Scanning an Application in AWS Elastic Beanstalk (Tomcat + WAR file)

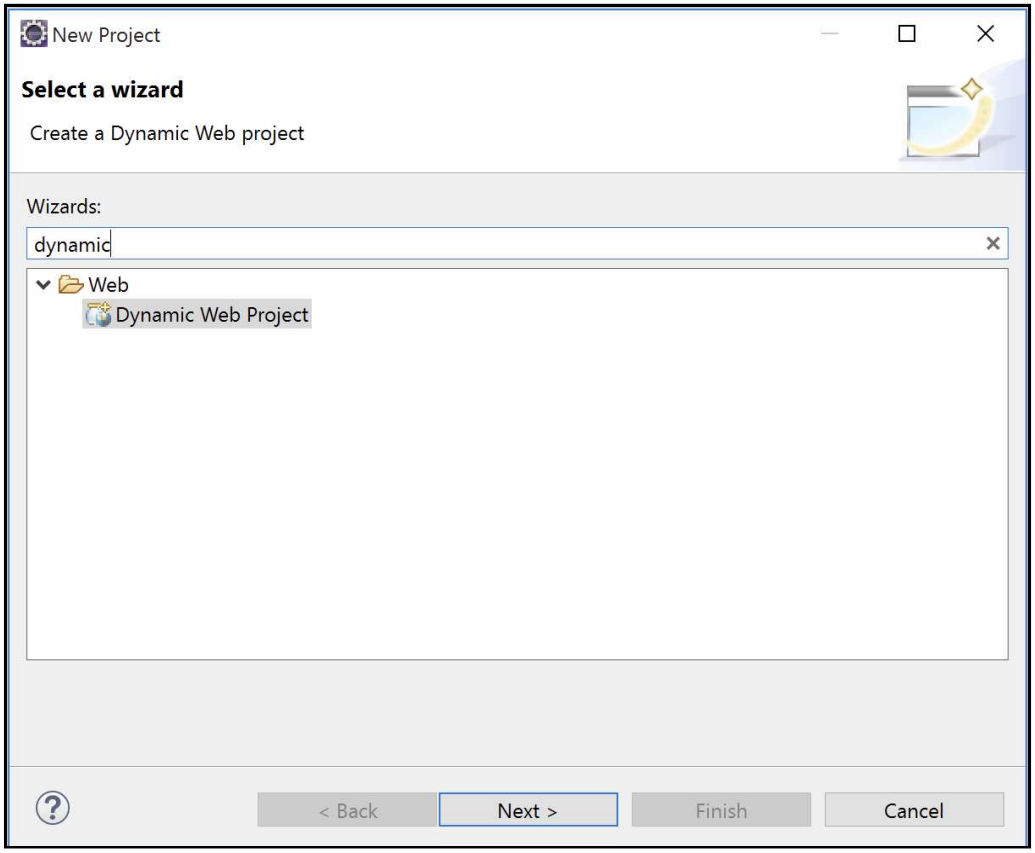
The following article shows you how you can run a Java application in AWS Elastic Beanstalk and then use AcuSensor to run an interactive application security testing (IAST) (https://www.acunetix.com/blog/web-security-zone/what-is-iast-interactive-application-security-testing/) scan for that application.

Prerequisites

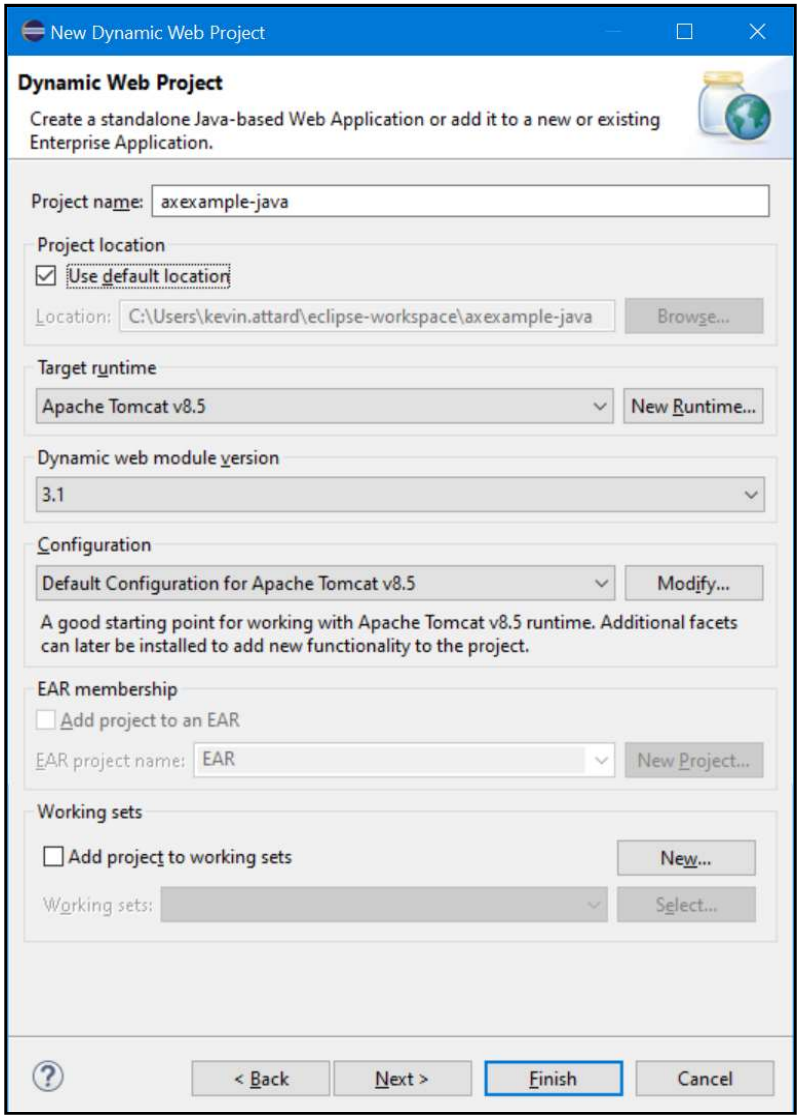
- Install JAVA (https://www.java.com/en/download/)
- Install Eclipse IDE (https://www.eclipse.org/downloads/) for Enterprise JAVA and Web Developers
- Install Eclipse Extensions from "Web, XML, Java EE and OSGI Enterprise Development":
    - Eclipse Java EE Developer Tools
    - Eclipse Java Web Developer Tools
    - Eclipse Web Developer Tools
    - JST Server Adapters Extensions (Apache Tomcat)

