How to run the JShaft Project ?

This document describes how to run the JShaft Project by providing a simple HOWTO.

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1. Overview

Currently, a single architecture is supported : A cluster composed of two tiers.

- One is for Web (Apache v2)
- The other one for Web Containers (JOnAS or Tomcat)

Note:

The configurations are quite similar because Tomcat is embedded in JOnAS.

This kind of cluster offers :

- **Fail Over** : If one of the nodes breaks down, the cluster still running and the HTTP session isn't lost.
- **LoadBalancing** : The load is balanced to several servers (RoundRobin Algorithm)
- **Scalability** : An extensive number of servers can support a heavy load

To create and configurate a cluster with JShaft, you have to follow three mains steps as described below :
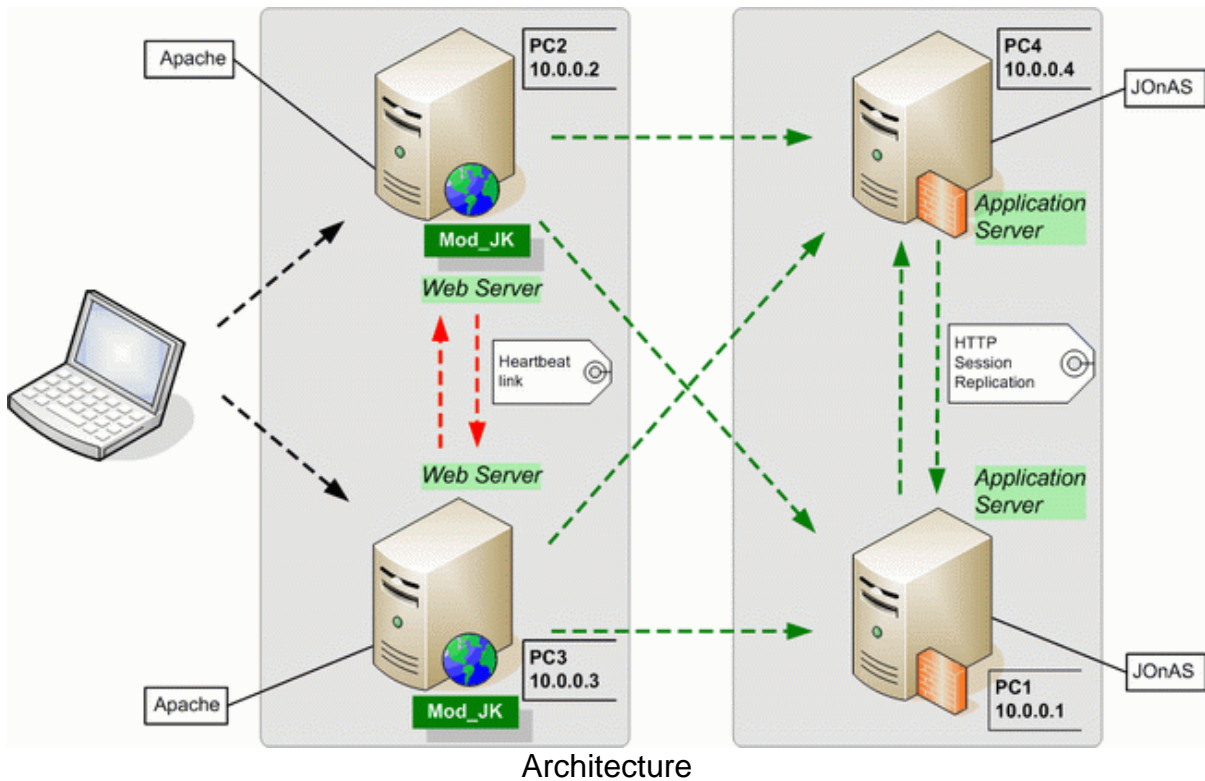
- Write the configuration file
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2. Write the configuration file

The configuration file is a XML file that represents two separate things :

- one to describe the architecture of the cluster, which means number of tiers, of nodes for each tiers and information that identify nodes (like IP address and network name)
- another one to describe what do you want to do with this cluster

Imagine this case :

Architecture

As you can see, the first tier is composed of two http servers, the second of the application servers.

