# Apache Roller, Acegi Security and Single Sign-on

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Raible Designs

# Today’s Agenda

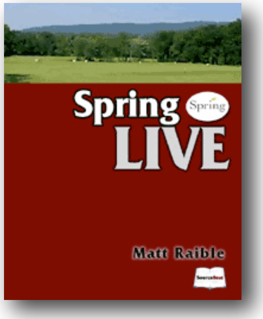
- Introductions
- Integrating Roller with LDAP and CAS on Tomcat
- Introduction to Acegi Security
- Introduction to Apache Roller
- Conclusions
- Q and A

# Introductions

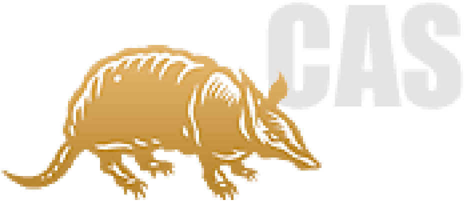
- Do you blog?
- Do you use Roller or JRoller?
- What do you want to get from this session?
- Experience with Acegi Security, LDAP, or SSO Solutions?
- Preferred Server: Tomcat, Geronimo, JBoss or GlassFish?

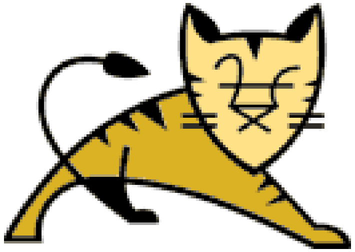
# Who is Matt Raible?

- One of the first Roller users and Committers - started in August 2002
- Java Blogger since 2002
- Power user of Java Web Frameworks
- Author of Spring Live and Pro JSP 2.0
- Founder of AppFuse (http://appfuse.org)
- Member of Java EE 5, JSF 1.2 and Bean Validation Expert Groups



# Integrating Roller with CAS on Tomcat





[http://cwiki.apache.org/confluence/display/ROLLER/Roller+4.0+with+LDAP+and+CAS](http://cwiki.apache.org/confluence/display/ROLLER/Roller+4.0+with+LDAP+and+CAS)

# Installing Roller on Apache Geronimo

http://cwiki.apache.org/confluence/display/ROLLER/Roller+4.0+on+Geronimo

# Acegi Security

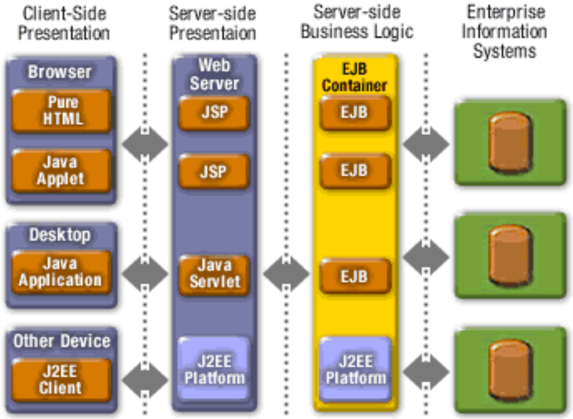
- A powerful, flexible security solution for enterprise software, with a particular emphasis on applications that use Spring.

Acegi
SECURITY
SYSTEM
FOR SPRING

Spring 2.1

# J2EE's CMA

- Container Managed Authentication (CMA) built into the Servlet API
- Configure security-constraints in web.xml
- Configure Authentication Realm in your application server



# Form Authentication

```xml
<security-constraint>
    <web-resource-collection>
        <web-resource-name>Secure Area</web-resource-name>
        <url-pattern>*.html</url-pattern>
    </web-resource-collection>

    <auth-constraint>
        <role-name>*</role-name>
    </auth-constraint>
</security-constraint>

<login-config>
    <auth-method>FORM</auth-method>
    <form-login-config>
        <form-login-page>/login.jsp</form-login-page>
        <form-error-page>/loginError.jsp</form-error-page>
    </form-login-config>
</login-config>
```

# Form Authentication

- /login.jsp

```
<form id="loginForm" method="post" action="j_security_check">
    <p>
        <label for="j_username">Username:</label>
        <input type="text" name="j_username" id="j_username"/><br/>

        <label for="j_password">Password:</label>
        <input type="password" name="j_password" id="j_password"/>

        <button type="submit">Login</button>
    </p>
</form>
```

- /loginError.jsp

```
<p>
    Login failed - please <a href="index.jsp">try again</a>.
</p>
```

# Tomcat Realms

- MemoryRealm, JDBCRealm, DataSourceRealm, JAASRealm, JNDIRealm
- JDBCRealm Example:

```
<Context path="" docBase="roller" debug="99"
    reloadable="true" antiJARLocking="true" antiResourceLocking="true">

    <Realm className="org.apache.catalina.realm.JDBCRealm" debug="99"
          driverName="com.mysql.jdbc.Driver"
       connectionURL="jdbc:mysql://localhost/roller?autoReconnect=true"
      connectionName="root" connectionPassword=""
           userTable="users" userNameCol="username" userCredCol="password"
       userRoleTable="user_roles" roleNameCol="rolename"/>
</Context>
```

# Problems with CMA

- Not as portable as you'd think
- Every server has proprietary configuration
- Form-based authentication problems:
    - Often can't control SQL for user/role query
    - No way to filter on /j_security_check to trap when users first login
    - Implementation different on various servers
- **However** - Vendors *love* it!

# Solution: Acegi Security

- Everything can be configured in your application
- Secure URLs by role with regular expressions
- URL patterns can be regular expressions or Ant-style patterns (i.e. /**/admin*.html)
- Authentication methods supported: Basic, Digest, Form, Yale Central Authentication Service (CAS)
- Authentication Providers: JDBC, XML, LDAP, CAS

# Configuration: web.xml

```
<filter>
    <filter-name>securityFilter</filter-name>
    <filter-class>org.acegisecurity.util.FilterToBeanProxy</filter-class>
    <init-param>
        <param-name>targetClass</param-name>
        <param-value>org.acegisecurity.util.FilterChainProxy</param-value>
    </init-param>
</filter>

<filter-mapping>
    <filter-name>securityFilter</filter-name>
    <url-pattern>/*</url-pattern>
</filter-mapping>
```

# security.xml

- The **filterChainProxy** bean contains the filter list that will process the authentication process. These filters each perform specific duties:
  - **httpSessionContextIntegrationFilter**: This filter is responsible for communicating with the user's session to store the user's authentication in the SecurityContextHolder.
  - **basicProcessingFilter**: This filter processes an HTTP request's BASIC authorization headers, placing the result into the SecurityContextHolder.
  - **exceptionTranslationFilter**: Defines exceptions and entry point (URL and SSL)

# security.xml

```
<bean id="filterChainProxy" class="org.acegisecurity.util.FilterChainProxy">
    <property name="filterInvocationDefinitionSource">
        <value>
            CONVERT_URL_TO_LOWERCASE_BEFORE_COMPARISON
            PATTERN_TYPE_APACHE_ANT
            /**=httpSessionContextIntegrationFilter,authenticationProcessingFilter,
                remoteUserFilter,rememberMeProcessingFilter,anonymousProcessingFilter,
                exceptionTranslationFilter,filterInvocationInterceptor
        </value>
    </property>
</bean>
```

# Form Authentication

- Changing from Basic to Form-based authentication is just XML configuration
- Login and Error pages can be same as CMA pages
- No code needed to support Remember Me and Password Encryption - just XML
- Can configure SSL “channels” based on URL-pattern

