

# Waratek Upgrade Installation Guide for JAVA (22.x.x)

Waratek Upgrade for JAVA

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# 1 Minimum System Requirements for Waratek Upgrade (22.x.x)


Requirements	Descriptions
Operating System	<ul style="list-style-type: none"> <li>• CentOS 6 or above</li> <li>• RHEL 5.9, 6.1, 6.9, 7.4</li> <li>• Ubuntu 18.04</li> <li>• Oracle Linux 6</li> <li>• Suse Linux Enterprise Server 10 or above</li> <li>• Solaris10 or above</li> <li>• AIX 6 or above</li> <li>• Windows Server 2003</li> <li>• Windows Server 2008</li> <li>• Windows Server 2012 (32 and 64 bit)</li> </ul>
RAM	Specific to application
Java Vendors	<ul style="list-style-type: none"> <li>• Oracle Hotspot</li> <li>• OpenJDK</li> <li>• IBM J9</li> <li>• Amazon Corretto</li> <li>• JRockit</li> </ul>
Java Versions	<ul style="list-style-type: none"> <li>• Host: Java 7, 8, 11, 14</li> <li>• Guest: Java 4, 5, 6, 7, 8</li> </ul>

## 2 Waratek Proposed Directory Structure for Waratek Upgrade (22.x.x)

By default, Waratek uses the following layout for its root directory.

```
$ tree waratek-upgrade-19.x.x-bxxx/
├── agent
│   ├── aix-ppc32
│   │   └── libwaratek.so
│   ├── aix-ppc64
│   │   └── libwaratek.so
│   ├── compiler11.jar
│   ├── compiler8.jar
│   ├── guest.jar
│   ├── host.jar
│   ├── linux-i586
│   │   └── libwaratek.so
│   ├── linux-x64
│   │   └── libwaratek.so
│   ├── module_patch.jar
│   ├── solaris-sparc
│   │   └── libwaratek.so
│   ├── solaris-sparcv9
│   │   └── libwaratek.so
│   ├── waratek.jar
│   ├── windows-i586
│   │   └── waratek.dll
│   └── windows-x64
│       └── waratek.dll
├── conf_1
│   ├── rules.armr
│   └── waratek.properties
├── conf_2
│   ├── rules.armr
│   └── waratek.properties
├── doc
│   ├── Waratek Enterprise Install Guide 2019-09.pdf
│   ├── Waratek Enterprise User Guide 2019-09.pdf
│   └── Waratek JLP Install Guide 2019-09.pdf
├── launcher
│   ├── waratek-jlp-aix-ppc32
│   ├── waratek-jlp-aix-ppc64
│   ├── waratek-jlp-linux-i586
│   ├── waratek-jlp-linux-x64
│   ├── waratek-jlp-solaris-sparc
│   ├── waratek-jlp-solaris-sparcv9
│   ├── waratek-jlp-windows-i586
│   └── waratek-jlp-windows-x64
└── scripts
    └── waratek-deploy.sh
```

OS	Expected location of Waratek Software
Linux/Solaris	/opt/waratek
Windows	There is no specific directory recommendation for Windows

Directory	Description
agent	Location of Waratek agent installation.
conf_*	<p>Each configuration folder contains a separate configuration for an instance of the Application.</p> <p>The name of the configuration folder can be changed according to the user's requirements.</p> <p> Files will be modified in this directory and therefor write access must be permitted</p>
doc	Location of the product documentation
launcher	Java Launcher Pack (this is for Java Upgrade only)
keystore	Directory for location of optional Keystore (HTTPS/SSL configuration )