• First tier : Apache HTTP Server
• Second tier : JOnAS Application Server

The representation into the XML configuration file is described below :

```xml
<?xml version="1.0" encoding="UTF-8"?>

<!-- The 'configuration' element has two parts :
                - one to describe a particular configuration of servers
                - another one to describe the configuration to construct
-->
<!-- Hypothesis :
    - A node name is into a single clusterTier
    - A node name is used once -->
<configuration xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="conf.xsd">
 <!-- Description of the complete network and software configuration -->
 <configuration_description>
  <!-- Single cluster : a cluster is composed of many cluster tier -->
  <cluster>
```

```xml
    <!-- often HTTP server like Apache with mod_jk module -->
    <clusterTier id="tier1">
     <node name="pc3" ip_address="10.0.0.3">
      <!-- Component listing -->
      <components>
       <!-- Must be absolute path (Windows or Unix) -->
       <component name="apache" basedir="/usr/local/apache2"/>
      </components>
     </node>
     <node name="pc2" ip_address="10.0.0.2">
      <!-- Component listing -->
      <components>
       <!-- Must be absolute path (Windows or Unix) -->
       <component name="apache" basedir="/usr/local/apache2"/>
      </components>
     </node>
    </clusterTier>
    <!-- many applications servers, two nodes here -->
    <clusterTier id="tier2">
     <!-- First node -->
     <node name="pc4" ip_address="10.0.0.4">
      <!-- Component listing -->
      <components>
       <component name="jonas" basedir="/home/phdezann/JONAS_4_7_4"/>
      </components>
     </node>
     <!-- First node -->
     <node name="pc1" ip_address="10.0.0.1">
      <!-- Component listing -->
      <components>
       <component name="jonas" basedir="/home/phdezann/JONAS_4_7_4"/>
      </components>
     </node>
    </clusterTier>
   </cluster>
 </configuration_description>
 <wished_configuration>
  <feature name="loadbalancing_Apache_ModJK" idref="tier1"/>
  <feature name="jonas_HTTP_session_replication" idref="tier2"/>
 </wished_configuration>
</configuration>
```

Note:

The XML configuration file is an instance of a XML Schema that you can see into the J-Shaft sources archive.

Before running JShaft, you have to install Apache and JOnAS. These installations aren't automatic yet which means that you have to download and configure each server. But, don't worry, we're here !

Warning:

Be sure that the correlation between the XML config file and the servers you will install is correct.

Warning:

The installation and the configuration of Hearbeat between the two Apache web servers aren't available yet. A documentation (HowTo) explaining this point is scheduled in the Roadmap but JShaft won't integrate it because this system is OS-dependent. Nevertheless, you can install it by reading this documentation.

3. Install components

For each server described in the configuration file, you must install the component mentionned in the node element.

If your configuration file looks like

```
...
 <node name="pc3" ip_address="10.0.0.3">
  <!-- Component listing -->
  <components>
   <!-- Must be absolute path (Windows or Unix) -->
   <component name="apache" basedir="/usr/local/apache2"/>
  </components>
 </node>
...
```

You must intall Apache on the pc3 node (network name) with ip address 10.0.0.3. Apache must be installed into `/usr/local/apache2`directory.

3.1. Installing Apache on PC2 and PC3

Note:

These tutorials have been tested on Linux/Ubuntu, the installation on others distributions or Microsoft Windows may be different. Please refer to the Apache Documentation

To install Apache, you need to follow these steps :

First, download the file httpd-2.2.2.tar.gz

The installation is simple :

```
tar -xvzf httpd-2.2.2.tar.gz
cd httpd-2.2.2/
./configure --prefix=$HOME/apache2 --with-port=80
make
make install
```

To start or stop Apache :

```
$HOME/apache2/bin/apachectl start
$HOME/apache2/bin/apachectl stop
```

3.2. Installing JOnAS on PC1 and PC4

First, download the file [jonas4.7.4-tomcat5.5.15.tgz](#)

The installation is also simple :

```
tar -xvzf jonas4.7.4-tomcat5.5.15.tgz
export JONAS_ROOT=$HOME/JONAS_4_7_4
```

To start or stop JOnAS :

```
jonas start
jonas stop
```

4. Run JShaft

Note:
You must run JShaft on all the nodes (PC1, PC2, PC3 and PC4)

Download JShaft files here : [Download Section](#)

On Unix :

```
$> sh JShaft.sh
```

On Windows :

```
C:\> jshaft.cmd
```

The program should produce a log trace.

