

# Hibernate Model/SQL

- Model class (with necessary relationship among tables)
  - Tool content
  - Tool session
  - Tool attachment
  - Tool users
  - Others
- Hibernate Xdoclet => Hibernate.hbm files + Tool table SQL script
- Insert tool default content in createToolTable.sql script
- Update SQL script in `${toolRoot}/db/sql`
  - lams\_learning\_activity
  - lams\_learning\_library
  - lams\_tool



# Service bean and DAO

- DAO class
  - HQL language
  - Initialized by spring and inject to tool service bean
- Tool service bean class
  - Spring managed bean class
- Spring (toolApplicationContext.xml)
  - messageServiceBean: for i18n
  - SessionFactory: hibernate session factory cover all hbm
  - Manage DAO beans
  - Inject DAO and lams core service (web.xml) into tool service bean
  - Transaction control for service methods



# Action class/ servlet

- STRUTS action
  - Authoring
  - Learning
  - Monitoring
  - ClearSession
- Servlet
  - ExportPorfolio



# Viewer

- JSP to create view page
  - JSTL tag
  - STRUTS HTML tag
  - Customized tag from lams, such as `<lams:AuthoringButton .../>`



# More details in JSP pages

- Authoring page is most similar across all tools:
  - Use `<lams:head>` to include necessary style/JS
  - Use `<lams:Tabs>` to create 3 tab page
  - Use `<lams:AuthoringButton>` to create save/cancel button. It also redirect to success page and call `ClearSession` class automatically.
  - Use `<lams:FCKEditor>` to create standard and upload-file-allow FCKeditor
  - Suggest copy from existed tool:
    - Some Ajax for instruction file delete
    - Some JS and IFrame style for extra authoring items (such as forum topics)
- Use `<lams:Tabs>` for Monitoring
- Use `<lams:FCKEditor toolbarSet="Default-Learner">` to forbid file uploading. Most using in learner page if it need FCKEditor
- Other JSP pages :
  - Monitoring define it later page: one tab (basic) from authoring page
  - Learner define it later page: simply use `<lams:DefineLater/>` tag
  - Learner run offline page : provide run offline message and finish button



# Other need care about

- Define it later
- Run offline
- Lock on finish
- Reflect on tool
  - Continue button to replace finish button on learner page
  - Inject lams core ICoreNotebookService
    - createNotebookEntry() for learner create reflection
    - getEntry() for monitoring read out reflection
- Learner page ToolAccessMode
  - Authoring preview
  - Learner mode
  - Monitoring read-only



# Communication with LAMS core

- Service injection (web.xml and toolApplicatonContext.xml)
- Tool service class Implement interface from lams core:
  - ToolCotentManager
    - copyToolContent : duplicate tool content
    - exportToolContent/importToolContent
  - ToolSessionManager
    - createToolSession: new record for tool session table



# Web.xml configuration

- Web.xml
  - I18n configure for JSTL
  - Service import from lams core
  - Filter
    - SystemSessionFilter – provide shared session across multiple webapps
    - OpenSessionInViewFilter
  - Servlet
    - ExportPortfolio servlet
  - Tag definition
  - Security
  - Error page : 404, 403 etc



# Ant

- Lams-build task
  - copyfiles: run once for JBOSS configuration
  - rebuild-db: reset lams-core tables. Need execute when developer want to redeploy tool
  - assemble-ear, deploy-ear: deploy lams core to JBOSS
  - deploy-tools: optional, deploy all available tools. For new tool, need manually add it to this tasks.
- Tool ant build.property
  - Tool signature
- Tool ant task
  - schemaexport: create \*.hbm files and initial table script (need manually copy new script to deployable SQL script)
  - deploy-tool(explode-tool): deploy(explode) to JBOSS
  - synchronize-deploy: this task could synchronize JSP files if tool is exploded under JBOSS



# Miscellaneous

- Use SessionMap instead of HttpSession to avoid multiple windows conflict
- Exception
  - STRUTS global-exceptions =>CustomStrutsExceptionHandler
- Rename tool to help you start from an exist tool
  - <http://wiki.lamsfoundation.org/display/lams/RenameTool>
- Recommend reading
  - <http://wiki.lamsfoundation.org/display/lams/Tool+Creation+Experience>