# Authentication Providers

- **Custom**: write your own
- **In-Memory**: credentials in XML file
- **JAAS**: provided by LoginModule
- **JDBC**: credentials in database
- **LDAP**: credentials in database
- **OpenID**: experimental support, see SEC-432
- **Windows NT**: experimental support, see SEC-8
- **SSO**: Yale's CAS, SiteMinder

# Authentication Providers

```xml
<bean id="daoAuthenticationProvider"
    class="org.acegisecurity.providers.dao.DaoAuthenticationProvider">
    <property name="userDetailsService" ref="inMemoryDaoImpl"/>
</bean>

...

<bean id="inMemoryDaoImpl"
    class="org.acegisecurity.providers.dao.memory.InMemoryDaoImpl">
    <property name="userMap">
        <value>
            tomcat=tomcat,ROLE_USER
            springlive=springlive,ROLE_USER
        </value>
    </property>
</bean>
```

# Password Encryption

```
bean id="inMemoryDaoImpl"
    class="org.acegisecurity.providers.dao.memory.InMemoryDaoImpl">
    <property name="userMap">
        <value>
          tomcat=536c0b339345616c1b33caf454454d8b8a190d6c,ROLE_USER
          springlive=2a9152cff1d25b5bbaa3e5fbc7acdc6905c9f251,ROLE_USER
        </value>
    </property>
</bean>

<bean id="daoAuthenticationProvider"
    class="org.acegisecurity.providers.dao.DaoAuthenticationProvider">
    <property name="userDetailsService" ref="inMemoryDaoImpl"/>
    <property name="passwordEncoder" ref="passwordEncoder"/>
</bean>

<bean id="passwordEncoder"
    class="org.acegisecurity.providers.encoding.ShaPasswordEncoder"/>
```

# JDBC Provider

- To use JDBC, just define a bean with a dataSource dependency:

```
<bean id="jdbcDaoImpl"
    class="org.acegisecurity.providers.dao.jdbc.JdbcDaoImpl">
    <property name="dataSource" ref="dataSource"/>
</bean>
```

- Default SQL for select users and roles:

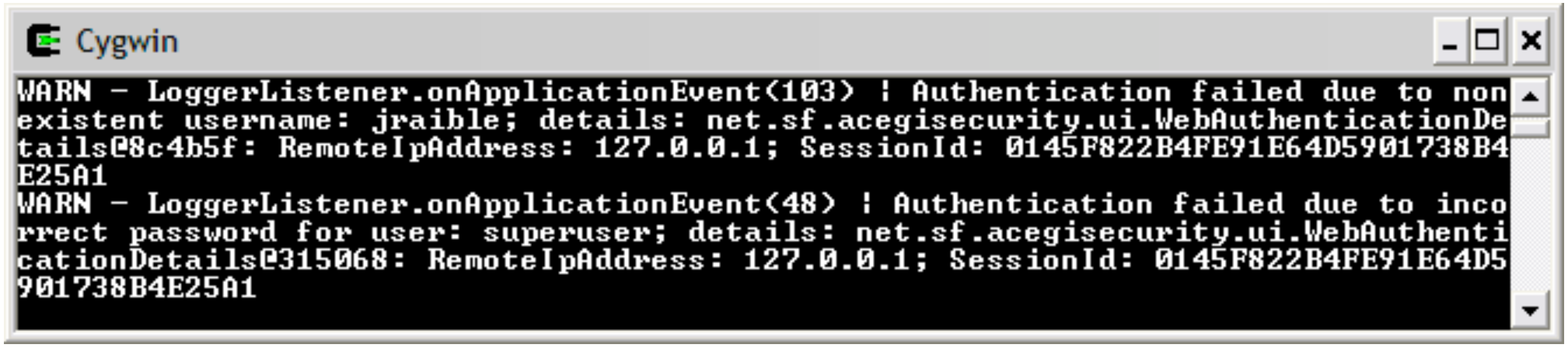
```
"SELECT username,password,enabled FROM users WHERE username = ?";
"SELECT username,authority FROM authorities WHERE username = ?";
```

# Cool Features

- Event Listeners
- SecurityContextAwareRequestFilter
- Secure Methods by Role
- Remember Me
- SSL Switching

# Other Features

- **Anonymous Filter:** Creates Authentication object with anonymous user information
- **Access Control Lists (ACLs)**: Control permissions per object
- **AfterMethodInvocation Interceptor**: Removes objects from collections when user can't read them



```
WARN - LoggerListener.onApplicationEvent(103) ¦ Authentication failed due to non
existent username: jraible; details: net.sf.acegisecurity.ui.WebAuthenticationDe
tails@8c4b5f: RemoteIpAddress: 127.0.0.1; SessionId: 0145F822B4FE91E64D5901738B4
E25A1
WARN - LoggerListener.onApplicationEvent(48) ¦ Authentication failed due to inco
rrect password for user: superuser; details: net.sf.acegisecurity.ui.WebAuthenti
cationDetails@315068: RemoteIpAddress: 127.0.0.1; SessionId: 0145F822B4FE91E64D5
901738B4E25A1
```

# J2EE vs. Acegi Security

| Security Framework | Pros | Cons |
|---|---|---|
| **J2EE Security** | It is easy to set up from an application perspective.<br>User Realm configuration is in the hands of the deployer.<br>Because it's a standard, many sources of documentation are available. | It can be difficult to port from one application server to the other.<br>Even though the application-developer configuration is standardized, the realm configuration for servers is not.<br>Service layer methods can only be secured if using EJBs. |

# J2EE vs. Acegi Security

| Security Framework | Pros | Cons |
|---|---|---|
| **Acegi Security** | Security configuration is completely self-contained in the application – you don't have to worry about application server portability.<br>It solves many of the shortcomings of J2EE security and allows all the same things, with the option to customize.<br>It supports single sign-on with CAS.<br>It's evolving and improving very rapidly.<br>It allows you to secure methods of any Spring-managed bean and filtering objects based on their ACLs. | It requires a lot of XML to configure.<br>The learning curve can be a little steep and seem overwhelming at first.<br>Realm information is packaged with the application, making it tough for a deployer to change. |

# Apache Roller

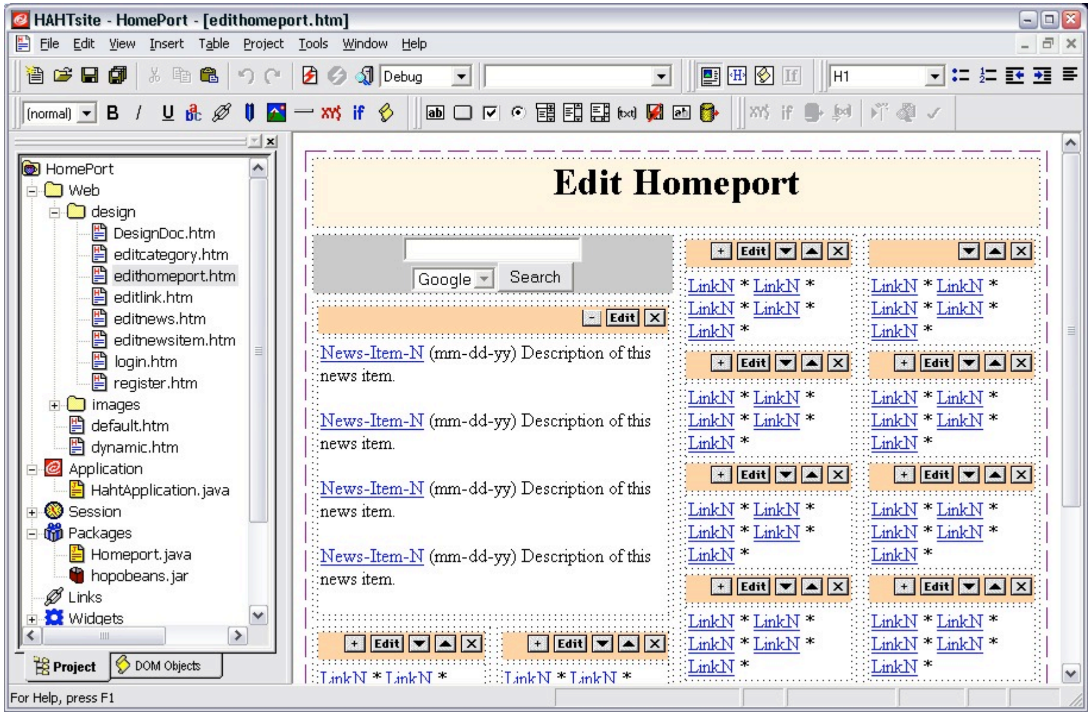
- What is Apache Roller?
- Installing Roller
- Roller Architecture
  - Blog Customization
  - Server Customization
- Other Features: Clients and Planet

