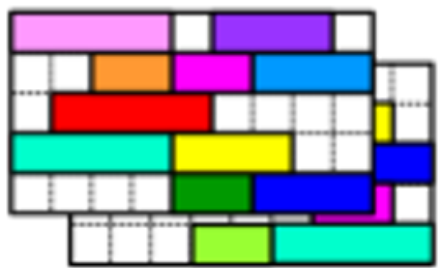




Credit: Photo by Loïc Romer



UNI^{TIME}

Internationalization of UniTime

Zuzana Müllerová, Tomáš Müller





Agenda

Agenda

- Internationalization in UniTime
 - A few technical details
- Providing translations
 - Using Zanata
 - Build using different / multiple languages
- Other considerations



This presentation is available at www.unitime.org/present/apereo18-internationalization.pdf

Internationalization

- Mixture of GWT / JSP pages, with backend services (solver, etc.)
- Bundles are using the Constant / Messages interfaces
- Translations are plain old .properties files

GwtMessages.java

```
public interface GwtMessages extends Messages {
    @DefaultMessage("Version {0} built on {1}")
    String pageVersion(String version, String buildDate);

    @DefaultMessage("Sort by {0}")
    String opSortBy(String column);

    @DefaultMessage("Showing all lines {0} -- {1}.")
    String infoShowingLines(int firstLine, int lastLine);

    @DefaultMessage("{0,number,#0.0###}, {1,number,#0.0###}")
    String coordinates(Double x, Double y);
}
```

GwtMessages_cs.properties (in UTF-8)

```
# Default: Sort by {0}
opSortBy=Se\u0159adit dle {0}

# Default: Showing all lines {0} -- {1}.
infoShowingLines=Z\u00E1znamy {0} -- {1} zobrazeny.
```

```
public interface GwtConstants extends Constants {
    @DefaultStringValue("4.3")
    @DoNotTranslate
    String version();

    @DefaultBooleanValue(true)
    boolean useAmPm();

    @DefaultStringValue({"Mon", "Tue", "Wed",
        "Thu", "Fri", "Sat", "Sun"})
    String[] days();

    @DefaultStringValue("MM/dd/yyyy")
    String eventDateFormat();

    @DefaultStringValue({"Pending", "Approved", "Rejected", "Cancelled"})
    String[] eventApprovalStatus();

    @DefaultStringValue("red")
    @DoNotTranslate
    String freeTimeColor();
}
```

GWT client code

- GWT Constant / Messages Interfaces for the GWT client code

```
static final GwtMessages MESSAGES = GWT.create(GwtMessages.class);
```

- Methods of the created interface return the appropriate language

```
return MESSAGES.opSortBy(MESSAGES.colCurriculum());
```

- A permutation is compiled for each browser and language/country
- Configured in UniTime.gwt.xml

```
<extend-property name="locale" values="en"/>  
<extend-property name="locale" values="en_UK"/>  
<extend-property name="locale" values="cs"/>  
<set-property-fallback name="locale" value="en"/>
```

- Default locale in Application Configuration (unitime.locale)
 - Can take browser's settings, user preferences, or locale=XX URL parameter

For example <https://demo.unitime.org/UniTime/login.do?locale=cs>

Server code

- Same approach, but using Localization class to create an instance of the Messages / Constants interface
- Implemented using Java proxies

```
final static CourseMessages MSG = Localization.create(CourseMessages.class);

// Throw a localized exception if the user is not logged in
if (!context.isAuthenticated())
    throw new Exception(MSG.exceptionAccessDenied());

// Localized message
MSG.listInstructors(department.getDeptCode(), department.getName());
```


