MAKING DSPACE 1.5.X YOUR OWN
CUSTOMIZATION VIA OVERLAYS

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DSpace 1.5.x Overview

- Maven Build Architecture
  - DSpace “modules”
  - Application “Overlays”
- XMLUI (aka. Manakin)
- JSPUI
- SWORD Interface
- LNI (Lightweight Network Interface)
- OAI-PMH Interface
Introducing Maven…

- Apache Software Foundation
- Java Project Build / Management Tool

**Advantages:**
- Manages dependencies
- Easier to manage/build many “modules”
- Allows for basic application customizations via “overlays”

**Disadvantages:**
- Yet another XML config (many actually…)
- Somewhat complex, if doing more than basic overlays
Maven v. Ant

- DSpace 1.x-1.4 used Ant to build & install DSpace
- DSpace 1.5 uses both Maven & Ant
  - Maven – Builds / Assembles DSpace “package”
    - Includes applying “overlays” and pulling down all the necessary 3rd party dependencies
  - Ant – Installs or Updates your DSpace Installation directory ([dspace.dir] in dspace.cfg)
Ok, so what really is Maven?

Build DSpace

mvn package

<dependencies/>

pom.xml

Maven Repository

Here's what I need...

Here you go...

local copies

dspace-1.5-build.dir

target

Dependencies!
Maven Concepts: An Overview

- pom.xml (Project Object Model) config file
- Standard directory layout

```
src
  main
    java (Java Source Code)
    resources (Application Resources)
    webapp (Web Application Source)
  target (Build / Package Output)
```
DSpace 1.5.x Release Structure

For those who only want to make minor (non-Java) customizations

- **dspace-1.5**
  - **dspace**
    - **bin**
    - **config**
    - **docs**
    - **etc**
    - **modules** (Module Overlays)
    - **src**
    - **pom.xml** (Maven Project Object Model config)
DSpace 1.5.x “Modules”

Where’s the actual source code?

src / main / java?
DSpace 1.5.x Source (SVN)

In Release Version:
Maven pulls down pre-compiled versions of these modules

Source code for DSpace “modules”

(ds Same as release version – see previous slides)
DSpace 1.5.x Overlays

• Overview of Overlays
• How to take advantage of them
Customization via Overlays…

- Overlay is Maven term ("Maven WAR Overlays")
- Simple way to override defaults with your own customizations and code
- Allow you to more easily manage your customizations separate from DSpace core code
- What can you “overlay”?
  - User interface look-and-feel (JSPUI, XMLUI Themes)
  - Language / terminology (messages.xml)
  - Java code to add functionality (XMLUI Aspect)
    - Although, this may be better built into a custom “module”
Build DSpace

<build/>

<dependencies/>

Can you give me the JSPUI Web application?

Here you go…

Overlay

My JSPUI

Maven Repository

<build/>

<dependencies/>

Overlay

JSPUI WAR

My JSPUI

Build DSpace

dspace

modules

jspui

messages.properties

jsp
Creating a Basic Overlay - JSPUI

Notice the Maven "standard directory layout"

See "The Dspace Course" (S. Lewis & C. Yates) for more details on 1.5.x JSPUI customizations

(Replacement for "/jsp/local")
Creating a Basic Overlay - XMLUI

- dspace
  - modules
    - xmlui
      - src
        - main
          - java
          - resources
          - webapp
        - webapp
      - messages.xml
  - webapp
    - i18n
      - themes
        - My-Custom-Theme
          - css
          - xsl
          - images
          - sitemap.xmap
Building/Installing an Overlay

- Add your files to appropriate "/dspace/modules/" directory (see previous slides)
- Rebuild DSpace: `mvn package`
  - Builds to `[dspace-src]/dspace/target/
- Update DSpace installation: `ant update`
  - Installs to `[dspace.dir]` (as specified in dspace.cfg)
Review: Why Overlays?

- Essentially, they came along with move to Maven
- You can manage your own customizations separate from DSpace source code
  - “/dspace/modules” subdirectories empty by default
- JSPUI replacement for “/jsp/local” from pre-1.5
- It is possible to overlay most *anything* (Java code, JSPs, XMLUI Aspects/Themes, sitemaps, etc.)
Overlays: things to watch out for...

- We don’t recommend overlaying core APIs
- Be very careful to merge in new code changes during your next upgrade
  - A local SVN code repository is helpful (“SVN vendor branch”)
- It is recommended to only place overlays in `[dspace-src]/dspace/modules/` (and subdirectories)

Image borrowed from: http://www.flickr.com/photos/valgonzarp/
Quick XMLUI Review

- Cocoon
- DRI
- Aspects
- Themes
XMLUI Architecture Review

- Built on Apache Cocoon
  - Modular, web-development framework
  - Pipeline based architecture
- DRI (Digital Repository Interface) Schema
  - Structure based on TEI (light)
  - Metadata referenced in METS
- Aspects and Themes
  - Aspects = functionality in system (Java or XSL)
  - Themes = style / look & feel (XSL, CSS, images)
Cocoon’s Pipeline Model

Sitemaps are used by both XMLUI Aspects and Themes.

Diagram Credit: Scott Phillips, Texas Digital Library
XMLUI Architecture Overview

content generation

defines aspect chain & themes

xmlui.xconf

aspect chain

aspect 1

aspect 2

aspect 3

DRI Document

style application

themes

theme A

theme B

theme C

Diagram Credit: Scott Phillips, Texas Digital Library

Notice the similarities to Cocoon Pipeline model...
Three “tiers” of customization...

- **Style Tier (CSS only)**
  - Simple Themes: change basic look & feel

- **Theme Tier (XSL, CSS)**
  - More Complex Themes: change page layout, what/how content is displayed

- **Aspect Tier (Java or XSL, sitemap)**
  - Add new features via Java (and Cocoon)
  - Change XML (DRI) structure/hierarchy via XSL
Creating an XMLUI Theme

- A few hints and tips on starting an XMLUI theme
- Creating a theme via overlay
Create a new Theme via overlay

- dspace
  - modules
  - xmlui
- src
  - main
    - java
    - resources
    - webapp
  - webapp
- webapp
  - i18n
  - themes
- My-Custom-Theme
  - css
  - xsl
  - images
  - sitemap.xmap
  - messages.xml
Tips on creating a theme

- Start with an existing theme and tweak it
- Use `XML` to view XML/DRI source document
  - Firebug (http://getfirebug.com/) for CSS/XHTML
- Locate appropriate `<xsl:template>` in `dri2xhtml`
  - `DIM Handler.xsl` matches METS containing DIM
  - `General-Handler.xsl` matches METS `<fileSec>`
  - `MODS-Handler.xsl` matches METS containing MODS
  - `QDC-Handler.xsl` matches METS containing QDC
  - `structural.xsl` defines layout/page structure
Tips on creating a theme

- Four metadata display “modes”
  - **SummaryList** = Summarized list of objects
    - (E.g.) Community/Collection listing, item browse/search
  - **SummaryView** = Summarized view of single object
    - (E.g.) Item homepage (summary metadata only)
  - **DetailList** = Detailed list of objects
    - Rarely used: (E.g.) “item appears in following collections”
  - **DetailView** = Detailed view of single object
    - (E.g.) Item “full record” page, collection/community pages
Homepage Structural Breakdown

Search DSpace

Enter some text in the box below to search DSpace.

Go

Communities in DSpace

Select a community to browse its collections.

- Test Community

communitySummaryList-DIM (DIM-Handler.xsl)

Digital Initiatives
Research & Technology
"White and Nerdy": Computers, Race, and the Nerd Stereotype

Title: "White and Nerdy": Computers, Race, and the Nerd Stereotype

Author: Kendall, Lori

Abstract: The nerd stereotype portrays nerds as white males and thus acts as a "gatekeeper" to the acquisition of computer expertise and employment. This article examines three popular culture representations of nerds: the Geek Squad homepages, Weird Al Yankovic's "White and Nerdy" video, and various representations of nerdcore, a nerd genre of hip hop.

URI: http://hdl.handle.net/2142/1792

Date: 2007-08-09

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- GSLIS Faculty and Staff Research and Scholarship
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Simple XMLUI Theme Overlay

- Task: Modify file display to show a format icon
- (E.g.) PDF icon is displayed next to PDF files
Review: Create a new Theme
Creating a new theme folder

dspace/modules/xmlui/src/main/webapp

themes

MyTheme

sitemap.xmap

images

lib  (CSS is stored here)

Copy the default “Reference” theme into a new folder called “MyTheme”
Adding File Format icons to theme

Copy of “mets:file” template from General-Handler.xsl

```xml
<xsl:template match="mets:file">
  ...
  <xsl:call-template name="getFileFormatIcon">
    <xsl:with-param name="mimetype">
      <xsl:value-of select="@MIMETYPE"/>
    </xsl:with-param>
  </xsl:call-template>
  ...
</xsl:template>
<xsl:template name="getFileFormatIcon">
  ...
</xsl:template>
<xsl:when test="$mimetype='application/pdf'">
  <xsl:value-of select="$theme-path"/>
  <xsl:text>/images/pdf.png</xsl:text>
</xsl:when>
```

Snippet from `getFileFormatIcon`
Adding File Format icons to theme

```
<src/main/webappthemes
  - MyTheme
    - my-theme.xsl
    - sitemap.xmap
    - images
      - pdf.png
    - lib

  <map:sitemap>
    <map:pipelines>
      <map:pipeline>
        ...
        <map:transform src="my-theme.xsl"/>
        ...
        <map:serialize type="xhtml"/>
      </map:pipeline>
    </map:pipelines>
  </map:sitemap>
```
Enable your new theme...