Step 1: Prepare an Example Application Using Eclipse IDE

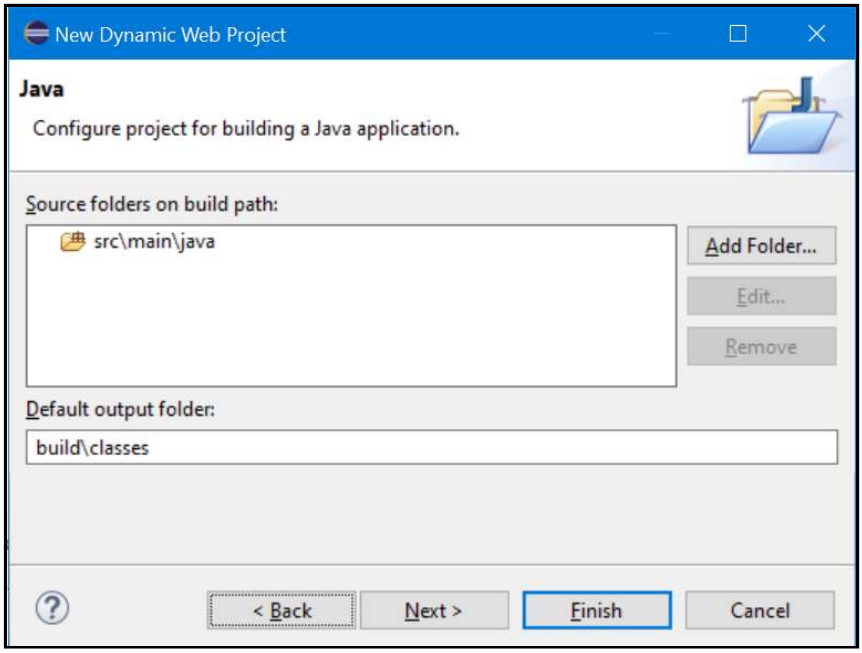
- Go to the menu item ***File*** → ***New*** → ***Project***



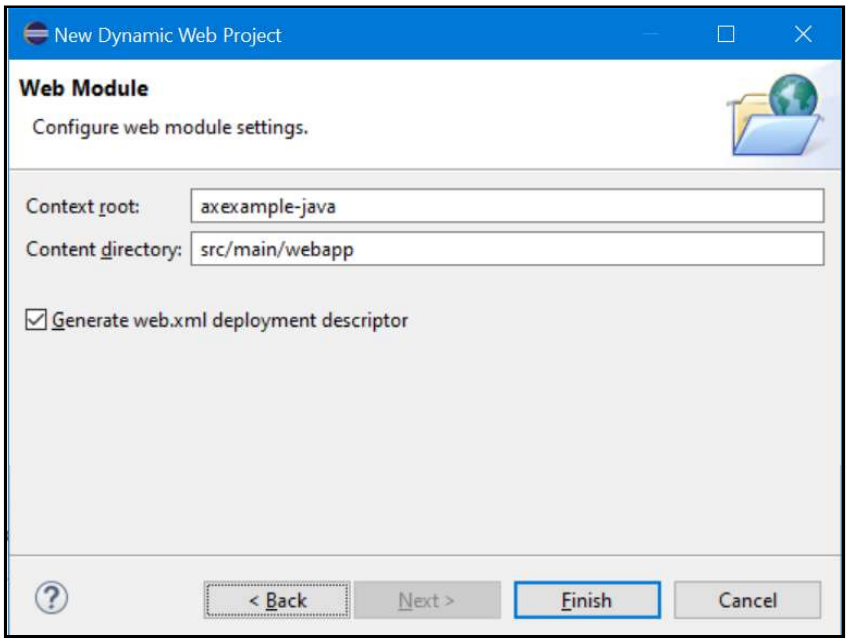
- In the ***New Project*** wizard, search for and select the ***Dynamic Web Project*** option and click on the ***Next*** button



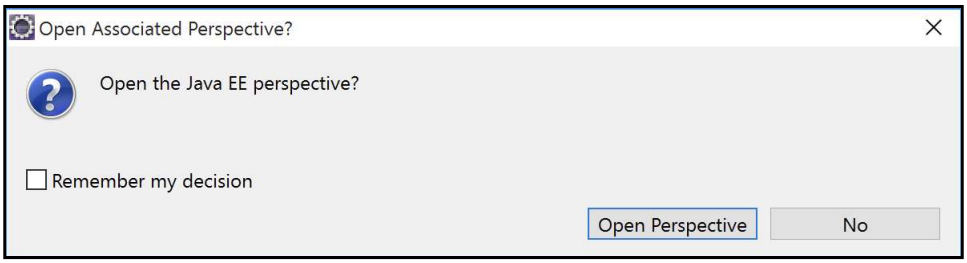
- Set the ***Project name*** field to ***axexample-java***
- Set the ***Target runtime*** field to ***Apache Tomcat v8.5***
- Set the ***Dynamic web module version*** field to ***3.1***
- Set the ***Configuration*** field to ***Default Configuration for Apache Tomcat v8.5***
- Click on the ***Next*** button



- In the ***Java*** window, leave default settings and click on the ***Next*** button

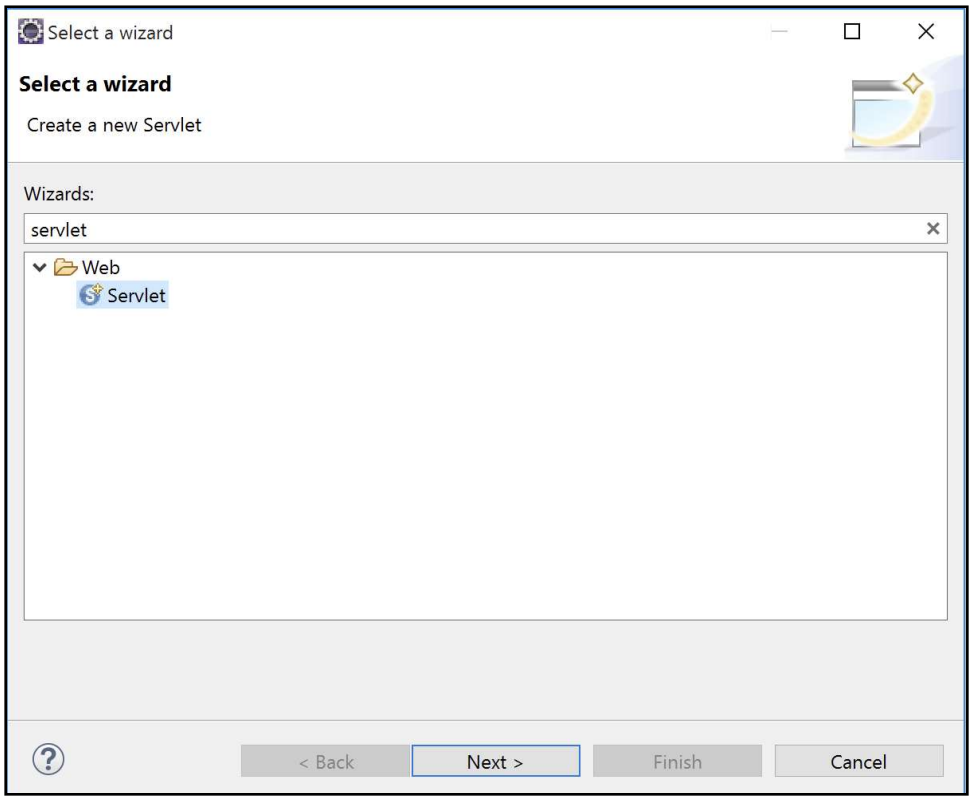


- In the ***Web Module*** window, enable the ***Generate web.xml*** option and click the ***Finish*** button

