

OLAT Conference 2008

Developer Workshop I



Universität Zürich



OLAT for Developers: Introduction to Working with Eclipse

Patrick Brunner
(Informatikdienste, MELS)

Contact: patrick.brunner@id.uzh.ch

OLAT Conference 2008

Developer Workshop I



Universität Zürich



Goals

- 09:00 ~ 10:30 **OLAT in Eclipse**
 - Who is Who, Install Prerequisites, CVS, build.properties, tomcat start
- 10:40 ~ 11:00 **OLAT Structure**
 - Config Files, Startup, „Module“
- 11:10 ~ 12:15 **Basic Principles of OLAT**
 - Component/Controller/Manager, BasicController, Velocity, Debugging

OLAT Conference 2008

Developer Workshop I



Universität Zürich



Presentation Round, please tell something about you
who are you ?
where are you from ?
why do you attend to this developer workshops ?

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Install Devel Env HOW-TO (up-to-date March 2008)

<https://twiki.tu-chemnitz.de/bin/view/OLAT/HowToSetupDevelopmentEnvironment>

- ✓ MySQL installed
- ✓ Shell access to MySQL
- ✓ OLAT DB and OLAT DB User created on MySQL DB

```
C:\WINDOWS\system32\cmd.exe - mysql -u root -p
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Dokumente und Einstellungen\patrickb>mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 5.0.45-community-nt MySQL Community Edition (GPL)

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

mysql> CREATE DATABASE olatconf; GRANT ALL PRIVILEGES ON olatconf.* TO 'olatconf'@'localhost' IDENTIFIED BY 'olatconf2008';
Query OK, 1 row affected (0.00 sec)

Query OK, 0 rows affected (0.00 sec)

mysql>
```



Install Devel Env HOW-TO (up-to-date March 2008)

<https://twiki.tu-chemnitz.de/bin/view/OLAT/HowToSetupDevelopmentEnvironment>

Checkpoint

- ✓ MySQL installed
- ✓ Shell access to MySQL
- ✓ OLAT DB and OLAT DB User created on MySQL DB
- ✓ Tomcat installed
- ✓ Eclipse CVS Repository Location with anonymous/anonymous
- ✓ OLAT3 Project checked out into workspace

Next Step: Remove Build Path Problems

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
Structure
Principles



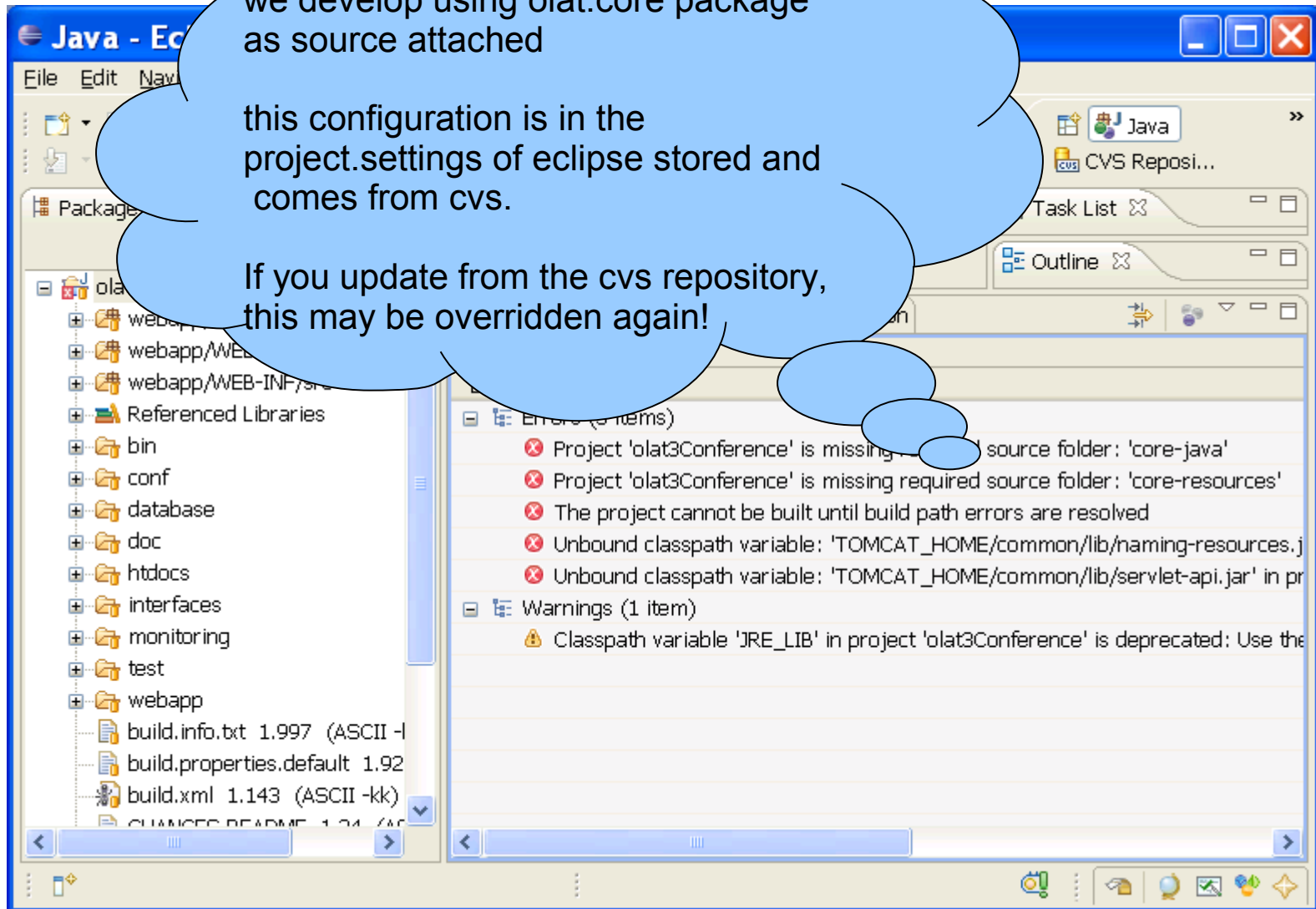
Universität Zürich



we develop using olat.core package
as source attached

this configuration is in the
project.settings of eclipse stored and
comes from cvs.

If you update from the cvs repository,
this may be overridden again!



OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



1. open project properties [alt] + [enter]
2. remove the missing source folders

Properties for olat3Conference

type filter text

Resource
BeanInfo Path
Builders
CVS
Java Build Path
Java Code Style
Java Compiler
Java Editor
Javadoc Location
Profile Compliance and Va
Project References
Run/Debug Settings
Server
Task Repository
Task Tags
Validation

2 build path entries are missing

Source folders on build path:

- olat3Conference/core-java (missing)
- olat3Conference/core-resources (missing)
- olat3Conference/webapp/WEB-INF/patchesSrc
- olat3Conference/webapp/WEB-INF/src
- olat3Conference/webapp/WEB-INF/test/java

Buttons: Add Folder..., Link Source..., Edit..., Remove

Allow output folders for source folders

Default output folder:
olat3Conference/webapp/WEB-INF/classes

Buttons: Browse...