JSP code

- Using localization tags, or calling the interface methods directly
- Both Constants and Messages can be used

```
<%@ taglib uri="http://www.unitime.org/tags-localization" prefix="loc" %>
<loc:bundle name="CourseMessages">
  <!-- translated message, using loc:message, e.g., titleRemoveRoomPreferences=Remove Room Preferences --%>
  <loc:message name="titleRemoveRoomPreference"/>

  <!-- translated message with one argument, e.g., labelConfiguration=Configuration {0} --%>
  <loc:message name="labelConfiguration"><bean:write property='configName'/></loc:message>

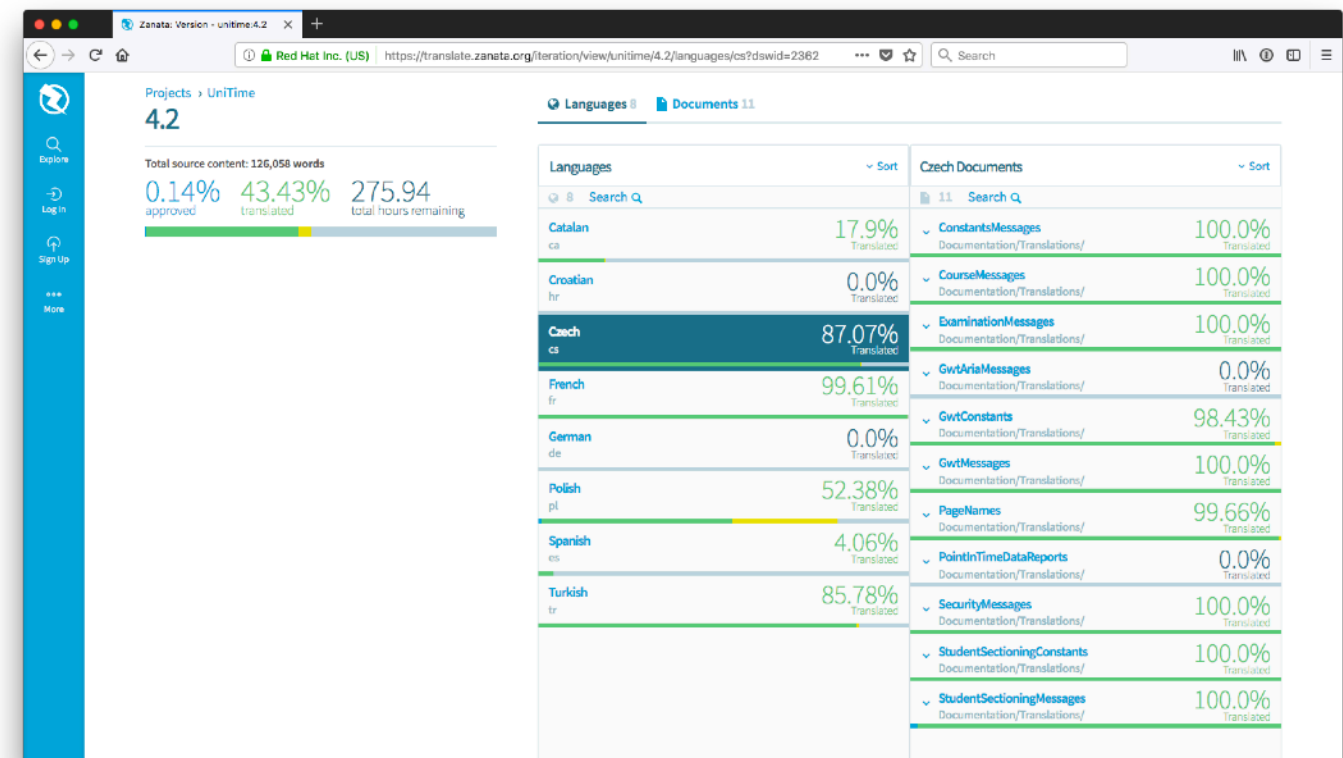
  <!-- translated message, using MSG property --%>
  <%=MSG.confirmRoomSizeDifferentFromCapacity()%>

  <!-- additional message bundle --%>
  <loc:bundle name="ConstantsMessages" id="CONST">
    <loc:message name="monday" id="CONST"/>
    <%=MSG.sunday()%>
  </loc:bundle>
</loc:bundle>
```




Using Zanata

- Different UniTime versions, one “document” for each class
- Translations can be provided online or offline
- Integrates with Maven
- Permissions (users are associated with one or more languages)
- Czech, French, Polish, Turkish, and a few other (less complete)



See <https://translate.zanata.org/project/view/unitime> for more details.



