Kosmos Reference Manual

Komposite Open Source Monitoring Suite

For the Kosmos 0.1.x branch

Revision: Id

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Table of Contents

List of Figures

Preface

Project motivation & history

Working as developer and later lead engineer on various Java and C++ projects in the recent years, I had to spend a serious amount of time with reguarly checking various sources of information: build reports, source code metrics, PMD and CheckStyle reports, the source code itself, project pages of the dependencies, industry news in online mags and such. In other words, I had to filter and manage information coming from different places to get a global picture about the current state of the project. This process was extremely cumbersome and time-consuming, and distracted me from the more enjoyable part of engineering.

Other members of the team suffered from the same problem, however they wanted to have this global 24/7 picture from a slightly different aspect, based on their "roles" in the team. We clearly needed some flexible and easily personalizable solution.

And this is what portals are about, right? Aggregation and customization.

Later I came up with the idea of developing a suite of lightweight, highly customizable portlets backed by a central server mechanism, and then deploying those to a customization-enabled portlet container. This way beside having a "reference" community page, everyone could set-up his own personal portal page.

This was how *Kosmos* has born.

While working on the very first portlets, I contacted JBoss and had explained them my plans. They liked the idea, it was in sync with certain things what they wanted to do themselves, so they invited my project as one of the first projects hosted in their new-born JBoss Labs forge.

Figure 1. Kosmos logo

In the very beginning, the project ran under a different temporary codename, but when incubating it to JBoss Labs, I had to find out the final name. As the guys at JBoss were waiting for me, I had to come up with a fancy name in a couple of hours. Finally, I decided to use the word *kosmos*, because of several reasons (not explained here).

Acknowledgments

Huge thanks to my wife, Szilva, for not giving up the struggle for such a long time, and Damon Sicore and everyone else at JBoss Labs for their support.

Contact

You can always find the latest information about the Kosmos project, published by the community, at the JBoss Labs project page: http://labs.jboss.com/projects/kosmos [http://labs.jboss.com/projects/kosmos]. Beside the downloads and documentation, we host also our Wiki and blog here, and this is our primary information resource. Come and visit us regularly.

You can reach me in email at the following address: <aron dot gombas at midori dot hu>.

Aron Gombas

Chapter 1. Overview

Vision

The first releases of Kosmos focus on integrating only a small set of de-facto standard open source tools like Subversion or CruiseControl. These releases will also establish a stable base for future development, and they target reaching a production-ready state as soon as possible.

For the long run, by leaving the door open with an extensible architecture, we consider supporting anything demanded: both popular open source and commercial tools if they are accessible through some kind of public web-services, API or at least by page-scraping (in case of web interfaces).

Design goals

We aim to reach the following primary design goals:

1. Lightweight architecture through POJOs.
2. Several independent and simplistic components instead of a single monolithic monster.
3. Easy and flexible deployment: no changes to make in the monitored resources.
4. Full transparency for the monitored resources and no extra burden on those.
5. Maximal vendor-indepence: no proprietary features of servlet containers, application servers, portlet containers or WebDAV servers.
6. Consistent and intuitive user interface for all portlets.
7. Visualization by using charts and graphics instead of plain textual information, whereever possible.

Implementation goals

We aim to reach the following primary implementation goals:

1. Java 1.5 language compatibility (however using some of the language features introduced in Java 1.5 are not compatible with Hessian).
2. Portlets that are JSR-168-compliant.
3. Portlets that are conform with the portal theme by using exclusively the standard JSR-168 CSS styles.

Dependencies

Kosmos is built on the top of:

- Apache Commons [http://jakarta.apache.org/commons] projects: various packages used as utility classes.

- Display tag [http://displaytag.sourceforge.net] library: used for rendering the tables.
- Hessian [http://www.caucho.com/hessian] binary web service protocol: used for implementing the web-services.
- JavaSVN [http://tmate.org/svn] Subversion client library: used for processing Subversion repositories.
- Jakarta Slide [http://jakarta.apache.org/slide]: its client library is used to access the WebDAV-based cache. Additionally, Slide is also our primary WebDAV server implementation.
- JFreeChart [http://www.jfree.org/jfreechart] library: used to generate the chart images.
- JTidy [http://jtidy.sourceforge.net]: used to transform the HTML documents to XML before further processing.
- JSTL [http://jakarta.apache.org/taglibs] tag library: used in the view tier.
- Log4j [http://logging.apache.org/log4j/docs] library: used for general-purpose logging.
- Saxon [http://saxon.sourceforge.net] XSLT and XQuery processor: used to analyze HTML documents.
- Spring Framework [http://www.springframework.org]: used as IoC container.