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



add TOMCAT_HOME
variable

Properties for olat3Conference

type filter text

- Resource
- BeanInfo Path
- Builders
- CVS
- Java Build Path**
- Java Code Style
- Java Compiler
- Java Editor
- Javadoc Location
- Profile Compliance and Va
- Project References
- Run/Debug Settings
- Server
- Task Repository
- Task Tags
- Validation

JRE_LIB is deprecated: Use the JRE System Libr...

Source Projects Libraries Order

JARs and class folders on the build path:

- resolver.jar - olat3Conference/webapp/WEB-INF
- rss4j-0.92.jar - olat3Conference/webapp/WEB-INF
- shibboleth13.jar - olat3Conference/webapp/WEB-INF
- smack-3.0.4.jar - olat3Conference/webapp/WEB-INF
- smackx-3.0.4.jar - olat3Conference/webapp/WEB-INF
- spring-2.0.6.jar - olat3Conference/webapp/WEB-INF
- tm-extractors-0.4.jar - olat3Conference/webapp/WEB-INF
- velocity-1.5.jar - olat3Conference/webapp/WEB-INF
- xalan-2.6.0.jar - olat3Conference/webapp/WEB-INF
- xercesImpl2.7.1.jar - olat3Conference/webapp/WEB-INF
- xml-apis.jar - olat3Conference/webapp/WEB-INF
- xmlsec-20050514.jar - olat3Conference/webapp/WEB-INF
- xpp3_min-1.1.3.4.I.jar - olat3Conference/webapp/WEB-INF
- xstream-1.2.2.jar - olat3Conference/webapp/WEB-INF
- JRE_LIB - C:\Programme\Java\jre1.6.0_02\lib\rt.jar
- TOMCAT_HOME/common/lib/haming-resources.jar
- TOMCAT_HOME/common/lib/servlet-api.jar

Add JARs

Add External JAR

Add Variable...

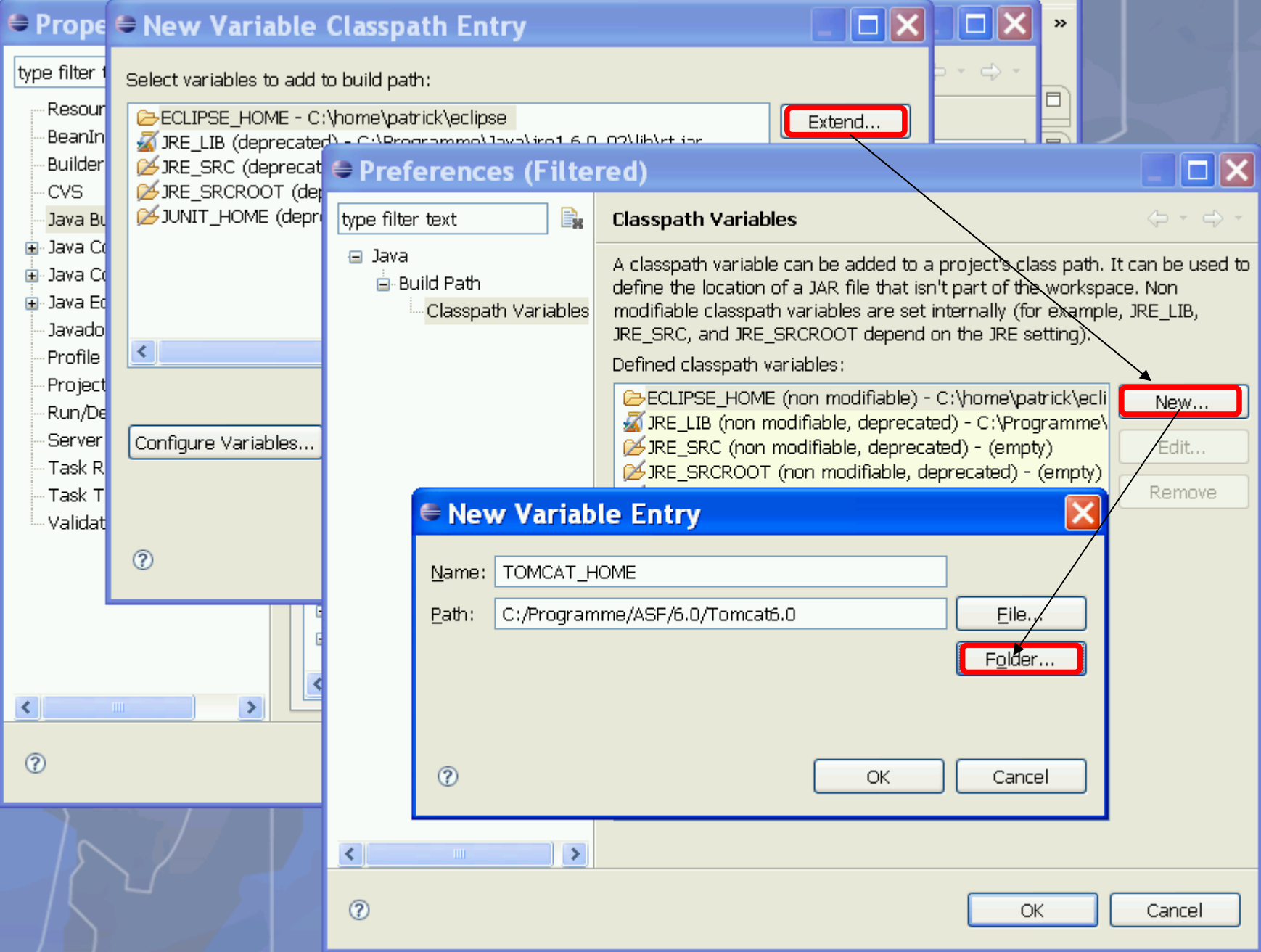
Add Library...

Add Class Folder...

Edit...

Remove

Migrate JAR File...



C
D

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Properties for olat3Conference

type filter text

Resource
BeanInfo Path
Builders
CVS
Java Build Path
Java Code Style
Java Compiler
Java Editor
Javadoc Location
Profile Compliance and Va
Project References
Run/Debug Settings
Server
Task Repository
Task Tags
Validation

JRE_LIB is deprecated: Use the JRE System Library instead

Source Projects Libraries Order and

JARs and class folders on the build path:

- resolver.jar - olat3Conference/webapp/WEB-INF/lib/resolver.jar
- rss4j-0.92.jar - olat3Conference/webapp/WEB-INF/lib/rss4j-0.92.jar
- shibboleth13.jar - olat3Conference/webapp/WEB-INF/lib/shibboleth13.jar
- smack-3.0.4.jar - olat3Conference/webapp/WEB-INF/lib/smack-3.0.4.jar
- smackx-3.0.4.jar - olat3Conference/webapp/WEB-INF/lib/smackx-3.0.4.jar
- spring-2.0.6.jar - olat3Conference/webapp/WEB-INF/lib/spring-2.0.6.jar
- tm-extractors-0.4.jar - olat3Conference/webapp/WEB-INF/lib/tm-extractors-0.4.jar
- velocity-1.5.jar - olat3Conference/webapp/WEB-INF/lib/velocity-1.5.jar
- xalan-2.6.0.jar - olat3Conference/webapp/WEB-INF/lib/xalan-2.6.0.jar
- xercesImpl2.7.1.jar - olat3Conference/webapp/WEB-INF/lib/xercesImpl2.7.1.jar
- xml-apis.jar - olat3Conference/webapp/WEB-INF/lib/xml-apis.jar
- xmlsec-20050514.jar - olat3Conference/webapp/WEB-INF/lib/xmlsec-20050514.jar
- xpp3_min-1.1.3.4.I.jar - olat3Conference/webapp/WEB-INF/lib/xpp3_min-1.1.3.4.I.jar
- xstream-1.2.2.jar - olat3Conference/webapp/WEB-INF/lib/xstream-1.2.2.jar
- JRE_LIB - C:\Programme\Java\jre1.6.0_02\lib\rt.jar
- TOMCAT_HOME/common/lib/naming-resources.jar**
- TOMCAT_HOME/common/lib/servlet-api.jar**

Remove
Migrate JAR File...