## 2.1 Conf folder


File	Description
logProps.xml	<p>This is the standard logging configuration XML file where the user can specify the mode of the logs, the name of the log file and the max size of the log files, etc</p> <p>Here is an example:-</p> <pre data-bbox="507 656 1422 1003"> &lt;logProps-array&gt;   &lt;logProps&gt;     &lt;logMode&gt;LOCAL&lt;/logMode&gt;     &lt;logFile&gt;SECURITYLOG&lt;/logFile&gt;     &lt;fileName&gt;path_to_rules_filename&lt;/fileName&gt;     &lt;priorityLevel&gt;DEBUG&lt;/priorityLevel&gt;     &lt;maxFileSize&gt;20MB&lt;/maxFileSize&gt;     &lt;maxBackupIndex&gt;10&lt;/maxBackupIndex&gt;   &lt;/logProps&gt; &lt;/logProps-array&gt; </pre>
waratek.properties	<p>This is the main configuration for the agent, where the user can specify a variety of properties.</p> <p>Here is an example:-</p> <pre data-bbox="507 1285 1422 1424"> com.waratek.rules.local=/opt/waratek/conf[1..20]/jvc.rules com.waratek.log.properties=/opt/waratek/conf[1..20]/logProps.xml com.waratek.rules.autoreload=true </pre>
instance.waratek.properties	<p>When an agent on-boards to the Management Console for the first time, it will create a file called instance.waratek.properties</p> <p>The Management Console uses this file to save credentials (node ID and password) to uniquely identify an agent after connection to the management console.</p>

## 3 Waratek Upgrade Deployment (22.x.x)

Deployment script `waratek-deploy.sh` to handle deployments of Waratek Upgrade. The script can handle the following use cases:

1. Fresh install
2. Upgrade to the latest version
3. Rollback to the previous version

This script allows you to upgrade or rollback the product while retaining your existing config in the `conf_x` folder.

 The deployment script supports \*nix only and doesn't support Windows.

### 3.1 Fresh Install 22.x.x

1. Extract `waratek-java-upgrade-22.x.x-bx` under `/opt`.
2. Make the script `waratek-deploy.sh` executable.

```
$ chmod +x /opt/waratek-java-upgrade-22.x.x-bx/script/waratek-deploy.sh
```

3. Run the script `waratek-deploy.sh`.

```
$ /opt/waratek-java-upgrade-22.x.x-bx/script/waratek-deploy.sh
  Available Installed Waratek Products:
  [1] waratek-java-upgrade-22.x.x-bx
  [0] Exit/Stop
  Choose the Product Version you wish to use [0 to exit]: 1
You chose 1
[INFO] /opt/waratek-java-upgrade-22.x.x-bx is now the active product.
```

4. You should have the `/opt/waratek` symlink if the script runs successfully.

### 3.2 Upgrade from 19.x.x to 22.x.x

1. Extract `waratek-java-upgrade-22.x.x-bx` under `/opt`.
2. Make the script `waratek-deploy.sh` executable.

```
$ chmod +x /opt/waratek-java-upgrade-22.x.x-bx/script/waratek-deploy.sh
```

3. Run the script `waratek-deploy.sh`.

```

/opt/waratek-java-upgrade-22.x.x-bx/scripts$ sudo ./waratek-deploy.sh
Available Installed Waratek Products:
[1] waratek-java-upgrade 19.0.0 [active]
[2] waratek-java-upgrade 22.0.0
[0] Exit/Stop
Choose the Product Version you wish to use [0 to exit]: 2
You chose 2
[INFO] /opt/waratek-java-upgrade-22.x.x-bx is now the active product.

```

4. Check the `/opt/waratek-java-upgrade-22.x.x-bx/conf_x/waratek.properties` to see if it has the config synced.

### 3.3 Rollback to 19.x.x

1. Run the script `waratek-deploy.sh`.

```

/opt/waratek-java-upgrade-22.x.x-bx/scripts$ sudo ./waratek-deploy.sh
Available Installed Waratek Products:
[1] waratek-java-upgrade 19.0.0
[2] waratek-java-upgrade 22.0.0 [active]
[0] Exit/Stop
Choose the Product Version you wish to use [0 to exit]: 1
You chose 1
[INFO] /opt/waratek-java-upgrade-19.x.x-bx is now the active product.

```

2. Check the `/opt/waratek-java-upgrade-19.x.x-bx/conf_x/waratek.properties` to see if it has the config synced.

## 4 Apache Tomcat on Upgrade (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 4.1 Basic Configurations

1. Open the `launcher.cfg` file which is located in the top-level directory of the Java Launcher Pack.
2. Search for the following lines:

```
#CONTAINER_HOME=<absolute-path>
#JVM_HOME=<absolute-path>
#WARATEK_HOME=<absolute-path>
```

**i** Relative paths are supported in the JLP configuration file. The paths are resolved relative to the location of the `launcher.cfg` file that they are defined in.