Compatibility

Please see the detailed compatibility matrix maintained on the project website.

Chapter 2. Components, features and configuration

Kosmos server

The “remote server” component acts like a traditional back-end: it collects, analyzes, stores and caches all the information rendered later by the front-end.

You might want to ask, why is it necessary to complicate the deployment with this additional component? Having a single layer (portlets only, that access the monitored resources directly), it could be much simpler!

The primary reason is that certain operations performed by the system (for instance monitoring a remote Subversion repository) can be *very* expensive: traversing the repository content can easily took for hours depending on many factors like the repository complexity, server performance or network bandwidth. By using a simple caching mechanism built into the server component, if several portlet instances are monitoring the same repo and they fire identical requests, only the very first will result in a new traversal. The other requests will receive the cached result until the first cache-miss (which can be caused also by a time-out, of course). Even this naive mechanism gives a huge performance boost and puts less burden on the “target box”, the Subversion server in this case.

Server component features:

- Implements the application logic.
- Provides Hessian-based web services for the portlets (i.e. view tier).
- Caches calculation results and publishes the dynamically generated content (e.g. chart images) to a WebDAV file repository.

Kosmos portlets

The portlets implement the “view tier”, they are responsible for rendering the results computed by the server component. Portlet technology was chosen over “traditional” web-application techniques, because flexible customization was a high-priority project goal.

You can easily configure custom-tailored portal pages, that can contain any of the portlets in various layouts. Also, you can mix Kosmos portlets with other portlets coming from other projects and vendors, without any restriction. The deployment and configuration process is portlet container-dependent, thus it is out of the scope of this document. Please refer to the technical documentation of your particular container.

Using the portlet user interfaces should be straight-forward. There is a couple of common features supported by all the portlets:

- You can minimize, maximize each portlet or get some help by clicking the icons in the titlebar (provided your portlet container supports this and your portal theme doesn't hide those controls).
- You can sort the items in the tables in ascending or descending order by clicking to the column headers.

- You can get detailed information related to a given attribute by clicking the *information* icons.

CruiseControl Monitoring portlet

This portlet monitors the continuous integration build processes managed by CruiseControl, a very well-known continuous build framework. Thus it helps you to track whether the builds of your projects didn't get broken, without checking email reports or web reports one-by-one.

Portlet features:

- It reports on the build labels, build results, timestamps and unit test results. Also, you can get detailed information about the unit tests.
- The status icons denote failed builds or successful builds with failed unit tests.

Please visit http://cruisecontrol.sourceforge.net [http://cruisecontrol.sourceforge.net] if you want to learn more about CruiseControl.

JIRA Monitoring portlet

This portlet monitors projects hosted by JIRA, a popular issue tracking and project management application. It helps you by giving an quick overview about the state of several projects in a single place.

Portlet features:

- It reports on project details and issues organized by status, priority and assignee. Some of the statistics are available as graphical charts.
- The status icons denote projects with a significant number of open issues.
- You can jump onto the JIRA page of the given project by clicking the project name, or to the actual project webpage by clicking the URL in project details view.

Please visit http://www.atlassian.com/software/jira [http://www.atlassian.com/software/jira] for a short summary about JIRA.

SourceForge Monitoring portlet

This portlet monitors the file releases on SourceForge, the world's largest development and download repository of open source projects. The main goal of this portlet is to help you to keep your project dependencies and development toolbox up-to-date, without regularly checking the dependency project pages one-by-one.

Portlet features:

- It reports on the latest versions of the packages and their age.
- The status icons denote new releases (projects with fresh file releases) or inactive projects (projects with very old latest release).

- You can jump onto the download pages of the given project or that particular version on SourceForge by clicking the appropriate package name or the version label.

Please visit the main page of Sourceforge at http://www.sourceforge.net [http://www.sourceforge.net] if you haven't done it before.