OK Cancel

depending on your tomcat version

- delete reference to naming-resources.jar

- point to the correct location of servlet-api.jar



Install Devel Env HOW-TO (up-to-date March 2008)

<https://twiki.tu-chemnitz.de/bin/view/OLAT/HowToSetupDevelopmentEnvironment>

Checkpoint

- ✓ Build Path Correct
- ✓ No Java Compiler Errors on olat3 Project

Next Step: create a build.properties



1. Copy `build.properties.default` and name it `build.properties`

2. Change Values:

`base.dir=C:/home/patrick/conferenceworkspace/olat3Conference`

forward slashes!

`userdata.dir=C:/tmp/olatconference/olatdata`

`instance.id=confolat`

max. 10 Chars!

`server.domainname=localhost`

`server.port=8080`

`ajax.mode=15`

`adminemail=<YOUR_VALID_EMAIL_HERE>`

`supportemail=<YOUR_VALID_EMAIL_HERE>`

`smtp.host=smtp.uzh.ch`

`db.name=olatconf`

`db.user=olatconf`

`db.pass=olatconf2008`

`brasato.debug=true`

`localization.cache=false`

`log.rootCategory = INFO, syslog, A1`

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



olat3Conference build.xml

Edit configuration and launch.

Run an Ant build file.

Name: olat3Conference build.xml

Check targets to execute:

Name	Description
<input type="checkbox"/> install	Install OLAT
<input type="checkbox"/> jar	make OLAT jar
<input type="checkbox"/> javadoc	Build Code Documentation
<input type="checkbox"/> jsmath	Unzip the jsMath fonts
<input type="checkbox"/> junit	Run junit test cases
<input type="checkbox"/> nightly	
<input type="checkbox"/> readme	Installation Readme
<input type="checkbox"/> SVNcheckout	Update package from SVN
<input type="checkbox"/> SVNnightly	
<input type="checkbox"/> undeploy	Deploy the tomcat context descriptor in the tomcat container
<input type="checkbox"/> Usage [default]	Displays Usage Help

3 out of 42 selected

Sort targets

Hide internal targets not selected for execution

Target execution order:
deletedatadir, dbsetup, config-all

Apply Revert

Run Close

sort targets

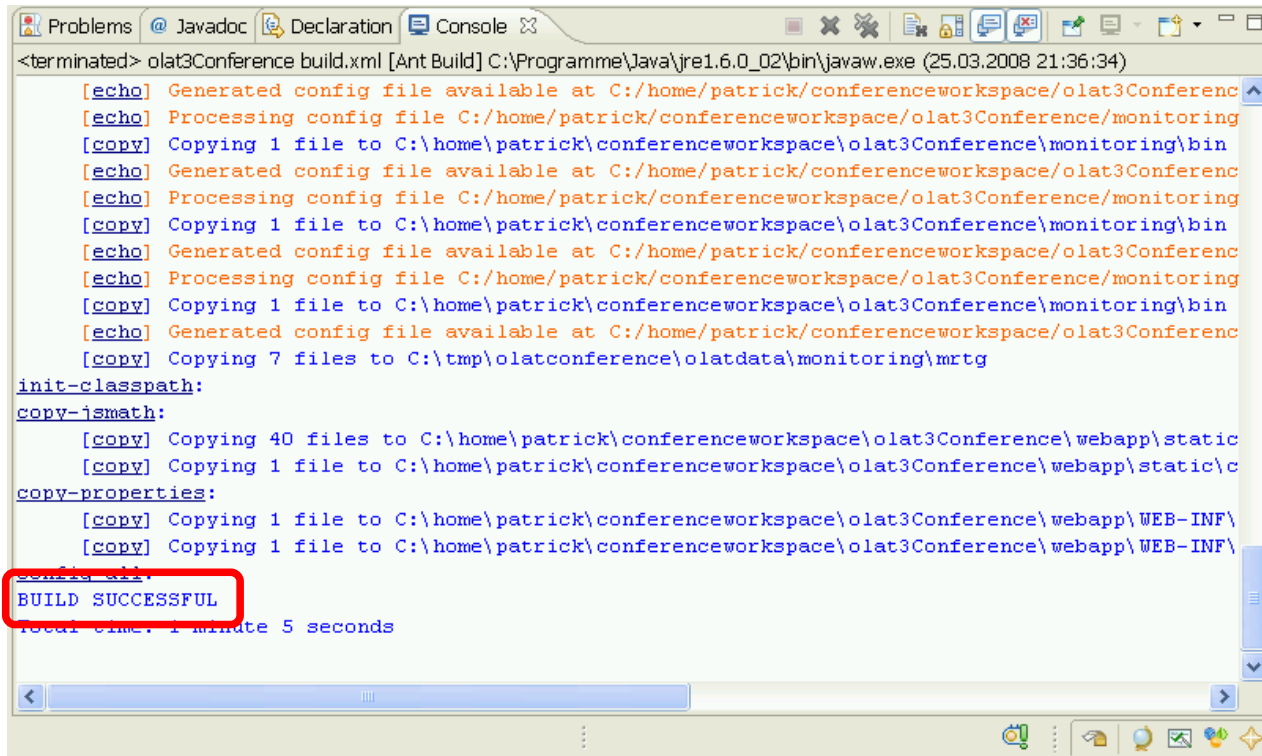
- deletedatadir
 - dbsetup
 - config-all
- run