# What is Apache Roller?

- Apache Roller is a full-featured, multi-user and group-blog server suitable for blog sites large and small
- Cool Features:
  - Multi-user and Group blogging
  - Comment moderation and spam prevention
  - Complete control over UI with templates
  - Built-in Search
  - RSS 2.0 and Atom 1.0 Support

# History

- Started by Dave Johnson in 2000 as “Homeport”



News-Item-N (mm-dd-yy) Description of this news item.

News-Item-N (mm-dd-yy) Description of this news item.

News-Item-N (mm-dd-yy) Description of this news item.

News-Item-N (mm-dd-yy) Description of this news item.

http://rollerweblogger.org/roller/date/20021231

# History of Roller

- In 2002, Dave ditched EJBs and HAHTsite IDE for open source tools (Ant, Castor, Struts, and Velocity)
- April 5, 2002: Roller 0.9.0 Released
- April 17, 2002: O'Reilly Article "Building an Open Source J2EE Weblogger" Published
- July 31 - August 7, 2002: The world starts blogging with Roller

http://rollerweblogger.org/roller/date/20021231

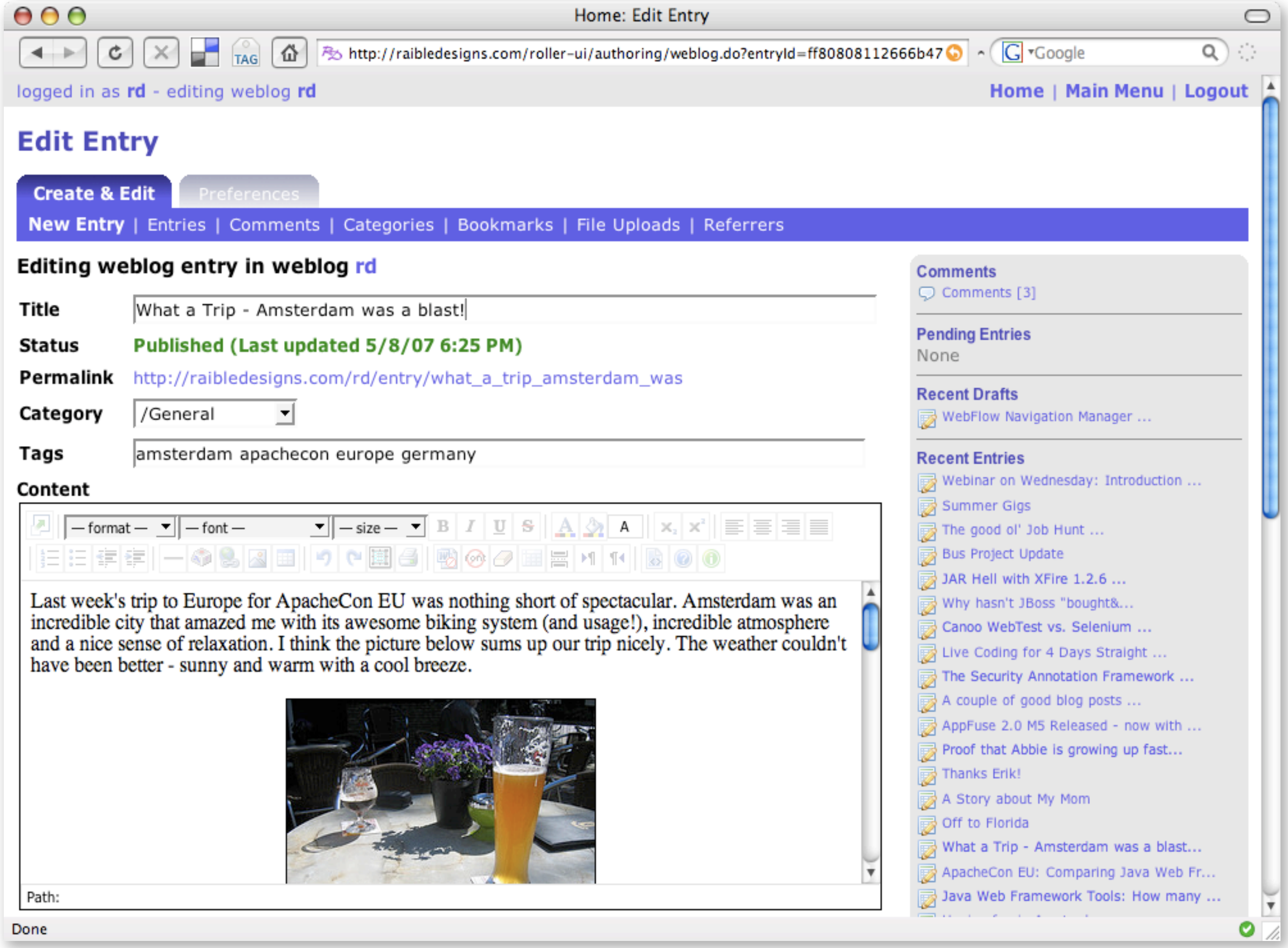
# Roller since 2002

- Roller now powers jroller.com, blogs.sun.com, IBM developerWorks blogs and many others
- Dave hired by Sun to work on Roller full-time in September 2004
- Roller began incubation at Apache in June 2005
- April 23, 2007: Graduated and released 3.1

# But what ***is*** Roller?

- Roller is a **blogging** engine
- **Blogs** make web publishing easy
  - Everyone can do it
  - No need for IT or Webmasters
  - Tools are in the users hands
- **Feeds** make reading blogs easy
  - Feeds are XML-based: RSS or Atom
  - You *subscribe* to a feed in a **Feed Reader**
  - **Feed Readers** are like inboxes for the web

# Posting a Weblog Entry



Home: Edit Entry

http://raibledesigns.com/roller-ui/authoring/weblog.do?entryId=ff80808112666b47

logged in as **rd** - editing weblog **rd**

**Home** | **Main Menu** | **Logout**

## Edit Entry

**Create & Edit** | Preferences

**New Entry** | Entries | Comments | Categories | Bookmarks | File Uploads | Referrers

**Editing weblog entry in weblog rd**

| | |
|---|---|
| **Title** | What a Trip - Amsterdam was a blast! |
| **Status** | Published (Last updated 5/8/07 6:25 PM) |
| **Permalink** | http://raibledesigns.com/rd/entry/what_a_trip_amsterdam_was |
| **Category** | /General |
| **Tags** | amsterdam apachecon europe germany |

**Content**

Last week's trip to Europe for ApacheCon EU was nothing short of spectacular. Amsterdam was an incredible city that amazed me with its awesome biking system (and usage!), incredible atmosphere and a nice sense of relaxation. I think the picture below sums up our trip nicely. The weather couldn't have been better - sunny and warm with a cool breeze.