Making a build

- Clone UniTime git repository
- Add language in UniTime.gwt.xml

```
<extend-property name="locale" values="cs"/>
```

- Pull the translations from Zanata
- Import translations (makes sure they are UTF-8 encoded)
- Build UniTime

```
git clone https://github.com/UniTime/unitime.git
mvn zanata:pull -Dzanata.locales=cs
ant -Dlocale=cs import-translations
ant build
```

- Push to Zanata
 - Needs user name and an API key

```
ant -Dlocale=cs export-translation
mvn zanata:push -Dzanata.user=jan.novak -Dzanata.key=12345
mvn zanata:push -Dzanata.locales=cs -Dzanata.pushType=trans
```





Terminology

Translation and Terminology

- There is a set of terms that express the core concepts in UniTime, such as
 - Instructional Offerings vs. Course Offerings
 - Subject Areas vs. Academic Areas
 - Scheduling Subparts
 - Classes
 - ...
- Use UniTime in English before translating it



Other Considerations

Other Considerations

- Date format (d.m.y vs m/d/y), time format (12/24 hours)
- Time grid (start time, end time, increments)
- First day of the week
- Horizontal / Vertical
- ...

Preference na čas

Pracovní dny x denní doba

☒ Vodorovně

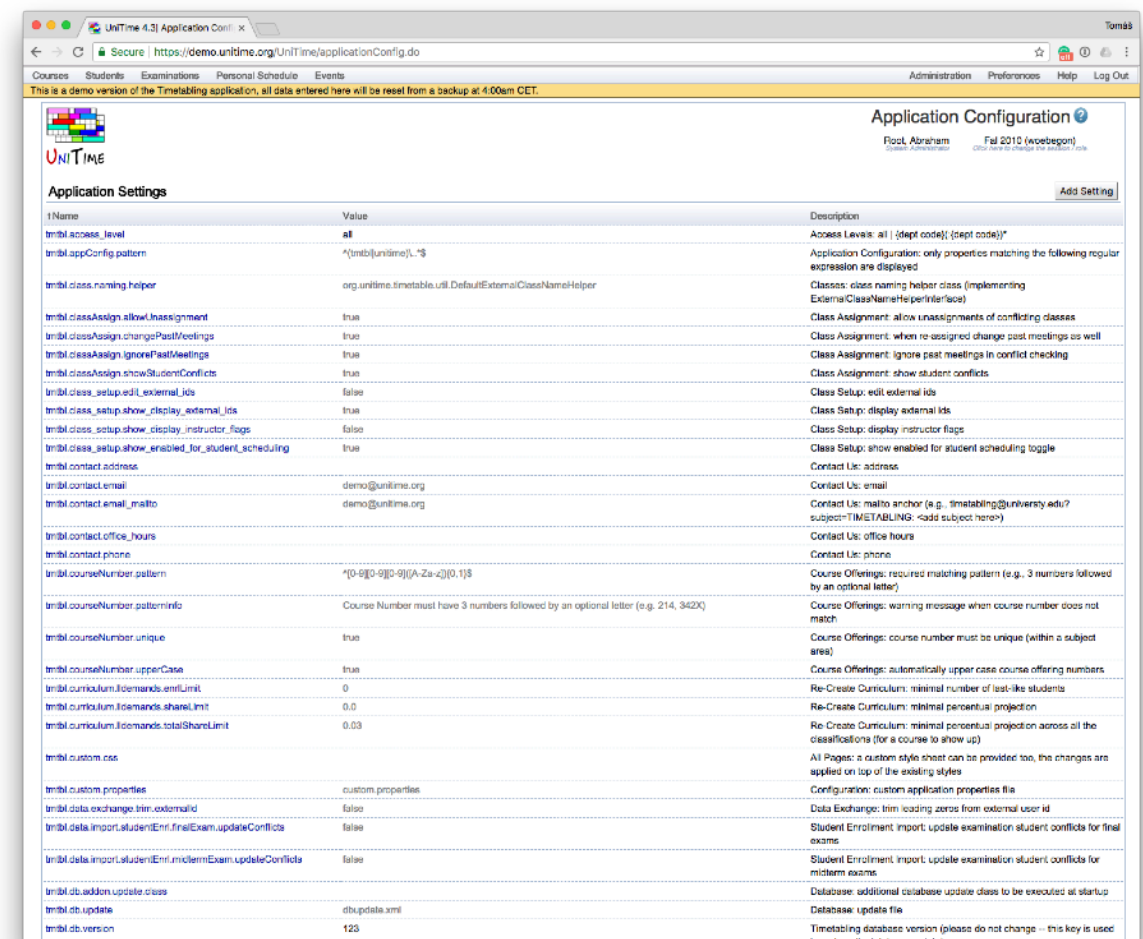
od:	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	
do:	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	
Po													
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Silně preferované
 Preferované
 Neutrální
 Nevhodné
 Velmi nevhodné
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D 2 (137, 41, 72)	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00