say „yes“ to
delete Datadir
and Database



Checkpoint

✓ Build of OLAT successful

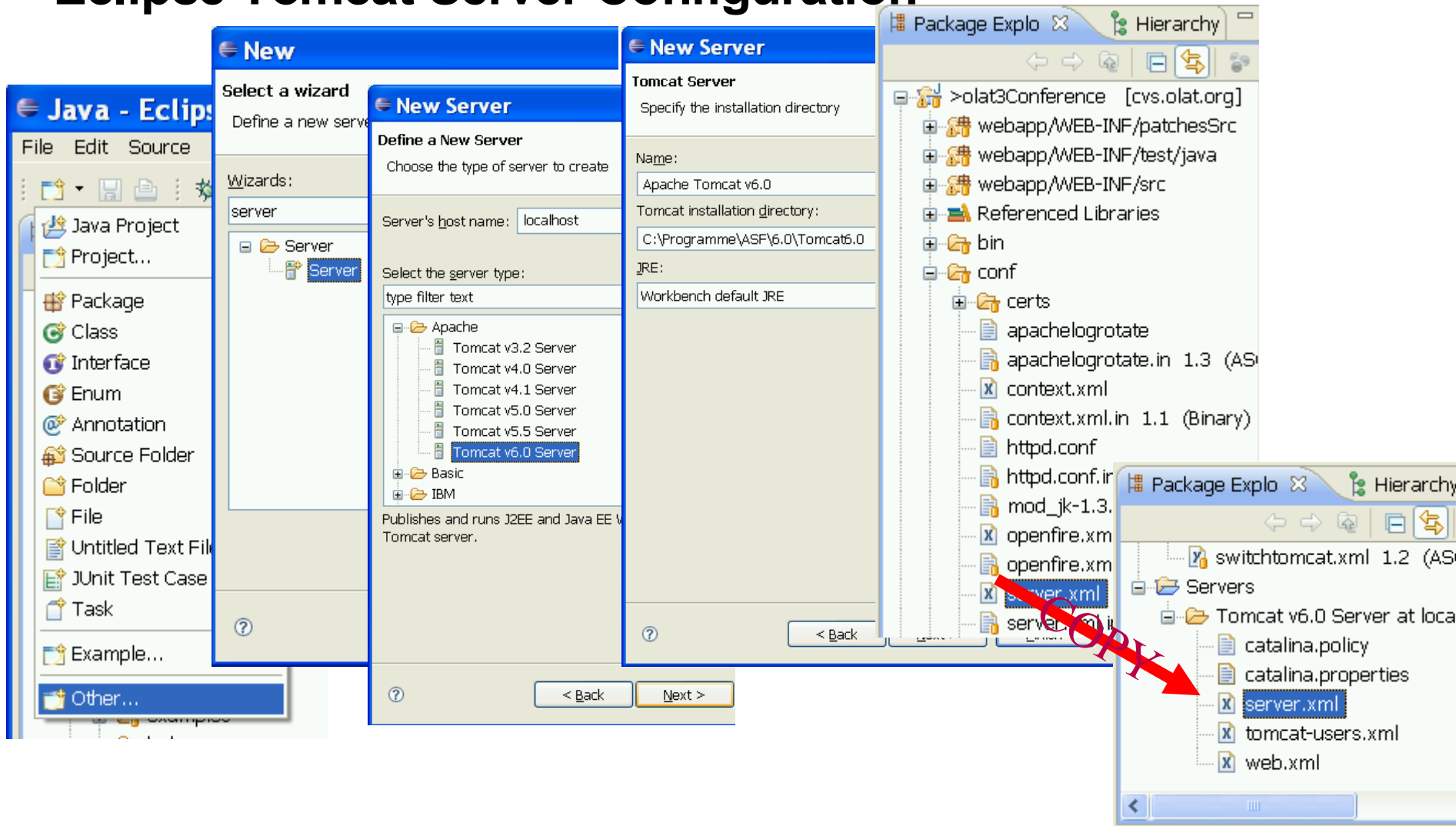


```
<terminated> olat3Conference build.xml [Ant Build] C:\Programme\Java\jre1.6.0_02\bin\javaw.exe (25.03.2008 21:36:34)
[echo] Generated config file available at C:/home/patrick/conferenceworkspace/olat3Conference
[echo] Processing config file C:/home/patrick/conferenceworkspace/olat3Conference/monitoring
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\monitoring\bin
[echo] Generated config file available at C:/home/patrick/conferenceworkspace/olat3Conference
[echo] Processing config file C:/home/patrick/conferenceworkspace/olat3Conference/monitoring
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\monitoring\bin
[echo] Generated config file available at C:/home/patrick/conferenceworkspace/olat3Conference
[echo] Processing config file C:/home/patrick/conferenceworkspace/olat3Conference/monitoring
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\monitoring\bin
[echo] Generated config file available at C:/home/patrick/conferenceworkspace/olat3Conference
[echo] Processing config file C:/home/patrick/conferenceworkspace/olat3Conference/monitoring
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\monitoring\bin
[echo] Generated config file available at C:/home/patrick/conferenceworkspace/olat3Conference
[echo] Processing config file C:/home/patrick/conferenceworkspace/olat3Conference/monitoring
[copy] Copying 7 files to C:\tmp\olatconference\olatdata\monitoring\mrtg
init-classpath:
copy-ismath:
[copy] Copying 40 files to C:\home\patrick\conferenceworkspace\olat3Conference\webapp\static
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\webapp\static\c
copy-properties:
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\webapp\WEB-INF\
[copy] Copying 1 file to C:\home\patrick\conferenceworkspace\olat3Conference\webapp\WEB-INF\
BUILD SUCCESSFUL
Total time: 1 minute 5 seconds
```

Next Step: configure a tomcat server to run olat



Eclipse Tomcat Server Configuration



The screenshot illustrates the Eclipse IDE interface during the configuration of a Tomcat server. The main window is titled "New Server" and is divided into several panes:

- Left Pane (Project Explorer):** Shows the project structure with folders like "Java Project", "Project...", "Package", "Class", "Interface", "Enum", "Annotation", "Source Folder", "Folder", "File", "Untitled Text File", "JUnit Test Case", "Task", and "Example...".
- Top Left Pane (New Wizard):** Displays "Select a wizard" with "server" selected under the "Server" category.
- Top Middle Pane (Define a New Server):** Shows the "Define a New Server" dialog with "Apache Tomcat v6.0 Server" selected under the "Apache" category.
- Top Right Pane (Tomcat Server Configuration):** Shows the "Tomcat Server" configuration dialog with the following fields:
 - Name: Apache Tomcat v6.0
 - Tomcat installation directory: C:\Programme\ASF\6.0\Tomcat6.0
 - JRE: Workbench default JRE
- Right Pane (Package Explorer):** Shows the project structure with folders like "webapp", "bin", "conf", "certs", "apachelogrotate", "context.xml", "httpd.conf", "mod_jk-1.3", "openfire.xml", "server.xml", and "switchtomcat.xml".
- Bottom Right Pane (Package Explorer):** Shows the "Servers" folder with "Tomcat v6.0 Server at localhost" selected, and the "server.xml" file highlighted.

