiteit Amsterdam								
2.	Network Programming	2010L	NO	9.00	English	none / none	(unknown)	Z - approved	
	WYK LAB EGZ Educational institution: Vrije Universiteit Amsterdam								
3.	Operating Systems Practical	2010L	NO	9.00	English	none / none	(unknown)	Z - approved	
	LAB Educational institution: Vrije Universiteit Amsterdam								
4.	Scientific Writing in English	2010L	NO	3.00	(unknown)	none / none	(unknown)	Z - approved	
	PRA-P WYK Educational institution: Vrije Universiteit Amsterdam								
5.	Software Configuration Management	2010L	NO	6.00	English	none / none	(unknown)	Z - approved	
	CW PRA-P WYK Educational institution: Vrije Universiteit Amsterdam								
Total number of ECTS credits attempted:				33.00					

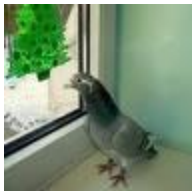
## Real life scenario - 3

- **International Relations Office** is ready to deliver lists of nominated students to partner institutions
  - Personal data
  - Learning agreement
  
- When student returns (after a semester or a year) International Relations Office would like to get:
  - Transcript of records
  - Exact dates of arrival and departure (to calculate exact amount of scholarship)



# Real life scenario – 4

## Sending data from home to partner institution



**e-mail**



(all pictures are obtained from the Internet)

# Real-life Wishful scenario – 5 (list of nominated students)

USOS - [Przyjazdy]

Akcja Edycja Zapytanie Blok Rekord Pole Okno Pomoc

Program <wszystkie> Etap <wszystkie> Cykl dydaktyczny <wszystkie> Miejsce <wszystkie>

Osoby

Projekt MOBILITY

Kod dyscypliny	Poziom studiów	Rok. akad. przyjazdu	Okres przyjazdu	Jednostka przyjmująca	Czas utworzenia wpisu
08.4	2	2008	S1	Facolta di Lingue e Letterature straniere	19.06.2009 12.38.33
10.0	4	2008	S2	Facolta di Giurisprudenza, Istituto di Diritto e	19.06.2009 12.38.33
10.0	2	2008	S1	Facolta di Lingue e Letterature straniere	20.06.2009 17.42.52
10.0	4	2008	S2	Facolta di Giurisprudenza, Istituto di Diritto e	20.06.2009 17.42.52

Jednostka wysyłająca  
Instytut Archeologii

Nazwisko i imię koordynatora jednostki przyjmującej  
Prof. Modrzewska-Pianetti lwona