Pondělí	PV PV112 Před 1 Programování grafických aplikací 8:00 - 9:50 Kozlíková, Barbora asist	PV PV183 Před 1 Technologie počítačových sítí 10:00 - 11:50 Pelikán, Jaroslav lektor	IV IV003 Před 1 Algoritmy a datové struktury II 12:00 - 13:50 Černá, Ivana prof.	MB MB104 Před 1 Diskrétní matematika 14:00 - 15:50 Slovák, Jan prof.	PV PV251 Před 1 Vizualizace 16:00 - 17:50 Kozlíková, Barbora asist							
Úterý	PA PA151 Před 1 Soudobé počítačové sítě 8:00 - 9:50 Staudek, Jan doc.	PB PB130 Před 1 Úvod do digitálního zpracování obrazu 10:00 - 11:50 Matula, Petr doc.	PB PB071 Před 1 Principy nízkourovňového programování 12:00 - 13:50 Švenda, Petr asist	IA IA067 Před 1 Informatics Colloquium D DINKOL Před 1 Informatické kolokvium 14:00 - 15:50 Gruska, Jozef prof.	IA IA012 Před 1 Složnost 16:00 - 17:50 Černá, Ivana prof.	PV PV203 Před 1 IT Services Management 18:00 - 19:50 Vágnér, Vladimír						
Středa	PB PB153 Před 1 Operační systémy a jejich rozhraní 8:00 - 9:50 Ráček, Jaroslav lektor Daňa, Josef Mgr.	IB IB006 Před 1 Formální jazyky a automaty 10:00 - 11:50 Křetinský, Mojmir prof.	PB PB009 Před 1 Základy počítačové grafiky 12:00 - 13:50 Sochor, Jiří prof.		MB MB102 Před 1 Diferenciální a integrální počet 16:00 - 17:50 Hasil, Petr Ph.D.							
Čtvrtek	VB VB006 Před 1 Panorama fyziky II 8:00 - 9:50 Humlíček, Josef	PV PV207 Před 1 Business Process Management 10:00 - 11:50 Kolář, Jiří Ph.D.	VB VB000 Před 1 Základy odborného stylu 12:00 - 13:50 Sudě týčny Nevěřilová, Zuzana Hlaváčková, Dana Pala, Karel doc. Peňáz, Petr lektor		BLOKACE SPP Ost 1 Přednášky externistů 16:00 - 17:50	BLOKACE ZKVS Ost 1 Vnitrosměstní zkoušky 18:00 - 19:50 Týdny 8-17						
Pátek		IV IV109 Před 1 Modelování a simulace 10:00 - 11:50 Pelánek, Radek doc.										