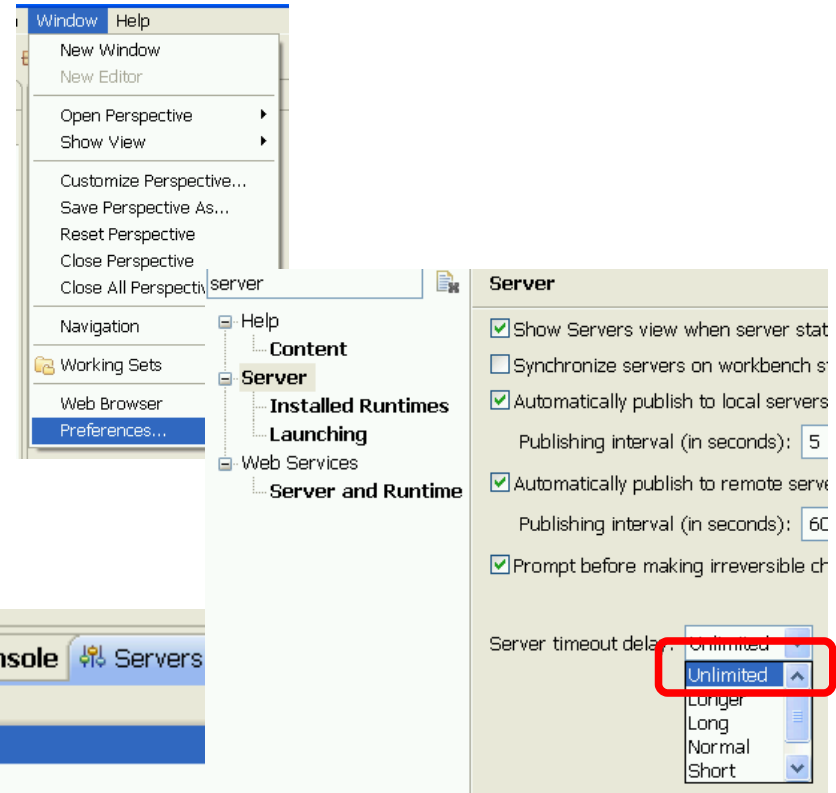
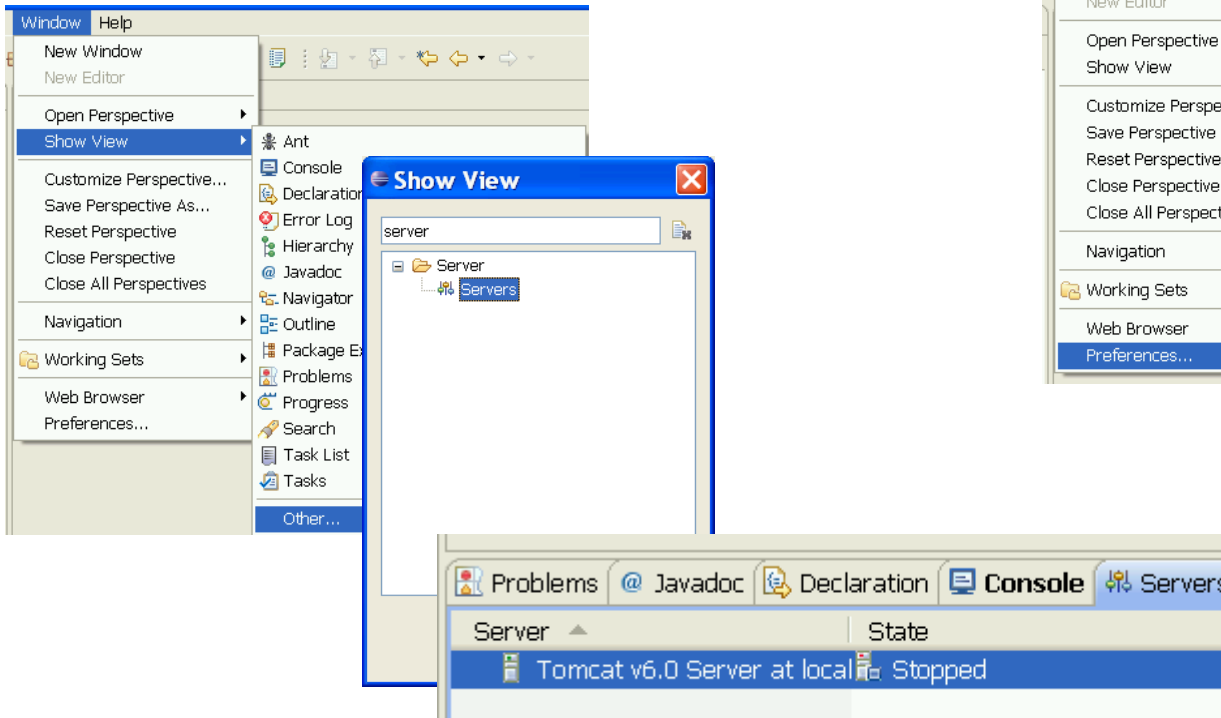
A red arrow points from the "server.xml" file in the Package Explorer to the "server.xml" file in the "Servers" folder, indicating the location of the configuration file.



Servers View

&

Server Timeout



OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Coffee Break

OLAT Conference 2008

Developer Workshop I



Universität Zürich



Goals

- 09:00 ~ 10:30 **OLAT in Eclipse**
 - Who is Who, Install Prerequisites, CVS, build.properties, tomcat start
- 10:40 ~ 11:00 **OLAT Structure**
 - Config Files, Startup, „Module“
- 11:10 ~ 12:15 **Basic Principles of OLAT**
 - Component/Controller/Manager, BasicController, Velocity, Debugging



Config Files

....is a mess at this very moment (March 2008)

The reasons are:

- legacy config files and the new way of configuration are existing side by side – we are in progress to rework the whole setup process
- Ant preprocess is needed to distribute values from the build.properties to the various config.xml.files
- Separation of org.olat.core and OLAT LMS Webapp

Whatever you learn today about config files is subject to change tomorrow – this will be more stable with the OLAT 6.0.0 Release available (but it may change for 6.2.0)



Config Files - NON-Springified

- `webapp/build.properties`
main file with definition of variables which are used to replace placeholders in various other files. Used by Ant build process.
- `webapp/WEB-INF/`
 - `log4j.properties`
 - `olat_buildingblocks.xml`
 - `olat_config.xml`
 - `olat_extensions.xml`
 - `olat_portals.xml`
 - `olat_upgrades.xml`
- `conf/*.*`
contains various generated config files for tomcat, apache, etc.
Only the `server.xml` is of interest in a localhost developer setup.



org.olat.core.CoreSpringFactory

```
/**
 * Description:<br>
 * The core spring factory is used to load resources and spring beans. The
 * application context is generated from XML files that are located in a special
 * serviceconfig directory on the top level directory of your classpath. E.g. in
 * yourapp/webapp/WEB-INF/src/serviceconfig/*
 * <p>
 * Config files must be named defaultconfig.xml or extconfig.xml while the later
 * will override configuratoins from the first one.
 *
 * <P>
 * Initial Date: 12.06.2006 <br>
 *
 * @author patrickb
 */
```



org.olat.core.CoreSpringFactory

```
public class CoreSpringFactory {
/**
 * search for /_spring/defaultconfig.xml and override/add values from
 * /_spring/extconfig.xml
 */
static {
try {
// init the core context first, since it may be used by beans in the default and ext configs of olat.
core_ac = new ClassPathXmlApplicationContext(
new String[] {
"classpath*:serviceconfig/org/olat/core/_spring/olatcoreconfig.xml"
});

// now let all olat modules init
ClassPathXmlApplicationContext cpac = new ClassPathXmlApplicationContext(
new String[] {
"classpath*:serviceconfig/**/_spring/olatdefaultconfig.xml",
"classpath*:serviceconfig/**/_spring/olatextconfig.xml" });
ac = cpac;
```



org.olat.core.service.ServiceFactory

```
/ let spring do the work
ac = new ClassPathXmlApplicationContext(new String[] {
    "classpath*:serviceconfig/brasatoconfig.xml",
    "classpath**:*_spring/brasatoconfigpart.xml",
    "classpath**:*_spring/brasatoalias.xml"
});
```



Springified config files

`serviceconfig/org/olat/core/_spring/olatcoreconfig.xml`

- decides between SingleVM (or Distributed OLAT -> Scalability Project!)

`serviceconfig/**/_spring/olatdefaultconfig.xml`

- exists 1..n times! check with [ctrl] + [shift] + r -> search for olatdefaultconfig.xml

`serviceconfig/**/_spring/olatextconfig.xml`

- exists 1..n times! overrides maybe olatdefaultconfig.xml values

`serviceconfig/brasatoconfig.xml`

- configures the org.olat.core Web GUI Framework

`**/_spring/brasatoconfigpart.xml`

- configures a map of URL's to what dispatcher class to invoke

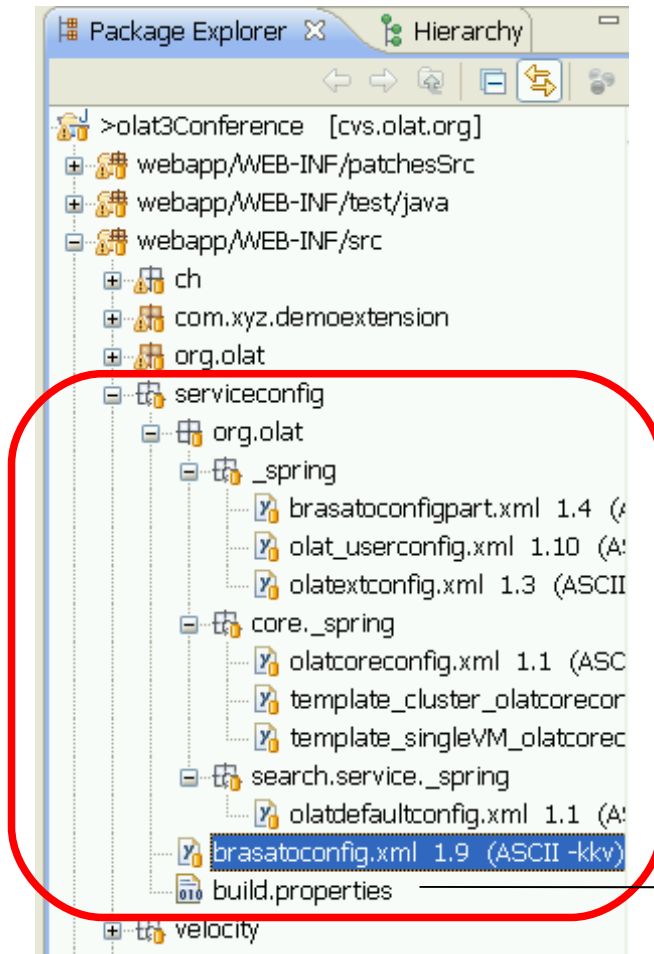
OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



- Spring relevant Config Files are found in `_spring` folders

→ build.properties copied from ant used in Spring for variable substitution

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



OLAT Startup is done in `ConfigurationManager.java`

- loads `olat_config.xml`
- Loops over all modules
- calls `init(..)` on the found modules

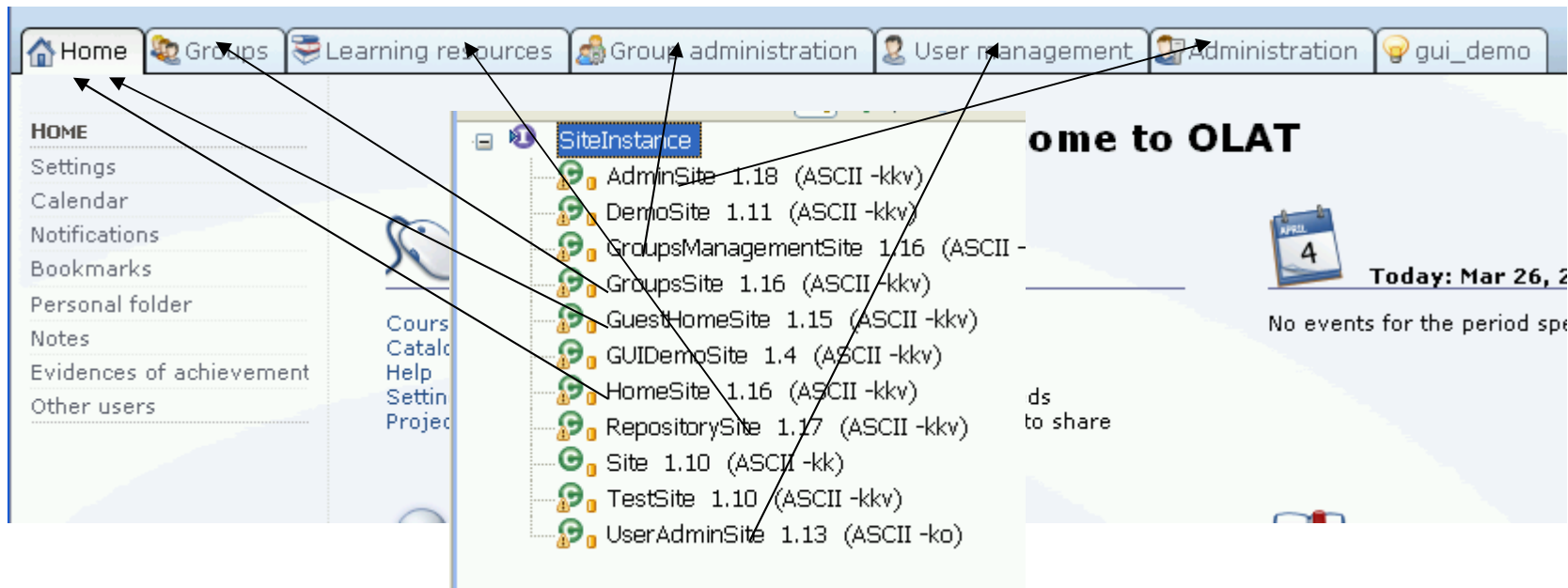
List of current modules by searching Workspace References to
`org.olat.core.configuration.OLATModule`

and see also <http://www.olat.org/api/org/olat/package-summary.html>



OLAT's visible „Modules“ – approached from the „GUI“ Side

- defined in `olat_extensions.xml`
- Implementors of `SiteInstance.java`



The screenshot displays the OLAT user interface. At the top, a navigation bar contains icons and labels for 'Home', 'Groups', 'Learning resources', 'Group administration', 'User management', 'Administration', and 'gui_demo'. Below this, a central pane shows a tree view of 'SiteInstance' with the following entries:

- AdminSite 1.18 (ASCII -kkv)
- DemoSite 1.11 (ASCII -kkv)
- GroupsManagementSite 1.16 (ASCII -kkv)
- GroupsSite 1.16 (ASCII -kkv)
- GuestHomeSite 1.15 (ASCII -kkv)
- GUIDemoSite 1.4 (ASCII -kkv)
- HomeSite 1.16 (ASCII -kkv)
- RepositorySite 1.17 (ASCII -kkv)
- Site 1.10 (ASCII -kk)
- TestSite 1.10 (ASCII -kkv)
- UserAdminSite 1.13 (ASCII -ko)

Arrows from the text above point to the 'Home' and 'Administration' icons in the navigation bar, and to the 'AdminSite' and 'UserAdminSite' entries in the SiteInstance list. The right side of the screenshot shows a 'Welcome to OLAT' message with a calendar for April 4th and the date 'Today: Mar 26, 2008'.