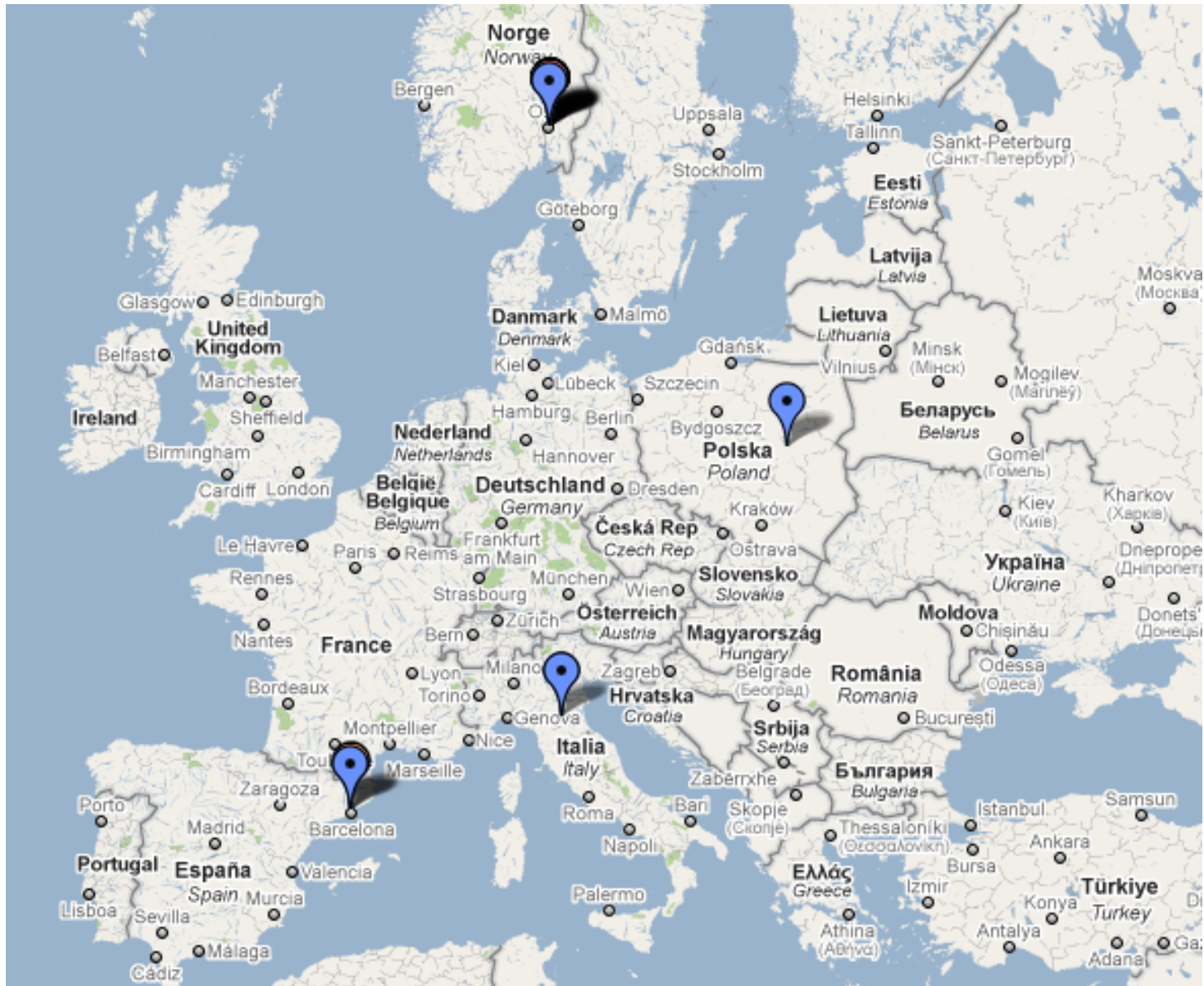
Nazwisko	Imię	Data urodzenia	Kraj urodzenia	Płeć	Czas utworzenia wpisu
Kurzydłowski	Michał	1985-10-26	PL	M	19.06.2009 12.38.33
Kowalski	Fabio	1985-01-14	PL	M	19.06.2009 12.38.33

Miasto urodzenia Email  
Warszawa michal.kurzydowski@students.mimuw.edu.pl

Zamknij

Filtruj po etapach  
Filtr  
Osoba  
Programy osoby  
Szukaj po indeksie  
Szukaj...  
Dokumenty  
Szukaj duplikatów  
Wyślij wiadomość  
Raporty  
Generuj nr teczki  
Usuń nr teczki  
MOBILITY w. 1  
MOBILITY w. 2

# Mobility nodes (testbed)



# The Mobility Project – 1

- **EUNIS 2008** – presentation of the USOS Mobility module for IRO. **MUCI** (Polish consortium) and **CINECA** (Italian consortium) decide to start the project
- **EUNIS 2009**
  - first version of mobility network (with two nodes) is presented
  - first workshop of **RS3G** standardization body gathers other interested groups

# The Mobility Project – 2

- **November 2009, Workshop in Uppsala**
  - Brings together consortia and companies willing to take an active part in the project
  - Main problem domains identified, **Work Teams** formed, team leaders appointed:
    - Business Processes
    - WSDL (data format)
    - Identity and Access Management
    - Security and LifeCycle Management
    - System Architecture

# The Mobility Project – 3

- **March 2010, Workshop in Bologna**
  - Brings together the Mobility Group and TF-EMC2 to discuss the aspects of security and of identity and access management
  - Possible solutions outlined
- **June 2010, RS3G workshop in Warsaw**  
(some important plans made on how to speed up the project)