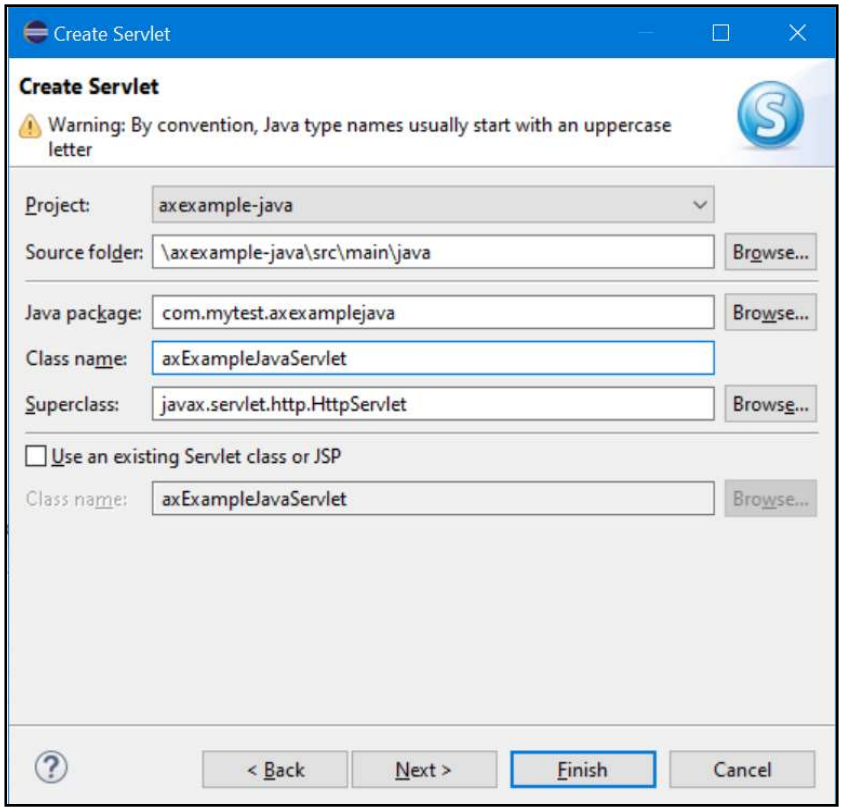


- In the ***Open Associated Perspective?*** dialog, click on the ***No*** button
- Expand the ***axexample-java*** project
- Right-click on the ***src*** folder

- Select the ***New*** → ***Other*** option



- Highlight the ***Servlet*** option
- Click on the ***Next >*** button

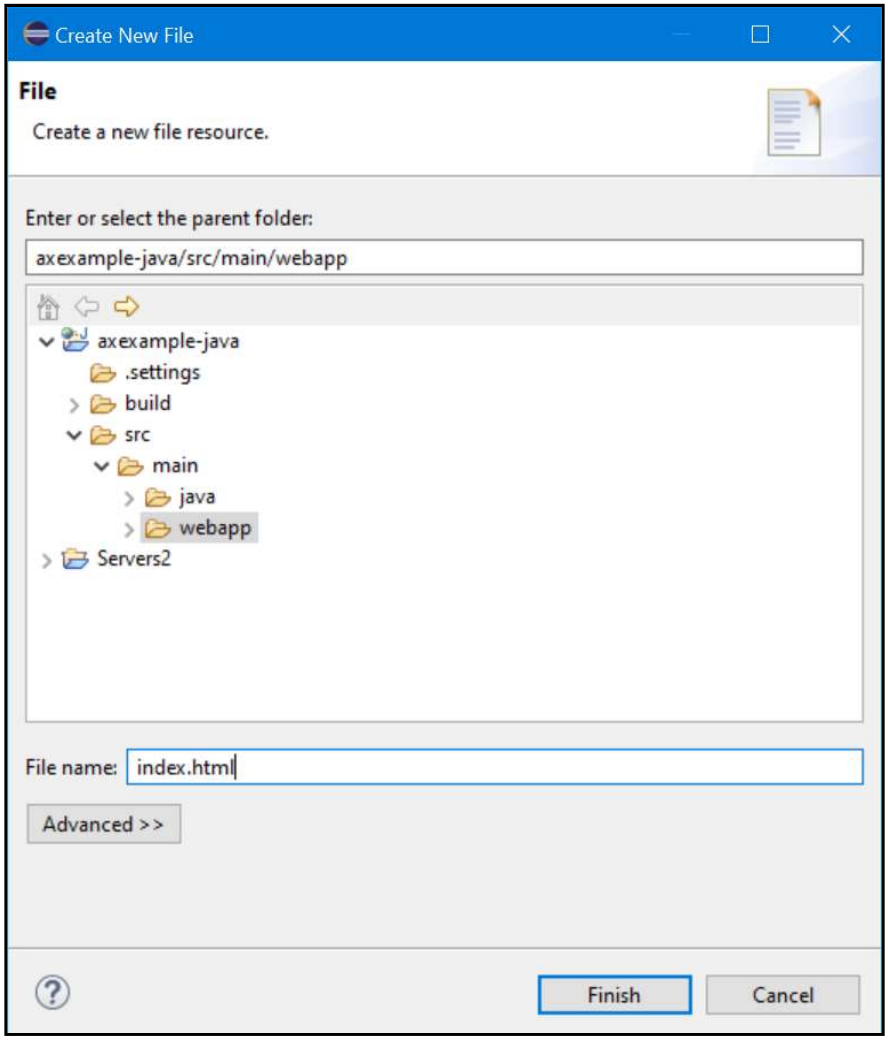


- Set the ***Java package*** field to ***com.mytest.axexample***

- Set the ***Class name*** field to ***axExampleJavaServlet***
- Click on the ***Finish*** button
- Edit the contents of the ***axExampleJavaServlet.java*** file to read as follows:

```
package com.mytest.axexamplejava;

import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

/**
 * Servlet implementation class HelloWorldServlet
 */
@WebServlet("/axExampleJavaServlet")
public class axExampleJavaServlet extends HttpServlet {
	private static final long serialVersionUID = 1L;

    /**
     * @see HttpServlet#HttpServlet()
     */
    public axExampleJavaServlet() {
        super();
        // TODO Auto-generated constructor stub
    }

	/**
	 * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
	 */
	protected void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
		PrintWriter out = response.getWriter();
		out.print("<html><body><h1>Test JAVA Site Example for AWS Elastic Beanstalk</h1><br>Welcome
to the main page.<br></body></html>");
	}

	/**
	 * @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)
	 */
	protected void doPost(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
		// TODO Auto-generated method stub
		doGet(request, response);
	}
}
```