1. Delete the "#" symbol at the beginning of each line to enable settings.
2. Set `CONTAINER_HOME` to the location of JDK which your existing Application is using (e.g. Oracle Hotspot version 6u23)
3. Set `JVM_HOME` to the location of host JDK which is typically the latest version at the time of the Waratek installation (e.g. Oracle Hotspot version 8u191).
4. Set `WARATEK_HOME` to the location of the Waratek agent
  - On Linux

```
WARATEK_HOME=/opt/waratek/agent
```

- On Windows

```
WARATEK_HOME=<path-to-waratek-software>\agent
```

5. Set `JAVA_HOME` to the location where the Java Launcher Pack is installed :
  - On Windows, locate the `setenv.bat` (usually located in `bin/` folder of Tomcat), add the following line :

```
JAVA_HOME=<path-to-waratek-software>\launcher
```

- On Linux, locate the `setenv.sh` (usually located in `bin/` folder of Tomcat), add the following line:-

```
JAVA_HOME=/opt/waratek/launcher
```

6. Set `WARATEK_PROPERTIES`
  - It is recommended that this is set via a command-line argument
  - The property file can use any name.



## 5 Launch Apache Tomcat as a service in Windows (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 5.1 Running as a Windows Service

1. Go to `<absolute-path-to-tomcat>\bin`.
2. Open the `Tomcat<version_number>w.exe` file.
3. In the Monitor Tomcat GUI, check that the Service Status is Stopped.
4. Go to the Java Tab.
5. In the Java Virtual Machine field, add the path to the **host JVM** as follows:
  - For **JVM Mode**:

```
<absolute-path-to-host-jdk>\jre\bin\server\jvm.dll
```

- For **Java Mode**:

```
<absolute-path-to-host-jdk>\bin\java
```

Or

```
<absolute-path-to-host-jdk>\jre\bin\java
```

6. In the Java Options field add

```
-agentpath:<absolute-path-to-waratek-software>\agent\<path\to>\waratek.dll  
-javaagent:<absolute-path-to-waratek-software>\agent\waratek.jar
```

7. When using **JVM Mode** the following two arguments must be included in the **Java Options** field

```
-Dsun.java.command=org.apache.catalina.startup.Bootstrap  
-Dcom.waratek.jnimode=true
```

#### Notes:

- Leave any existing Java options unmodified (e.g. `-Dcatalina.home`, `-Dcatalina.base`, `-Djava.endorsed.dirs`, `-Djava.io1.tmpdir`, `-Djava.util.logging.manager`, `-Djava.util.logging.config.file`).
- If using a Java 11 host jdk with Tomcat running as a service (without the Java Launcher Pack), the following Java Option should also be added to the Java Options field;

```
--patch-module=java.base=<absolute-path-to-waratek-software>\agent\<path\to>\module_patch.jar
```

<sup>1</sup> <http://Djava.io>

8. Set CONTAINER\_HOME to the **guest JDK** in the properties file pointed to by -Dcom.waratek.WaratekProperties

```
com.waratek.ContainerHome=<absolute-path-to-guest-jdk>
```

9. Go to the Startup tab and the Shutdown tab
10. Ensure the Mode at the bottom is set to appropriate value
11. Click Apply.
12. Go to the General tab, start the Tomcat service to have the changes take effect

## 6 Glassfish on Upgrade (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 6.1 Basic Configurations

1. Open the `launcher.cfg` file which is located in the top-level directory of the Java Launcher Pack.
2. Search for the following lines:

```
#CONTAINER_HOME=<absolute-path>
#JVM_HOME=<absolute-path>
#WARATEK_HOME=<absolute-path>
```

**i** Relative paths are supported in the JLP configuration file. The paths are resolved relative to the location of the `launcher.cfg` file that they are defined in.