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Coffee Break

OLAT Conference 2008

Developer Workshop I



Universität Zürich



Goals

- 09:00 ~ 10:30 **OLAT in Eclipse**
 - Who is Who, Install Prerequisites, CVS, build.properties, tomcat start
- 10:40 ~ 11:00 **OLAT Structure**
 - Config Files, Startup, „Module“
- 11:10 ~ 12:15 **Basic Principles of OLAT**
 - Component/Controller/Manager, BasicController, Velocity, Debugging

OLAT Conference 2008

Developer Workshop I

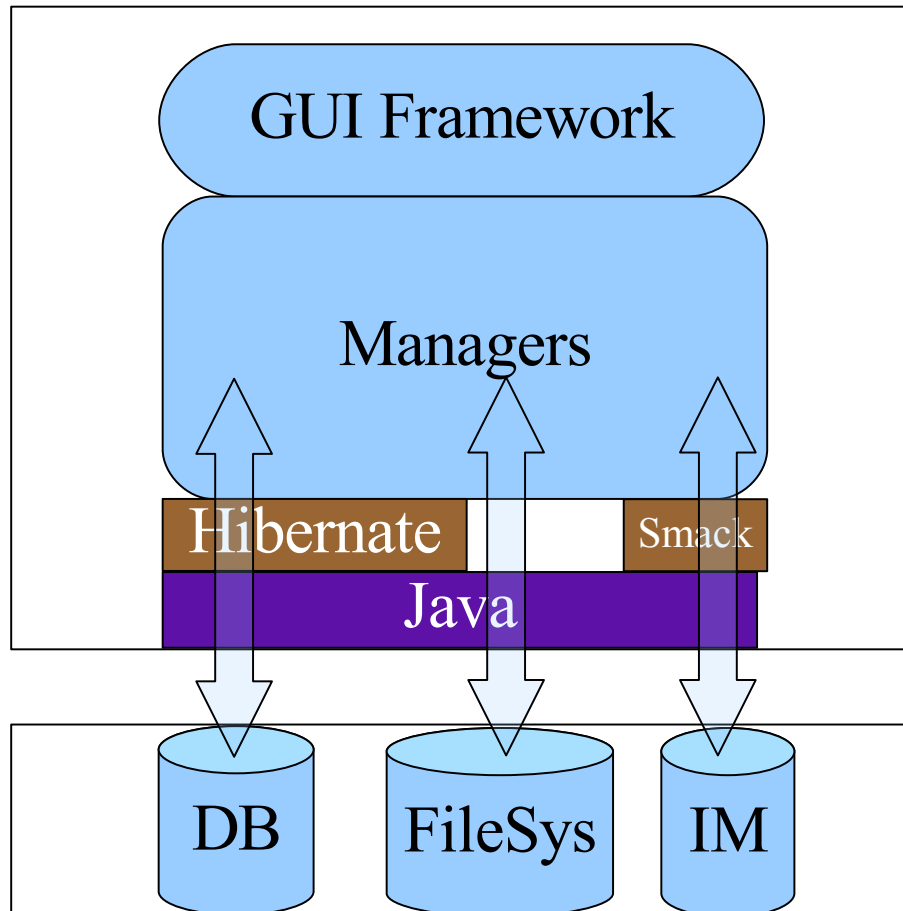
OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Overview



OLAT Conference 2008

Developer Workshop I

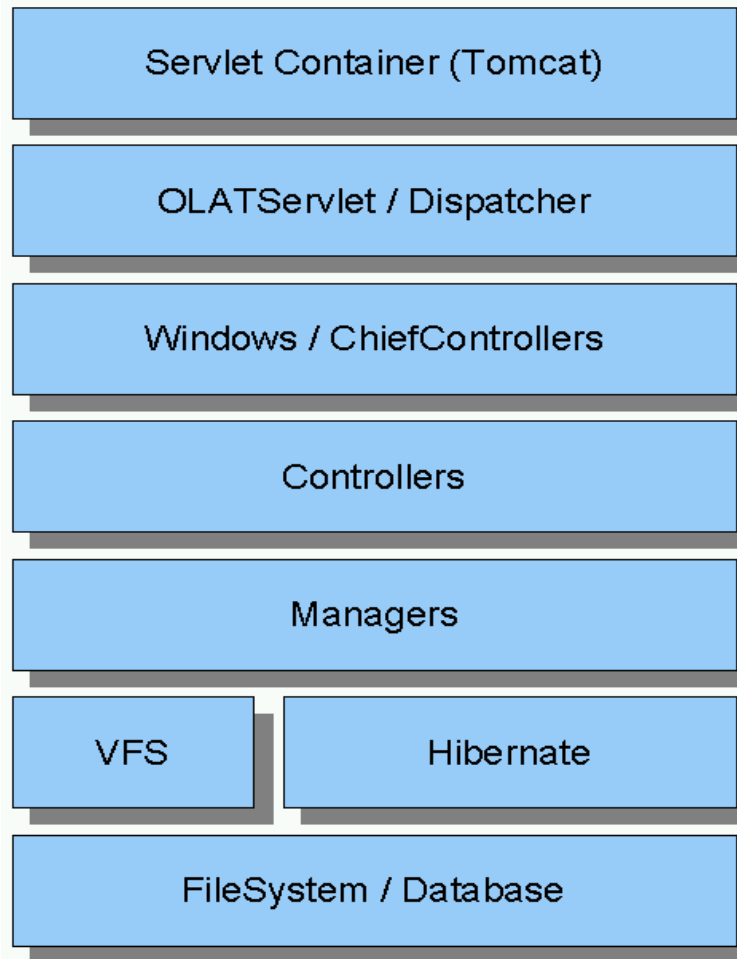
OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



Overview



OLAT Conference 2008

Developer Workshop I

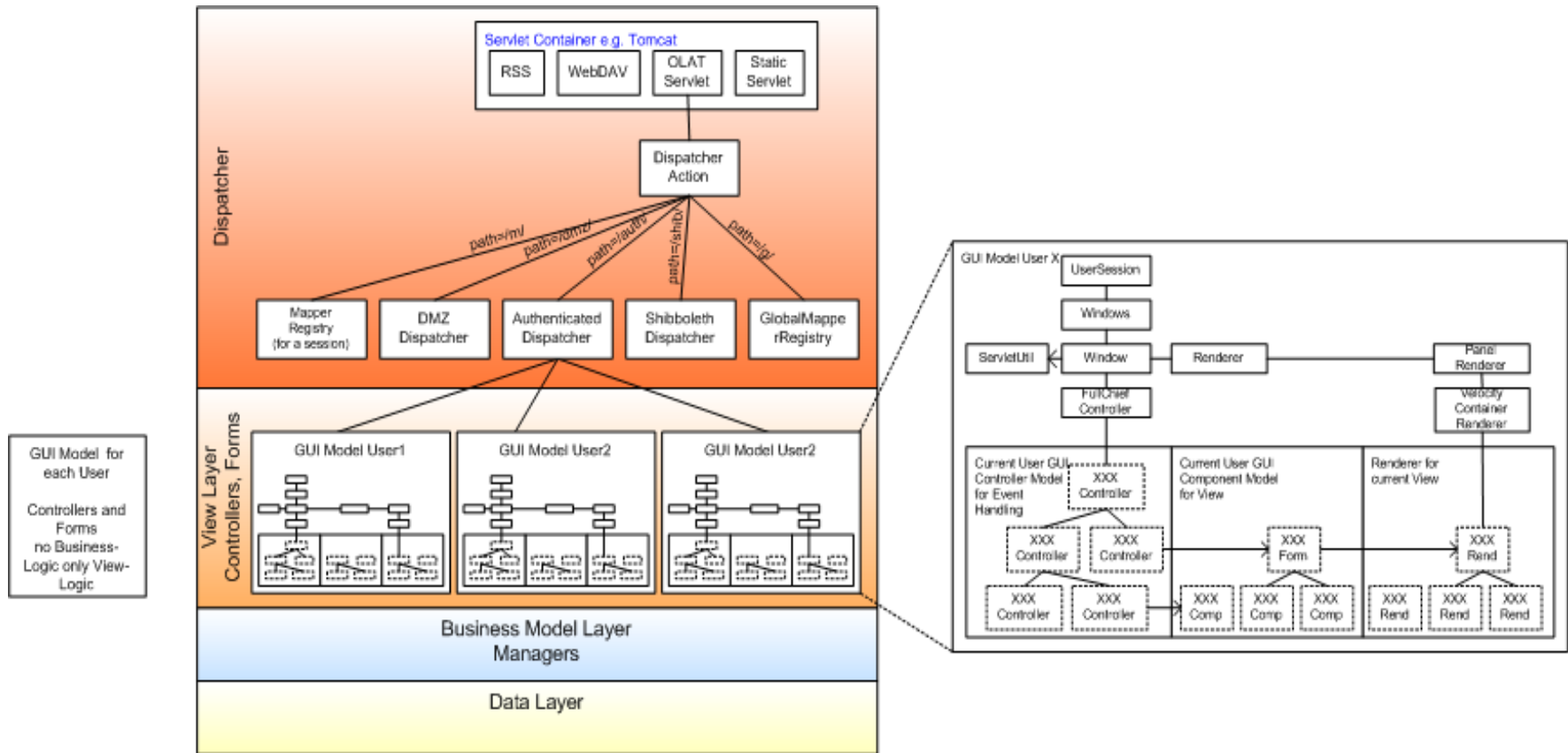
OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