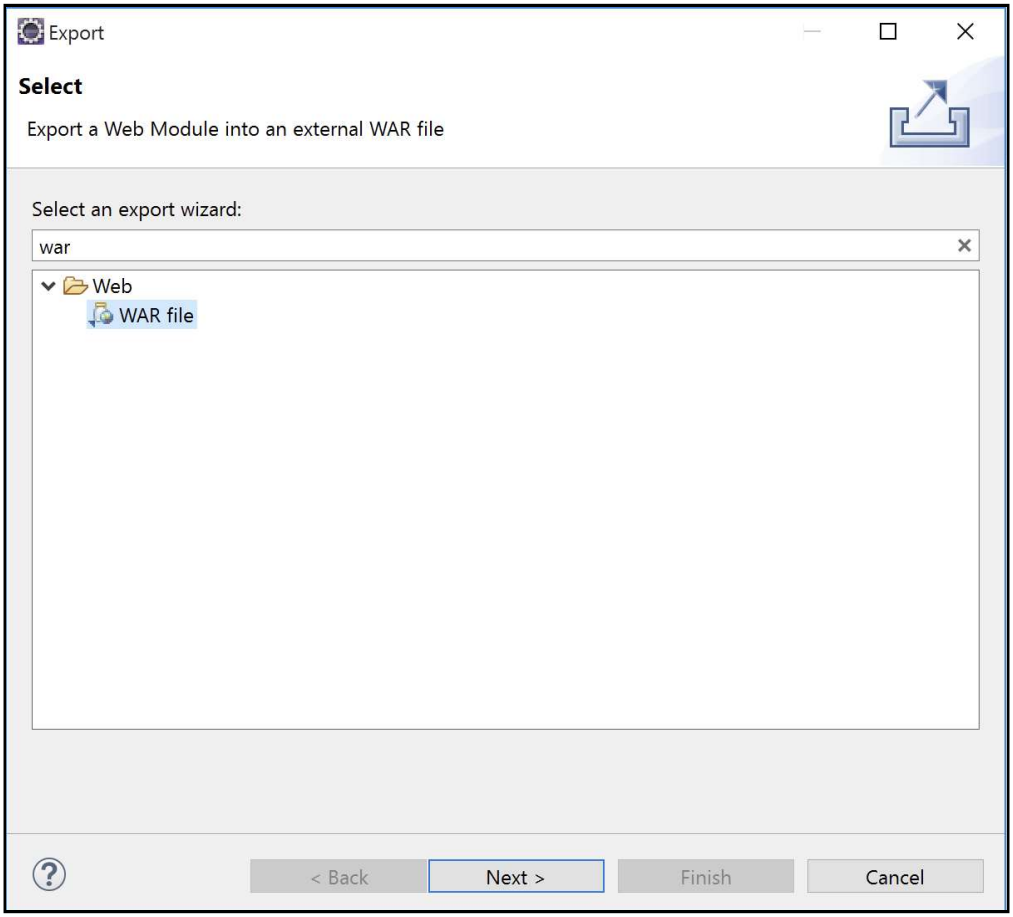
- Expand the ***axexample-java*** project, right click on the ***axexample-java/src/main/webapp*** folder, and select the ***New*** → ***File*** option



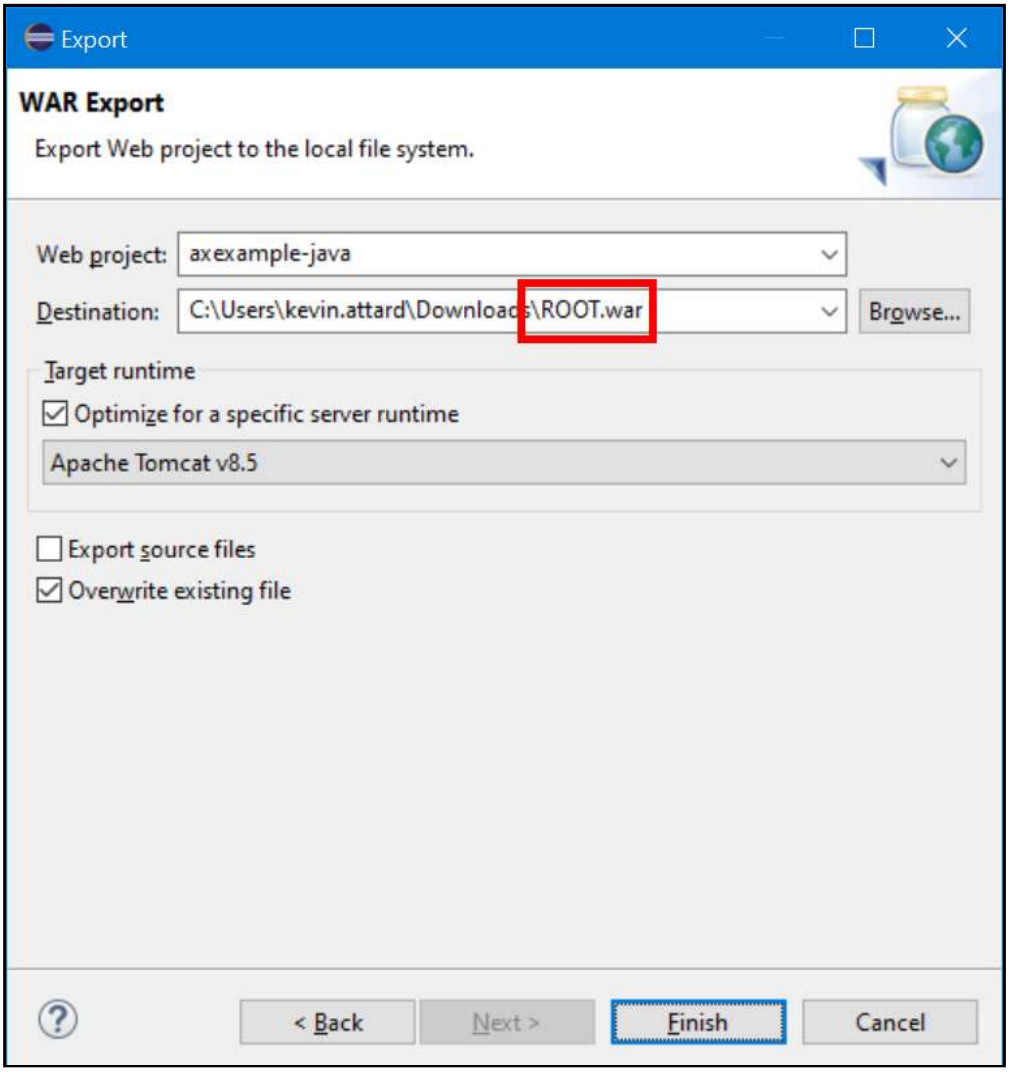
- Set the filename to ***index.html*** and click on the ***Finish*** button
- Edit the contents of the ***index.html*** file to read as follows:

```
<head>
<title>Test JAVA Site Example for AWS Elastic Beanstalk</title>
</head>
<body>
<h1>Test JAVA Site Example for AWS Elastic Beanstalk</h1><br/><br/>
<a href="axExampleJavaServlet">Click here to invoke servlet</a>
</body>
</html>
```

- Make sure that the changes to both new files are saved
- Right-click on the ***axexample-java*** project, click on the ***Export...*** option, search for the ***WAR file*** option, and select it



- Click on the ***Next >*** button and select a ***Destination*** for your exported WAR file



- Ensure that the filename for your export file is ***ROOT.war***
- Click on the ***Finish*** button

Step 2: Prepare AcuSensor for Java

We will deploy the test application to the following URL: ***http://eb.acunetixexample.com*** - you will need to change this to the hostname you will use for your test deployment

- Create a new target for the above URL, replacing ***http://eb.acunetixexample.com*** with the URL for your chosen hostname
- Download AcuSensor for Java from the Acunetix UI and retain the ***AcuSensor.jar*** file for the next step