1. Delete the "#" symbol at the beginning of each line to enable settings.
2. Set `CONTAINER_HOME` to the location of JDK which your existing Application is using (e.g. Oracle Hotspot version 6u23)
3. Set `JVM_HOME` to the location of host JDK which is typically the latest version at the time of the Waratek installation (e.g. Oracle Hotspot version 8u191)
4. Set `WARATEK_HOME` to the location of the Waratek agent
  - On Linux

```
WARATEK_HOME=/opt/waratek/agent
```

- On Windows

```
WARATEK_HOME=<path-to-waratek-software>\agent
```

5. Set `JAVA_HOME` to the location where you install the Java Launcher Pack.
  - On Windows, locate the `asenv.bat` (usually located in `glassfish/config` folder of Glassfish), add the following line into it:

```
set JAVA_HOME=<path-to-waratek-software>\launcher
```

- On Linux, locate the `asenv.conf` (usually located in `glassfish/config` folder of Glassfish), add the following line into it

```
JAVA_HOME=/opt/waratek/launcher
```

6. Set `WARATEK_PROPERTIES`
  - It is recommended that this is set via a command-line argument.



## 7 IBM WebSphere on Upgrade (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 7.1 Basic Configurations

1. Open the `launcher.cfg` file which is located in the top-level directory of the Java Launcher Pack.
2. Search for the following lines:

```
#CONTAINER_HOME=<absolute-path>
#JVM_HOME=<absolute-path>
#WARATEK_HOME=<absolute-path>
```

**i** Relative paths are supported in the JLP configuration file. The paths are resolved relative to the location of the `launcher.cfg` file that they are defined in.

1. Delete the "#" symbol at the beginning of each line to enable settings.
2. Set `CONTAINER_HOME` to the location of JDK which your existing Application is using (e.g. Oracle Hotspot version 6u23)
3. Set `JVM_HOME` to the location of host JDK which is typically the latest version at the time of the Waratek installation (e.g. Oracle Hotspot version 8u191)
4. Set `WARATEK_HOME` to the location of the Waratek agent
  - On Linux

```
WARATEK_HOME=/opt/waratek/agent
```

- On Windows

```
WARATEK_HOME=<path-to-waratek-software>\agent
```

### 7.2 Startup Settings

1. Log in to the **administrative console** for the WebSphere node where you want to install the Java Launcher Pack.
2. Go to *Environment > WebSphere variables > JAVA\_HOME*.

The screenshot shows the 'WebSphere variables' configuration page in the Integrated Solutions Console. A table lists various system variables. The 'JAVA\_HOME' variable is highlighted with a red box. The table contains the following data:

Variable Name	Value	Node
APP_INSTALL_ROOT	\${USER_INSTALL_ROOT}/installedApps	Node=ws18Node01
CONNECTJDBC_JDBC_DRIVER_PATH		Node=ws18Node01
CONNECTOR_INSTALL_ROOT	\${USER_INSTALL_ROOT}/installedConnectors	Node=ws18Node01
DB2390_JDBC_DRIVER_PATH		Node=ws18Node01
DB2UNIVERSAL_JDBC_DRIVER_NATIVEPATH		Node=ws18Node01
DB2UNIVERSAL_JDBC_DRIVER_PATH		Node=ws18Node01
DB2_JCC_DRIVER_NATIVEPATH		Node=ws18Node01
DB2_JCC_DRIVER_PATH		Node=ws18Node01
DB2_JDBC_DRIVER_PATH		Node=ws18Node01
DEPLOY_TOOL_ROOT	\${WAS_INSTALL_ROOT}/deploytool/ftp	Node=ws18Node01
DERBY_JDBC_DRIVER_PATH	\${WAS_INSTALL_ROOT}/derby/lib	Node=ws18Node01
DRIVER_PATH	\${WAS_INSTALL_ROOT}	Node=ws18Node01
INFORMIX_JCC_DRIVER_PATH		Node=ws18Node01
INFORMIX_JDBC_DRIVER_PATH		Node=ws18Node01
<b>JAVA_HOME</b>	<b>\${WAS_INSTALL_ROOT}/java</b>	<b>Node=ws18Node01</b>
JVM_CACHE		Node=ws18Node01
LOCALHOST_NAME	localhost	Node=ws18Node01
LOG_ROOT	\${USER_INSTALL_ROOT}/logs	Node=ws18Node01
MICROSOFT_JDBC_DRIVER_NATIVEPATH		Node=ws18Node01
MICROSOFT_JDBC_DRIVER_PATH		Node=ws18Node01