Path:

**Comments**
- Comments [3]

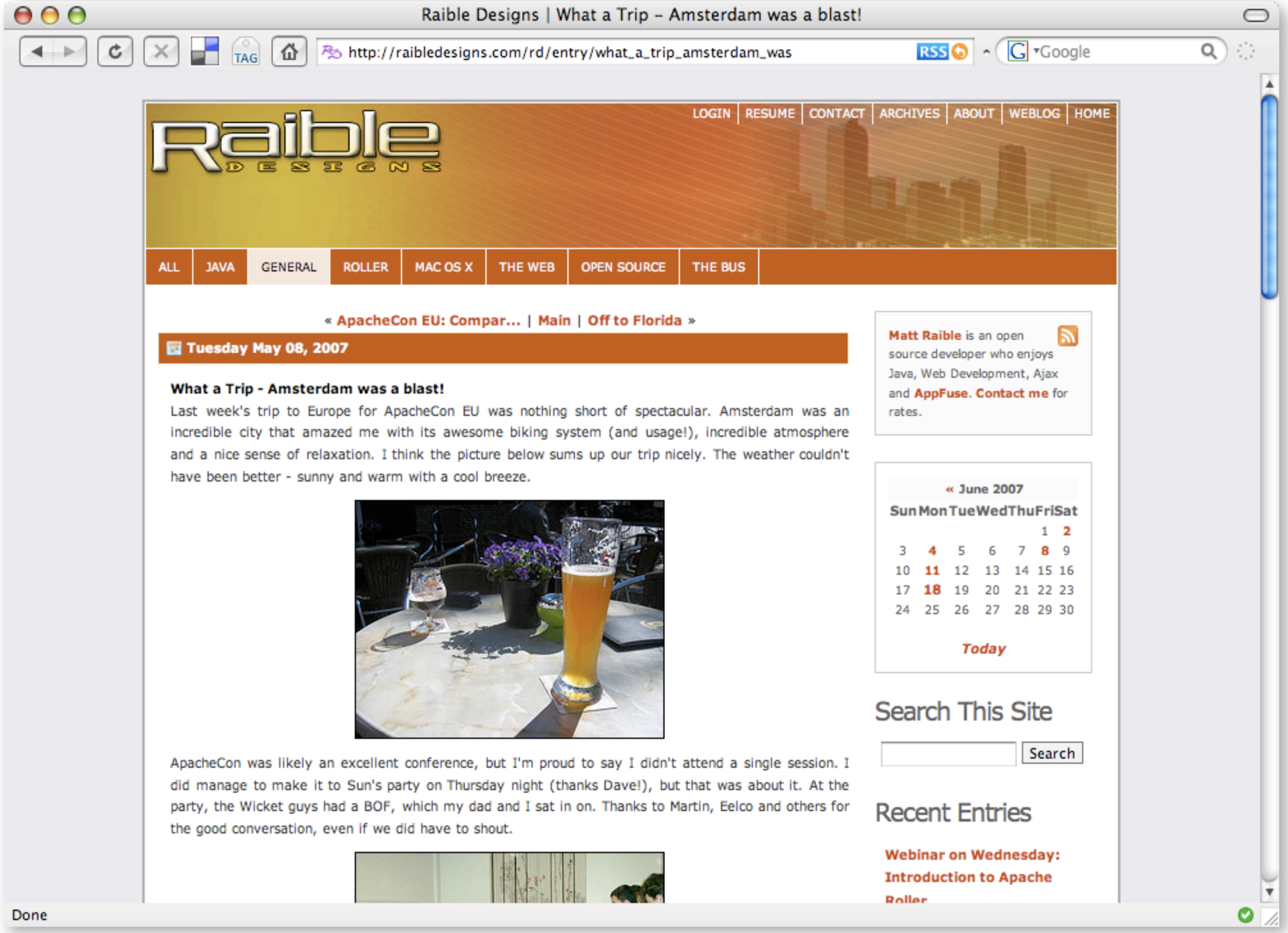
**Pending Entries**
None

**Recent Drafts**
- WebFlow Navigation Manager ...

**Recent Entries**
- Webinar on Wednesday: Introduction ...
- Summer Gigs
- The good ol' Job Hunt ...
- Bus Project Update
- JAR Hell with XFire 1.2.6 ...
- Why hasn't JBoss "bought&...
- Canoo WebTest vs. Selenium ...
- Live Coding for 4 Days Straight ...
- The Security Annotation Framework ...
- A couple of good blog posts ...
- AppFuse 2.0 M5 Released - now with ...
- Proof that Abbie is growing up fast...
- Thanks Erik!
- A Story about My Mom
- Off to Florida
- What a Trip - Amsterdam was a blast...
- ApacheCon EU: Comparing Java Web Fr...
- Java Web Framework Tools: How many ...

Done

# Viewing a Weblog Entry


Raible Designs | What a Trip - Amsterdam was a blast!
TAG
http://raibledesigns.com/rd/entry/what_a_trip_amsterdam_was
RSS
Google
Raible
DESIGNS
LOGIN | RESUME | CONTACT | ARCHIVES | ABOUT | WEBLOG | HOME
ALL
JAVA
GENERAL
ROLLER
MAC OS X
THE WEB
OPEN SOURCE
THE BUS
Search
Done

« ApacheCon EU: Compar... | Main | Off to Florida »

**Tuesday May 08, 2007**

**What a Trip - Amsterdam was a blast!**

Last week's trip to Europe for ApacheCon EU was nothing short of spectacular. Amsterdam was an incredible city that amazed me with its awesome biking system (and usage!), incredible atmosphere and a nice sense of relaxation. I think the picture below sums up our trip nicely. The weather couldn't have been better - sunny and warm with a cool breeze.

ApacheCon was likely an excellent conference, but I'm proud to say I didn't attend a single session. I did manage to make it to Sun's party on Thursday night (thanks Dave!), but that was about it. At the party, the Wicket guys had a BOF, which my dad and I sat in on. Thanks to Martin, Eelco and others for the good conversation, even if we did have to shout.

**Matt Raible** is an open source developer who enjoys Java, Web Development, Ajax and **AppFuse**. **Contact me** for rates.

« June 2007

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| | | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

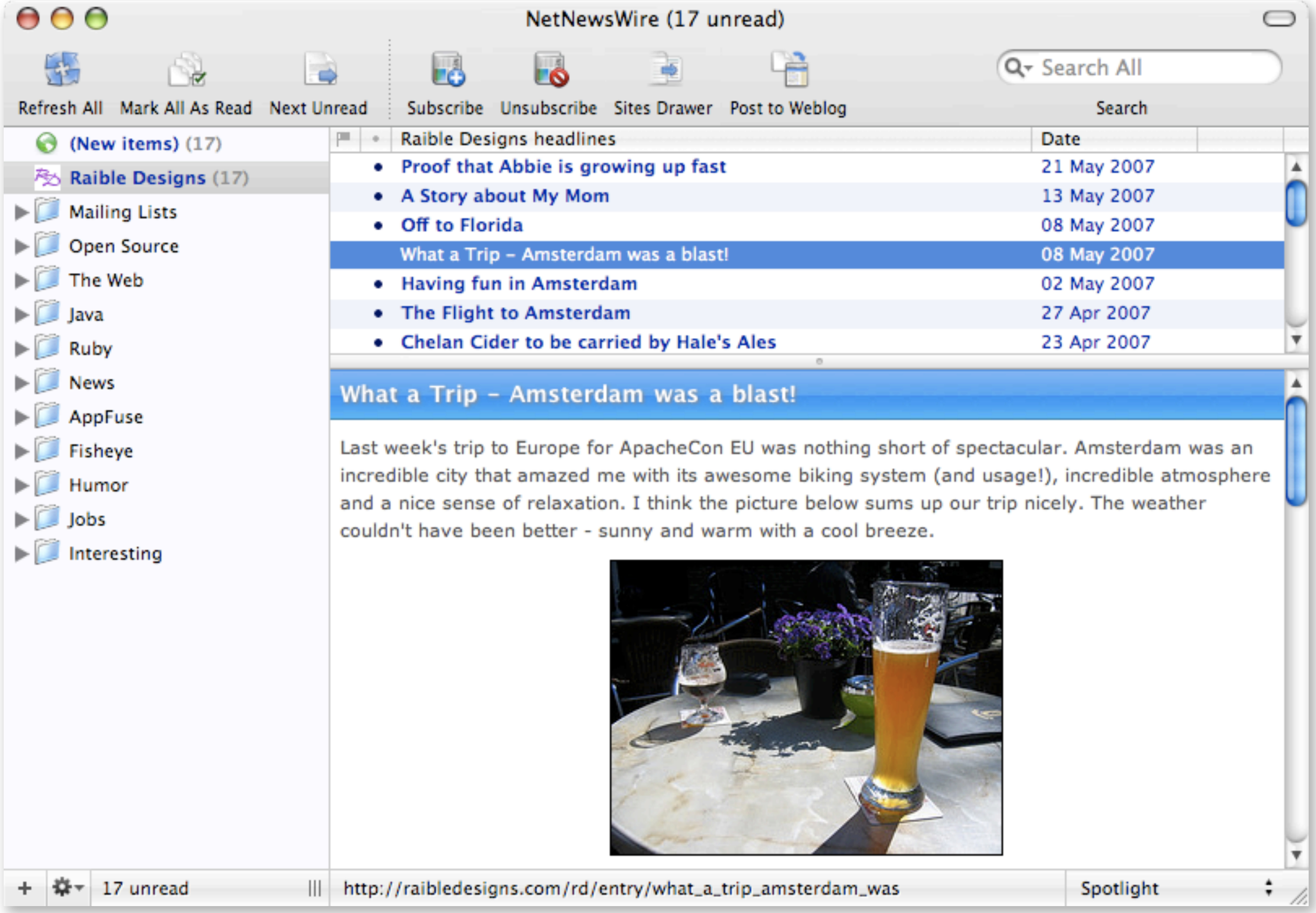
*Today*

Search This Site

Recent Entries

**Webinar on Wednesday: Introduction to Apache Roller**

# Reading a Weblog Entry



| Raible Designs headlines | Date |
|---|---|
| • Proof that Abbie is growing up fast | 21 May 2007 |
| • A Story about My Mom | 13 May 2007 |
| • Off to Florida | 08 May 2007 |
| What a Trip – Amsterdam was a blast! | 08 May 2007 |
| • Having fun in Amsterdam | 02 May 2007 |
| • The Flight to Amsterdam | 27 Apr 2007 |
| • Chelan Cider to be carried by Hale's Ales | 23 Apr 2007 |

What a Trip – Amsterdam was a blast!

Last week's trip to Europe for ApacheCon EU was nothing short of spectacular. Amsterdam was an incredible city that amazed me with its awesome biking system (and usage!), incredible atmosphere and a nice sense of relaxation. I think the picture below sums up our trip nicely. The weather couldn't have been better - sunny and warm with a cool breeze.

http://raibledesigns.com/rd/entry/what_a_trip_amsterdam_was

# Why choose Roller?

- Proven, full-featured blogging solution for big sites
  - Used by Sun, IBM, Yale University, Covalent and ESRI
- Open Source and Apache Licensed
- Active and growing community at Apache
- Standard Java Web Application Architecture

# Why choose Roller?

- It works great if you know what you're doing
- Nice looking example sites:
  - http://blogs.sun.com/greimer
  - http://blogs.sun.com/jonathan
  - http://blogs.usd.edu/jrbethke
  - http://rollerweblogger.org/roller
  - http://raibledesigns.com
  - http://ryandelaplante.com
- **Awesome** themes at http://rollerthemes.com!

# Installing Roller

- Download Roller 3.1 from http://cwiki.apache.org/confluence/display/ROLLER/Roller+Downloads
- Download Hibernate and other JARs from https://roller.dev.java.net/servlets/ProjectDocumentList?folderID=6962
- Copy JARs from java.net download into **apache-roller-3.1/webapp/roller/WEB-INF/lib**

# Installing Roller: Java &

- Download and Install Java 5 from:
  - http://java.sun.com/javase/downloads
- Download and install MySQL 5 from:
  - http://dev.mysql.com/downloads
- Create database with files in **WEB-INF/dbscripts**:

```
mysqladmin -u root -p create roller
cd webapp/roller/WEB-INF/dbscripts/mysql
mysql -u root -p roller < createdb.sql
```

**NOTE:** Use */WEB-INF/**classes**/dbscripts* in Roller 4.0.

# Installing Roller: Tomcat

- Download and install Tomcat 6 from:
  - http://tomcat.apache.org/download-60.cgi
- Copy **apache-roller-3.1/webapp/roller to $CATALINA_HOME/webapps/ROOT**
- Copy activation.jar, mail.jar and mysql-connector-java-5.0.3-bin.jar to $CATALINA_HOME/lib (common/lib for Tomcat 5.x)

» continued on next page

# Installing Roller: Tomcat

- Create ROOT/META-INF/context.xml with the following contents:

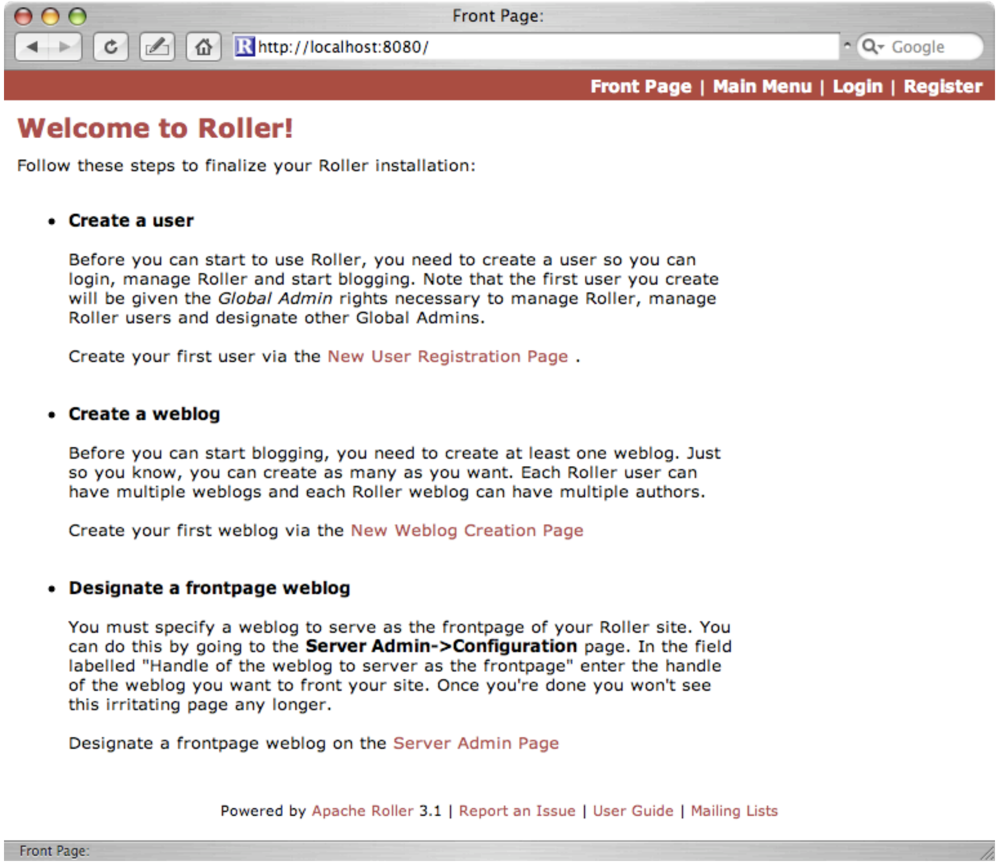
```
<Context path="" reloadable="false" antiJARLocking="true"
    antiResourceLocking="false" allowLinking="true">

    <Resource name="jdbc/rollerdb" auth="Container"
              type="javax.sql.DataSource"
              maxActive="20" maxIdle="10" maxWait="100"
              driverClassName="com.mysql.jdbc.Driver"
              username="root" password=""
              url="jdbc:mysql://localhost/roller"/>

    <Resource name="mail/Session" auth="Container"
              type="javax.mail.Session"
              mail.smtp.host="localhost" />
</Context>
```

# Roller Install: Startup

Start Tomcat and create your weblog at http:/localhost:8080



## Welcome to Roller!

Follow these steps to finalize your Roller installation:

- **Create a user**

  Before you can start to use Roller, you need to create a user so you can login, manage Roller and start blogging. Note that the first user you create will be given the *Global Admin* rights necessary to manage Roller, manage Roller users and designate other Global Admins.

  Create your first user via the New User Registration Page .

- **Create a weblog**

  Before you can start blogging, you need to create at least one weblog. Just so you know, you can create as many as you want. Each Roller user can have multiple weblogs and each Roller weblog can have multiple authors.

  Create your first weblog via the New Weblog Creation Page

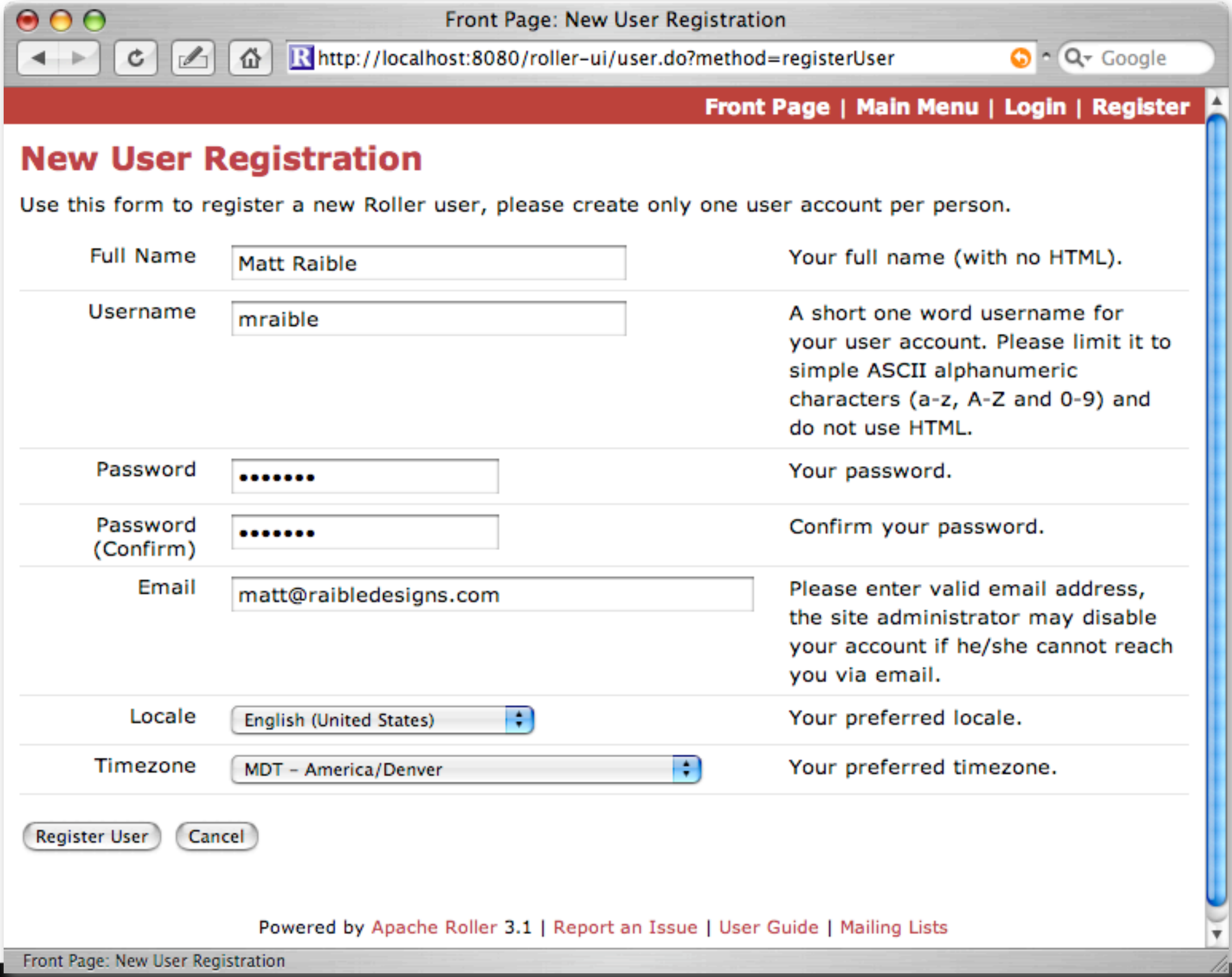
- **Designate a frontpage weblog**

  You must specify a weblog to serve as the frontpage of your Roller site. You can do this by going to the **Server Admin->Configuration** page. In the field labelled "Handle of the weblog to server as the frontpage" enter the handle of the weblog you want to front your site. Once you're done you won't see this irritating page any longer.

  Designate a frontpage weblog on the Server Admin Page

Powered by Apache Roller 3.1 | Report an Issue | User Guide | Mailing Lists

# Create a User



Front Page: New User Registration
http://localhost:8080/roller-ui/user.do?method=registerUser
Google
Front Page | Main Menu | Login | Register