Subversion Monitoring portlet

This portlet monitors repositories managed by Subversion, one of the most widely used version control systems. This way it helps you to track the activity and complexity of several separate repositories very easily in a single portlet.

Portlet features:

- It can connect both to secure and public repositories.
- It reports on the latest touch, developer activity and repository statistics. Additionally, some of stats are visualized in charts if you click to the `information` icons.
- The status icons denote inactive repositories (repositories with very low activity or very old latest touch).

Please visit http://subversion.tigris.org [http://subversion.tigris.org] if you are interested in Subversion.

Good practices

Here we just list a couple of additional ideas which can make your life easier when configuring your particular Kosmos portal instance:

- Combining Kosmos portlets with other portlets is a good practice to maximize the information effectively aggregated on your portal page.

  Other than the standard Kosmos portlets, you should consider using: Forums portlet, RSS portlet, Blog portlet, Poll portlet, CMS portlet and Wiki portlet. All these (provided you use them in the right way) should improve the communication both inside your community and with the external world.

- If CruiseControl runs on a remote machine (not the same machine like the container which hosts Kosmos container), you can map the remote CruiseControl log directory to the local filesystem and monitor it.
- All portlets support multiple monitored resources, group those as you wish.

  For example, you can have a separate portlet for monitoring Spring, and another for monitoring ACEGI, but it might make sense to group those as related packages together to a single portlet, plus keep all the Struts-related packages in another portlet and Tomcat-related packages in a third one.

Chapter 3. Deployment

Requirements

You will need to deploy the server component and the portlets separately. Please note that however we listed recommended container implementations below, you can use any other product until that is compliant with the appropriate servlet or portlet specifications. You can learn more about the compatibity issues by studying the compatibility matrix maintained on the project website.

- We offer deployment scripts in form of Ant build scripts, which automatize the deployment process. If you want to use these, you will need to install Ant. The default target of each script is `redeploy`, which deletes the old deployment (if there exists) and deploys a new clean one.

  Of course, you can still deploy manually if Ant is not available in your environment. Even in this case, it's a good idea to look through the deploy scripts and then to follow the step-by-step guide provided in the next sections.

- The server component requires standard servlet containers (or a single container) for proper running. The most trivial option is to use the Apache Tomcat [http://jakarta.apache.org/tomcat] container.

- The portlets needs a JSR-168-compliant portlet container. One possible open source choice is JBoss Portal [http://www.jboss.org/products/jbossportal] deployed into a JBoss Application server [http://www.jboss.org/products/jbossas] instance.

- For storing the dynamically generated content (e.g. chart images), you need a WebDAV [http://www.webdav.org/] server implementation. One option is to use Jakarta Slide [http://jakarta.apache.org/slide], but Subversion [http://subversion.tigris.org] provides a WebDAV interface, too.

Deployment models

Due to the flexible architecture of Kosmos, it's possible to deploy the system to various environments, for example:

- *minimalistic*: a single container which can act both as servlet-container for Kosmos server and for the WebDAV server and as portlet-container for the portlets. As result, there will be three separate web applications running in the same container. This is the simplest way to deploy Kosmos and it can be an effective setup in many cases.

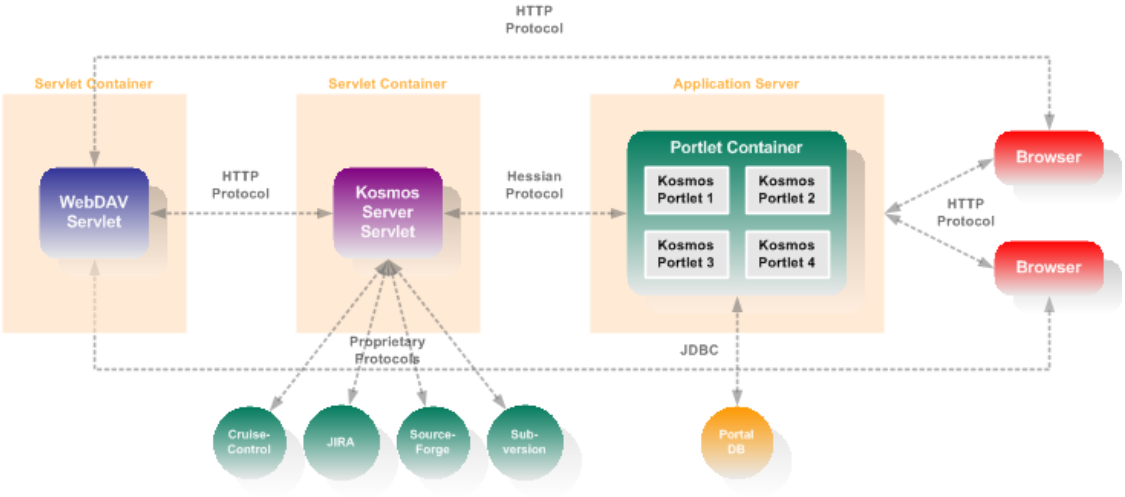
- *advanced*: separate (even heterogenous!) containers on the same physical node of the network: for example you can use Apache Tomcat as servlet-container and JBoss AS with JBoss Portal as portlet-container. It means that your components will run in separate JVMs which can be useful from stability or security viewpoint.