- Note the location used for **JAVA\_HOME**

```
${WAS_INSTALL_ROOT}/java
```

- Make a backup copy of the java directory used for JAVA\_HOME

```
$ mv java java_backup
```

- In the same directory, make a symbolic link 'java' to the Java Launcher Pack directory by command line. For example:

```
ln -s /opt/waratek/launcher ./java
```

- Check the symbolic link is created.

```
ls -l ./java
```

- Specify -Dcom.waratek.WaratekProperties as follows;  
In the administrative console, click WebSphere application servers > server\_name.

Integrated Solutions Console welcome admin

Cell=ws18Node01Cell, Profile=AppSrv01

Application servers

**Application servers**

Use this page to view a list of the application servers in your environment and the status of each of these servers. You can also use this page to change the status of a specific application server.

Preferences

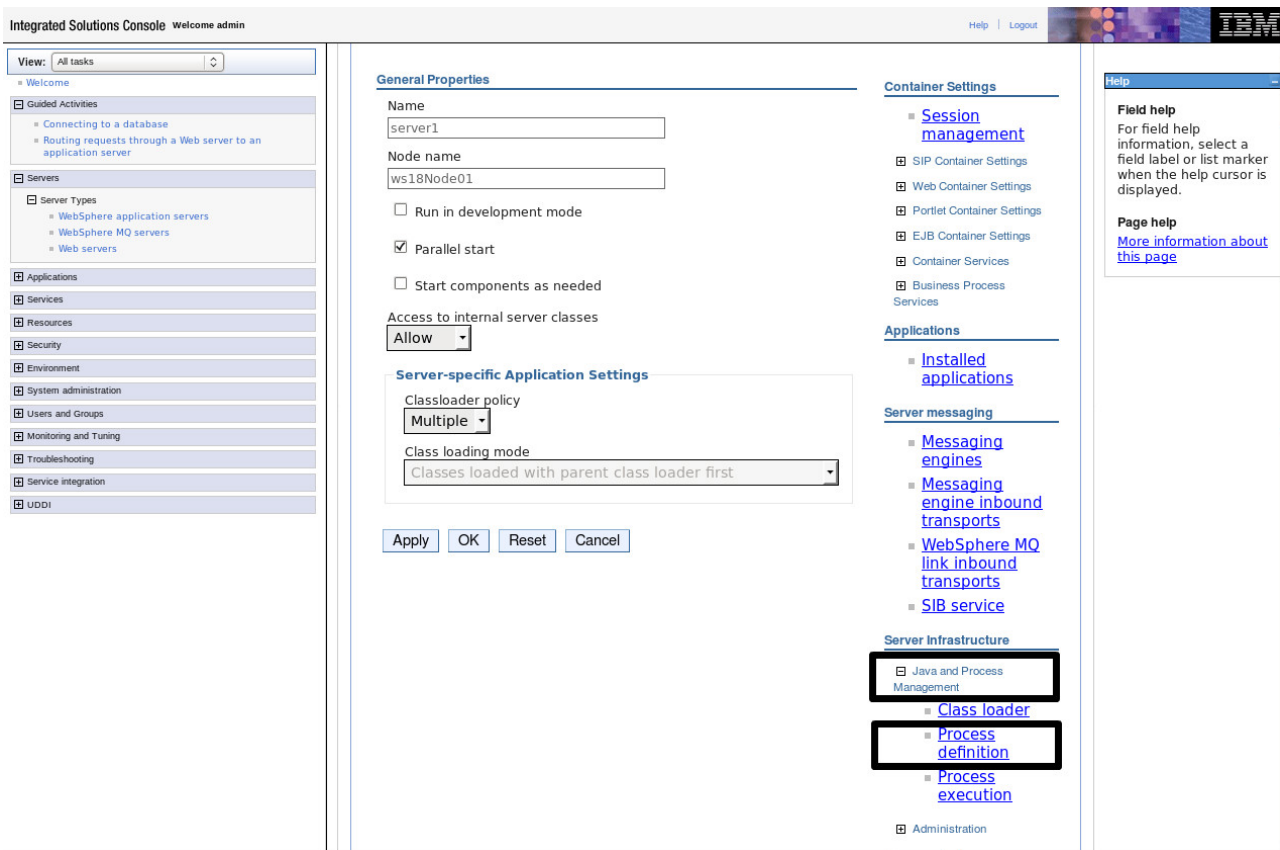
Name	Node	Host Name	Version
You can administer the following resources:			
server1	ws18Node01	ws18.waratek.lan	Base 7.0.0.0
Total 1			

Field help  
For field help information, select a field label or list marker when the help cursor is displayed.

