Rapid JCR applications development with Apache Sling

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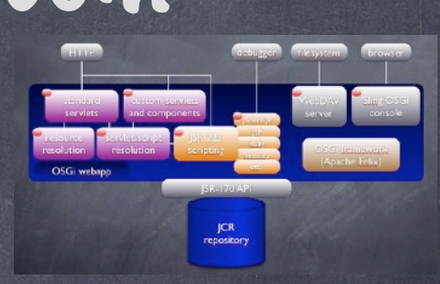
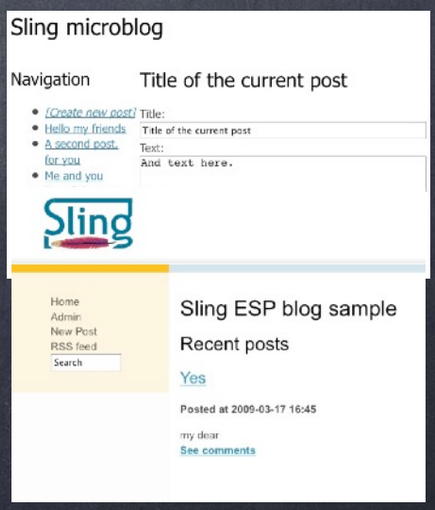




Slides revision: 2009-03-20
Slides theme design: David Nuescheler

Sling

Day

is this slide busy enough?

Intro to JCR

JCR = Java Content Repository API

JSR-170 / JSR-283

Everything Is Content - and JCR manages it as trees of Nodes and Properties, using rich data types.

What's JCR?

JSR-170

Content Repository for JavaTM technology API

Spec-Lead:
Day Software

Status:
Final Release 17-jun-2005

Java Community Process

Expert Group:

FileNet, Hummingbird, SAP, atg, IBM, bea, Apache, Day, Nuxeo, Venetica, macromedia, hp, MediaSurface, Fujitsu, Oracle, EMC documentum, sas, software AG THE XML COMPANY, STELLENT

What's JCR?

JSR-170

JSR-283

Content Repository for JavaTM technology API v2.0

Spec-Lead:
Day Software

Status:
Public Review Closed sep-2007

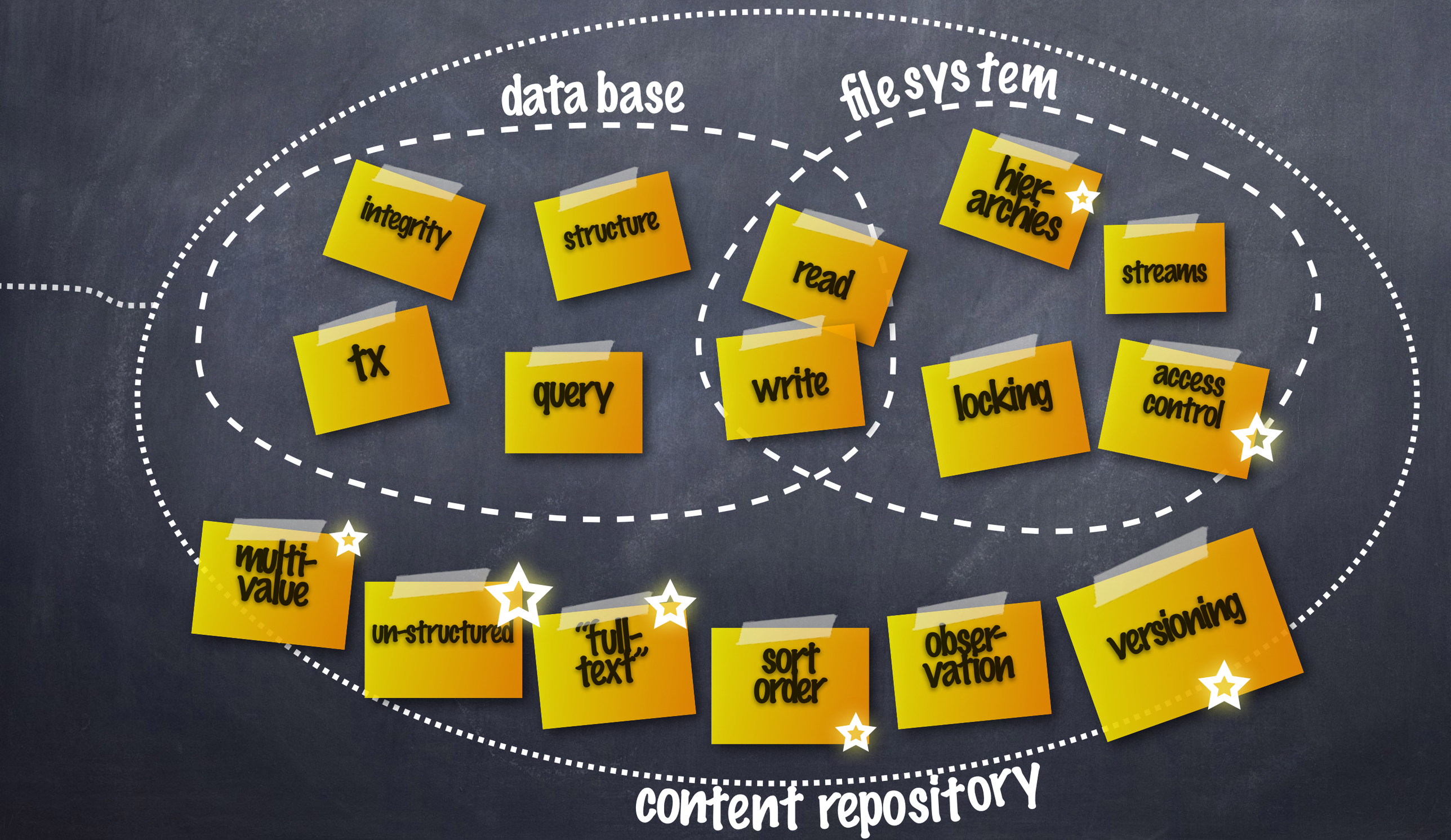
Expert Group:

Day

What's JCR?

"The API should be a standard, implementation independent, way to access content bi-directionally on a granular level to a content repository." ?

Best of both worlds.



Known compliant Repositories

* using third party connector

Apache **Jackrabbit**	Oracle **XML DB**	Exo **ECMS Platform**	Microsoft **Sharepoint** *	OpenText **Livelink** *
Day **CRX**	IBM FileNet **P8**	Xythos **Repository**	Alfresco **ECM**	Vignette **V7** *
Interwoven **Repository** *	IBM **CM**	EMC **Documentum** *		

+hundreds of TCKs **registered**

How many RDBMS vendors do you need?

Some known JCR Applications

BEA **Portal**

Sun **OpenPortal**

JBoss **Portal**

Oracle **Portal**

Enterprise Search

magnolia **WCMS**

Apache **Sling**

Communique DAM

Spring Framework

Alfresco **ECMS**

Mindquarry **Collaboration**

Communique Collab

Apache **Cocoon**

QSLabs **Compliance**

Communiqué WCMS

Apache **Tapestry**

IBM FileNet **WebSiteManager**

Apache **James**

Artifactory **Maven Proxy**

medic-2-medic **mapofmedicine**

GX **WebManager**

Exo **ECMS Platform**

TYPO3 **v5.0 WCM**

Nuxeo **ECM**

Online Community

Hippo **CMS**

Liferay **Enterprise Portal**

Percussion **Rhythmix**

QuickWCM **WCMS**

Jahia **Framework**

Sakai **E-learning**

Lutece **Portal**

Sourcemix **Sourcemix**

JCR code excerpt

```
Repository repository = new TransientRepository();
Session session = repository.login(...);

// Create content
Node root = session.getRootNode();
Node hello = root.addNode("hello");
Node world = hello.addNode("world");

world.setProperty("message", "Hello, World!");
session.save();

// Retrieve content
Node node = root.getNode("hello/world");
print(node.getPath());
print(node.getProperty("message").getString());
```

On to Sling

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Sling builds on top of JCR

Scriptable applications layer on top of JCR

OSGi-based industrial-strength framework

Simple, powerful, JCR inside

Runs on Apache Jackrabbit by default

http://incubator.apache.org/sling

join the fun!