5. Test the correct behaviour of the cluster

5.1. Deploy a sample web application

To test the cluster, you can deploy a sample web application (from the sources of Tomcat). It contains JSP files who creates an HTTP session. The two applications must be different in order to distinguish nodes.

Put the file [testServletSession.war](#) into directory
`$HOME/JONAS_4_7_4/webapps/autoload` for PC1.

Put the file [testServletSession.war](#) into directory
`$HOME/JONAS_4_7_4/webapps/autoload` for PC4.

Note:
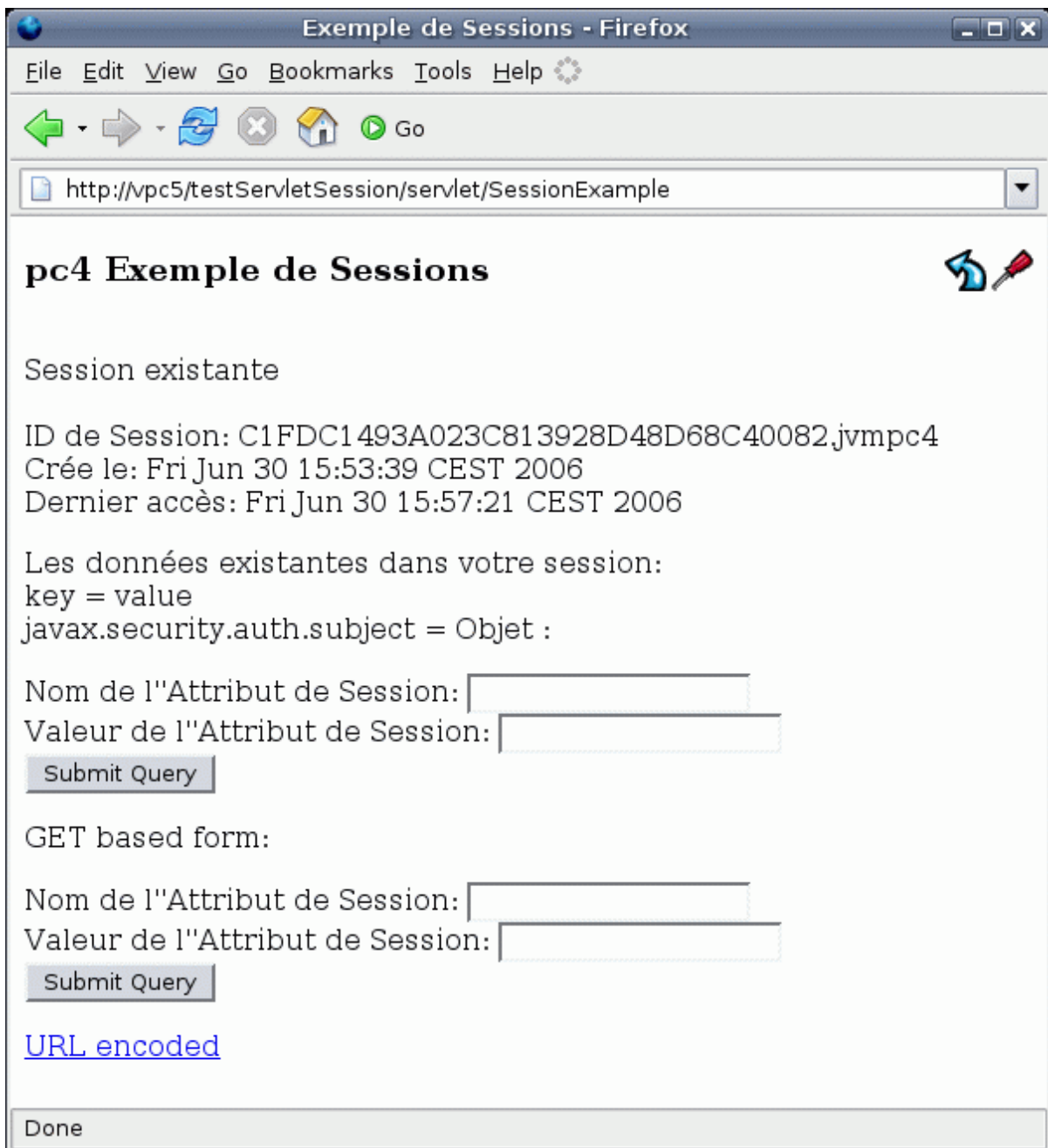You must put this file into the node PC1 and PC4 (where JOnAS is present).