Step 3: Prepare a folder for your source code bundle

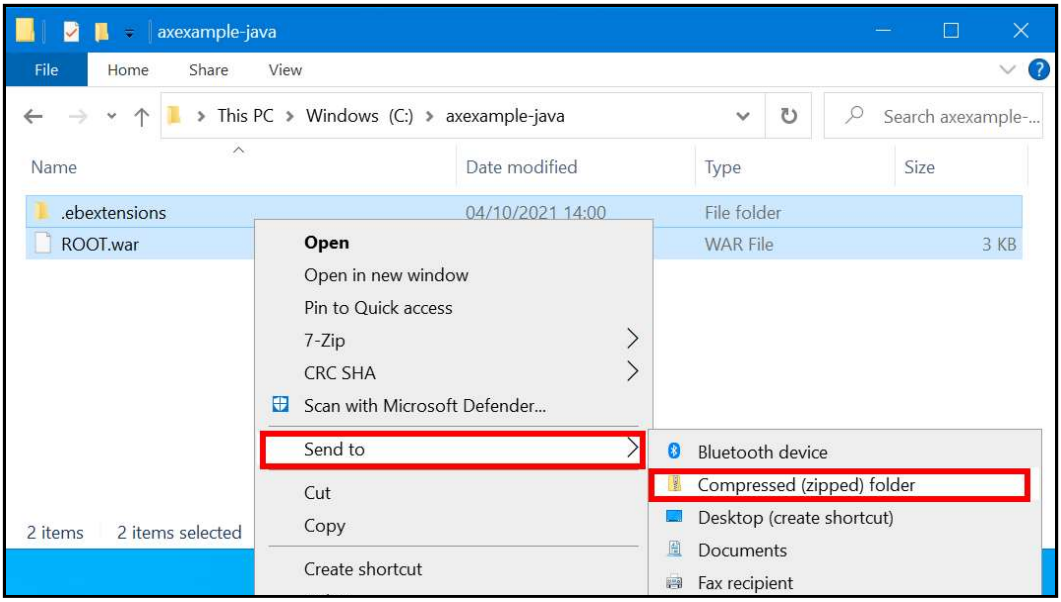
- Create a folder ***C:\axexample-java***

- Create a folder ***C:\axexample-java\.ebextensions***
- Copy your exported ***ROOT.war*** file into ***C:\axexample-java***
- Copy your ***AcuSensor.jar*** file into ***C:\axexample-java\.ebextensions***
- Using a text editor, create a file ***C:\axexample-java\.ebextensions\acusensor.config***
- Edit the contents of the ***C:\axexample-java\.ebextensions\acusensor.config*** file to read as follows:

```
commands:
  01_create_acusensor_directory:
    command: "mkdir -p /home/acusensor"
  02_get_aspectjweaver:
    command: "wget https://repo1.maven.org/maven2/org/aspectj/aspectjweaver/1.9.7/aspectjweaver-
1.9.7.jar -O /home/acusensor/aspectjweaver.jar"

option_settings:
  aws:elasticbeanstalk:container:tomcat:jvmoptions:
    JVM Options: '-javaagent:/usr/share/tomcat/lib/aspectjweaver.jar -Dacusensor.debug.log=ON'

container_commands:
  01_copy_acusensor:
    command: "cp .ebextensions/AcuSensor.jar /home/acusensor/AcuSensor.jar"
  02_change_acusensor_dir_permissions:
    command: "sudo chown -R root:root /home/acusensor"
  03_link_aspectjweaver_library:
    command: "ln -s /home/acusensor/aspectjweaver.jar /usr/share/tomcat/lib/aspectjweaver.jar"
  04_link_acusensor_library:
    command: "ln -s /home/acusensor/AcuSensor.jar /usr/share/tomcat/lib/AcuSensor.jar"
```

Note: The parameter "-Dacusensor.debug.log=ON" is optional, and should ONLY be used for troubleshooting purposes. If this parameter is retained, this will output AcuSensor logging as additional lines in the Tomcat logs starting with "[Acunetix-debug]".

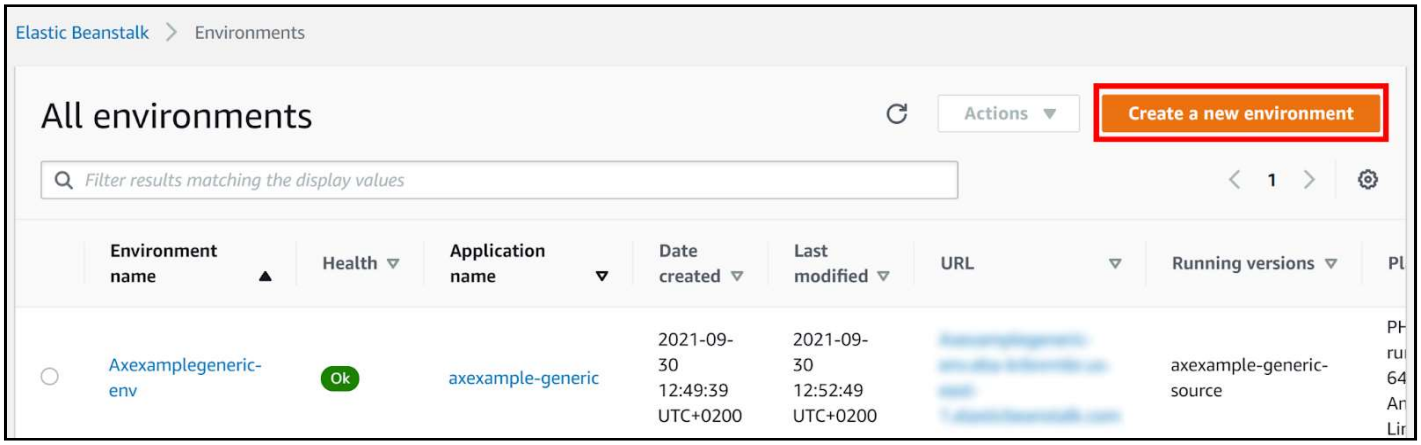
- Use Windows Explorer to navigate to ***C:\axexample-java***; click CTRL+A to select both ***.ebextensions*** and ***ROOT.war***
- Right-click on the selected items and click the ***Send to -> Compressed (zipped) folder*** menu option:



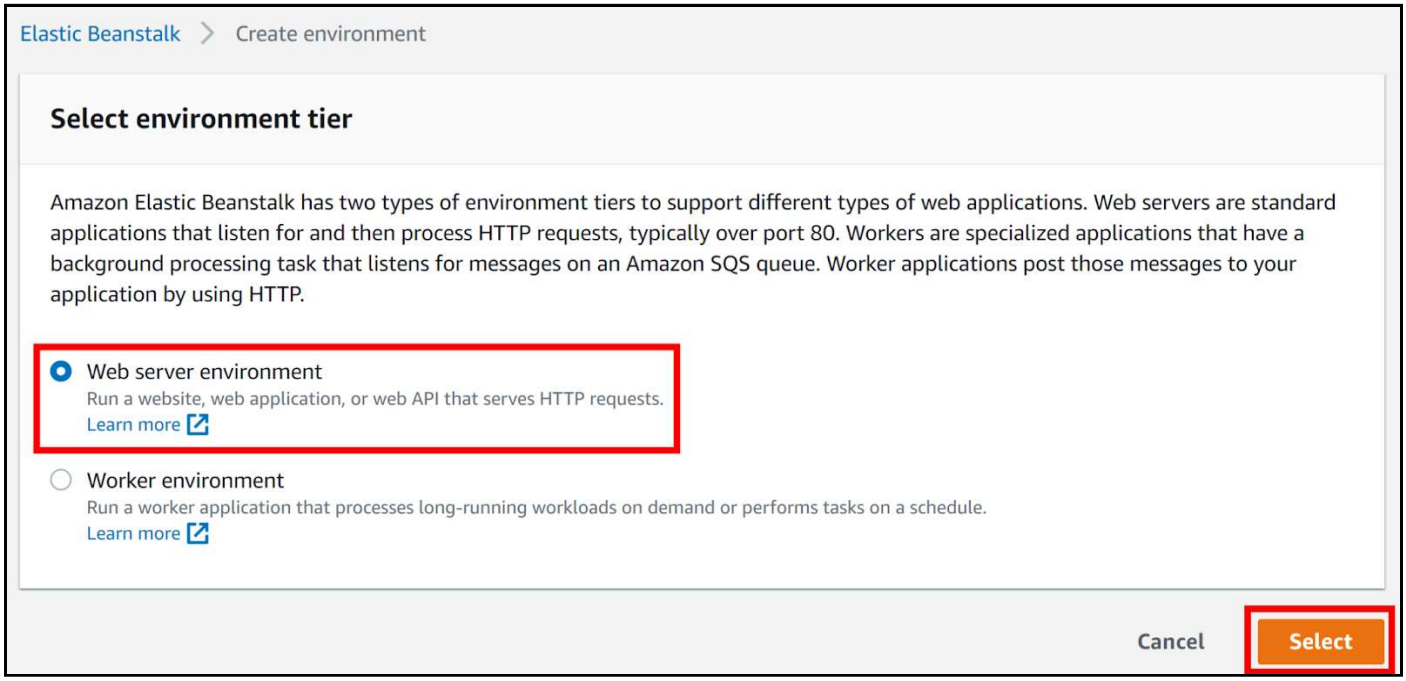
- Rename your zip file to ***axexample-java.zip*** and retain your zip file for deployment steps below

Deploy your web application to AWS Elastic Beanstalk

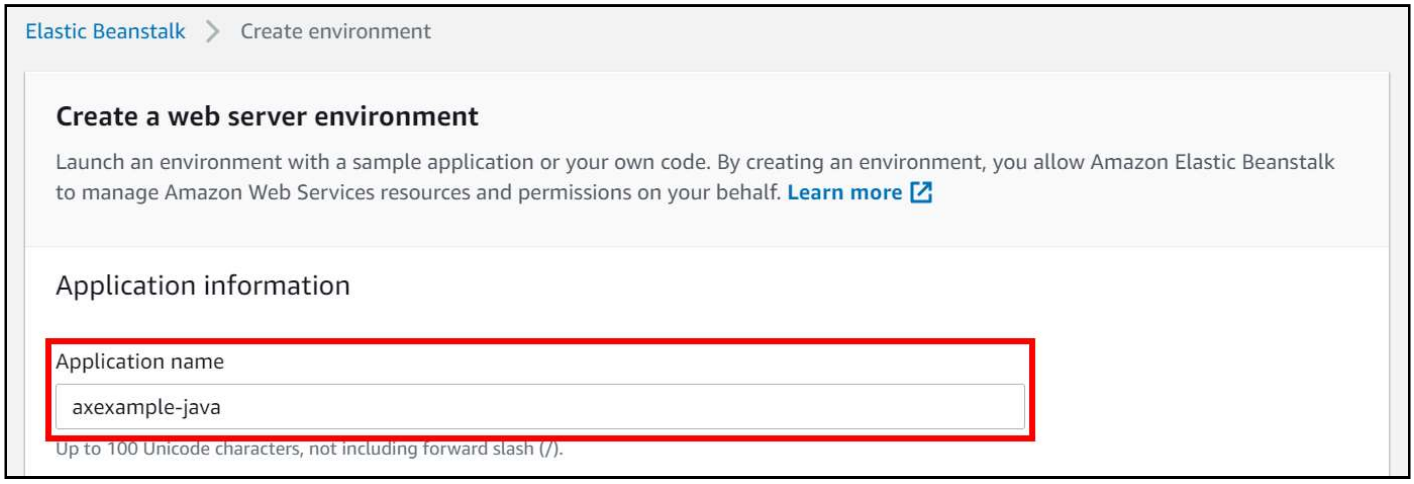
- From your AWS Dashboard, navigate to *Elastic Beanstalk -> Environments*
- Click the *Create a new environment* button



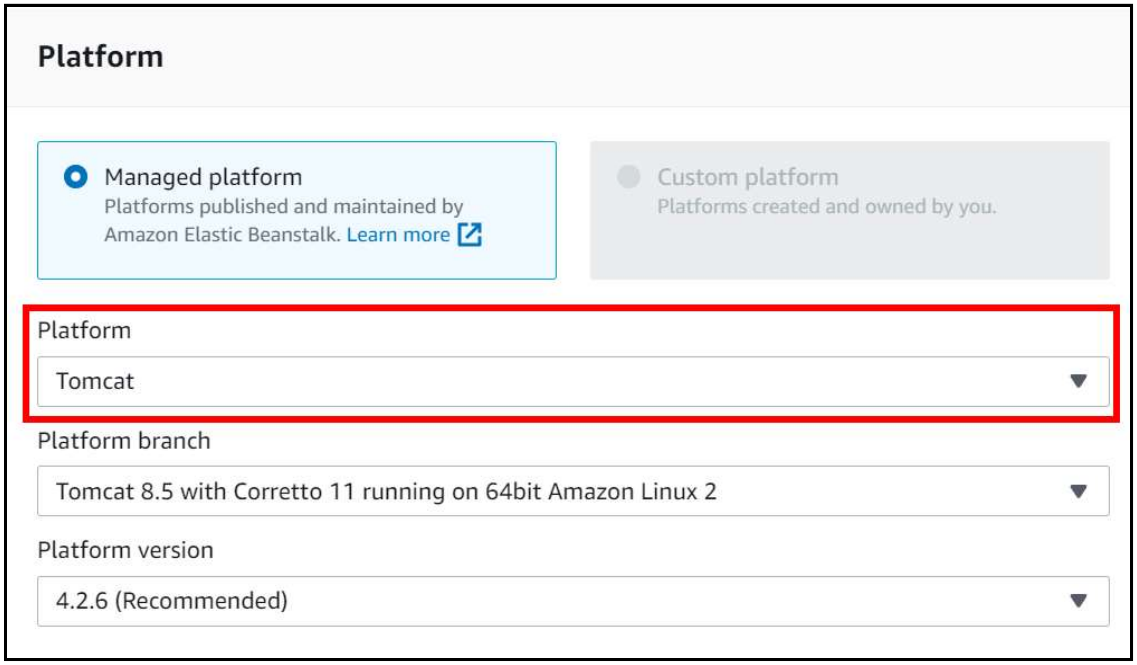
- Set your environment tier to *Web server environment*