Sling == REST over JCR

UNIVERSITY OF CALIFORNIA,
IRVINE

Architectural Styles and the Design of Network-based Software Architec

DISSERTATION

submitted in partial satisfaction of the requirements for the degree

DOCTOR OF PHILOSOPHY

in Information and Computer Science

by

Roy Thomas Fielding

REST -> Roy T. Fielding

JCR: David Nuescheler

released y2k
162 pages

Content Repository API for Java™ Technology Specification

Java Specification Request 170
version 1.0
11 May 2005

v1.0 released 2005
+300 pages

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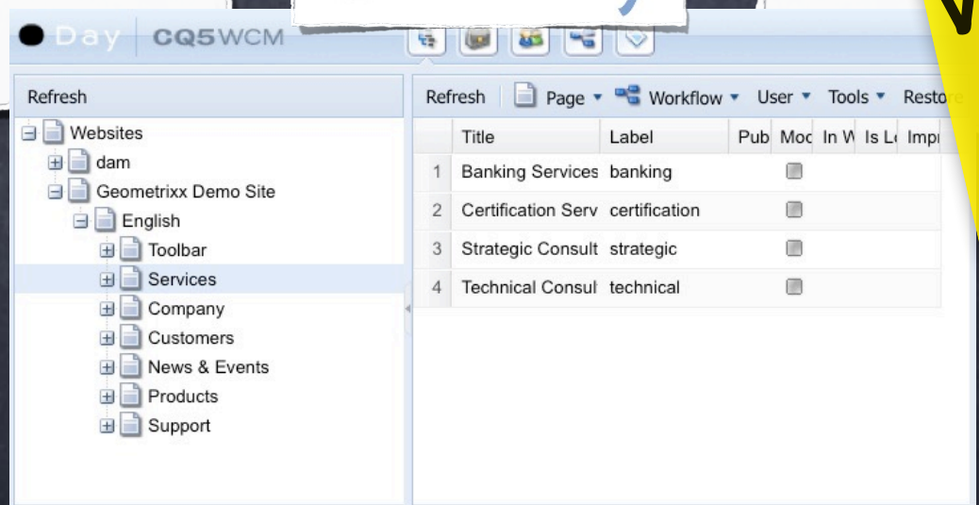

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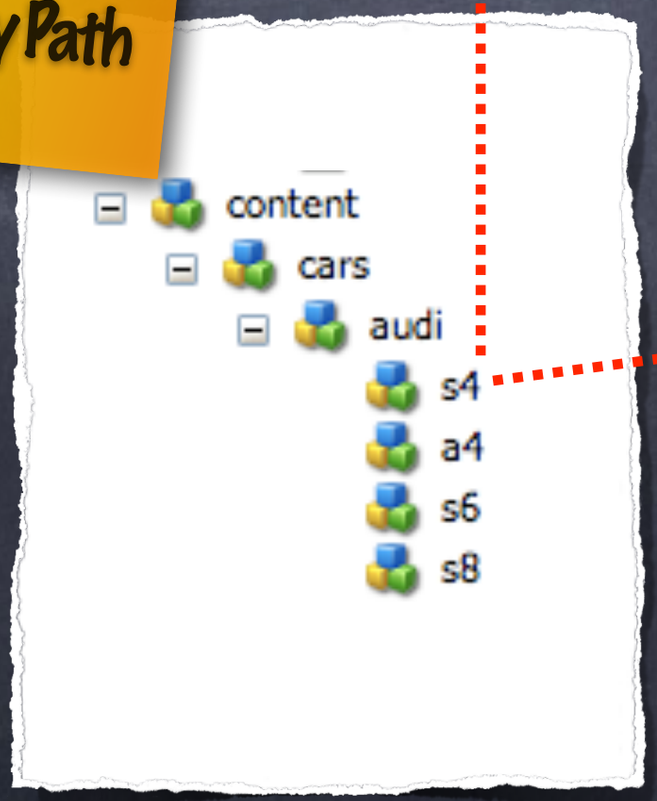
Reclaiming the web.
Sling URL decomposition.

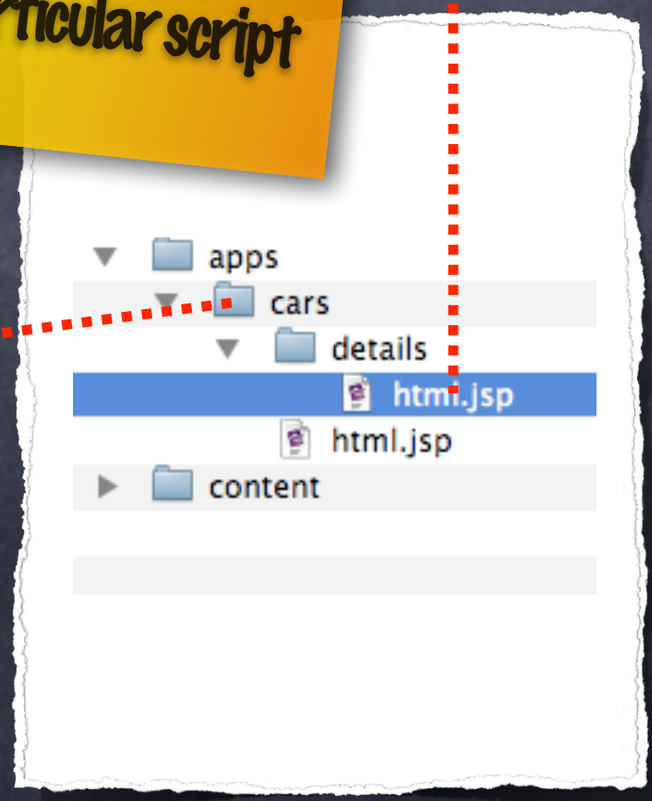
```
/cars/audi/s4.details.html
```

Content Repository Path

...selects a particular script

Repository





Sling architecture

POST, json GET

sling.js utility

HTTP

debugger

filesystem

browser

WebDAV access

standard servlets

custom servlets and components

resource resolution

servlet/script resolution

JSR 223 scripting

javascript

JSP

Ruby

Velocity

etc..

WebDAV server

Sling OSGi console

OSGi framework (Apache Felix)

OSGi webapp

ESP server-side javascript

JSR-170 API

JCR repository

Sling

get the code from
dev.day.com :
http://tinyurl.com/
slingblog46

A minimal Sling blog

Consisting of one .esp script

```
cat /Volumes/localhost/apps/blog/blog.esp | wc -l
54
```

Sling POST servlet

```
# POST to Sling
curl -F title=hello http://localhost:8888/foo
-> 200 OK

# GET created node in json format
curl http://localhost:8888/foo.tidy.json
{
  "jcr:primaryType": "nt:unstructured",
  "title": "hello"
}
```

POST parameters set node properties

Sling

blog step 1: create content

```
<form method="POST">
  Title:
  <input type="text" name="title" style="width:100%"/>

  Text:
  <textarea style="width:100%" name="text"></textarea>

  <input type="submit" value="save"/>

  <input type="hidden" name=":redirect" value="*"/>
</form>
```

Form fields drive the content model

blog step 2: retrieve content

```
<script src="/system/sling.js"></script>
<form method="POST">
...
</form>
```

```
<!-- initialize form fields from current node values -->
<script>Sling.wizard();</script>
```

Instant CRU(D)

blog step 3: navigation

```
<ul>
    <li>
      <a href="/content/blog/*">
      [Create new post]</a>
    </li>
  <script>
    var posts = Sling.getContent("/content/blog", 2);
    for(var post in posts) {
      document.write(
        "<li><a href='" + post + "'>"
        + posts[post].title + "</a></li>");
    }
  </script>
</ul>
```

Navigation

- *[Create new post]*
- Hello my friends
- A second post, for you
- Me and you
- New Orleans at dawn
- Title of the current post

we got a blog!

html form + Sling.wizard() + Sling.getContent()

The ESP blog sample

ESP scripting + java + javascript

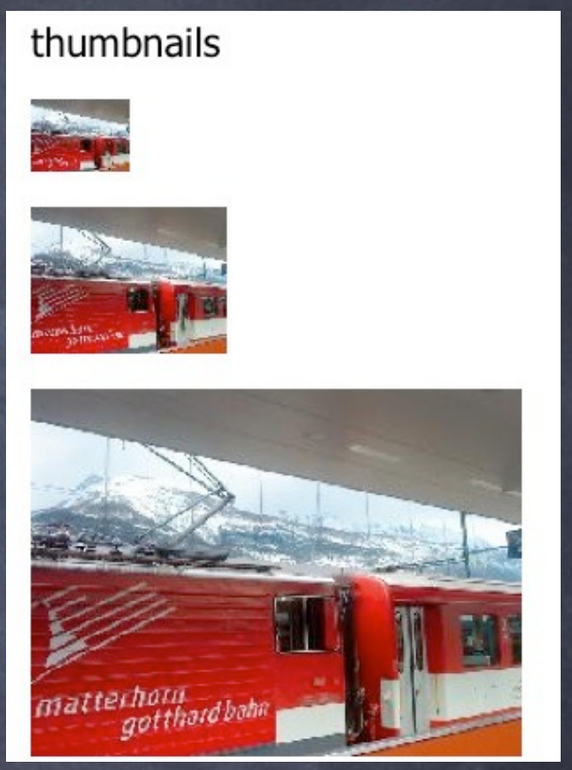
OSGi bundle, initial content, WebDAV, observation, RAD

Code under sling/samples
http://tinyurl.com/slingblogesp

ESP blog in action

create

retrieve



thumbnails

update

ESPblog demo

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ESP blog source files

admin.esp
edit.esp
html.esp
list.esp
menu.esp

xml.esp (RSS feed)
constants.esp
header.esp

pom.xml
ThumbnailGeneratorService.java
ThumbnailGeneratorServiceImpl.java

espblog.css
sling-logo.png

espblog resource type points to those scripts

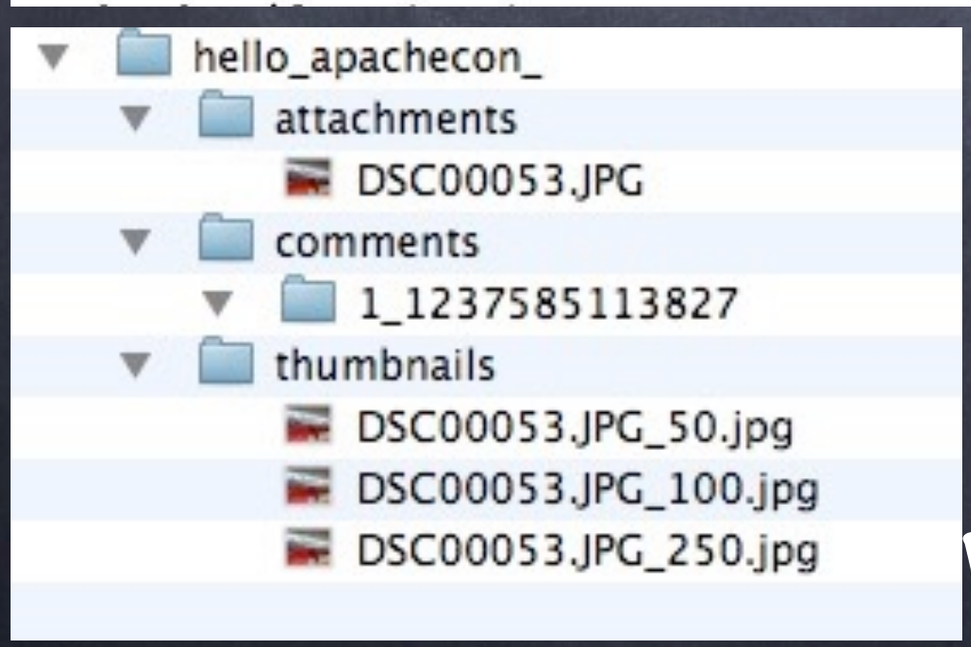
ESP blog content structure

JSON dump

```
  created: "Fri Mar 20 2009 22:38:14 GMT+0100",
  jcr:primaryType: "nt:unstructured",
  posttext: "This is a sample post for my ApacheCon Sling talk",
  title: "Hello, ApacheCon!",
- attachments: {
      jcr:primaryType: "nt:unstructured",
    - DSC00053.JPG: {
          jcr:created: "Fri Mar 20 2009 22:38:14 GM
          jcr:primaryType: "nt:file",
        - jcr:content: {
              jcr:primaryType: "nt:resource",
              :jcr:data: 119212,
              jcr:mimeType: "image/jpeg",
              jcr:uuid: "5ef09129-6e06-449f-9183-194af99f51c6",
              jcr:lastModified: "Fri Mar 20 2009 22:38:14 GMT+0100"
          }
      }
  },
```

```
- thumbnails: {
      jcr:created: "Fri Mar 20 2009
      jcr:primaryType: "nt:folder",
    + DSC00053.JPG_50.jpg: { … },
    + DSC00053.JPG_100.jpg: { … },
    + DSC00053.JPG_250.jpg: { … }
  },
```

```
- comments: {
      jcr:primaryType: "nt:unstructured",
    - 1_1237585113827: {
          commenter: "Bertrand",
          commenttext: "I like it, thanks!",
          jcr:primaryType: "nt:unstructured"
      }
  }
```



WebDAV view

ESP blog edit script

```
<%
pageTitle = currentNode.title; load("header.esp");
%>
<body>
  <form method="POST" action="<%= currentNode %>">
    <p><label>Title</label>
    <input name="title" type="text"
      value="<%= currentNode.title %>"></p>
    ...
    <input type="hidden" name="created"/>
    <input name=":redirect" type="hidden"
      value="/content/espblog/posts.admin.html"/>
    <input type="submit" value="Post" class="button">
  </form>
...
```

ESP blog thumbnails: OSGi service

```
/**
 * Observe the espblog content for changes, and generate
 * thumbnails when images are added.
 *
 * maven-scr-plugin uses annotations to generate the OSGi
 * Declarative Services XML configuration files
 * @scr.service
 * @scr.component immediate="true"
 *
 */
public class ThumbnailGeneratorServiceImpl
  implements ThumbnailGeneratorService, EventListener {
```

ESP blog thumbnails: observation

```
/** @scr.reference (framework injects it automatically) */
private SlingRepository repository;

/** called by framework when service is activated */
protected void activate(ComponentContext context) {
  Session s = repository.loginAdministrative(null);
  // Listen for nt:file NODE_ADDED repository events
  ObservationManager m =
    s.getWorkspace().getObservationManager();
    String[] types = { "nt:file" };
    m.addEventListener(
      this,
      Event.NODE_ADDED,
      contentPath, ...);
```

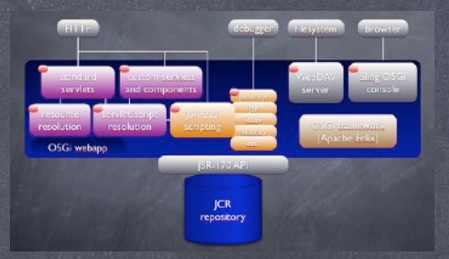
ESP blog thumbnails: NODE_ADDED

```
/** Called by JCR Observation manager for events that this
  *  EventListener registered for
  */
public void onEvent(EventIterator it) {
  while (it.hasNext()) {
    Event event = it.nextEvent();
    if (event.getType() == Event.NODE_ADDED
      && !(event.getPath().contains("thumbnails")))
      {
        String p = event.getPath();
        Node n = session.getRootNode().getNode(p);
        createThumbnails(addedNode);
      }
    }
```

...

We got a typical Sling application!

JCR features: WebDAV, observation, nt:unstructured.



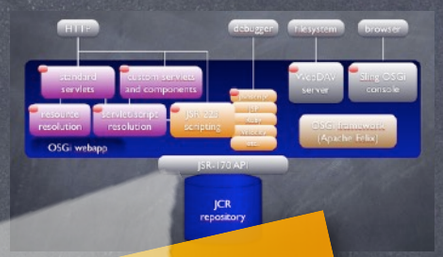
Sling goodies: simple script mappings (BYOL), POST servlet, RESTful interface.

OSGi bundle, code + initial content, Maven plugins.

ESPblog source code is found under sling/samples

Where is Sling going?

Where is Sling going? (aka conclusion)



First web framework designed for JCR.
Embrace the web, act like a very clever web server!
Intelligent HTTP/JSON storage?
OSGi, organic app growth.

Growing community, graduate in 2009?

"Sling is not a web applications framework, it's a **web** framework"

http://incubator.apache.org/sling
http://dev.day.com
http://contentcentric.org/

join the fun!

Sling