Other sample theme settings:

- `regex="^$"` (Theme for homepage ONLY)
- `regex="^browse$"` (Theme for all global “Browse By” pages)
- `handle="2142/2"` (Theme for Community/Collection/Item)

Restart web server for changes to take effect
### BibApp: Information Architected

**Title:** BibApp: Information Architected  
**Author:** Larson, Eric; Shreeves, Sarah L.  
**URL:** http://hdl.handle.net/2142/5441  
**Date:** 2008-04-30

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Creating an XMLUI Aspect

- A few (high-level) hints and tips on starting an XMLUI aspect
Options for adding custom Java

via Overlay

- Little more simplistic
- Sitemap (XMLUI)
- Compiled in WAR
- Only one "module" (UI) can use

via Maven Module

- Little more complex
- pom.xml & sitemap (XMLUI)
- Compiled in JAR
- Multiple "modules" can use via dependencies
- Easier to share with others
Create a simple Aspect via overlay

Good for simple aspects
Aspect via a new Maven module

For complex aspects or for easier sharing

java
(Custom java source code)

resources

aspects

my-module

modules

dspace

src

main

java

resources

pom.xml

sitemap.xmap

MyAspect
Aspect via a new Maven module

Very simple example of a valid pom.xml

```xml
<project>
  <groupId>edu.myu.modules</groupId>
  <artifactId>my-aspect</artifactId>
  <packaging>jar</packaging>
  <name>My Aspect's API</name>
  <version>1.0-SNAPSHOT</version>
  <dependencies>...</dependencies>
</project>
```

More pom.xml details: http://cocoon.apache.org/
Add new Module as a Dependency

Add it to `/dspace/modules/pom.xml` so it is built alongside other modules

```xml
<project>
  ...
  <modules>
    ...
    <module>my-module</module>
  </modules>
</project>
```

Also add it as a `<dependency>` in `pom.xml` of UI modules (XMLUI, JSPUI, etc)

Rebuild DSpace for changes to take effect
Simple Aspect via Overlay

- Modify Breadcrumb Trail to link to our Library’s Homepage
- Do this at the “aspect” level so that it will apply across all of our XMLUI Themes
- No Java…just XSLT

Credit: Conal Tuohy, New Zealand Electronic Text Centre
Review: Simple Aspect via overlay

XSLT-only Aspect, so everything will go in `/src/main/resources`
Aspect Overlay – Breadcrumb trail

Remember: Aspects generate XML/DRI
Aspect Overlay – Breadcrumb trail

```xml
<xsl:template match="*">
    <xsl:copy>
        <xsl:copy-of select="@*"/>
        <xsl:apply-templates/>
    </xsl:copy>
</xsl:template>

<xsl:template match="dri:pageMeta">
    <xsl:copy>
        <xsl:copy-of select="@*"/>
        <dri:trail target="www.library.my.edu/">
            My Library
        </dri:trail>
        <xsl:apply-templates/>
    </xsl:copy>
</xsl:template>
```
Enable your new aspect...

...<aspects>
    ...
    <aspect name="Trail"
        path="resource://aspects/Trail/">
    </aspect>
    ...
</aspects>
...

Restart DSpace for changes to take effect
Search DSpace

Enter some text in the box below to search DSpace.

Communities in DSpace

Select a community to browse its collections.

- Test Community
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Recent Additions

Hunger, Herbert (Department of Classics, University of Illinois at Urbana-Champaign., 1981)
PDF (439KB)

Bateman, John J. (Department of Classics, University of Illinois at Urbana-Champaign., 1981)
PDF (574KB)

Top Downloads this Month

2. The Face in the Surf [total: 317]
3. Does Fitness Bring People Together? [total: 308]
4. Estrategias para Motivar el Aprendizaje Colaborativo en Cursos a Distancia [total: 276]
5. An extension of the Dewey decimal system of classification applied to the engineering industries [total: 204]
7. A Statewide Collection Map: Results from the Statewide Assessment of Monographs and Electronic Resources in Illinois [total: 162]
8. DSpace How-To Guide: Tips and tricks for managing common DSpace chores (Now serving DSpace 1.4.2 and Manakin 1.1) [total: 142]
9. How We Do User-Centered Design [total: 796]
Useful Resources

http://wiki.dspace.org/index.php/Category:HOWTO
http://www.dspace.org (“Training Materials”)

“The DSpace Course” (Stuart Lewis & Chris Yates):
http://hdl.handle.net/2160/615
(Also linked to from www.dspace.org under “Training Materials”)

“Learning to Use Manakin” Tutorial (Scott Phillips):
http://di.tamu.edu/publications/resources/dsug07/LearningToUseManakin.pdf
http://di.tamu.edu/publications/resources/dsug07/LearningToUseManakin.zip
(Also linked to from www.dspace.org under “Training Materials”)


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DSpace Mailing Lists
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    dspace-tech@lists.sourceforge.net
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    dspace-devel@lists.sourceforge.net

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