- *distributed*: containers on separate nodes, for example *server A* can run one instance of JBoss AS to host the server component, *server C* can run another to host the WebDAV repository, while *server C* can run a third one to host the portlet container.

  Moreover, for advanced users it is possible to deploy each service of the server component to different nodes if that's necessary! You can fine-tune the performance of the system this way.

And since all the information is exposed as standard Hessian web-services, it is possible and perfectly legal to develop other types of front-end for the system: web applications, applets or desktop applications and completely avoid using a portlet container!

Figure 3.1. Minimalistic deployment



You can complicate all the models by another important decision: what RDBMS to use to support the portlet container and how to deploy it. Again, it's possible to use the same physical node or nodes which host the containers, or to have separate database servers for this purporse. It's all up to you, your needs and possibilities.

In the following sections, we give detailed step-by-step instructions for various deployment models, but because of their huge variety, we will cover just some of those. After reading these, it should be relatively easy to find out what to do in situations not listed here.

Deployment step-by-step for Apache Tomcat and eXo Platform

1. Install eXo Platform [http://www.exoplatform.com] as written in its documentation [http://www.exoplatform.com/portal/faces/public/exo/home/community/wiki]. We recommend using the bundle distribution, because that contains both the Apache Tomcat servlet container and the eXo Platform portlet container in a single package.

2. Deploy Jakarta Slide [http://jakarta.apache.org/slide] to the Tomcat instance used by eXo as written in the JBoss AS step-by-step.

3. You can deploy the server component into the Apache Tomcat instance used by eXo, by running the server deploy script:

   ```
   ant -f deploy-server-tomcat.xml
   ```

   Please don't forget to set the `CATALINA_HOME` environment variable before.

4. Deploy the portlet web application by running the portlet deployment script as:

   ```
   ant -f deploy-portlet-exo.xml
   ```

5. Launch eXo, open the default portal page (e.g. `http://localhost:8080/portal`), and login with the default account (`admin` and `exo`).
   Go to page `edit` mode and add the Kosmos portlets to the page. Change back to `view` mode.

Deployment step-by-step for Apache Tomcat and Gridsphere

1. Install Gridsphere [http://www.gridsphere.org] as written in its manual [http://www.gridsphere.org/gridsphere/docs/UsersGuide/UsersGuide.html].

2. Deploy Jakarta Slide [http://jakarta.apache.org/slide] to the Tomcat instance used by Gridsphere as written in the JBoss AS step-by-step.

3. You can deploy the server component into the Apache Tomcat instance used by Gridsphere simply by running the server deploy script:

   ```
   ant -f deploy-server-tomcat.xml
   ```

   Please don't forget to set the `CATALINA_HOME` environment variable before.

4. Deploy the portlet web application by running the portlet deploy script as:

   ```
   ant -f deploy-portlet-gridsphere.xml
   ```

   As an additional step, copy `$GRIDSPHERE_HOME/build/lib/gridsphere-ui-tags.jar` to `$CATALINA_HOME/webapps/kosmos-portlet.war/WEB-INF/lib`.

5. Launch Gridsphere, open the default portal page (e.g. `http://localhost:8080/gridsphere`), and login with the default account (`root` and empty password). After this, there are couple of extra steps that you have to do using the Gridsphere admin portlets:

   a. Deploy `kosmos-portlet` manually.

   b. Create a new public group `kosmos` that contains all the Kosmos portlets and add your user to this new group.

   c. Go to your new page and add the Kosmos portlets to this.

