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07: When to use a ServletContextListener in Java EE? Understanding ServletContext and ServletContextListener with examples

Posted on October 27, 2014 by Arulkumaran Kumaraswamipillai — No Comments ↓

A ***ServletContext*** object refers to the whole web application, whilst a *ServletConfig* is for a Servlet. Once an application is deployed onto the web application, ***ServletContextListener*** may be configured using annotations or the configuration file named **web.xml**. A *ServletContext* object is initialized once while a web application is being deployed, and this object can be accessed from anywhere within the same web application.

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Q1 What are servlet lifecycle events?

A1 Servlet lifecycle events work like the Swing events. Any listener interested in observing the *ServletContext* lifecycle can implement the *ServletContextListener* interface and in the *ServletContext* attribute lifecycle can implement the *ServletContextAttributesListener* interface. The session listener model is similar to the *ServletContext* listener model (Refer Servlet spec 2.3 or later). Servlet contexts' and and sessions' listener objects are notified when servlet contexts and sessions are initialized and destroyed, as well as when attributes are added or removed from a context or session.

Example 1: You can declare a listener in the **web.xml** deployment descriptor as follows:

```
<listener>
      <listener-class>com.MyJDBCConnectionManager
</listener>

```

You can create a custom listener class as shown below:

```
public class MyJDBCConnectionManager implements

  public void contextInitialized(ServletContextE
       Connection con  = // create connection
       event.getServletContext().setAttribute("c
  }

  public void contextDestroyed(ServletContextEve
       Connection con = (Connection) e.getServle
       try { con.close(); } catch (SQLException
  }
}

```

Example 2: **bootstrapping spring into RESTEasy framework**

A typical example where a ***ServletContextListener*** is used is in bootstarpping a spring ***applicationContet*.xml** file into a web application that is using RESTEasy for RESTful web services. For example, if under com.mytutorial you are having an *applicationContet.xml*, which defines the beans for web service, POJO service, and dao layers.

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```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/sch
    xmlns:aop="http://www.springframework.org/sc
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-
    xsi:schemaLocation="http://www.springframewo
                        http://www.springframewo

      <bean id="simpleRestWeb" class="com.mytutor
   &nbsp;
    .....
</beans>

```

The above spring context file needs to be bootstrapped via ***web.xml*** file when the web app is being deployed. This is accomplished via org.jboss.resteasy.plugins.spring.***SpringContextLoaderListener*** for JBoss RESTEasy framework. This *SpringContextLoaderListener* is nothing but an implementation of ***ServletContextListener***. In the web.xml file you will be defining

```
<!DOCTYPE web-app PUBLIC
 "-//Sun Microsystems, Inc.//DTD Web Application
 "http://java.sun.com/dtd/web-app_2_3.dtd" >

<web-app>
 <display-name>Archetype Created Web Application


 <context-param>
  <param-name>contextConfigLocation</param-name>
  <param-value>classpath:/com/mytutorial/applica
 </context-param>

 <listener>
  <listener-class>org.jboss.resteasy.plugins.ser
 </listener>
 <listener>
  <listener-class>org.jboss.resteasy.plugins.spr
 </listener>


 <servlet>
  <servlet-name>resteasy-simple</servlet-name>
  <servlet-class>org.jboss.resteasy.plugins.serv
 </servlet>

 <servlet-mapping>
  <servlet-name>resteasy-simple</servlet-name>
  <url-pattern>/rest/*</url-pattern>
 </servlet-mapping>

</web-app>

```

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Take note of the "*contextConfigLocation*" param definition where the spring context location is defined, and *SpringContextLoaderListener* is used to bootstrap this during deployment of the war file. Similar *ServletContextListener* based approach is used by other web frameworks for bootstrapping.

Example 3: copying a bean from spring context into servlet context for Yammer metrics

Another scenario that I came across recently where I had to provide my own implementation of the ***ServletContextListener*** when using yammer metrics to provide web based monitoring. If you register yammer via your spring *applicationContext.xml* file as shown below

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/sch
    xmlns:aop="http://www.springframework.org/sc
    xmlns:metrics="http://www.yammer.com/schema/
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-
    xsi:schemaLocation="http://www.springframewo
                        http://www.springframewo
                        http://www.yammer.com/sc

    <metrics:metrics-registry id="rest-metrics"/
    <metrics:health-check-registry id="rest-heal
    <metrics:annotation-driven metrics-registry=

    <bean id="simpleRestWeb" class="com.mytutori

</beans>

```

Now, I needed to get the ***MetricRegistry*** out if the Spring context and then put it on to the Servlet context so that the admin servlet that comes with Yammer can find it to report metrics via web URL like http://localhost:8080/tutorial/admin. Here is an implementation of *ServletContextListener*.

```
package com.mytutorial;

import javax.servlet.ServletContext;
import javax.servlet.ServletContextEvent;
import javax.servlet.ServletContextListener;

import org.springframework.web.context.WebApplic
import org.springframework.web.context.support.W

import com.yammer.metrics.core.MetricsRegistry;
import com.yammer.metrics.reporting.MetricsServl

/**
 * Application Lifecycle Listener for Metrics.
 *
 *I need to fetch the MetricsRegistry from the S
 * for the yammer admin-servlet to be able to fi
 *
 */
public class MetricsContextLoaderListener implem

    public MetricsContextLoaderListener() {

    }

 public void contextInitialized(ServletContextEv
        ServletContext context = event.getServle
        MetricsRegistry metricsRegistry = getMet
        setMetricsRegistry(metricsRegistry, cont
    }


    public void contextDestroyed(ServletContextE

    }


    protected MetricsRegistry getMetricsRegistry
        WebApplicationContext springContext = We
        return springContext.getBean(MetricsRegi
    }


    protected void setMetricsRegistry(MetricsReg
        context.setAttribute(MetricsServlet.REGI
    }
}

```

You can now define this listener and Yammer metrics servlet via the web.xml file

```
<!DOCTYPE web-app PUBLIC
 "-//Sun Microsystems, Inc.//DTD Web Application
 "http://java.sun.com/dtd/web-app_2_3.dtd" >

<web-app>
 <display-name>Archetype Created Web Application


 <context-param>
  <param-name>contextConfigLocation</param-name>
  <param-value>classpath:/com/mytutorial/applica
 </context-param>

 <context-param>
  <param-name>resteasy.servlet.mapping.prefix</p
  <param-value>/rest</param-value>
 </context-param>


 <listener>
  <listener-class>org.jboss.resteasy.plugins.ser
 </listener>
 <listener>
  <listener-class>org.jboss.resteasy.plugins.spr
 </listener>
  <listener>
   <listener-class>com.mytutorial.MetricsContext
  </listener>

  <servlet>
  <servlet-name>resteasy-simple</servlet-name>
  <servlet-class>org.jboss.resteasy.plugins.serv
 </servlet>
 <servlet>
  <servlet-name>admin-servlet</servlet-name>
  <servlet-class>com.yammer.metrics.reporting.Ad
  <load-on-startup>2</load-on-startup>
 </servlet>


 <servlet-mapping>
  <servlet-name>resteasy-simple</servlet-name>
  <url-pattern>/rest/*</url-pattern>
 </servlet-mapping>
 <servlet-mapping>
  <servlet-name>admin-servlet</servlet-name>
  <url-pattern>/admin/*</url-pattern>
 </servlet-mapping>
</web-app>

```

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