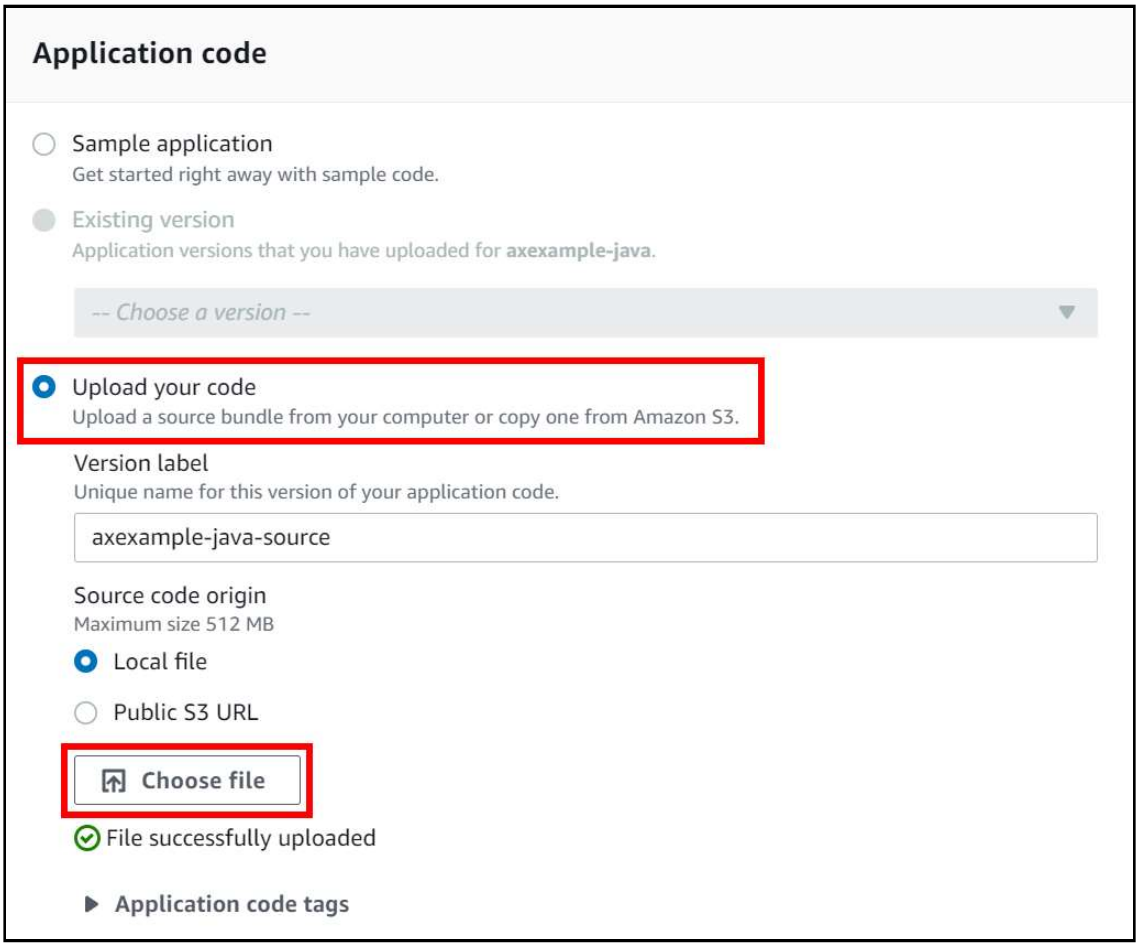
- Click the *Select* button
- In the *Elastic Beanstalk -> Create environment* page:
    - Set the *Application name* field to the name for your web application; in this example you will use the name *axexample-java*