Deployment step-by-step for JBoss AS and JBoss Portal

1. Install JBoss AS as written in its manual. The current reference documentation both for JBoss AS

and JBoss Portal is available from the http://www.jboss.org site.

2. Deploy Jakarta Slide [http://jakarta.apache.org/slide] to JBoss AS and configure it as written in the appropriate manuals. We have included the Slide web application archive (`slide.war`) in the binary distribution package of Kosmos, under the `/etc` folder. In most situations, it's enough to copy this file to the deployment folder of the servlet container or the application server.

   As a quick test, check whether you can access the Slide repositories through a WebDAV navigator. If you use Windows XP, it is able to map a WebDAV repository as a folder to your filesystem. Otherwise try to open the repository in your browser using the `http://localhost:8080/slide` URL.

3. Install JBoss Portal as written in its manual. Check if there are no error messages in the JBoss AS logfile.

4. Run the server deploy script as:

   ```
   ant -f deploy-server-jboss-as.xml
   ```

5. Deploy the portlet web application by running the portlet deploy script as:

   ```
   ant -f deploy-portlet-jboss-portal.xml
   ```

6. Launch JBoss AS and check the default portal page (e.g. `http://localhost:8080/portal`), whether you can see the `Kosmos` page in the page list.

It is possible also to hot-deploy the components while JBoss AS is running.

Deployment step-by-step for Apache Tomcat and Liferay Portal

1. Install Liferay Portal [http://www.liferay.com/web/guest/products] as written in its manual. We recommend using the bundle distribution, because that contains both the Apache Tomcat servlet container and the Liferay Portal portlet container in a single package.

2. Deploy Jakarta Slide [http://jakarta.apache.org/slide] to the Tomcat instance used by Liferay as written in the JBoss AS step-by-step.

3. You can deploy the server component into the Apache Tomcat instance used by Liferay simply by running the server deploy script:

   ```
   ant -f deploy-server-tomcat.xml
   ```

   Please don't forget to set the `CATALINA_HOME` environment variable before.

4. Hot-deploy the portlets as written at http://www.liferay.com/web/guest/documentation/development/hot_deploy. The portlet distribution package of Kosmos contains a customized version of `portlet-deployer-3.5.0.xml` which you might find convenient as starting point.

   There are a couple of issues you can face while starting up your Liferay, depending on your JVM version:

a. You have to downgrade the `$LIFERAY_HOME/webapps/kosmos-portlet/WEB-INF/lib/ext/commons-logging-1.0.4.jar` to `commons-logging-1.0.3.jar` (downloadable from http://www.ibiblio.org/maven/commons-logging/jars/) if Liferay throws a `java.lang.NoSuchMethodError: org.apache.log4j.Category.log(Ljava/lang/String;Lorg/apache/log4j/Level;Ljava/lang/Object;Ljava/lang/Throwable;)V`. The same exception might be thrown also for the kosmos-servlet and the kosmos-portlet web-applications, the fix is the same: downgrade the same JAR also in `$LIFERAY_HOME/webapps/kosmos-server/WEB-INF/lib` and `$LIFERAY_HOME/webapps/kosmos-portlet/WEB-INF/lib`, respectively.

b. You have to delete `$LIFERAY_HOME/common/endorsed/xml-apis.jar` if Liferay throws a `javax.servlet.ServletException: Provider org.apache.xalan.processor.TransformerFactoryImpl not found` exception

c. You have to copy `$LIFERAY_HOME/liferay/WEB-INF/tld/liferay-portlet.tld` to `$LIFERAY_HOME/webapps/kosmos-portlet/WEB-INF/tld` if Liferay throws a `org.apache.jasper.JasperException: /pages/sf_monitoring.jsp(1,1) File "/WEB-INF/tld/liferay-portlet.tld" not found` or similar exception

d. You have to copy `$LIFERAY_HOME/liferay/WEB-INF/lib/util-taglib.jar` to `$LIFERAY_HOME/webapps/kosmos-portlet/WEB-INF/lib` if Liferay throws a `org.apache.jasper.JasperException: /pages/sf_monitoring.jsp(1,1) Failed to load or instantiate TagExtraInfo class: com.liferay.portlet.taglib.ActionURLTei` or similar exception

5. Launch Liferay, open the default portal page (e.g. `http://localhost:8080`) and login with the default account (`test@liferay.com` and `test`).

   Open the portlet administration portlet and assign some roles to the Kosmos portlets (e.g. `User` and `Guest`). Also, set the JIRA and Subversion monitoring portlets to `wide` style, all the others to `narrow`. Create a new page or go to an existing page, and check whether you can see the Kosmos portlets selectable in the combo boxes at the bottom of the portal pages.

Deployment step-by-step for Apache Tomcat and Apache Pluto

Follow these steps:

1. Install Pluto [http://portals.apache.org/pluto] as written in its manual. We recommend using the bundle distribution, because that contains both the Apache Tomcat servlet container and the Pluto portlet container in a single package.

2. Deploy Jakarta Slide [http://jakarta.apache.org/slide] to the Tomcat instance used by Pluto as written in the JBoss AS step-by-step.

3. You can deploy the server component into the Apache Tomcat instance used by Pluto simply by running the server deploy script:

```
ant -f deploy-server-tomcat.xml
```

Please don't forget to set the `CATALINA_HOME` environment variable before.

4. Pluto has a portlet called `Deploy War Admin Portlet` to deploy other portlets. It makes the deployment process extremely easy: just select the portlet WAR and configure the pages, Pluto will take care of all the low-level details. Don't forget to restart Pluto after you've deployed your portlets, otherwise your new portal page won't appear in the menu!

   If for some reason you decided to do an automated deployment instead of using the administrative portlet, deploy the portlet web application by running the portlet deploy script as:

   ```
   ant -f deploy-portlet-pluto.xml
   ```

   After this, you have to manually update the following Pluto configuration files:

```
pageregistry.xml
portletcontexts.txt
portletentityregistry.xml
```

   You can use the sample files found in `/conf/pluto` of the Kosmos portlet distribution package as starting point.

5. Launch Pluto and check the default portal page (e.g. `http://localhost:8080/pluto/portal`), whether you can see your new page in the page list.

General server configuration

The server component can be configured through its Spring application context configuration file `kosmos-services-servlet.xml`. (Please note that former versions were configurable partly through their `web.xml`, but after introducing the pluggable cache store mechanism, all configuration was moved to the Spring XML.) It's absolutely straightforward to modify it, but please note that the configuration changes might require reloading the servlet to take effect!

Here is some basic help for better understanding of the `kosmos-services-servlet.xml`:

- Each service is implemented by a POJO that is exposed as web service by a Spring-based Hessian proxy class. Consequently there is one section like this per service:

  ```
  <!-- CC service -->
  <bean id="ccService" class="hu.midori.kosmos.server.cc.CcServiceImpl"/>
    <property name="store" ref""webdavCachedDataStore"/>
  </bean>
  <bean name="/cc-service" class="org.springframework.remoting.caucho.HessianServi
    <property name="service" ref="ccService"/>
    <property name="serviceInterface" value="hu.midori.kosmos.protocol.CcService"/
  </bean>
  ```

  You can activate and deactivate the services by adding or deleting these sections, depending which portlets you're going to use. In the default configuration, all the services are activated and unless there is a special reason to remove them, it's better not to touch these sections. There is hardly any performance penalty or security problem even if you have unused, but active services.

  There is one required property for the services: this is called `store` and it's a reference to the cache store to use. See next section for more details.

- The services can generate and save cached data, mostly images that are later used by the portlets view tier. There is a simple, but flexible store mechanism built into Kosmos. However this is a "plug-gable" mechanism, by default, there is only one implementation shipped with Kosmos: a WebDAV-based cache store. (In the very beginning, using WebDAV for this purpose was a requirement, not an option, but the poor quality of the WebDAV client libraries and servers motivated adding an extra level of abstraction to ensure that with some minimal work, any other web-based store can be used here.)