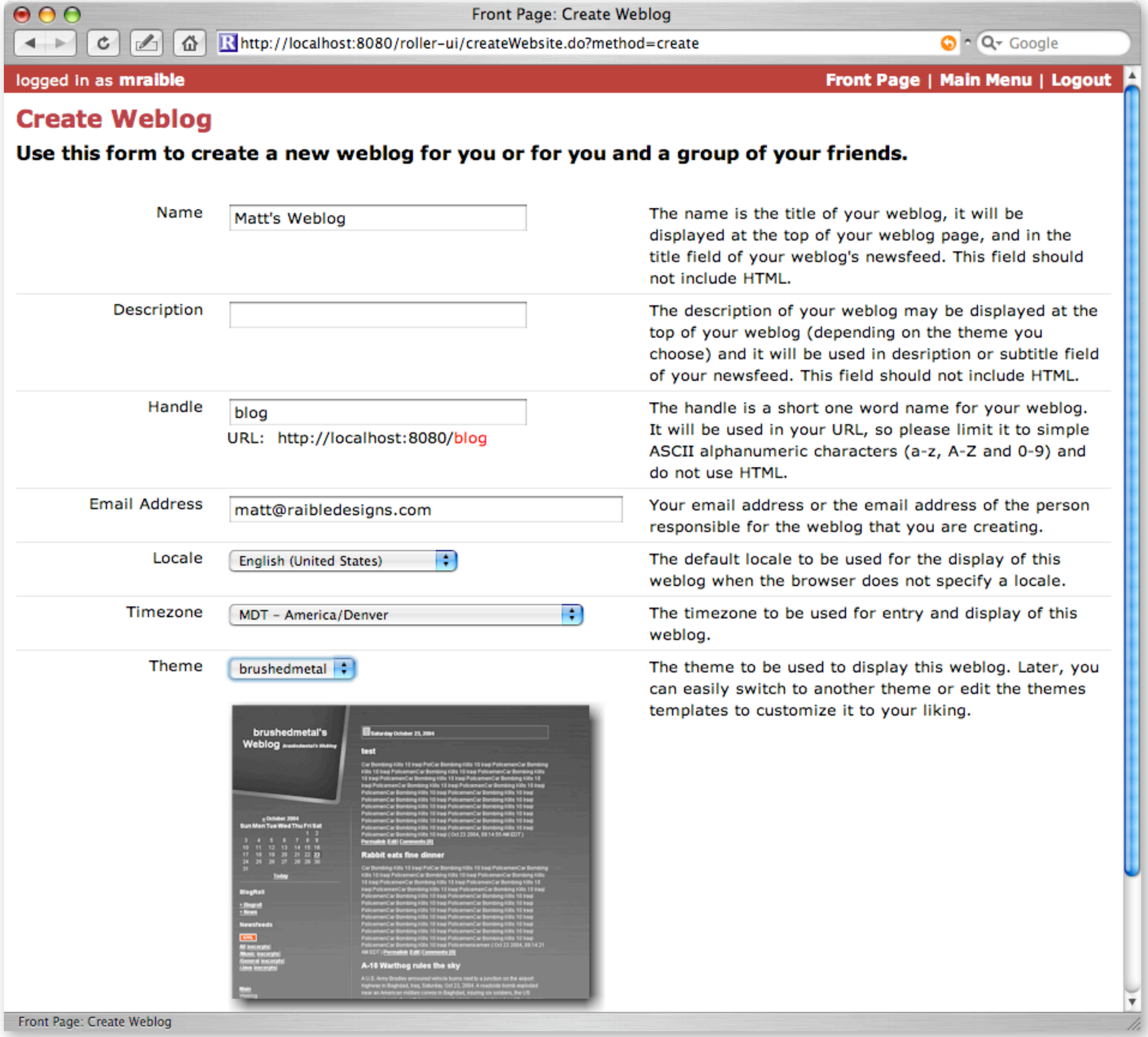
## New User Registration

Use this form to register a new Roller user, please create only one user account per person.

| | | |
|---|---|---|
| Full Name | Matt Raible | Your full name (with no HTML). |
| Username | mraible | A short one word username for your user account. Please limit it to simple ASCII alphanumeric characters (a-z, A-Z and 0-9) and do not use HTML. |
| Password | ••••••• | Your password. |
| Password (Confirm) | ••••••• | Confirm your password. |
| Email | matt@raibledesigns.com | Please enter valid email address, the site administrator may disable your account if he/she cannot reach you via email. |
| Locale | English (United States) | Your preferred locale. |
| Timezone | MDT - America/Denver | Your preferred timezone. |