    - Set the *Platform* dropdown to *Tomcat*

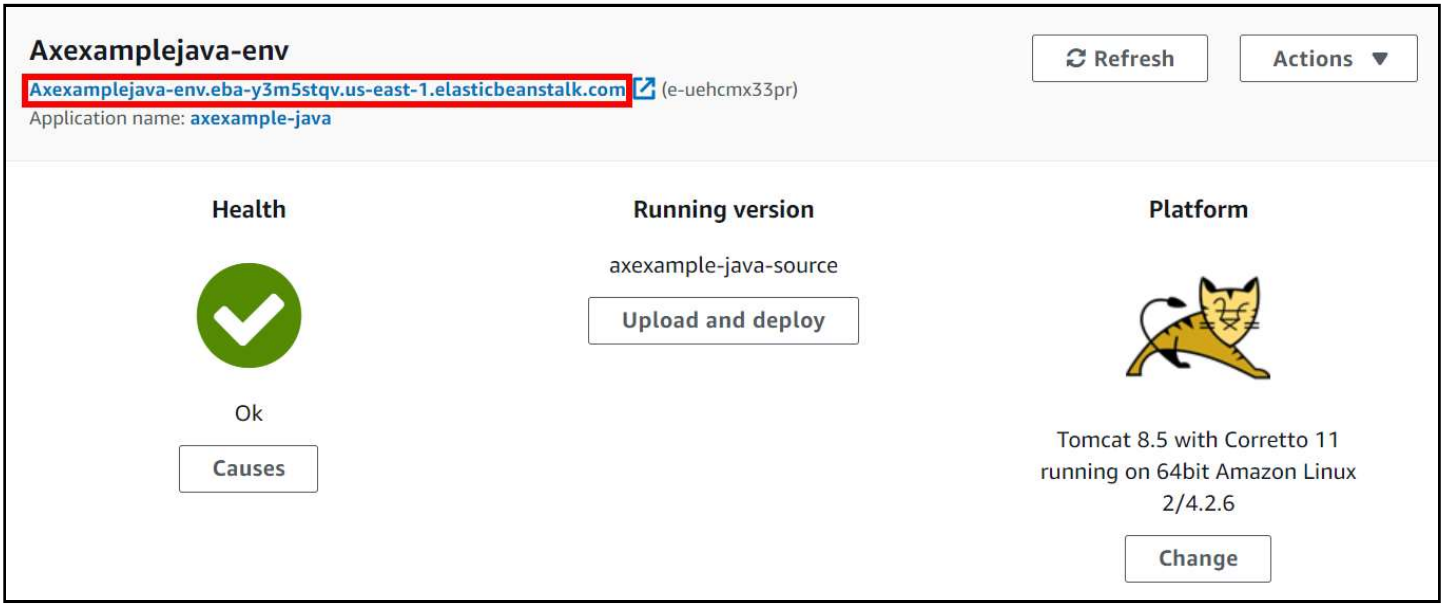


- Enable the *Upload your code* option and click the *Choose file* button

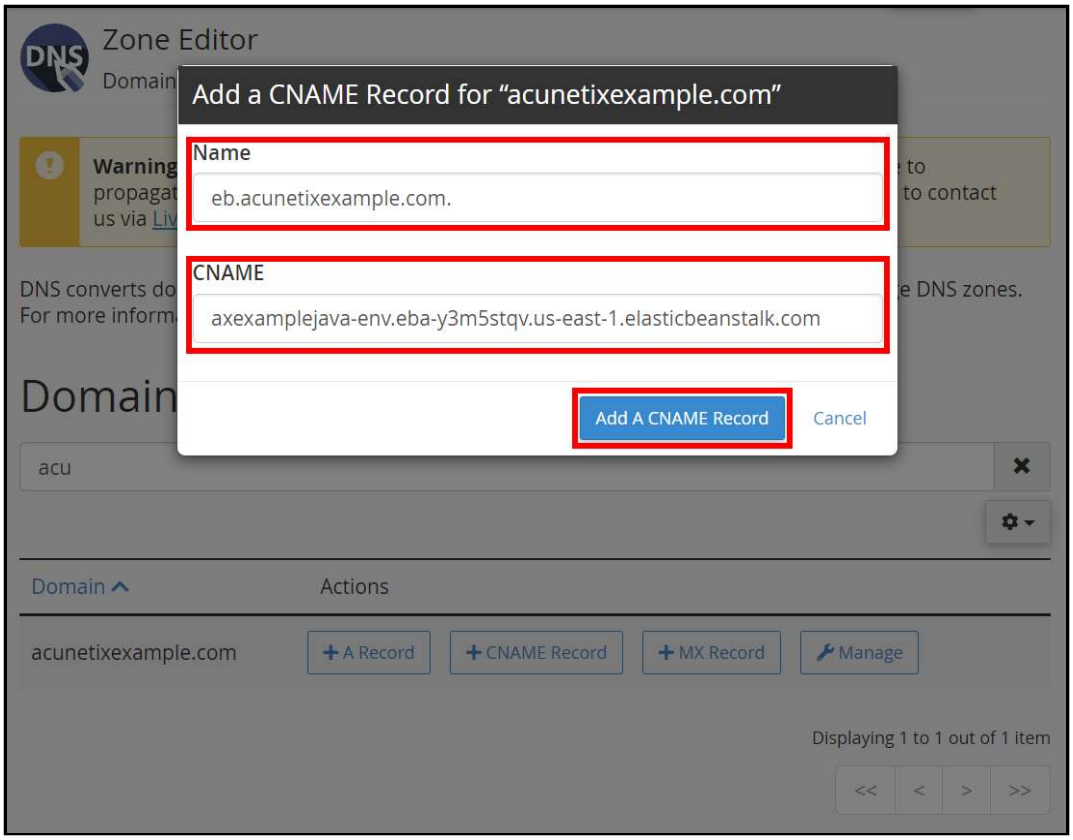


- Select your *axexample.zip* source code bundle for upload and click the *Create environment* button

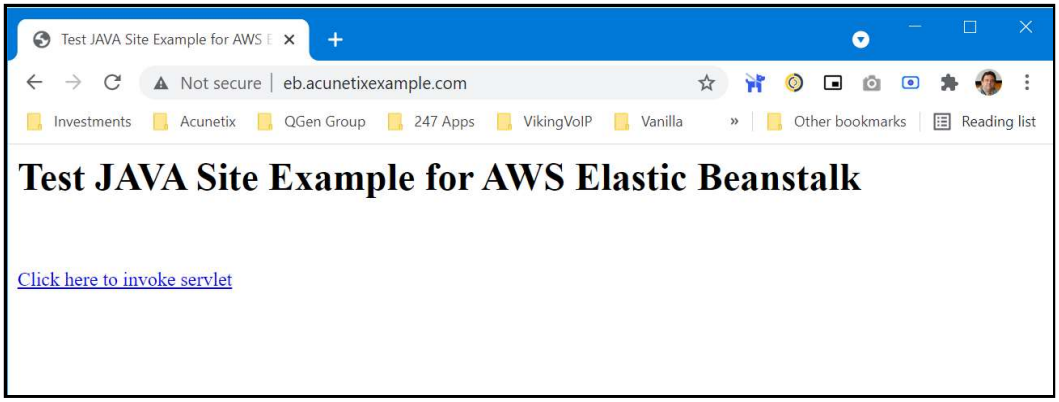
- AWS Elastic Beanstalk will now create your environment; this can take a few minutes
- When the process is complete you will be sent to your environment's dashboard



- Take note of your environment's new URL which was created automatically by AWS Elastic Beanstalk:
  - you will need this to create a CNAME to point to this URL
  - in this example, we would create a CNAME for *eb.acunetixexample.com* to point to *axexamplejava-env.eba-y3m5stqv.us-east-1.elasticbeanstalk.com*; here is an example using the *Namecheap* cPanel interface:

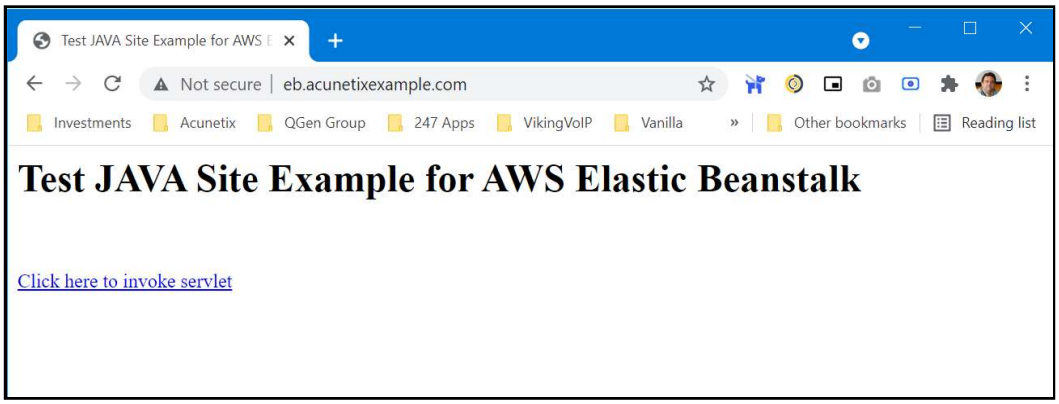


- Once the CNAME record has been added (giving time for DNS records to propagate), you can see the web application you have created by browsing to your URL (in this example http://eb.acunetixexample.com (http://eb.acunetixexample.com)):

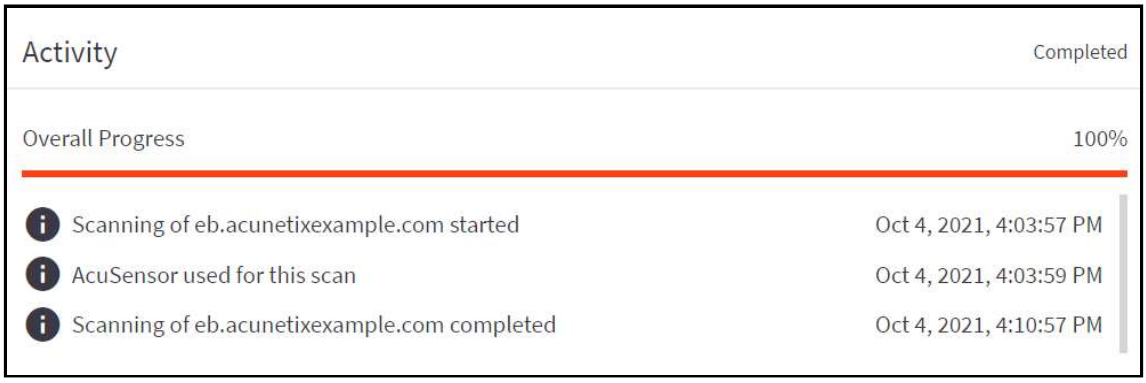


Test and scan your web application

Point your browser to your web application - in this example *http://eb.acunetixexample.com* - to confirm it is running as intended; you will get the following:



Finally, run a scan on your target; the *Activity* panel will confirm that AcuSensor was detected and used for the scan.



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