  The cache stores are implemented as POJOs, too. They can have different properties depending on the implementation, we discuss only `WebdavCachedDataStore` here:

  ```
  <!-- WebDAV cached data store -->
  <bean id="webdavCachedDataStore" class="hu.midori.kosmos.server.WebdavCachedData
    <property name="webdavUrl" value="http://localhost:8080/slide/files"/><!-- Bot
    <property name="webdavUser" value=""/>
    <property name="webdavPassword" value=""/>
    <!-- This URL will be used as base URL for the generated images.
         If you don't specify anything here, the value of "webdavUrl"
         will be used. Uncomment this, if you want to override that.
      <property name="clientUrl" value="http://myserver/my-webdav/kosmos-images"/>
    -->
  </bean>
  ```

  The URL is required, but you can leave the user and password empty if your WebDAV is configured to serve unauthenticated requests, too. In the URL you can use both HTTP and HTTPS protocols. The `clientUrl` parameter makes it possible to override the URLs generated for the clients: you can store the images as `https://secure.mydomain.com/mywebdav`, but access them as `http://public.mydomain.com/webdav` if your network environment is configured to match this.

- It's possible (and relatively easy) to do more complicated changes (like using separate or even in-homogenous cache stores per service, using more than one instance of the same service, etc.), but please make sure that you know what you do. It's recommended to study the related sections of the Spring Framework documentation [http://www.springframework.org/documentation], too.

For better understanding, please take a look at the full sample configuration files shipped in the distributed package.

General portlet configuration

All the other portlet settings can be configured by specifying `<init-param>` entities in the `portlet.xml` . The common init-parameters supported by every portlet are:

`monitored.resource`	It is used only for display purposes, doesn't affect the functionality.
`service.url`	It points to the appropriate Hessian-service. For example, in the case of `SfMonitoringPortlet` it can be: `ht-`

. A quick check to test whether the service is available at the given URL is opening the URL in a normal browser window. You should see a “Hessian requires POST” error message if everything is fine.

`monitored.urls` (or `monitored.dirs`)

Comma-separated list of items to monitor. Depending on the portlet, items can be URLs or directory paths:

- `CcMonitoringPortlet`: path of the directories where CruiseControl produces its logfiles related to the projects to monitor. For example: `/cruisecontrol/logs/myproject1,/cruisecontrol/logs/myproject2`.

Warning

This portlet is not configured properly in the default `portlet.xml` shipped in the package, because it requires local paths!

- `JiraMonitoringPortlet`: URLs of the JIRA home pages related to the projects to monitor. For example: `http://jira.jboss.com/jira/browse/JBWIKI,http://jira.jboss.com/jira/browse/JBLAB`.
- `SFMonitoringPortlet`: URLs of the SourceForge pages which host the projects to monitor. For example: `http://www.sourceforge.net/projects/springframework,http://sourceforge.net/projects/aceg isecurity`.
- `SvnMonitoringPortlet`: URLs of the Subversion repositories to monitor. For example: `http://svn.apache.org/repos/asf/commons,http://svn.apache.org/repos/asf/db`. If you have secure repositories, you must include the username and the password in the URL: `http://myusername:mypassword@www.mycompany.com/svn/mysecurerepo`. Please note that the security information will not appear in the user interface, so if you restrict the access to `portlet.xml` and the serverside log, then it's completely safe.

Here is a section of the default `portlet.xml` file shipped in the distribution:

```
<portlet>
  <portlet-name>KosmosDependenciesSfMonitoringPortlet</portlet-name>
  <portlet-class>hu.midori.kosmos.portlet.sf.SfMonitoringPortlet</portlet-class>
  <supported-locale>en</supported-locale>
  <supported-locale>hu</supported-locale>
  <resource-bundle>hu.midori.kosmos.portlet.sf.sf_monitoring</resource-bundle>
  <init-param>
    <name>monitored.resource</name>
    <value>Kosmos Dependencies</value>
  </init-param>
  <init-param>
    <name>service.url</name>
```

```
    <value>http://localhost:8080/kosmos-server/kosmos-services/sf-service</value>
  </init-param>
  <init-param>
    <name>monitored.urls</name>
    <value>
          http://sourceforge.net/projects/cruisecontrol/,
          http://sourceforge.net/projects/displaytag/,
          http://sourceforge.net/projects/jfreechart/,
          http://sourceforge.net/projects/jtidy/,
          http://sourceforge.net/projects/saxon/,
          http://www.sourceforge.net/projects/springframework
    </value>
  </init-param>
  <supports>
    <mime-type>text/html</mime-type>
    <portlet-mode>HELP</portlet-mode>
    <portlet-mode>VIEW</portlet-mode>
  </supports>
  <portlet-info>
    <title>SourceForge Monitoring</title>
  </portlet-info>
</portlet>
```

Had you any problems or question, first please study the default `portlet.xml`, probably you will find the answer there.

I18n

Setting the preferred language for the whole application is a two-step process:

- For the server component, you have to set the context parameter called `locale` in its `web.xml`:

  ```
  <context-param>
    <param-name>locale</param-name>
    <param-value>en</param-value>
  </context-param>
  ```

  This setting will affect mostly the labels on the chart images, as these are the only resources generated by the server component that are language-dependent.

- For the portlets, you have to set the context parameter which configures the JSTL library in the portlet module `web.xml`:

  ```
  <context-param>
    <param-name>javax.servlet.jsp.jstl.fmt.locale</param-name>
    <param-value>en</param-value>
  </context-param>
  ```

  This setting will specify the language for the whole web-based user interface.

Both these parameters accept the standard Java locale signs as value, but please make sure that the property file of the selected language is available in your distribution. Please see the project site for localized versions available.

For advanced users: as you see, one server supports only one language set, which is absolutely sufficient in most of the cases. A multi-language server would require a more complicated caching mechanism (some parts of the content are language-independent thus could be shared between client requests with different locale settings, while others are not), which is necessary only in some infrequent environments. As workaround, for two languages you can launch two separate Kosmos servers with different language

settings.

Chapter 4. Developer guide

Building from source

The Kosmos build system use a small set of easy-to-understand Ant scripts and property files. There are three actual build-scripts: one for building the server component (`build-server.xml`), one for building the portlets (`build-portlet.xml`) and one for creating the distribution packages (`build-distro.xml`). The two “real” build scripts use a common template `build/build.xml` and are configured through the property files in the `build` directory.

The variable names are self-explanatory and all the targets are well-documented in the appropriate script:

```
Buildfile: build-portlet.xml
Buildfile: build-portlet.xml
Kosmos Portlet Module build-script
Main targets:

 all       Recompiles all Java source files
 clean     Cleans up temporary files created during previous builds
 compile   Compiles Java source files
 deploy    Deploys the module to the container
 dist-bin  Prepares all binary distributables
 redeploy  Redeploys the module to the container
 undeploy  Undeploys the module from the container
Default target: redeploy
```

For instance, recompiling the full source code is simply:

```
ant -f build-portlet.xml all
```

Please study the scripts themselves for further details.

Generating the distribution packages

There are a couple of Ant targets for this purpose:

```
Buildfile: build-distro.xml
Kosmos Distro build-file
Main targets:

 clean               Cleans up temporary files created during previous builds
 dist                Prepares all distributables
 dist-bin            Prepares all binary distributables
 dist-src            Prepares all source distributables
 javadocs            Generates the javadocs
 manual              Generates the manual in all formats
 manual-html         Generates the manual in multi-page HTML format
 manual-pdf          Generates the manual in PDF format
 manual-single-html  Generates the manual in single-page HTML format
Default target: dist
```

The only detail you have to care about is setting the correct local paths in `build.properties` for the following dependencies that are not included in the Kosmos distribution package:

```
docbook.dir=/java/docbook-xsl-1.69.1
fop.dir=/java/fop-0.20.5
```

```
saxon.dir=/java/saxonb-8.5
```

Server component architecture

The high-level features of the services are implemented in the `AbstractKosmosService` class. This where the initialization and caching is performed. You should start learning the server component code by studying its javadocs. Also, to understand the cache store mechanism, please take a look at the `CachedDataStore` interface and `WebdavCachedDataStore` as a sample implementation.

As the monitored resources and their interfaces vary a lot, there is no uniform way for the concrete services to access them. They use various techniques to get the information requested, ranging from simple page-scraping to using proprietary APIs. All these are documented in the javadocs of the concrete `XxxServiceImpl` implementation classes which use callback-like classes `XxxHandler` to do the actual work.

From server to the portlets, the data is transferred simply by instantiating the DTO classes in the `hu.midori.kosmos.protocol` package and sending them over the wire using Hessian. All this is very simple and lightweight.

Portlets architecture

The portlets are extremely simple: they just connect to the appropriate service, download a collection of DTOs and render the JSPs. That's it.

Appendix A. Copyright

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Version 2.1, February 1999

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