Powered by Apache Roller 3.1 | Report an Issue | User Guide | Mailing Lists

# Create a Weblog



Front Page: Create Weblog

http://localhost:8080/roller-ui/createWebsite.do?method=create

logged in as **mraible**

**Front Page | Main Menu | Logout**

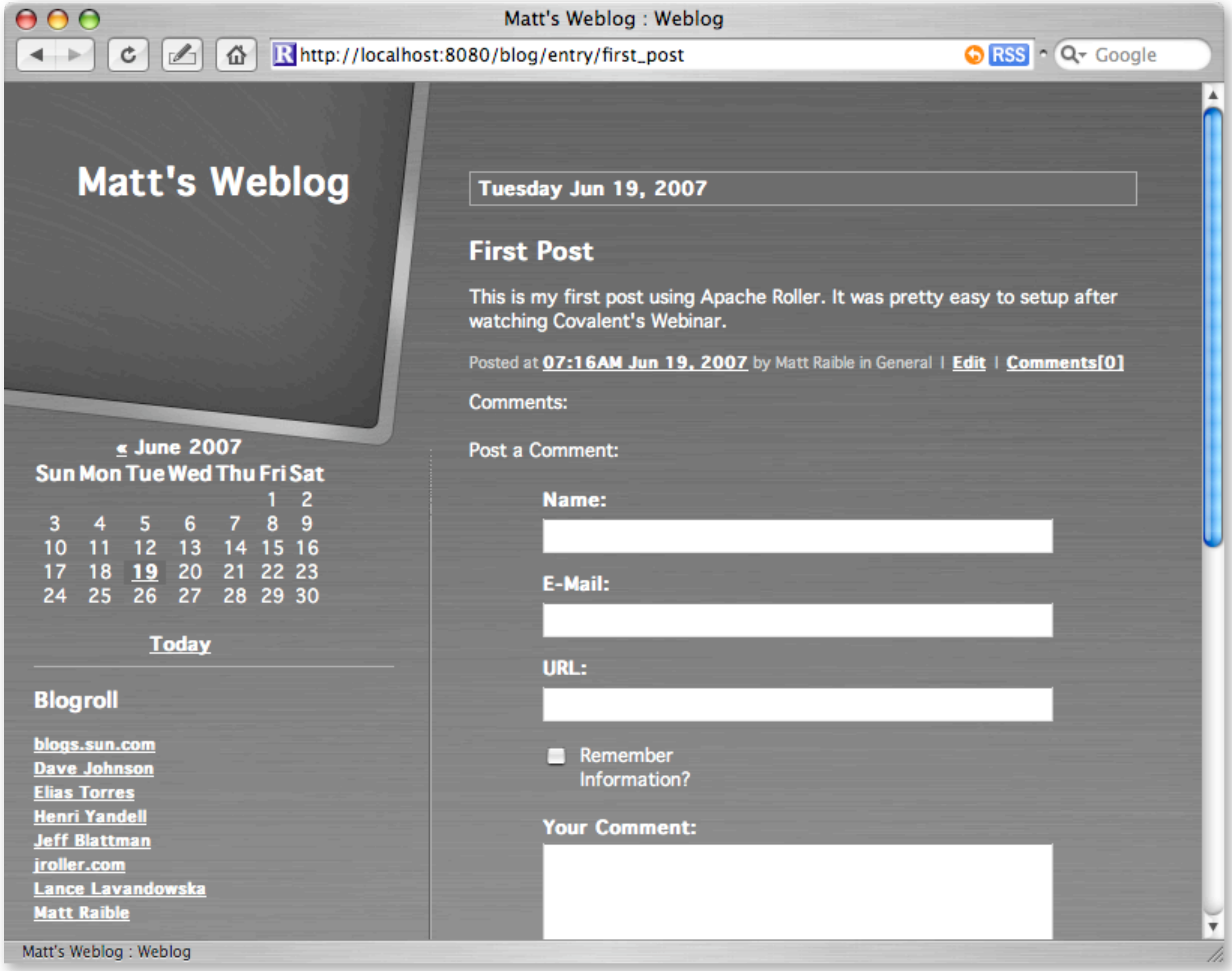
## Create Weblog

**Use this form to create a new weblog for you or for you and a group of your friends.**

| | | |
|---|---|---|
| Name | Matt's Weblog | The name is the title of your weblog, it will be displayed at the top of your weblog page, and in the title field of your weblog's newsfeed. This field should not include HTML. |
| Description | | The description of your weblog may be displayed at the top of your weblog (depending on the theme you choose) and it will be used in desription or subtitle field of your newsfeed. This field should not include HTML. |
| Handle | blog<br>URL: http://localhost:8080/blog | The handle is a short one word name for your weblog. It will be used in your URL, so please limit it to simple ASCII alphanumeric characters (a-z, A-Z and 0-9) and do not use HTML. |
| Email Address | matt@raibledesigns.com | Your email address or the email address of the person responsible for the weblog that you are creating. |
| Locale | English (United States) | The default locale to be used for the display of this weblog when the browser does not specify a locale. |
| Timezone | MDT - America/Denver | The timezone to be used for entry and display of this weblog. |
| Theme | brushedmetal | The theme to be used to display this weblog. Later, you can easily switch to another theme or edit the themes templates to customize it to your liking. |

Front Page: Create Weblog

# The obligatory first post



Matt's Weblog

« June 2007

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
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| 24 | 25 | 26 | 27 | 28 | 29 | 30 |

Today

Blogroll

- blogs.sun.com
- Dave Johnson
- Elias Torres
- Henri Yandell
- Jeff Blattman
- jroller.com
- Lance Lavandowska
- Matt Raible

Tuesday Jun 19, 2007

First Post

This is my first post using Apache Roller. It was pretty easy to setup after watching Covalent's Webinar.

Posted at 07:16AM Jun 19, 2007 by Matt Raible in General | Edit | Comments[0]

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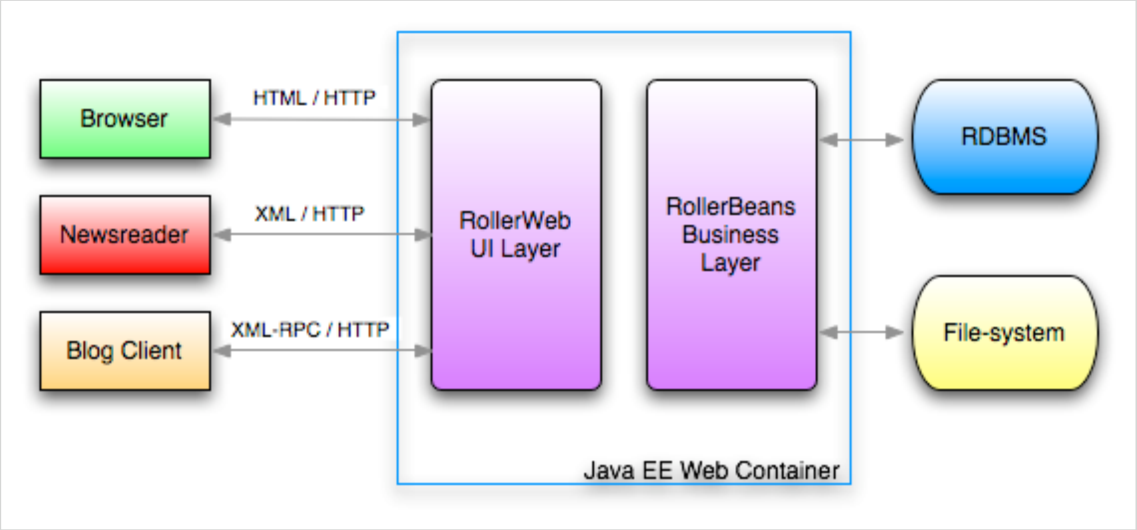
Matt's Weblog : Weblog

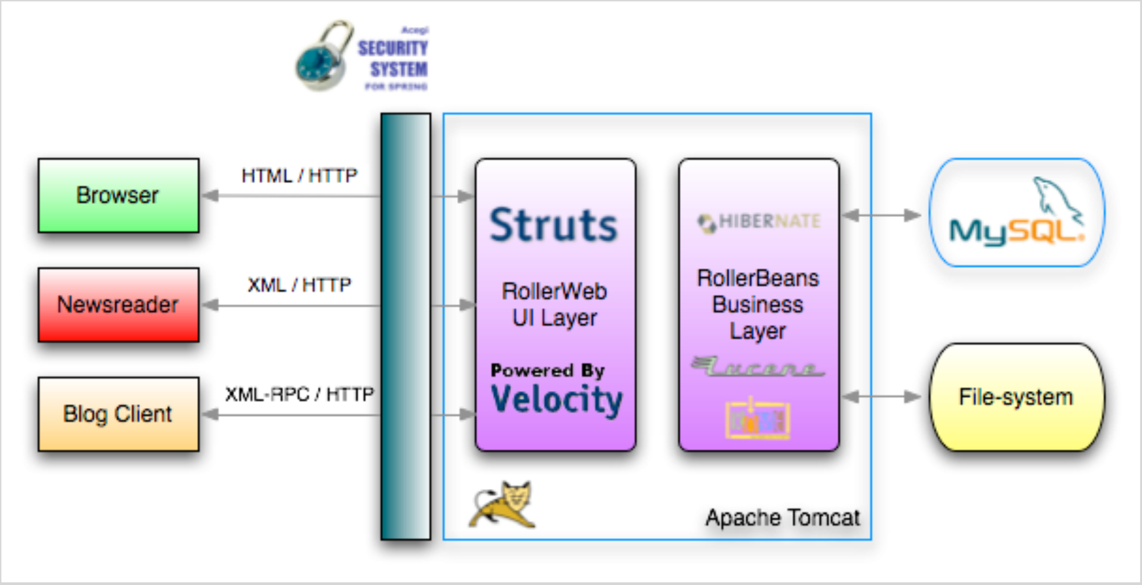
# Roller Architecture:

- Web UI via Java Servlets and JSP
  - Front controller, Web MVC and Open Session In View patterns
- Persistence via JDBC
  - Factory, Façade and Data Mapper patterns



# Roller Architecture: Geek

- Roller Web: Web and UI Layer
  - Editor UI via **Struts** and **JSP**, blog and feed rendering via **Velocity**
  - Feed parsing via **ROME**, Blogger API via **Apache XML-RPC**
- Roller Beans: Business and Persistence Layer
  - **Hibernate/JPA** for DBMS, **Lucene** for search



# What’s New in Roller 4.0

- Easier Theme Customization
- Easy Installation
- Java 5, Open JPA and Struts 2
- http://cwiki.apache.org/confluence/display/ROLLER/What%27s+New+in+Roller+4.0

webwork
Struts
Struts 2

# Conclusion

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Rocks!

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- Apache Roller is a full-featured blogging system

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- Apache Roller is a full-featured blogging system
- Installing Roller is Easy

# Conclusion

Rocks!

- Apache Roller is a full-featured blogging system
- Installing Roller is Easy
- Integrating with SSO is Painless

# Conclusion

Rocks!

- Apache Roller is a full-featured blogging system
- Installing Roller is Easy
- Integrating with SSO is Painless
- Blogging is fun - and great for your career!

# Additional Resources

- Acegi Security Forums:
  - http://forum.springframework.org/forumdisplay.php?f=33
- Yale's CAS:
  - http://ja-sig.org/products/cas/community/lists/index.html
- Roller User Mailing List:
  - user@roller.apache.org

# Questions?

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