GUI Framework - Model





GUI Framework - Elements

XXXManager.java a class which

- issues CRUD operations
- executes Businesslogic
- is Stateless

XXXController.java a class which

- control a workflow
- uses Managers during state transition
- is Stateful

XXXComponent.java

- Renders a visual representation of a Link, Table, etc.

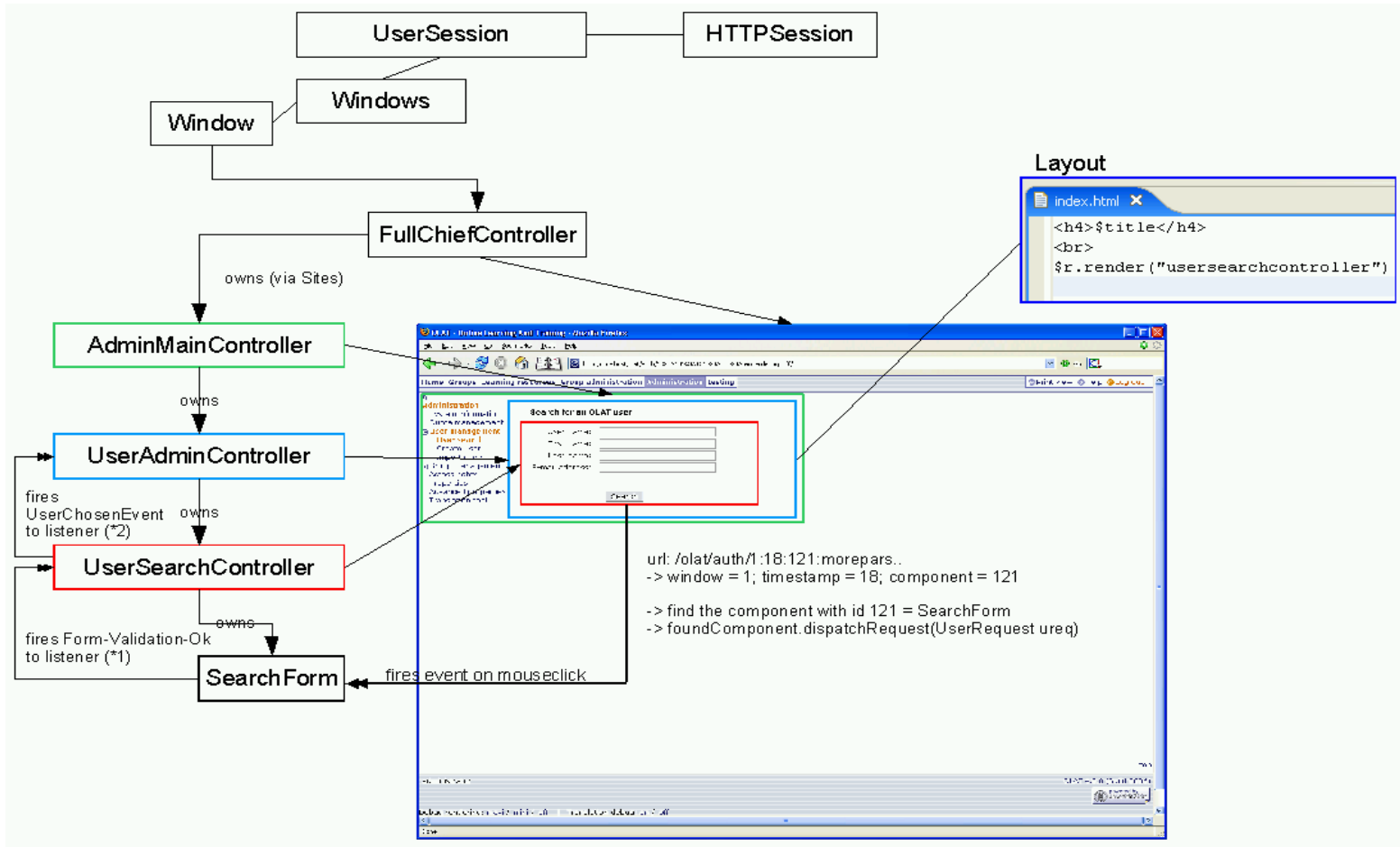


GUI Framework – Events

- Swing like Events
- Component fires Event to Controller
 - Controller fires Event to Parent Controller
 - Controller uses Manager which fires generic Event
- Upon an Event a Controller creates and places new Child-Controllers on the screen



Example GUI Model





Typical package structure

org.olat.user

_content

homepage.html

userinfo.html

_i18n

LocalStrings_de.properties

LocalStrings_en.properties

UserModule.java

UserInfoController.java

UserManager.java

UserManagerImpl.java

User.java

UserImpl.java

UserImpl.hbm.xml

Visual screen parts of
the workflow

translations for keys
(german and english)

Config and init during
startup

Workflow Controller

Businesslogic,
Businessobject,
ORM Mapping file



Velocity

- xxx.html are Velocity Templates
- \$r in the xxx.html is an Instance of VelocityRenderDecorator.java
- html used to layout the page, where needed
- often only a \$r.render(„a_component_name“)

OLAT Conference 2008

Developer Workshop I

OLAT Eclipse
OLAT Structure
Basic Principles



Universität Zürich



BasicController.java should be extended for own
xxxControllers.java

....as it provides convenience methods

- to translate keys from the extending controllers package
- create easily velocity pages from the extending controllers package
- to show info/warn/error messages
- open modal dialogs



Debugging

-> Live Demo

- fast development cycle -> Breakpoint / change / test
 - on i18n
 - on velocity page level
 - on java code level
- GUI Debug Mode explained by example