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5.2. Result

Start Apache and JOnAs

On PC1 and PC4

```
jonas start
```
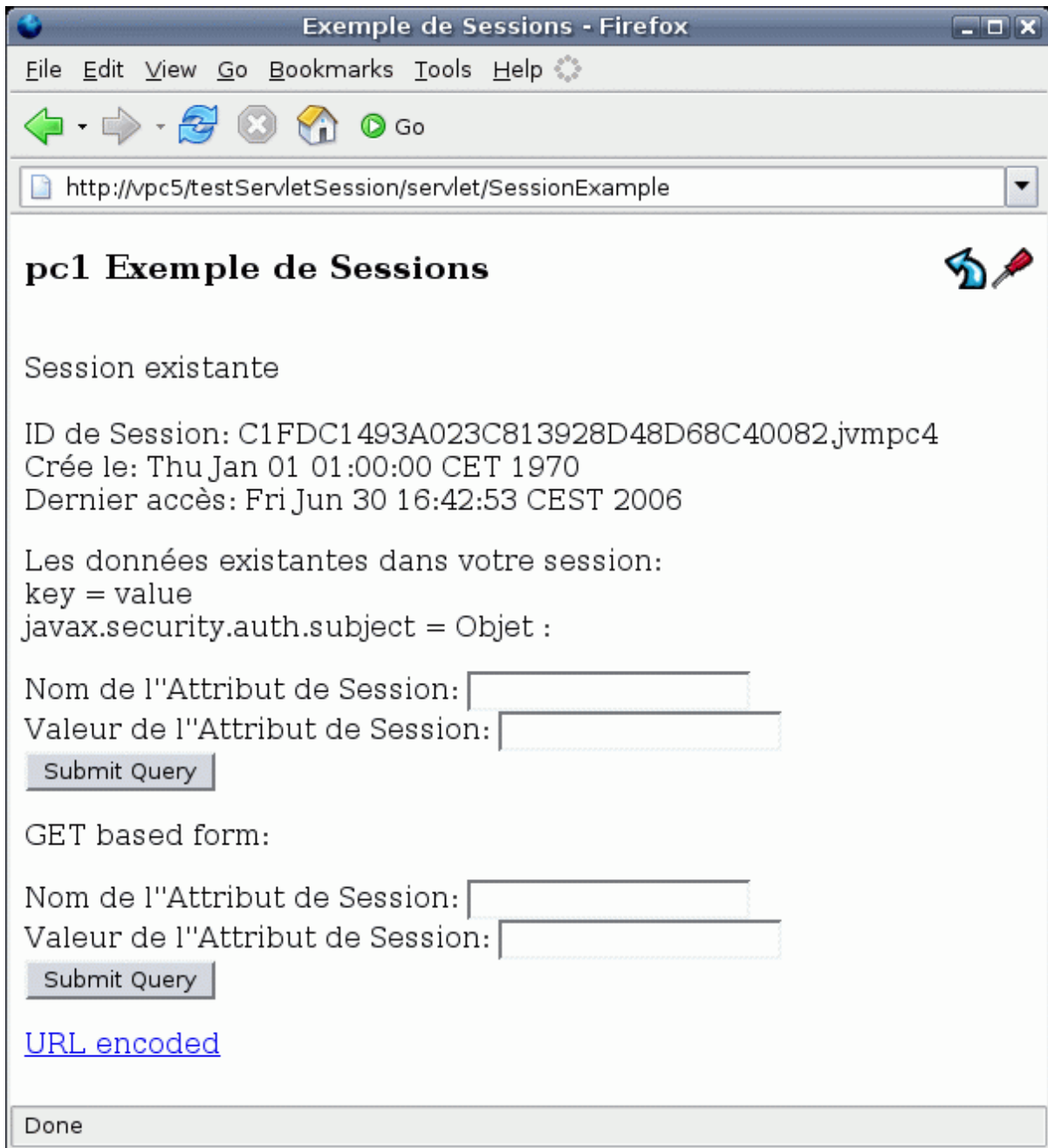
On PC2 and PC3

```
$HOME/apache2/bin/apachectl start
```

Screenshots:

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Capture

Capture

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