## Data format – WSDL ver.2.0

- Should model the **problem domain** well
- Should be as **simple** as possible and conform to existing **standards** as strictly as possible, **but**
  - Existing standards do not conform to each other
  - They do not cover fully the problem domain
- We try to take into account achievements of:
  - *Metadata for Learning Opportunities* (MLO) – programs of study and course catalogs
  - *European Learner Mobility* (ELM) – Europass portfolio
  - SCHAC (*SCHema for Academia*) – LDAP attributes

## Data format – WSDL ver.2.0

- Specific needs of the Mobility Project
  - data should be well structured
  - pieces of data should be uniquely identifiable (on a database level)
  - each party may want to use own identifiers and own language
  - data format should be generic, i.e. facilitate the data exchange not only in terms of Erasmus program but mobility programs in general

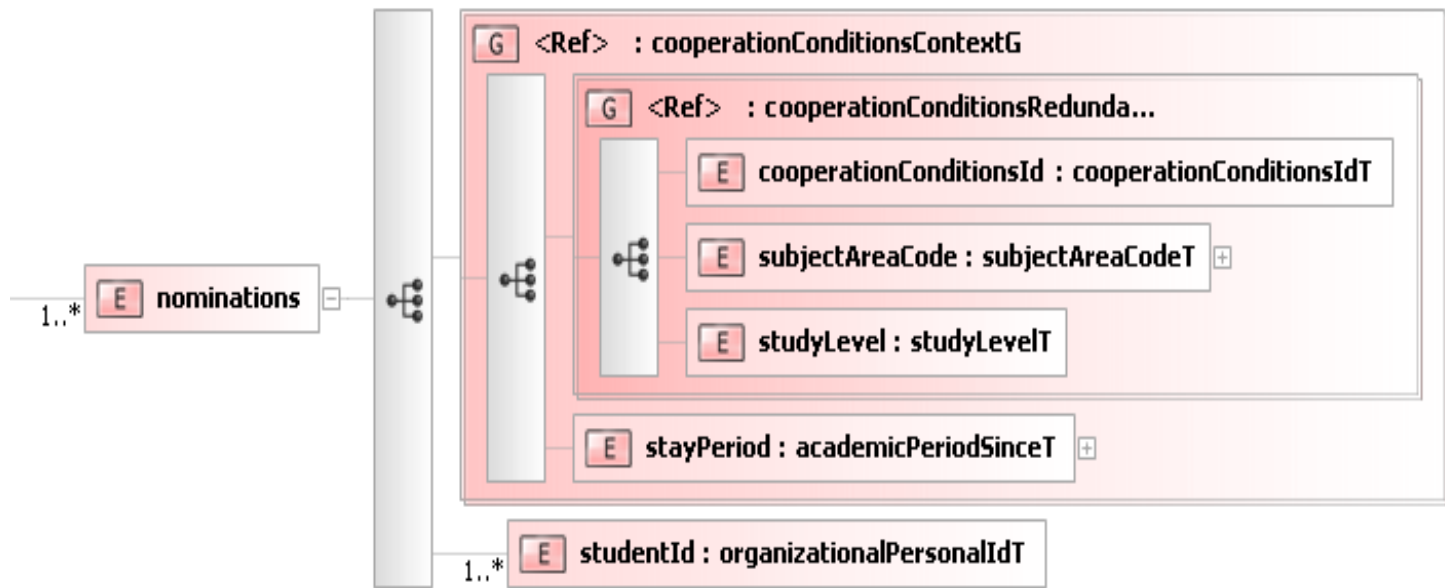


CT studentPersonalCharacteristicsT : personalCharacteristicsT

CT personalCharacteristicsT

- E nationalPersonalId : nationalPersonalIdT
- E givenName1 : string
- E givenName2 : string
- E surname1 : string
- E surname2 : string
- E gender : genderT

- E studentId : organizationalPersonalIdT
- E dateOfBirth : date
- E placeOfBirth : string
- E email : emailT
- E permanentAddress : addressT
- E correspondenceAddress : addressT
- E stationaryPhone : string
- E mobilePhone : string



