Customization of ILIAS and its Integration with the University Information System

Pavel Smrž

smrz@fi.muni.cz

Masaryk University in Brno, Czech Republic
Outline

1. Motivation
2. Integration Requirements and Possibilities
3. Different Data Models, Data Synchronization
4. Authentication
5. Benchmarking
6. Localization
7. Conclusion and Future Directions
Motivation (1)

E-learning suits usually consist of:
- educational tools
- e-learning administration
- infrastructure support

ILIAS:
- independence on the technical platform
- functions in the administration area
Motivation (2)

The case of the Masaryk University

- all educational and research administration is integrated in the Administrative Information Server (IS MU)
- all data needed by ILIAS administration modules covered
- IS MU better fits local conditions
Integration Requirements

1. minimize the overlap in the information content between ILIAS and IS MU
2. ensure future compatibility with coming ILIAS 3

IS MU runs on Oracle 9, ILIAS could support it directly, **BUT:**

- IS MU often overloaded
- “mission-critical” status
Integration Possibilities

1. replace all ILIAS operations on the local database by remote calls
2. replicate relevant information from the IS MU databases to ILIAS

The first approach would imply:
- many modifications to the ILIAS source
- limits to our potential to upgrade ILIAS to its new versions
### IS MU Data Model

<table>
<thead>
<tr>
<th>Table</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDIES</td>
<td>STUDY_ID, SUBJ_ID, ...</td>
</tr>
<tr>
<td>SUBJECT</td>
<td>SUBJ_ID, SUBJ_KOD, SEMESTER, SYLLABUS, ...</td>
</tr>
<tr>
<td>SUBJECT_TEACHER</td>
<td>SUBJ_ID, TEACHER_ID, NAME, ...</td>
</tr>
<tr>
<td>SUBJ_SEMGR</td>
<td>SUBJ_ID, SEMGR_ID, NAME, ...</td>
</tr>
<tr>
<td>SEMGR_TEACHER</td>
<td>SEMGR_ID, TEACHER_ID, NAME, ...</td>
</tr>
<tr>
<td>SEMGR_STUDENT</td>
<td>SEMGR_ID, STUDENT_ID, ...</td>
</tr>
</tbody>
</table>
Data Synchronization

- No one-to-one correspondence between ILIAS and IS MU data models (there could be e-learning material for a course as a whole as well as for a particular seminar group, data from both relevant sources are merged)

- Replication module copies all relevant data in the beginning of each session
Authentication

- **Kerberos** is used in IS MU
- **Advantages of integration:**
  - users use **the same passwords** as in IS MU with no additional risk
  - no need to maintain another authentication server
- **Recompiling** the ILIAS web server with Kerberos support
What Platform for ILIAS?

- Windows vs. Linux?
- **Zend** PHP Optimizer?
- Several comparisons on the same HW
- Zend slows down some parts of ILIAS
- Apache-PHP-MySQL subsystem significantly **faster on MS Windows**
Localization of ILIAS

- problems with **Czech characters in preview mode and courses**

**Possible solutions:**
- **addition of conversion functions into source code**
- **UTF-8 conversion of the MySQL DB, support in Apache, PHP - universal, memory requirements,**
Conclusion and Future Directions

- **ILIAS** has been chosen as the primary e-learning platform for the Masaryk University.


- Integration with standalone system for semi-automated testing of students' programs in Java and other languages.
Future Directions (cont.)

- Natural language processing support for e-learning enabling to go beyond simple multiple-choice tests
- Automatic linking of additional study materials available at MU based on intelligent text analysis
- Integration with multimedia teaching materials