Page help  
[More information about this page](#)

Command Assistance  
[View administrative scripting command for last action](#)

8. Click Java and Process Management > Process definition.



9. Click Java Virtual Machine.

10. In the Generic JVM Arguments field, add the JVM options as follows:

- On Linux

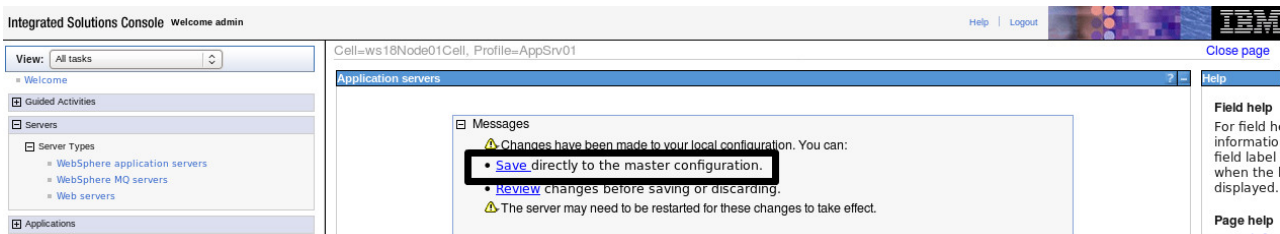
```
-Dcom.waratek.WaratekProperties=/opt/waratek/<conf_*>/<name of property file>
```

- On Windows

```
-Dcom.waratek.WaratekProperties=<absolute-path-to-waratek-software>\<conf_*>\<name of property file>
```

11. Click Apply.

12. Save the changes.



13. Restart the WebSphere server. The server must be restarted for the changes to take effect.

## 7.3 Troubleshooting

Verify the configuration settings by checking the **variable.xml** file of the WebSphere node where you installed the Java Agent. The files should have the entries.

1. Go to <WebSphereLocation>/profiles/<profileName>/config/cells/machineNameNode01Cell/nodes/machineNameNode01Cell
2. Open **variable.xml** in the same directory

Check the value of **JAVA\_HOME**

```
<entries xmi:id="VariableSubstitutionEntry_1528377842438" symbolicName="JAVA_HOME" value="/home/users/IBM/
WebSphere/AppServer/java" description="The filesystem path to the Java Virtual Machine installation
directory."/>
```

## 8 Oracle Weblogic on Upgrade (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 8.1 Basic Configurations

1. Open the `launcher.cfg` file which is located in the top-level directory of the Java Launcher Pack.
2. Search for the following lines:

```
#CONTAINER_HOME=<absolute-path>
#JVM_HOME=<absolute-path>
#WARATEK_HOME=<absolute-path>
```

**i** Relative paths are supported in the JLP configuration file. The paths are resolved relative to the location of the `launcher.cfg` file that they are defined in.

1. Delete the "#" symbol at the beginning of each line to enable settings.
2. Set `CONTAINER_HOME` to the location of JDK which your existing Application is using (e.g. Oracle Hotspot version 6u23)
3. Set `JVM_HOME` to the location of host JDK which is typically the latest version at the time of the Waratek installation (e.g. Oracle Hotspot version 8u191)
4. Set `WARATEK_HOME` to the location of the Waratek agent
  - On Linux

```
WARATEK_HOME=/opt/waratek/agent
```

- On Windows

```
WARATEK_HOME=<absolute-path-to-waratek-software>\agent
```

5. Set `JAVA_HOME` to the location where you install the Java Launcher Pack. Go to *Oracle/Middleware/user\_projects/domains/<domain\_name>/bin*
6. Set `JAVA_HOME` to the launcher directory at the beginning of the `setDomainEnv.batscript`