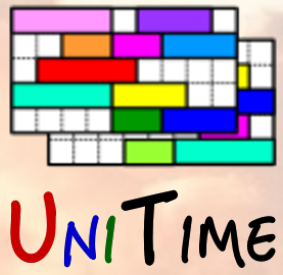
Other Considerations

- Constants for the language-dependent properties (e.g., en_UK)
- Custom properties for the rest (*we have over 450 properties*)
 - Defaults in the ApplicationProperty enum
 - Custom properties file
 - Application Configuration page
 - May be different for each term/campus



The screenshot shows the 'Application Configuration' page in the UniTime application. It displays a table of application settings with columns for Name, Value, and Description. The settings include various configuration options for the application, such as access levels, class naming helpers, and contact information.

Name	Value	Description
timbl.access_level	all	Access Level: all (dept code) (dept code)*
timbl.appConfig.pattern	*(timbl.unitime).*	Application Configuration: only properties matching the following regular expression are displayed
timbl.class.naming.helper	org.unitime.timetable.util.DefaultExternalClassNameHelper	Classes: class naming helper class (implementing ExternalClassNameHelperInterface)
timbl.classAssign.allowUnassignment	true	Class Assignment: allow unassignments of conflicting classes
timbl.classAssign.changePastMeetings	true	Class Assignment: when re-assigned change past meetings as well
timbl.classAssign.ignorePastMeetings	true	Class Assignment: ignore past meetings in conflict checking
timbl.classAssign.showStudentConflicts	true	Class Assignment: show student conflicts
timbl.class_setup.edit_external_ids	false	Class Setup: edit external ids
timbl.class_setup.show_display_external_ids	true	Class Setup: display external ids
timbl.class_setup.show_display_instructor_flag	false	Class Setup: display instructor flag
timbl.class_setup.show_enabled_for_student_scheduling	true	Class Setup: show enabled for student scheduling toggle
timbl.contact.address		Contact Us: address
timbl.contact.email	demo@unitime.org	Contact Us: email
timbl.contact.email_mailto	demo@unitime.org	Contact Us: mailto anchor (e.g., timetabling@university.edu/?subject=TIMETABLING: <add subject here>)
timbl.contact.office_hours		Contact Us: office hours
timbl.contact.phone		Contact Us: phone
timbl.courseNumber.pattern	*[0-9][0-9][0-9]([A-Za-z][0-9])?	Course Offerings: required matching pattern (e.g., 3 numbers followed by an optional letter)
timbl.courseNumber.patternInfo	Course Number must have 3 numbers followed by an optional letter (e.g., 214, 342X)	Course Offerings: warning message when course number does not match
timbl.courseNumber.unique	true	Course Offerings: course number must be unique (within a subject area)
timbl.courseNumber.upperCase	true	Course Offerings: automatically upper case course offering numbers
timbl.curriculum.itemsLimit	0	Re-Create Curriculum: minimal number of last-like students
timbl.curriculum.itemsShareLimit	0.0	Re-Create Curriculum: minimal percentage projection
timbl.curriculum.itemsTotalShareLimit	0.03	Re-Create Curriculum: minimal percentage projection across all the classifications (for a course to show up)
timbl.custom.css		All Pages: a custom style sheet can be provided too, the changes are applied on top of the existing styles
timbl.custom.properties	custom.properties	Configuration: custom application properties file
timbl.data.exchange.trim_external_id	false	Data Exchange: trim leading zeros from external user id
timbl.data.import.studentEnr.finalExam.updateConflicts	false	Student Enrollment Import: update examination student conflicts for final exams
timbl.data.import.studentEnr.midtermExam.updateConflicts	false	Student Enrollment Import: update examination student conflicts for midterm exams
timbl.db.addon.update.class	db.update.xml	Database: additional database update class to be executed at startup
timbl.db.update		Database: update file
timbl.db.version	123	Timetabling database version (please do not change - this key is used by automatic database updates)

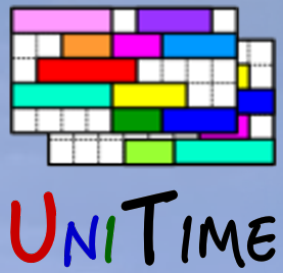


Contributions

Outside Contributions to Internationalization

- Sponsoring a feature
(e.g., week starting on Sunday)
- Testing localization
- Translations into other languages using Zanata
(e.g. Polish, Turkish, ...)
- Minimum contributions of code

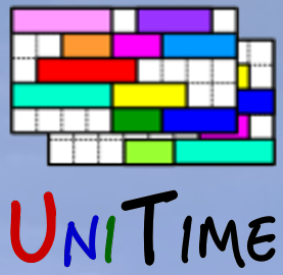




More things to do...

- More languages
- Deal with inflations in other languages
- Internationalization of older pages
- Documentation, manuals, online help
- Text direction (right-to-left)
- Other calendars
 - E.g., Hijri





Lessons Learned

Lessons Learned

- Terminology is very important (and hard to change later)
 - Subject vs Course vs Offering
 - Professors do not like being called instructors (teachers is fine)
- Write code with localization in mind
- Use type-safe techniques that rely on strongly-typed Java interfaces



Internationalization

- Started with all the texts hard-coded (not a good approach)
- All the new (GWT-based) code is localizable
- Some of the older pages still need to be localized
- Using GWT-like approach all across the application
- Zanata makes it easier to let others translate and share the translations
- Terminology needs good care and consideration

For more details, please see us at the conference

- Getting Started with UniTime (Sunday, 9 am in Liszt)
- UniTime: State of the Project (Monday, 2:30 pm in Debussy)
- UniTime Introduction (Monday, 5:30 pm, Showcase Reception)
- Student Scheduling at Purdue University (Tuesday, 11:15am in Debussy)
- Internationalization of UniTime (Wednesday 11:00 am in Debussy)

See <http://help.unitime.org/Localization> for more details.