Liquid XML Studio - FREE Community Edition 7.1.4.1284

```

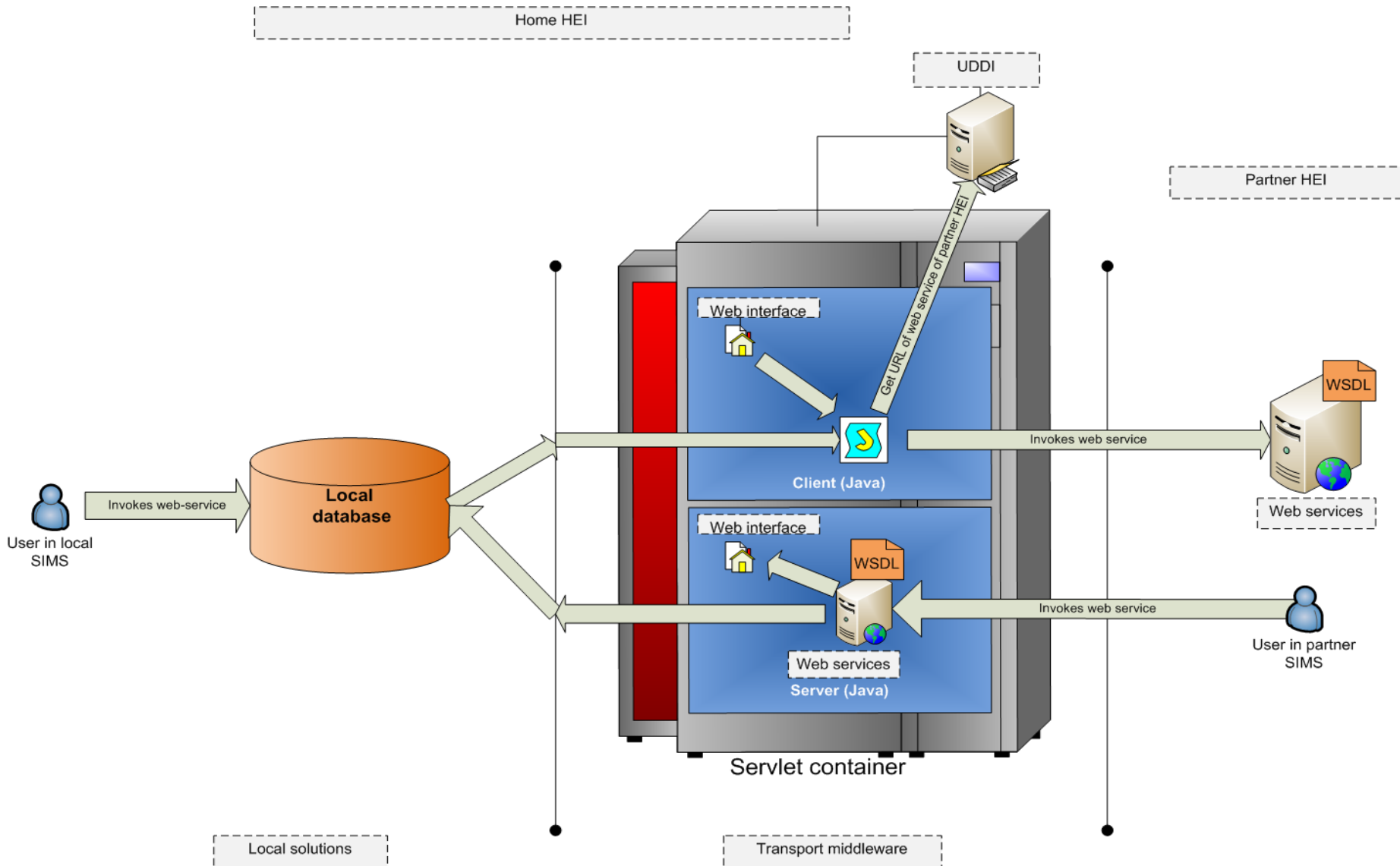
<tns:nominations>
  <tns:cooperationConditionsId>1</tns:cooperationConditionsId>
  <tns:subjectAreaCode>
    <tns:value classification="eu">11.3</tns:value>
  </tns:subjectAreaCode>
  <tns:studyLevel>1</tns:studyLevel>
  <tns:stayPeriod>
    <tns:academicYear>2008</tns:academicYear>
    <tns:academicPeriod>S1</tns:academicPeriod>
    <tns:duration>1</tns:duration>
  </tns:stayPeriod>
  <tns:studentId>unipr.it:9001</tns:studentId>
  <tns:studentId>unipr.it:7042</tns:studentId>
  <tns:studentId>unipr.it:4603</tns:studentId>
</tns:nominations>

```

## Software ver.2.0

- P2P-like architecture
- UDDI (*Universal Description Discovery and Integration*) registry stores addresses of endpoints
- Technologies involved:
  - Java with Spring framework
  - Apache as HTTP server and Apache Tomcat as a servlet container
  - Apache Camel as a routing and mediation engine
  - Apache CXF as a web services framework
  - Apache jUDDI as a UDDI Registry implementation
  - Apache Qpid as an AMQP implementation
  - ICEfaces as RIA (*Rich Internet Application*) framework etc.

# Architecture of the prototype (ver. 2.0)



# UDDI – Universal Description, Discovery and Integration (registry of Mobility nodes)

**Mobility Client**

**Information**

- Introduction

**Web Service Methods**

**OrganizationData**

- sendOrganizationData
- getOrganizationData

**AgreementData**

- sendAgreementData
- getAgreementData

**NominatedStudents**

- sendNominatedStudents
- getNominatedStudents

**ArrivalDate**

- sendArrivalDate
- getArrivalDate

**DepartureDate**

- sendDepartureDate
- getDepartureDate

**CourseData**

- getCourseData

**LearningAgreement**

- sendLearningAgreement
- getLearningAgreement

**TranscriptOfRecords**

- sendTranscriptOfRecords
- getTranscriptOfRecords

**Other**

- validateNationalPersonalId

**UDDI Registry**

	Id	Name	WSDL URL
⊙	unipr.it	it:Universita degli Studi di Parma	http://usosphp:7878/mobility-server-transport/webservices/mobility-service?wsdl
⊙	uw.edu.pl	pl:Uniwersytet Warszawski	http://usosphp:7979/mobility-server-transport/webservices/mobility-service?wsdl

**Details**

**Id \***  246 left / 255

**Name \***

**Language**

**Localized Name**

**WSDL URL \***

**Contact**

**Person Name**

**Phone Number**

**Service Name**

**Service Description**

\* - required

# Web client (client= WARSAW, server= PARMA)

http://usosphp.mimuw.edu.pl:7979/mobility-client-web/index.jsp

## Mobility Client

**Information**

- Introduction
- Web Service Methods**
  - OrganizationData
    - sendOrganizationData
    - getOrganizationData
  - AgreementData
    - sendAgreementData
    - getAgreementData
  - NominatedStudents
    - sendNominatedStudents**
    - getNominatedStudents
  - ArrivalDate
    - sendArrivalDate
    - getArrivalDate
  - DepartureDate
    - sendDepartureDate
    - getDepartureDate
  - CourseData
    - getCourseData
  - LearningAgreement
    - sendLearningAgreement
    - getLearningAgreement
  - TranscriptOfRecords
    - sendTranscriptOfRecords
    - getTranscriptOfRecords
  - Other
    - validateNationalPersonalId
- UDDI Registry
  - Edit
- Help
  - WSDL

**Client**

Id:

Name: pt:Uniwersytet Warszawski

WSDL URL: http://usosphp.7979/mobility-server-transport/webservices/mobility-service?wsdl

**Server**

Id:

Name: it:Universita degli Studi di Parma

WSDL URL: http://usosphp.7878/mobility-server-transport/webservices/mobility-service?wsdl

**Request**

Resource: xml/client=uw.edu.pl  
Path: /server=unipr.it

Sample Data File:

```
1 <?xml version="1.0" encoding="UTF-8"?><tns:sendNominatedStudentsRequest
2 xmlns:tns="http://mobility.usos.edu.pl" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
3 xsi:schemaLocation="http://mobility.usos.edu.pl MobilitySchema.xsd">
4 <tns:agreementId>
5 <tns:homeId>
6 <tns:organizationId>uw.edu.pl</tns:organizationId>
7 <tns:value>982/E/II08</tns:value>
8 </tns:homeId>
9 <tns:partnerId>
10 <tns:organizationId>unipr.it</tns:organizationId>
11 <tns:value>1207/E/XI08</tns:value>
12 </tns:partnerId>
13 </tns:agreementId>
14 <tns:academicYear>2008</tns:academicYear>
15 <tns:nominatedStudentsWithPersonalData>
16 <tns:uniquePersonalData>
17 <tns:student>
18 <tns:nationalPersonalId>PL:85 </tns:nationalPersonalId>
19 <tns:givenName1>Michał</tns:givenName1>
20 <tns:givenName2>Marek</tns:givenName2>
21 <tns:surname1>Kurzydłowski</tns:surname1>
22 <tns:gender>1</tns:gender>
23 <tns:studentId>uw.edu.pl:8001</tns:studentId>
```

Data successfully sent.

Type	Line	Column	Report
------	------	--------	--------

**Response**

```
1 <?xml version="1.0" encoding="UTF-8"?><tns:sendArrivalDateResponse xmlns:tns="http://mobility.usos.edu.pl"
2 xsi:schemaLocation="http://mobility.usos.edu.pl MobilitySchema.xsd" xmlns:soap="http://schemas.xmlsoap.org
3 /soap/envelope/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"/>
4
5
6
7
```

# Web server (server=PARMA)

http://usosphp.mimuw.edu.pl:7878/mobility-server-web/

### Mobility Server

Items: Page 15 Count 51 Id unipr.it

2009-11-13 14:28	getOrganizationDataRequest
2009-11-13 14:29	getOrganizationDataRequest
2009-11-13 14:31	getOrganizationDataRequest
2009-11-13 14:32	getOrganizationDataRequest
2009-11-13 17:04	sendAgreementDataRequest
2009-11-14 21:05	sendNominatedStudentsRequest

```
<tns:sendNominatedStudentsRequest xmlns:tns="http://mobility.usos.edu.pl" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://mobility.usos.edu.pl MobilitySchema.xsd">
  <tns:agreementId>
    <tns:homeId>
      <tns:organizationId>uw.edu.pl</tns:organizationId>
      <tns:value>982/E/108</tns:value>
    </tns:homeId>
    <tns:partnerId>
      <tns:organizationId>unipr.it</tns:organizationId>
      <tns:value>1207/E/108</tns:value>
    </tns:partnerId>
  </tns:agreementId>
  <tns:academicYear>2008</tns:academicYear>
  <tns:nominatedStudentsWithPersonalData>
    <tns:uniquePersonalData>
      <tns:student>
        <tns:nationalPersonalId>PL:85      </tns:nationalPersonalId>
      </tns:student>
    </tns:uniquePersonalData>
  </tns:nominatedStudentsWithPersonalData>
</tns:sendNominatedStudentsRequest>
```

# Test deployments

- Testbed – five nodes in four countries: Poland (France), Italy, Spain and Norway; sample data files to validate WSDL and test software
- Registries
  - Local UDDI of the node
  - EdUnify
- Easy-to-install package (takes 5 minutes to deploy, web client and sever inside Tomcat, small database for UDDI entries)
- Sample integration with local **Student Management Information System**
  - USOS, Oracle



# Conclusions

- The success of the project depends on the level of determination of stakeholders who will be main beneficiaries (IRO staff)
- They need help of IT specialists (US!)
- They may contribute by delivering business cases and testing business model (WSDL)
- We may contribute by testing various technology solutions
  - E.g. grid-like integration framework , registry look-up services, enterprise service bus
- Everybody can join and contribute

Join the Mobility Project at ...

<http://usos.edu.pl/Mobility>