- On Windows

```
set JAVA_HOME=<absolute-path-to-waratek-software>\launcher
```

- On Linux, locate the `setDomainEnv.sh` (usually located in *Oracle/Middleware/user\_projects/domains/<domain\_name>/bin* folder of Weblogic), add the following line into it

```
JAVA_HOME=/opt/waratek/launcher
```

9. Set WARATEK\_PROPERTIES and -Dweblogic.MuxerClass flag in JAVA\_OPTIONS

- It is recommended that this is set via command-line argument.
- The property file can use any name, for the example below we will name this *waratek.properties*, we will also assume that this references the first available configuration directory i.e. */opt/waratek/conf\_1*
- Open the *setDomainEnv.sh* (Linux) or *setDomainEnv.bat* (Windows) file. If using the Waratek Proposed Directory Structure, add the following to the beginning. On Linux:

```

• JAVA_OPTIONS="-Dcom.waratek.WaratekProperties=/opt/waratek/conf_1/waratek.properties
-Dweblogic.MuxerClass=weblogic.socket.NIOSocketMuxer $JAVA_OPTIONS"
    
```

- On Windows:

```

set JAVA_OPTIONS=-Dcom.waratek.WaratekProperties=<absolute-path-to-waratek-
software>\conf_1\waratek.properties -Dweblogic.MuxerClass=weblogic.socket.NIOSocketMuxer
%JAVA_OPTIONS%
    
```

**Note :** For more information on *-Dweblogic.MuxerClass* , see [Tuning Muxers<sup>2</sup>](#) in the Oracle documentation

10. Start the application and verify Waratek has been installed correctly by checking server logs or note the Waratek logo on the terminal :

```

_      _      _      _      _      _      _      _      _      _      _      _      _      _      _
| | / | / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \
|_| / | / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \ / _ \
                                     Waratek Application Security Technologies
                                     Copyright 2018 / All Rights Reserved
                                     www.waratek.com / @waratek
    
```

<sup>2</sup> [https://docs.oracle.com/cd/E13222\\_01/wls/docs100/perform/WLSTuning.html#wp1152246](https://docs.oracle.com/cd/E13222_01/wls/docs100/perform/WLSTuning.html#wp1152246)

## 9 Red Hat JBoss and Wildfly on Upgrade (22.x.x)

**i** Please refer to the separate documentation for the **Waratek Proposed Directory Structure** for assistance with the steps below.

### 9.1 Basic Configurations

1. Open the `launcher.cfg` file which is located in the top-level directory of the Java Launcher Pack.
2. Search for the following lines:

```
#CONTAINER_HOME=<absolute-path>
#JVM_HOME=<absolute-path>
#WARATEK_HOME=<absolute-path>
```

**i** Relative paths are supported in the JLP configuration file. The paths are resolved relative to the location of the `launcher.cfg` file that they are defined in.

1. Delete the "#" symbol at the beginning of each line to enable settings.
2. Set `CONTAINER_HOME` to the location of JDK which your existing Application is using (e.g. Oracle Hotspot version 6u23)
3. Set `JVM_HOME` to the location of host JDK which is typically the latest version at the time of the Waratek installation (e.g. Oracle Hotspot version 8u191)
4. Set `WARATEK_HOME` to the location of the Waratek agent
  - On Linux

```
WARATEK_HOME=/opt/waratek/agent
```

- On Windows

```
WARATEK_HOME=<path-to-waratek-software>\agent
```

5. Set `JAVA_HOME` to the location where you install the Java Launcher Pack.
  - On Windows, locate the `standalone.conf.bat` (usually located in `bin/` folder of JBoss or Wildfly), add the following line into it:

```
set JAVA_HOME=<absolute-path-to-waratek-software>\launcher
```

- On Linux, locate the `standalone.conf` (usually located in `bin/` folder of JBoss or Wildfly), add the following line into it

```
JAVA_HOME=/opt/waratek/launcher
```

- On Windows, If using JBoss 4.x or 5.x, open `run.conf.bat` (usually located in `bin/` folder of JBoss or Wildfly), add the following line into it:

