Tarea UD3

Despregramento de Aplicacións Web

24/25

Índice.

Sumario

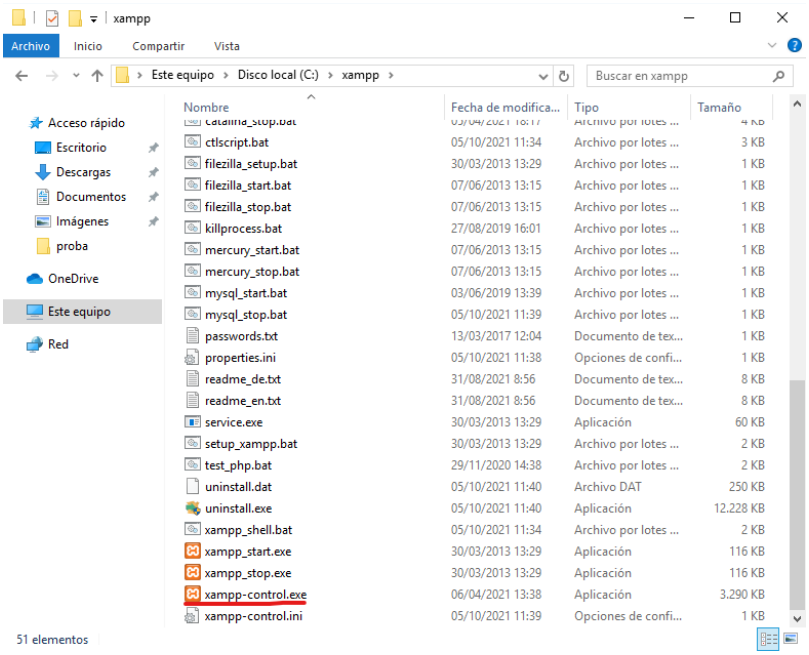
1. Funcionamiento de Tomcat en Windows con XAMPP

Se te facilita una máquina Windows, que ya viene con un Xampp operativo. Se te pide.

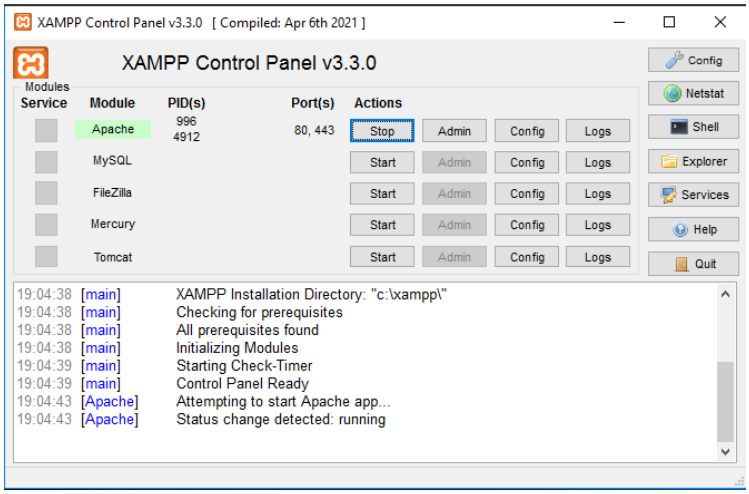
a. Arranque y configuración inicial

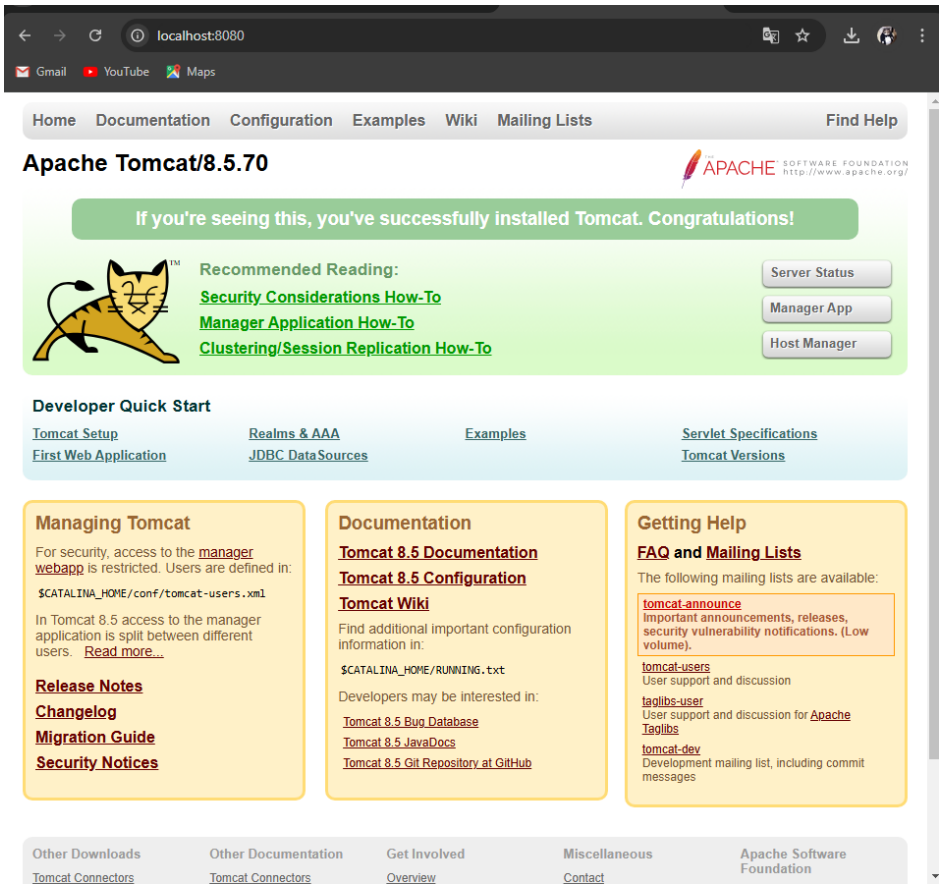
Configura para que arranque, y se pueda acceder a su página principal

Primero tenemos que activar apache en xamp



Activamos apache y mysql





b. Acceso a opciones de gestión y administración

Configúralo para que pueda acceder a server status, Manager App y Host Manager

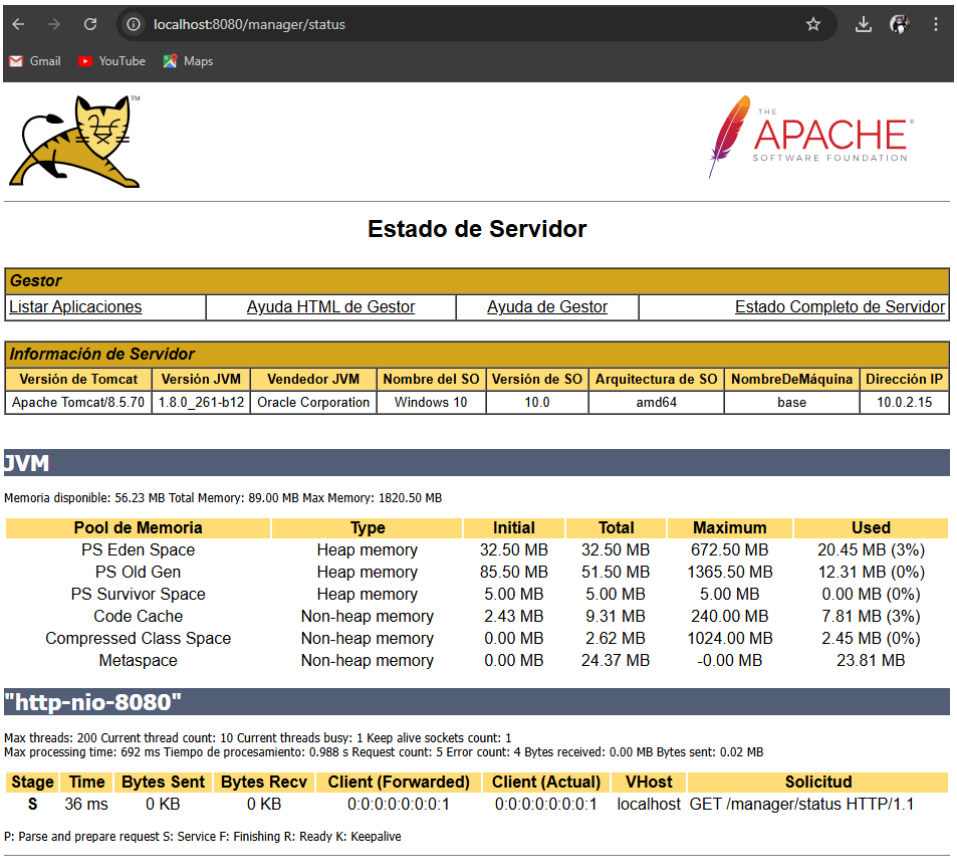
Accedemos al archivo conf/tomcat-users.xml en tomcat y añadimos lo siguiente

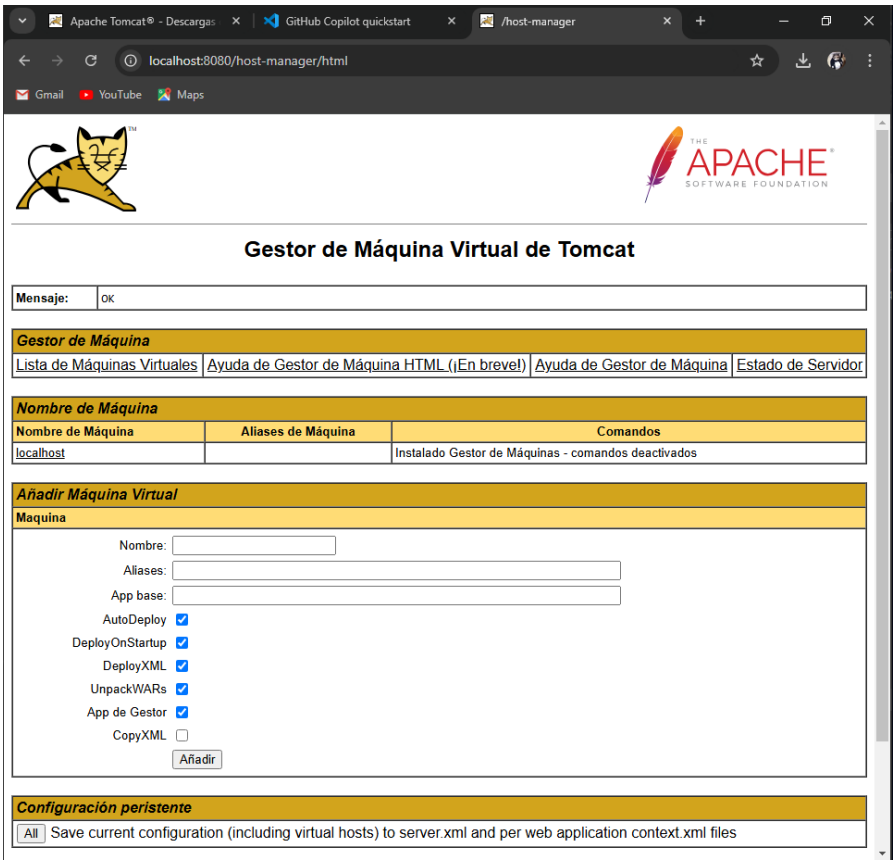
<role rolename="manager-gui" />

<role rolename="admin-gui" />

<user username="admin" password="admin" roles="manager-gui,admin-gui" />

```
<role rolename="manager-gui" />
<role rolename="admin-gui" />
<user username="admin" password="admin" roles="manager-gui,admin-gui" />
```


localhost:8080/manager/status
Gmail
YouTube
Maps
Estado de Servidor
Gestor
Listar Aplicaciones
Ayuda HTML de Gestor
Ayuda de Gestor
Estado Completo de Servidor
Información de Servidor
Versión de Tomcat
Versión JVM
Vendedor JVM
Nombre del SO
Versión de SO
Arquitectura de SO
NombreDeMáquina
Dirección IP
Apache Tomcat/8.5.70
1.8.0_261-b12
Oracle Corporation
Windows 10
10.0
amd64
base
10.0.2.15
JVM
Memoria disponible: 56.23 MB Total Memory: 89.00 MB Max Memory: 1820.50 MB
Pool de Memoria
Type
Initial
Total
Maximum
Used
PS Eden Space
Heap memory
32.50 MB
32.50 MB
672.50 MB
20.45 MB (3%)
PS Old Gen
Heap memory
85.50 MB
51.50 MB
1365.50 MB
12.31 MB (0%)
PS Survivor Space
Heap memory
5.00 MB
5.00 MB
5.00 MB
0.00 MB (0%)
Code Cache
Non-heap memory
2.43 MB
9.31 MB
240.00 MB
7.81 MB (3%)
Compressed Class Space
Non-heap memory
0.00 MB
2.62 MB
1024.00 MB
2.45 MB (0%)
Metaspace
Non-heap memory
0.00 MB
24.37 MB
-0.00 MB
23.81 MB
"http-nio-8080"
Max threads: 200 Current thread count: 10 Current threads busy: 1 Keep alive sockets count: 1
Max processing time: 692 ms Tiempo de procesamiento: 0.988 s Request count: 5 Error count: 4 Bytes received: 0.00 MB Bytes sent: 0.02 MB
Stage
Time
Bytes Sent
Bytes Recv
Client (Forwarded)
Client (Actual)
VHost
Solicitud
S
36 ms
0 KB
0 KB
0:0:0:0:0:0:0:1
0:0:0:0:0:0:0:1
localhost
GET /manager/status HTTP/1.1
P: Parse and prepare request S: Service F: Finishing R: Ready K: Keepalive
Copyright © 1999-2021, Apache Software Foundation

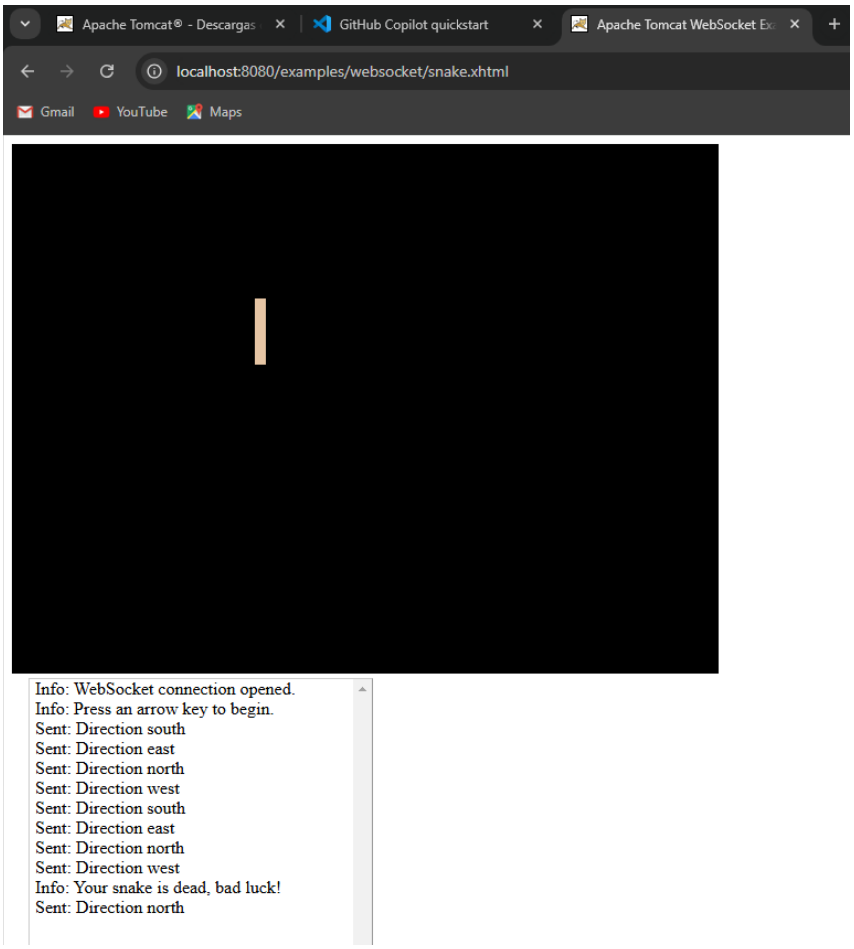

Apache Tomcat® - Descargas
GitHub Copilot quickstart
/host-manager
localhost:8080/host-manager/html
Gmail
YouTube
Maps
Gestor de Máquina Virtual de Tomcat
Mensaje:
OK
Gestor de Máquina
Lista de Máquinas Virtuales
Ayuda de Gestor de Máquina HTML (¡En breve!)
Ayuda de Gestor de Máquina
Estado de Servidor
Nombre de Máquina
Nombre de Máquina
Aliases de Máquina
Comandos
localhost
Instalado Gestor de Máquinas - comandos deactivados
Añadir Máquina Virtual
Maquina
Nombre:
Aliases:
App base:
AutoDeploy
DeployOnStartup
DeployXML
UnpackWARs
App de Gestor
CopyXML
Añadir
Configuración peristente
All
Save current configuration (including virtual hosts) to server.xml and per web application context.xml files

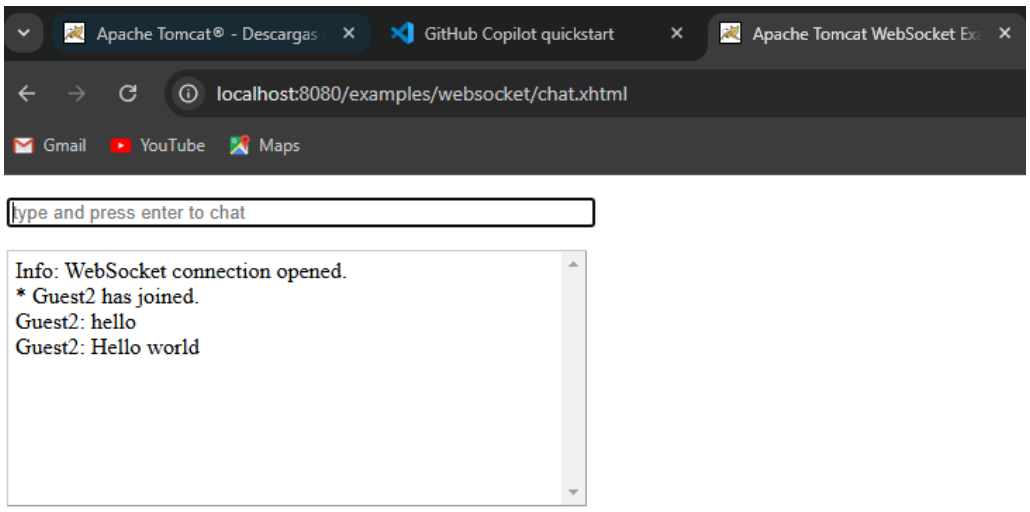
Pistas:

[Guide to Tomcat Manager Application | Baeldung]

c. Ejemplos

Muestra su funcionamiento con alguno de los ejemplos disponibles

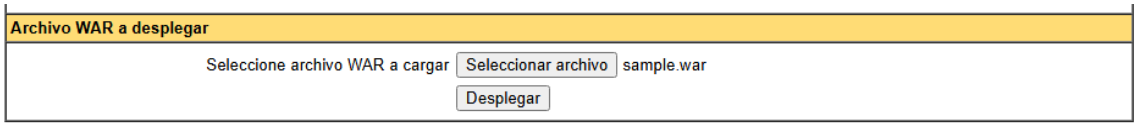


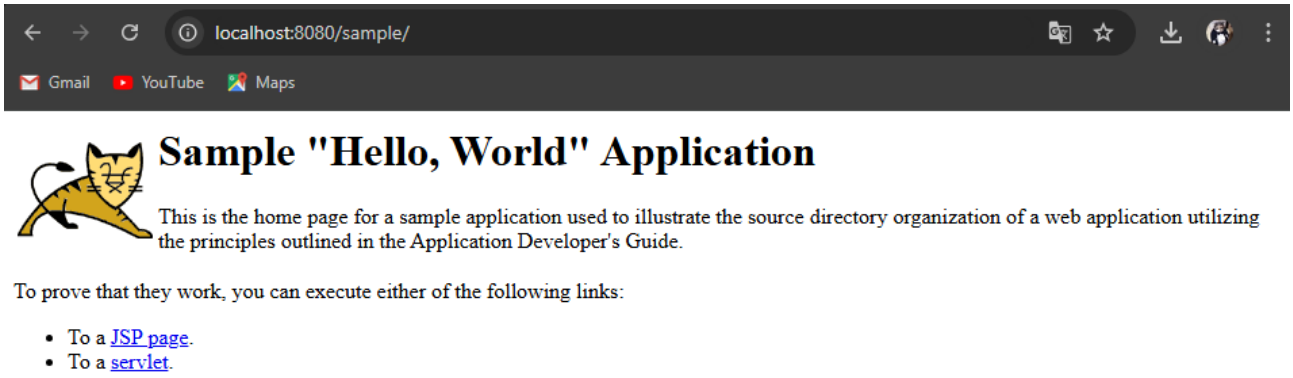


d. Despliega tu propia aplicación web

Despliega un fichero Sample.war, y comprueba que puedes acceder a a la aplicación

pagina: http://localhost:8080/manager/html





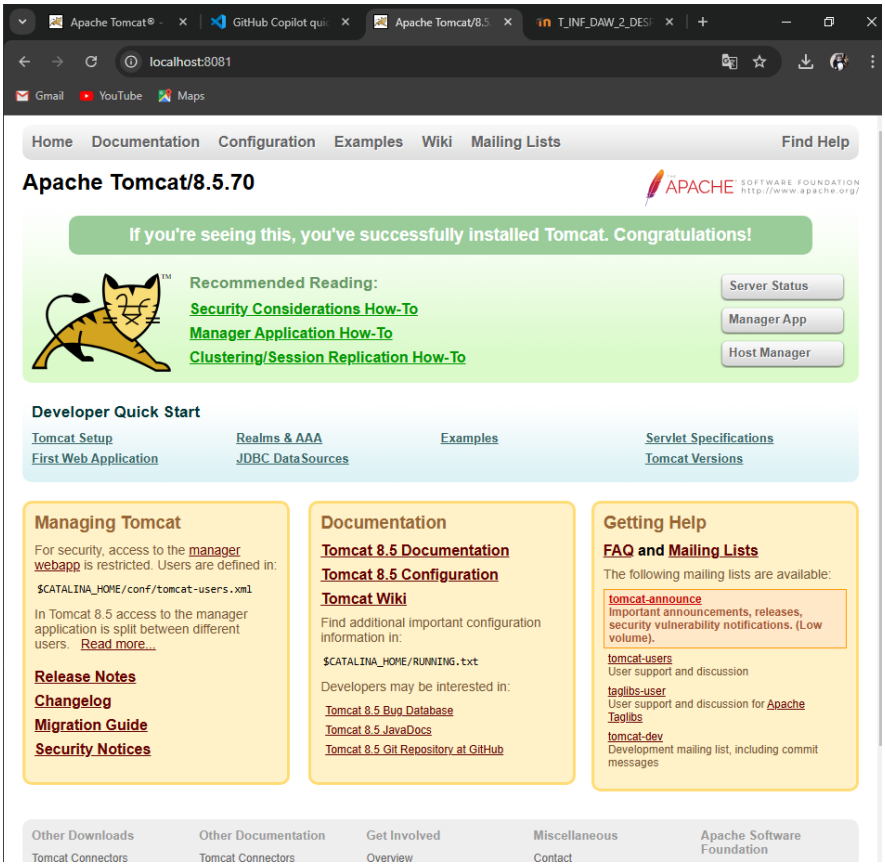
Pistas:

Apache Tomcat 11 (11.0.0-M16) - Tomcat Web Application Deployment

How to Deploy a WAR File to Tomcat | Baeldung

Tomcat Manager y su configuración - Arquitectura Java

e. Cambia el puerto donde escucha Tomcat



Pista:

[Change the Default Port of the Tomcat Server (microfocus.com)]

2. Instalación, configuración y funcionamiento de Tomcat en Linux

a) Instala y realiza confguración para que pueda acceder a server status, Manager App y Host Manager

Creamos un usuario llamado tomcat

sudo useradd -m -d /opt/tomcat -U -s /bin/false tomcat

```
xubu@xubu-VirtualBox:~$ sudo useradd -m -d /opt/tomcat -U -s /bin/false tomcat
useradd: warning: the home directory /opt/tomcat already exists.
useradd: Not copying any file from skel directory into it.
```

Instalamos java

sudo apt install openjdk-17-jdk -y

```
osboxes@osboxes:~$ sudo apt install openjdk-17-jdk -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ca-certificates-java fonts-dejavu-extra java-common libatk-wrapper-java
  libatk-wrapper-java-jni libice-dev libpthread-stubs0-dev libsm-dev libx11-dev libxau-dev
  libxcb1-dev libxdmcp-dev libxt-dev openjdk-17-jdk-headless openjdk-17-jre
  openjdk-17-jre-headless x11proto-dev xorg-sgml-doctools xtrans-dev
Suggested packages:
  default-jre libice-doc libsm-doc libx11-doc libxcb-doc libxt-doc openjdk-17-demo
  openjdk-17-source visualvm fonts-ipafont-gothic fonts-ipafont-mincho fonts-wqy-microhei
  | fonts-wqy-zenhei
The following NEW packages will be installed:
  ca-certificates-java fonts-dejavu-extra java-common libatk-wrapper-java
  libatk-wrapper-java-jni libice-dev libpthread-stubs0-dev libsm-dev libx11-dev libxau-dev
  libxcb1-dev libxdmcp-dev libxt-dev openjdk-17-jdk openjdk-17-jdk-headless openjdk-17-jre
  openjdk-17-jre-headless x11proto-dev xorg-sgml-doctools xtrans-dev
0 upgraded, 20 newly installed, 0 to remove and 0 not upgraded.
Need to get 266 MB of archives.
After this operation, 428 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 java-common all 0.72build2 [6,782 B]
Get:2 http://archive.ubuntu.com/ubuntu jammy/universe amd64 openjdk-17-jre-headless amd64 17
```

Tenemos que abrir el archivo setenv.sh

sudo nano /opt/tomcat/bin/setenv.sh

Y copiamos estos archivos

#!/bin/bash

export JAVA_HOME=/usr/lib/jvm/java-17-openjdk-amd64

export CATALINA_OPTS="-Xms512M -Xmx1024M"

```
#!/bin/bash
export JAVA_HOME=/usr/lib/jvm/java-17-openjdk-amd64
export CATALINA_OPTS="-Xms512M -Xmx1024M"
```

Nos aseguramos que sea ejecutable

chmod +x /opt/tomcat/bin/setenv.sh

```
xubu@xubu-VirtualBox:/tmp$ chmod +x /opt/tomcat/bin/setenv.sh
```

Descargamos tomcat:

wget https://dlcdn.apache.org/tomcat/tomcat-10/v10.1.33/bin/apache-tomcat-10.1.33.tar.gz

```
xubu@xubu-VirtualBox:/tmp$ wget https://dlcdn.apache.org/tomcat/tomcat-10/v10.1.33/bin/apache-tomcat-10.1.33.tar.gz
--2024-11-25 11:38:26--  https://dlcdn.apache.org/tomcat/tomcat-10/v10.1.33/bin/apache-tomcat-10.1.33.tar.gz
Resolvendo dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644
Conectando con dlcdn.apache.org (dlcdn.apache.org)|151.101.2.132|:443... conectado.
Petición HTTP enviada, agardando unha resposta... 200 OK
Lonxitude: 13678161 (13M) [application/x-gzip]
Gardando en: 'apache-tomcat-10.1.33.tar.gz'

apache-tomcat-10.1.33.tar.gz                        100%[=========================================

2024-11-25 11:38:39 (1,01 MB/s) - gardouse 'apache-tomcat-10.1.33.tar.gz' [13678161/13678161]
```

Descomprimimos el archivo

sudo tar -xvzf apache-tomcat-10.1.33.tar.gz -C /opt/

```
xubu@xubu-VirtualBox:/tmp$ sudo tar -xvzf apache-tomcat-10.1.33.tar.gz -C /opt/
apache-tomcat-10.1.33/conf/
apache-tomcat-10.1.33/conf/catalina.policy
apache-tomcat-10.1.33/conf/catalina.properties
apache-tomcat-10.1.33/conf/context.xml
apache-tomcat-10.1.33/conf/jaspic-providers.xml
apache-tomcat-10.1.33/conf/jaspic-providers.xsd
apache-tomcat-10.1.33/conf/logging.properties
apache-tomcat-10.1.33/conf/server.xml
apache-tomcat-10.1.33/conf/tomcat-users.xml
apache-tomcat-10.1.33/conf/tomcat-users.xsd
apache-tomcat-10.1.33/conf/web.xml
apache-tomcat-10.1.33/bin/
apache-tomcat-10.1.33/lib/
apache-tomcat-10.1.33/logs/
apache-tomcat-10.1.33/temp/
apache-tomcat-10.1.33/webapps/
apache-tomcat-10.1.33/webapps/ROOT/
apache-tomcat-10.1.33/webapps/ROOT/WEB-INF/
```

Movemos el archivo a opt y le cambiamos el nombre para facilidad

sudo mv /opt/apache-tomcat-10.1.33 /opt/tomcat

```
xubu@xubu-VirtualBox:/tmp$ sudo mv /opt/apache-tomcat-10.1.33 /opt/tomcat
```

Configuramos los permisos

sudo chown -R $USER /opt/tomcat

sudo chmod +x /opt/tomcat/bin/*.sh

```
xubu@xubu-VirtualBox:/tmp$ sudo chown -R $USER /opt/tomcat
sudo chmod +x /opt/tomcat/bin/*.sh
```

Añadimos la siguientes lineas de comando al archivo sudo nano /opt/tomcat/conf/tomcat-users.xml

<role rolename="manager-gui"/>

<role rolename="admin-gui"/>

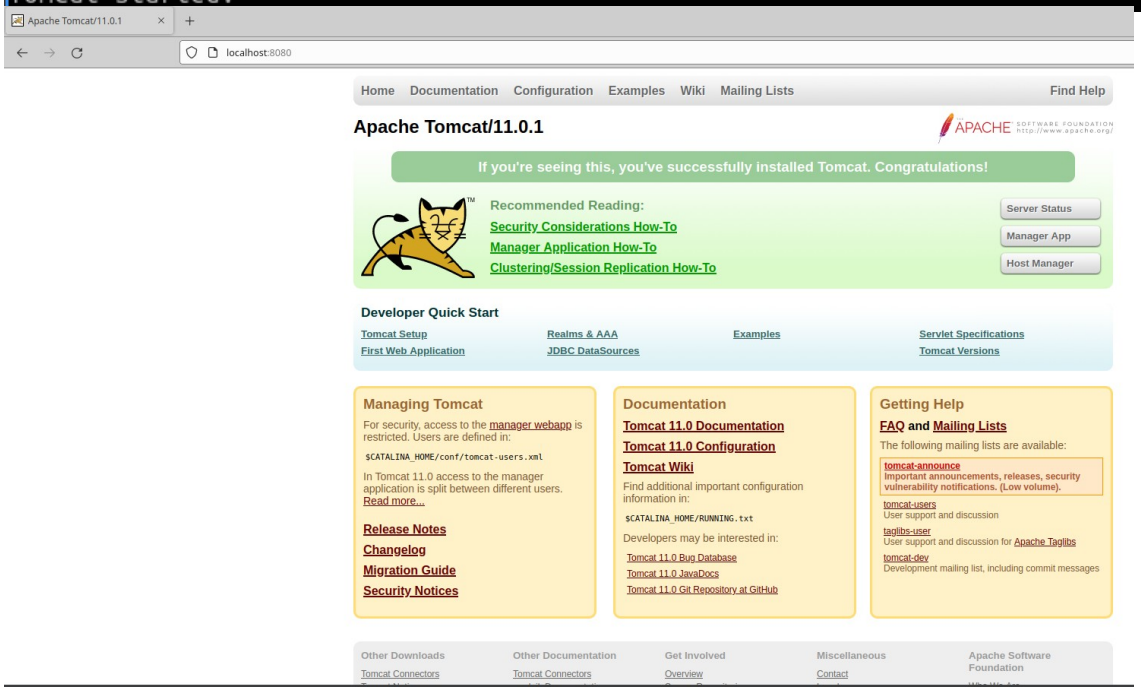
<user username="admin" password="admin" roles="manager-gui,admin-gui"/>

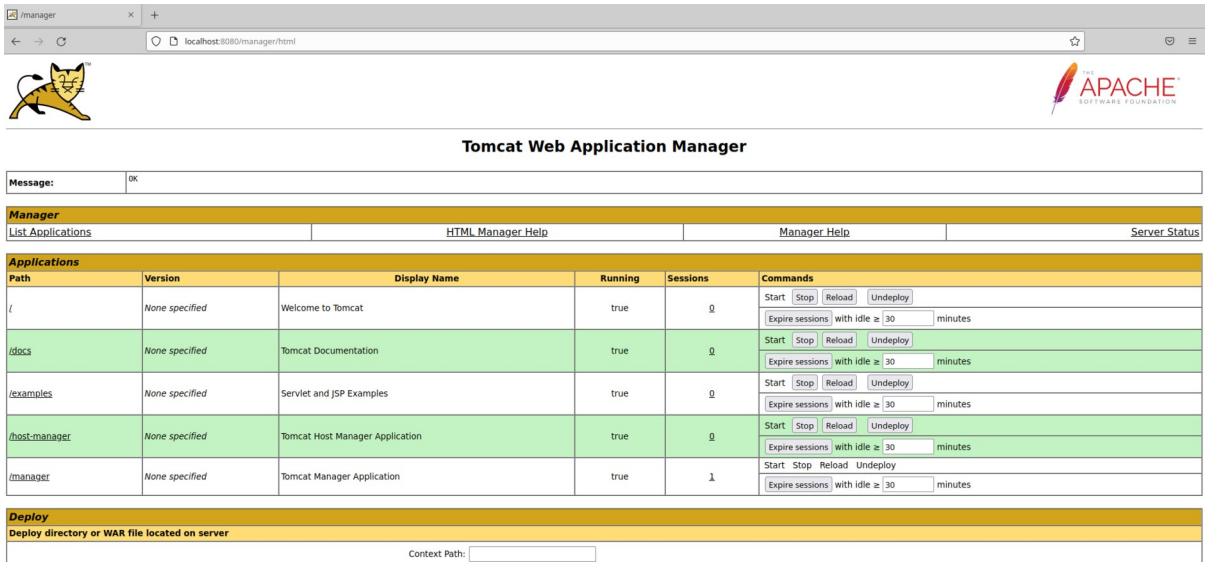
```
-->
<tomcat-users xmlns="http://tomcat.apache.org/xml"
              xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
              xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
              version="1.0">

  <role rolename="manager-gui"/>
  <role rolename="admin-gui"/>
  <user username="admin" password="admin" roles="manager-gui,admin-gui"/>
<!--
  By default, no user is included in the "manager-gui" role required
```

/opt/tomcat/bin/startup.sh

```
osboxes@osboxes:~$ /opt/tomcat/bin/startup.sh
Using CATALINA_BASE:   /opt/tomcat
Using CATALINA_HOME:   /opt/tomcat
Using CATALINA_TMPDIR: /opt/tomcat/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /opt/tomcat/bin/bootstrap.jar:/opt/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
```





/manager

localhost:8080/manager/html

Tomcat Web Application Manager

Message:	OK

Manager

List Applications	HTML Manager Help	Manager Help	Server Status

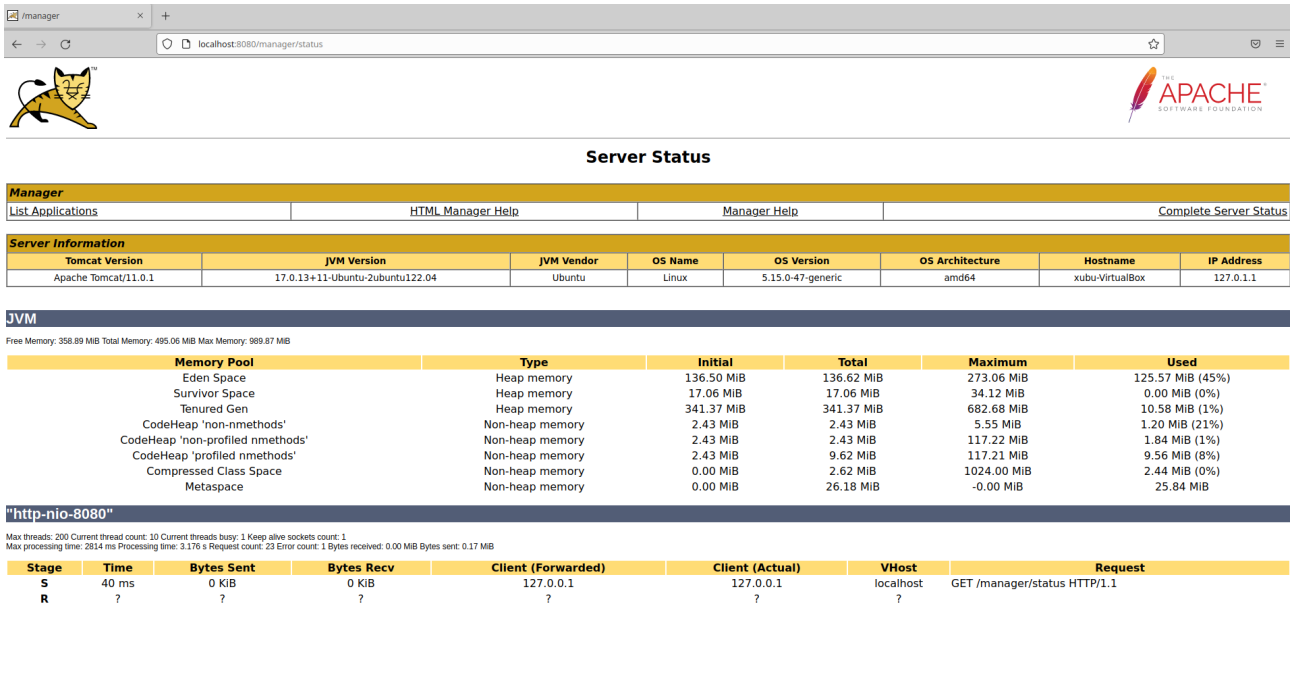
Applications

Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/examples	None specified	Servlet and JSP Examples	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/host-manager	None specified	Tomcat Host Manager Application	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

Deploy

Deploy directory or WAR file located on server

Context Path:



/manager

localhost:8080/manager/status

Server Status

Manager

List Applications	HTML Manager Help	Manager Help	Complete Server Status

Server Information

Tomcat Version	JVM Version	JVM Vendor	OS Name	OS Version	OS Architecture	Hostname	IP Address
Apache Tomcat/11.0.1	17.0.13+11-Ubuntu-2ubuntu122.04	Ubuntu	Linux	5.15.0-47-generic	amd64	xubu-VirtualBox	127.0.1.1

JVM

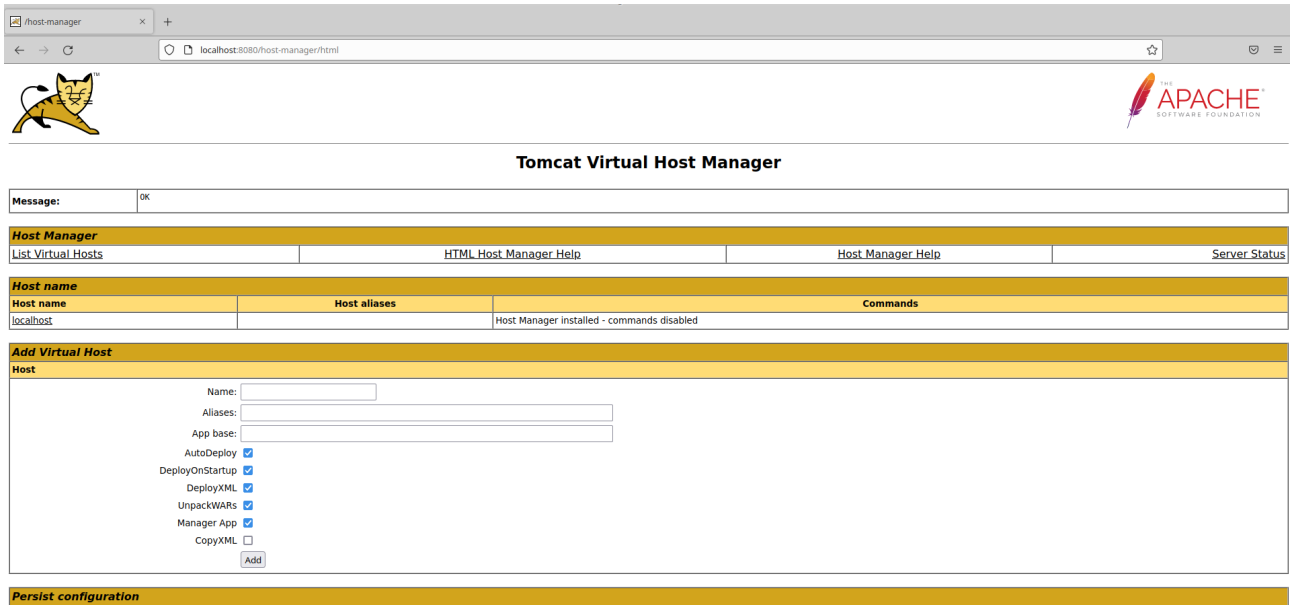
Free Memory: 358.89 MiB Total Memory: 495.06 MiB Max Memory: 989.87 MiB

Memory Pool	Type	Initial	Total	Maximum	Used
Eden Space	Heap memory	136.50 MiB	136.62 MiB	273.06 MiB	125.57 MiB (45%)
Survivor Space	Heap memory	17.06 MiB	17.06 MiB	34.12 MiB	0.00 MiB (0%)
Tenured Gen	Heap memory	341.37 MiB	341.37 MiB	682.68 MiB	10.58 MiB (1%)
CodeHeap 'non-nmethods'	Non-heap memory	2.43 MiB	2.43 MiB	5.55 MiB	1.20 MiB (21%)
CodeHeap 'non-profiled nmethods'	Non-heap memory	2.43 MiB	2.43 MiB	117.22 MiB	1.84 MiB (1%)
CodeHeap 'profiled nmethods'	Non-heap memory	2.43 MiB	9.62 MiB	117.21 MiB	9.56 MiB (8%)
Compressed Class Space	Non-heap memory	0.00 MiB	2.62 MiB	1024.00 MiB	2.44 MiB (0%)
Metaspace	Non-heap memory	0.00 MiB	26.18 MiB	-0.00 MiB	25.84 MiB

"http-nio-8080"

Max threads: 200 Current thread count: 10 Current threads busy: 1 Keep alive sockets count: 1
Max processing time: 2814 ms Processing time: 3.176 s Request count: 23 Error count: 1 Bytes received: 0.00 MiB Bytes sent: 0.17 MiB

Stage	Time	Bytes Sent	Bytes Recv	Client (Forwarded)	Client (Actual)	VHost	Request
S	40 ms	0 KiB	0 KiB	127.0.0.1	127.0.0.1	localhost	GET /manager/status HTTP/1.1
R	?	?	?	?	?	?	



Pista:

[How To Install Apache Tomcat 10 on Ubuntu 20.04 | DigitalOcean]

b. Despliega tu propia aplicación web

Despliega un fichero Sample.war, y comprueba que puedes acceder a a la aplicación

Pistas:

[Apache Tomcat 11 (11.0.0-M16) - Tomcat Web Application Deployment]

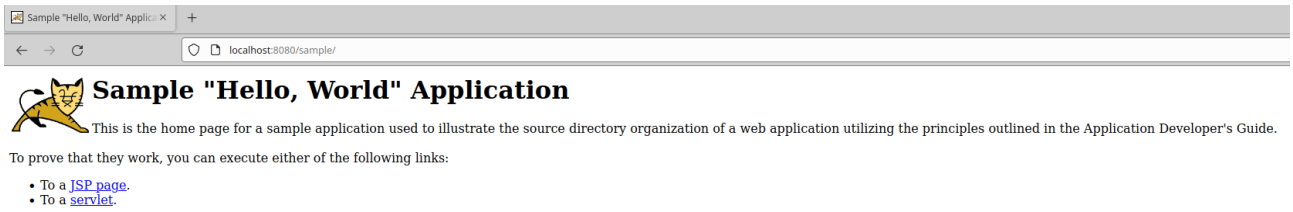
[How to Deploy a WAR File to Tomcat | Baeldung]

Copiamos el archivo sample.war a la carpeta webapps

sudo cp sample.war /opt/tomcat/webapps/

```
xubu@xubu-VirtualBox:~/Descargas$ sudo cp sample.war /opt/tomcat/webapps/
```

Acedemos a la pagina localhost:8080/sample/

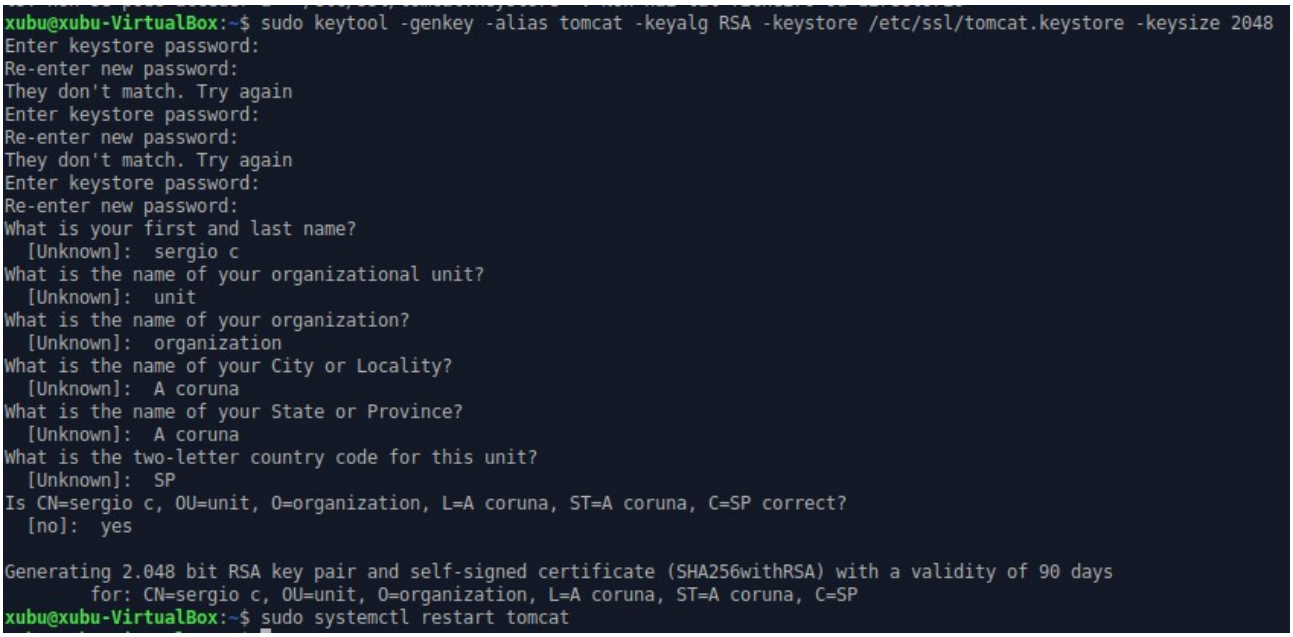


3. Securización

Configura para que el acceso sea seguro mediante certificados SSL, accediendo por HTTPS

Necesitaremos generar un certificado autofirmado asi que usaremos este comando:

sudo keytool -genkey -alias tomcat -keyalg RSA -keystore /etc/ssl/tomcat.keystore -keysize 2048



Nota: Al final de las preguntas hay que contestarle “yes” para que pueda procesar la informacion si no, repetirá todas las preguntas

Debemos conectar con https mediante estas lineas de codigo:

```
<Connector port="8443" protocol="org.apache.coyote.http11.Http11NioProtocol"
                        maxThreads="150" SSLEnabled="true">
                <SSLHostConfig>
                        <Certificate certificateKeystoreFile="/etc/ssl/tomcat.keystore"
                                certificateKeystorePassword="tu_contraseña"
                                type="RSA"/>
                </SSLHostConfig>
        </Connector>
```

```
        AJP  Connector: /docs/config/ajp.html
        Define a non-SSL/TLS HTTP/1.1 Connector on port 8080
    -->

        <Connector port="8443" protocol="org.apache.coyote.http11.Http11NioProtocol"
                   maxThreads="150" SSLEnabled="true">
            <SSLHostConfig>
                <Certificate certificateKeystoreFile="/etc/ssl/tomcat.keystore"
                             certificateKeystorePassword="changeit"
                             type="RSA"/>
            </SSLHostConfig>
        </Connector>

    <Connector port="8080" protocol="HTTP/1.1"
               connectionTimeout="20000"
               redirectPort="8443" />
    <!-- A "Connector" using the shared thread pool-->
    <!--
```

Abrimos el puerto https en el firewall

sudo ufw allow 8443

```
xubu@xubu-VirtualBox:~$ sudo ufw allow 8443
Omitindo a inserción dunha regra xa existente
Omitindo a inserción dunha regra xa existente (v6)
```

sudo ufw reload

```
xubu@xubu-VirtualBox:~$ sudo ufw reload
Recargouse a devasa
```

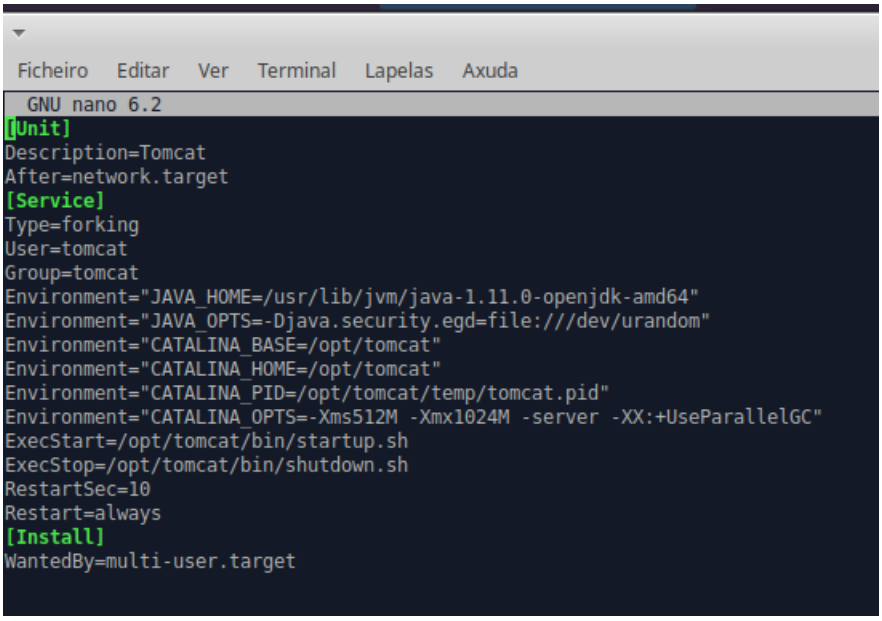
Por ultimo reiniciamos tomcat

sudo systemctl restart tomcat

Nota larga:

Estoy usando un servicio systemd en tomcat para facilitarme el trabajo, se pude hacer de la siguiente manera:
Primero creamos un archivo llamado tomcat.service

sudo nano /etc/systemd/system/tomcat.service



[Unit]

Description=Tomcat

After=network.target

[Service]

Type=forking

User=tomcat

Group=tomcat

Environment="JAVA_HOME=/usr/lib/jvm/java-1.11.0-openjdk-amd64"

Environment="JAVA_OPTS=-Djava.security.egd=file:///dev/urandom"

Environment="CATALINA_BASE=/opt/tomcat"

Environment="CATALINA_HOME=/opt/tomcat"

Environment="CATALINA_PID=/opt/tomcat/temp/tomcat.pid"

Environment="CATALINA_OPTS=-Xms512M -Xmx1024M -server -XX:+UseParallelGC"

ExecStart=/opt/tomcat/bin/startup.sh

ExecStop=/opt/tomcat/bin/shutdown.sh

RestartSec=10

Restart=always

[Install]

WantedBy=multi-user.target

/usr/lib/jvm/java-1.11.0-openjdk-amd64<----- Tiene que coincidir con la tuya

Cargamos de nuevo para que se reconozca

sudo systemctl daemon-reload

```
xubu@xubu-VirtualBox:~$ sudo systemctl daemon-reload
```

Iniciamos tomcat

sudo systemctl start tomcat

```
xubu@xubu-VirtualBox:~$  sudo systemctl start tomcat
```

Comprobamos su estado

sudo systemctl status tomcat

```
xubu@xubu-VirtualBox:~$ sudo systemctl status tomcat
● tomcat.service - Tomcat
     Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2024-11-26 22:34:31 CET; 10min ago
   Main PID: 3224 (java)
      Tasks: 42 (limit: 2288)
     Memory: 171.3M
        CPU: 5.426s
     CGroup: /system.slice/tomcat.service
             └─3224 /usr/lib/jvm/java-17-openjdk-amd64/bin/java -Djava.util.logging.config.file=/opt/tomcat/conf/logg

Nov 26 22:34:31 xubu-VirtualBox systemd[1]: tomcat.service: Deactivated successfully.
Nov 26 22:34:31 xubu-VirtualBox systemd[1]: Stopped Tomcat.
Nov 26 22:34:31 xubu-VirtualBox systemd[1]: tomcat.service: Consumed 6.112s CPU time.
Nov 26 22:34:31 xubu-VirtualBox systemd[1]: Starting Tomcat...
Nov 26 22:34:31 xubu-VirtualBox startup.sh[3217]: Tomcat started.
Nov 26 22:34:31 xubu-VirtualBox systemd[1]: Started Tomcat.
```

Por ultimo permitimos que tomcat se inicie con el sistema

sudo systemctl enable tomcat

```
xubu@xubu-VirtualBox:~$ sudo systemctl enable tomcat
xubu@xubu-VirtualBox:~$
```

Nota: No me muestra que se creó el link debido a que ya estaba configurado desde antes

Pistas:

A Step-By-Step Guide to Apache Tomcat with SSL Configuration | by Kayathiri Mahendrakumaran | Analytics Vidhya | Medium

Instalación del certificado SSL en el servidor Apache Tomcat (sslmarket.es)

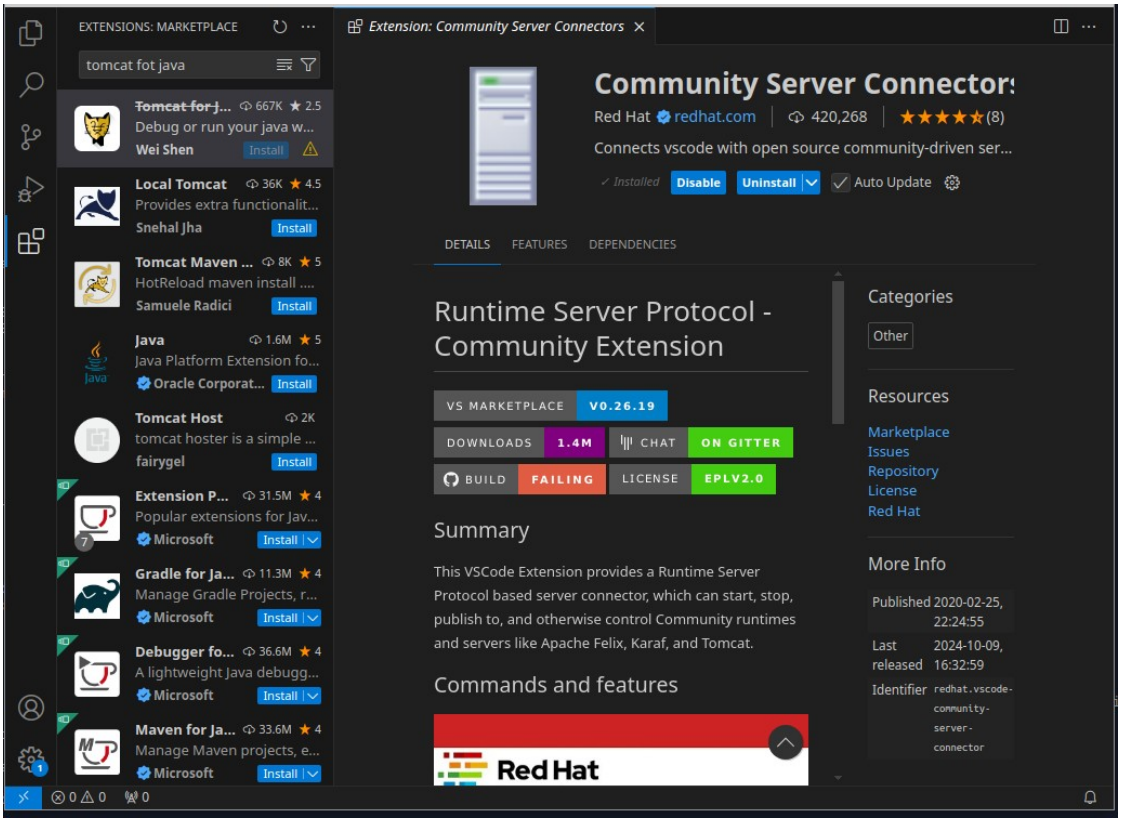
Apache Tomcat 9 (9.0.85) - SSL/TLS Configuration How-To

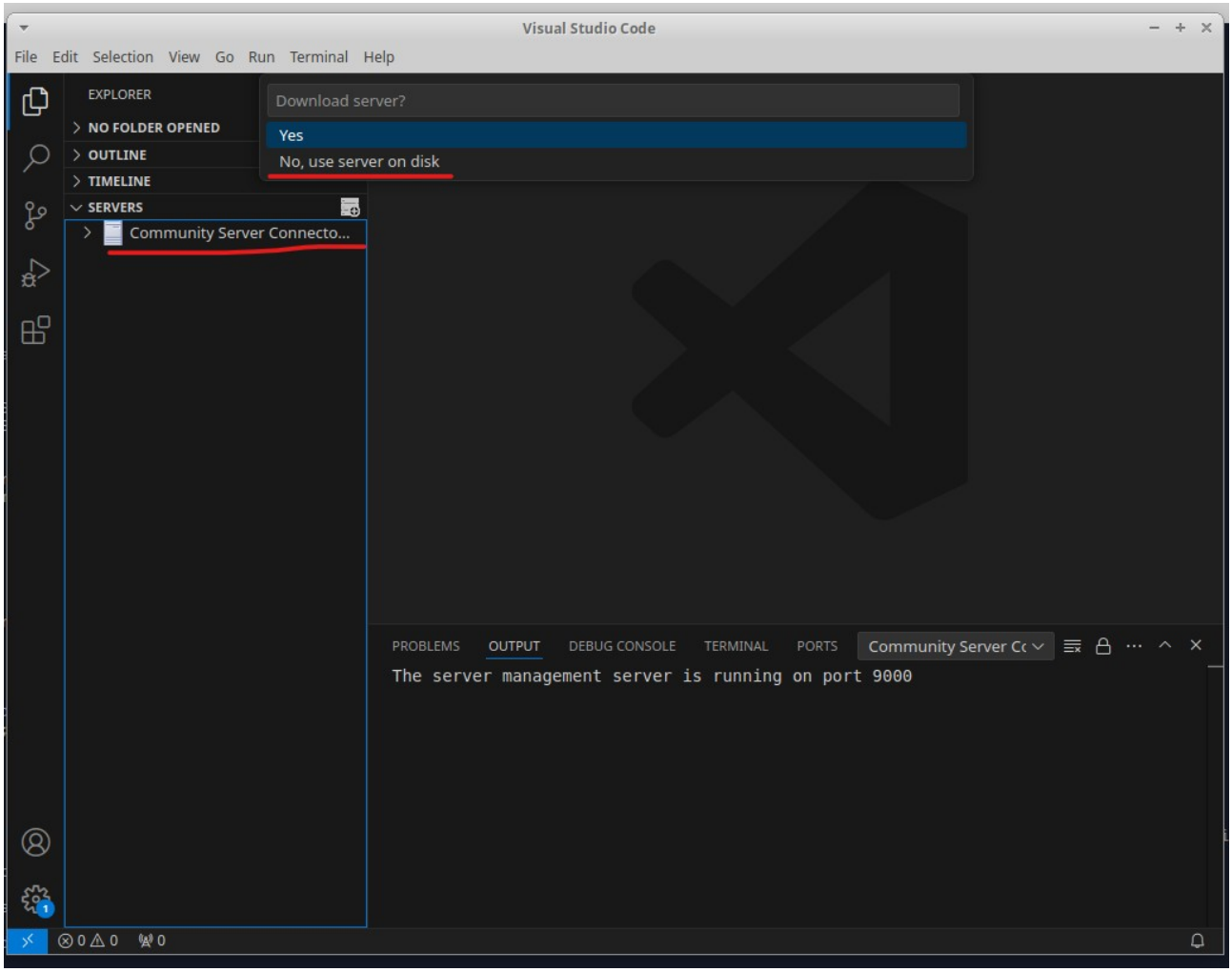
4. Integración con un IDE

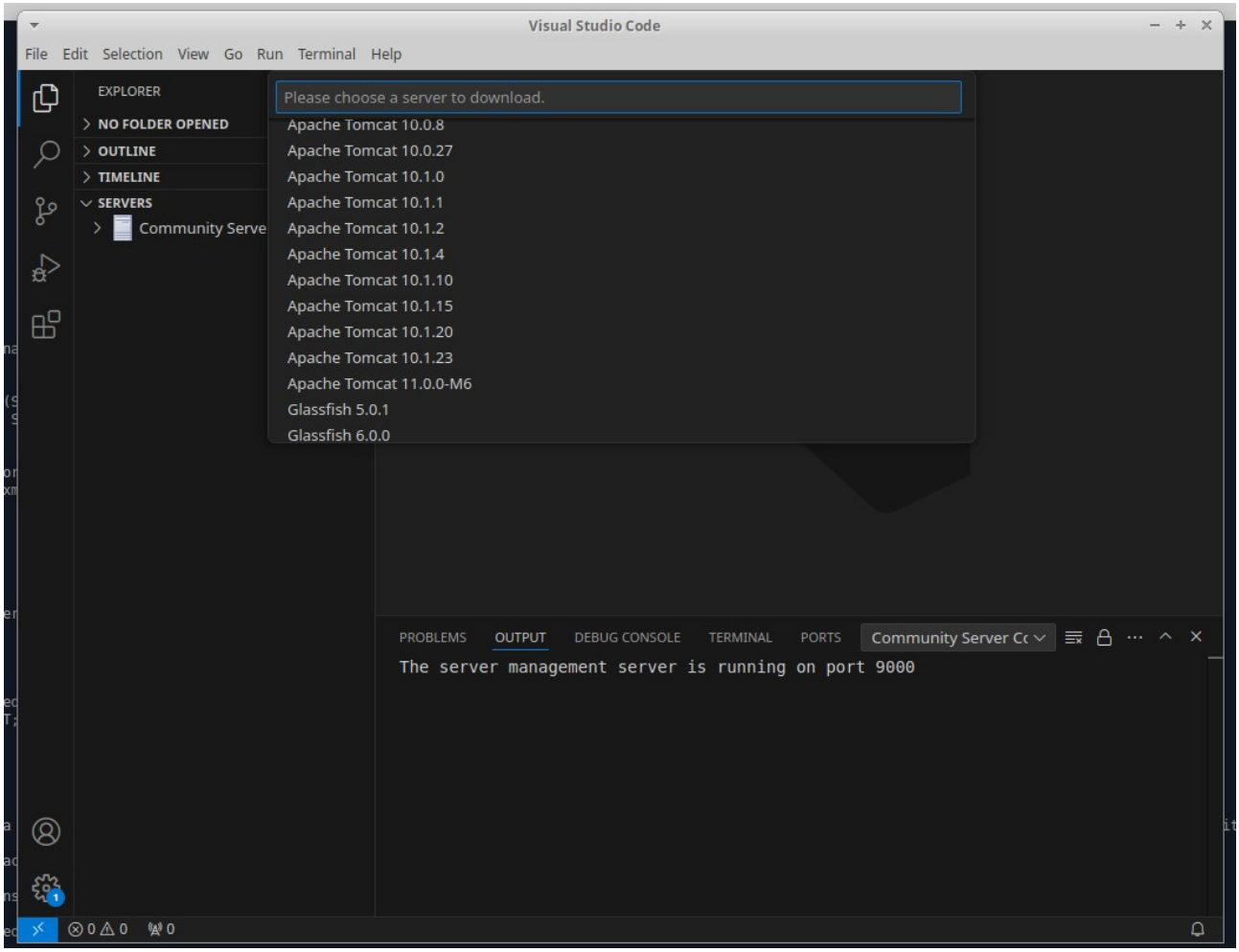
Raliza la integración de Tomcat con un IDE de tu elección (IntelliJ IDEA, Eclipse, Netbeans, Visual Studio Code,...)

Primero de todo instalamos visual studio aquí

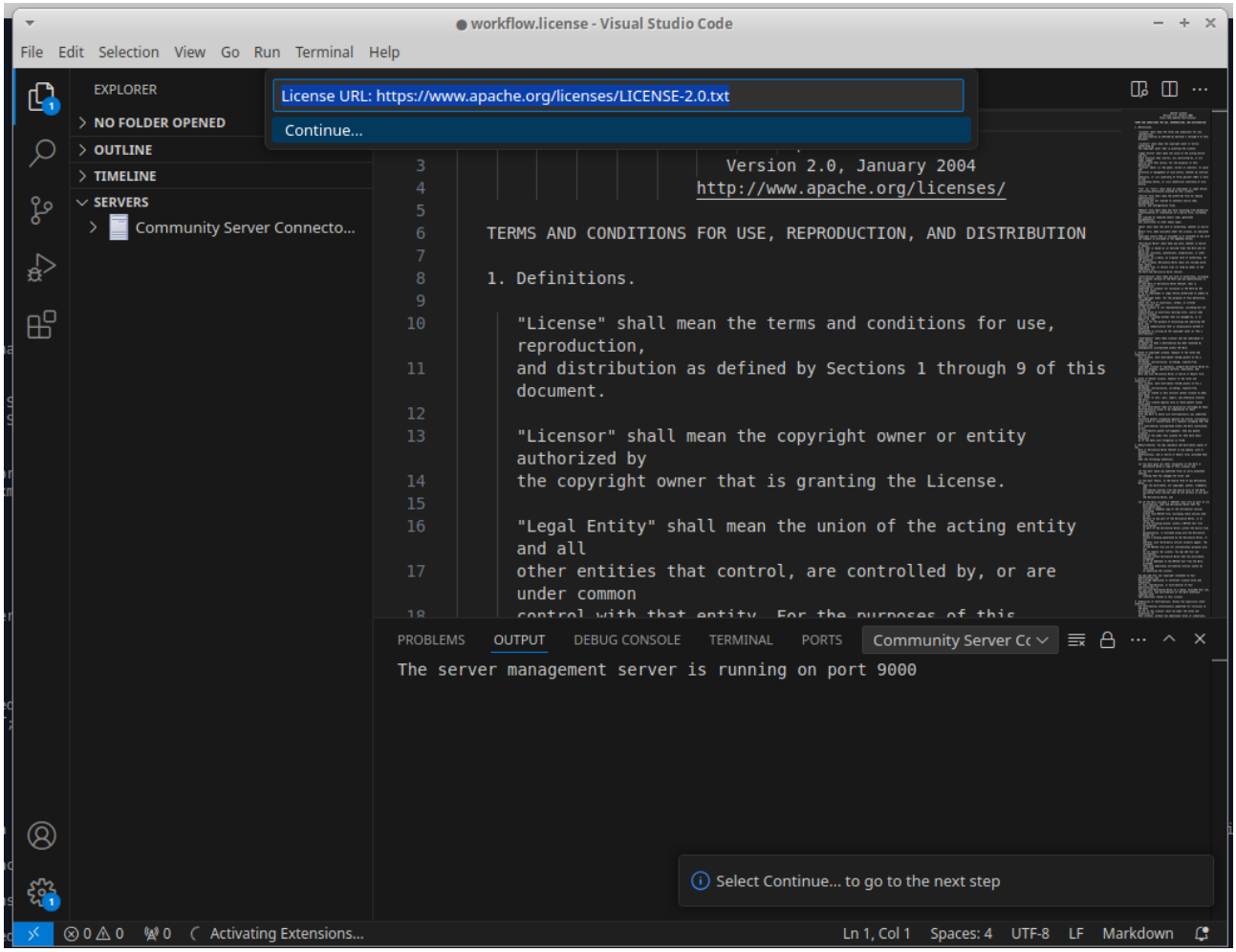
Despues de instalarlo añadimos la extension de tomcat Community Server Connectors




Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
NO FOLDER OPENED
OUTLINE
TIMELINE
SERVERS
Community Server Connecto...
Download server?
Yes
No, use server on disk
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Community Server Cc
The server management server is running on port 9000



Elegimos el que queramos, en mi caso elegi Apache tomcat 10.1.23


workflow.license - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
NO FOLDER OPENED
OUTLINE
TIMELINE
SERVERS
Community Server Connecto...
License URL: https://www.apache.org/licenses/LICENSE-2.0.txt
Continue...
Version 2.0, January 2004
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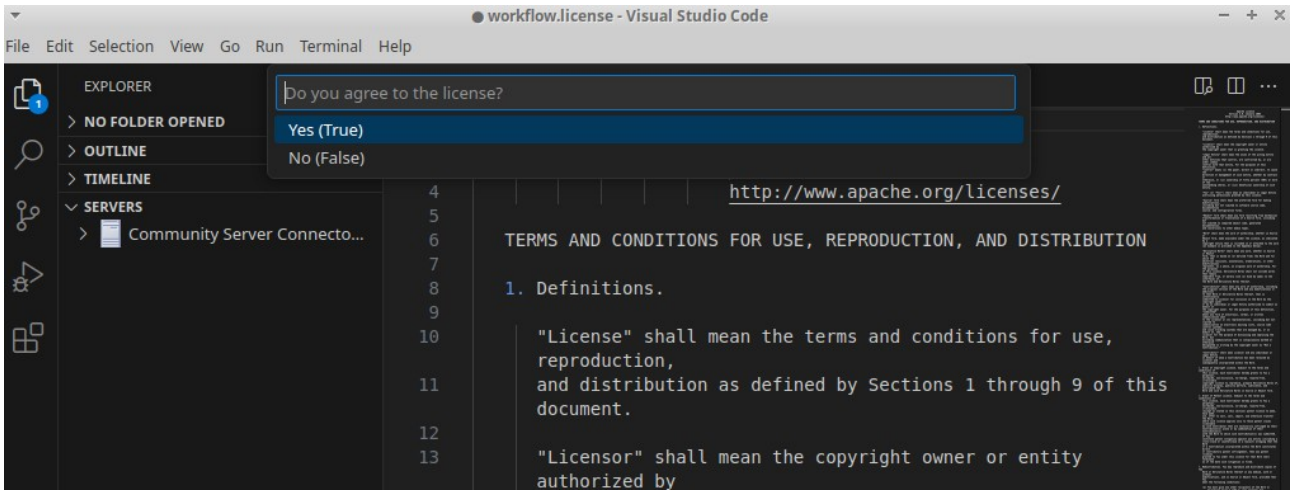
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Community Server Cc
The server management server is running on port 9000
Select Continue... to go to the next step
Activating Extensions...
Ln 1, Col 1 Spaces: 4 UTF-8 LF Markdown


workflow.license - Visual Studio Code
File Edit Selection View Go Run Terminal Help
EXPLORER
NO FOLDER OPENED
OUTLINE
TIMELINE
SERVERS
Community Server Connecto...
Do you agree to the license?
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No (False)
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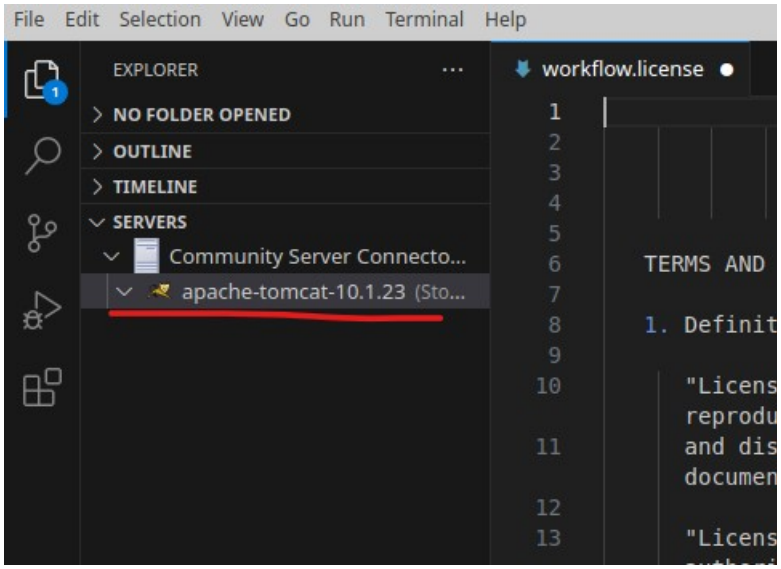
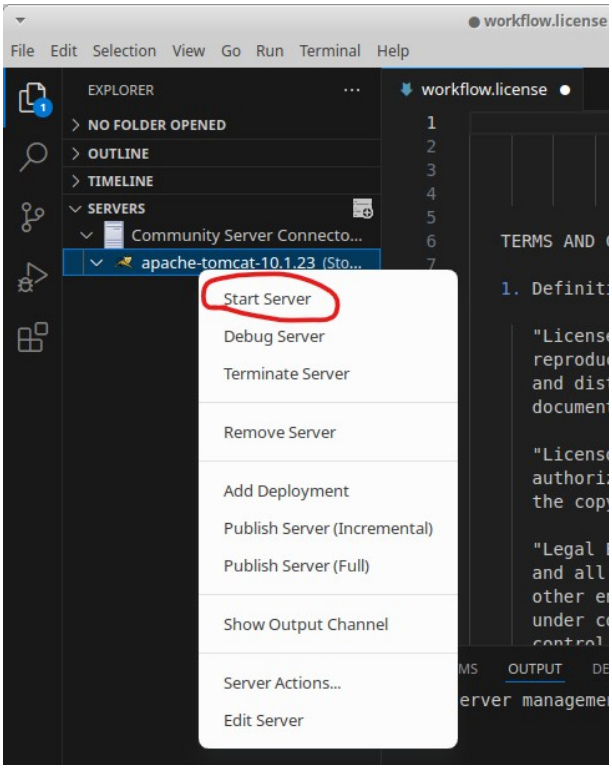
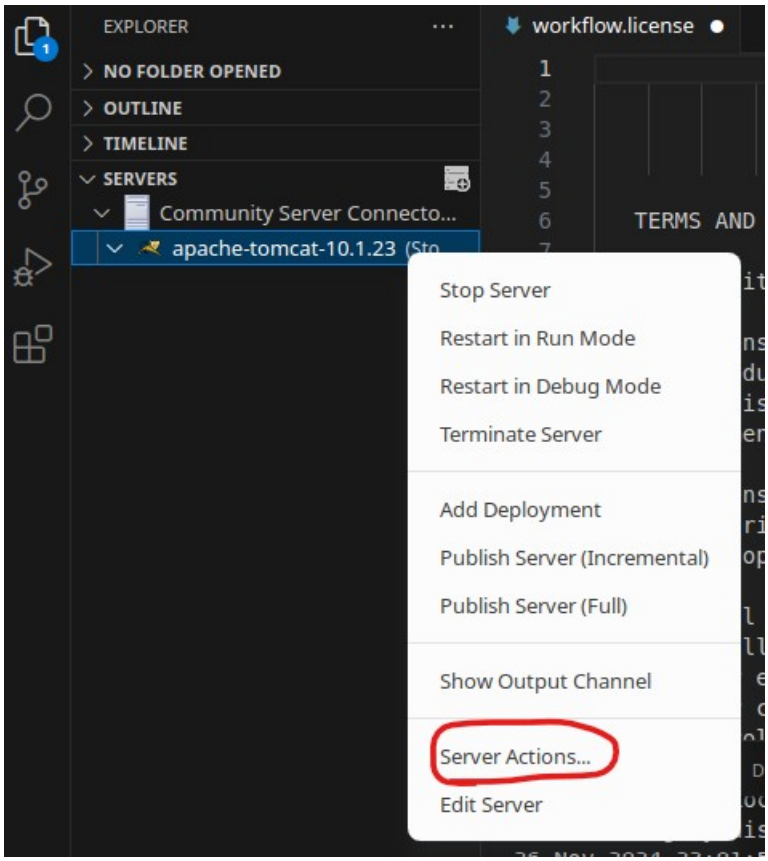
Esperamos a que descargue







No fui capaz de mostrar el servidor por visual studio, por alguna razon me muestra que los puertos están siendo ocupados aunque mate esos procesos

Una vez el servidor se inicia accedemos a **server actions** como se muestra en la imagen y nos mostrará la opcion de mostrar en el navegador, accedemos y tendremos tomcat con la versión que hayamos instalado en el navegador

Pistas:

How to Deploy a WAR File to Tomcat | Baeldung

Visual Studio Code Tomcat y su configuración - Arquitectura Java

Instalación de Tomcat y configuración con Visual Studio Code - YouTube

(Microsoft Word - Cap\355tulo 6. Eclipse con el plug-in de TOMCAT.doc) (us.es)

Cómo configurar Eclipse y Apache Tomcat para desarrollar aplicaciones Java Web - YouTube

AGREGAR EL SERVIDOR TOMCAT 9 A NETBEANS – VIDELCLOUD (wordpress.com)

Instalar y configurar Apache Tomcat 9 en NetBeans - YouTube

5. Cuestiones

a) ¿Qué versión de Apache Tomcat instalarás dependiendo de tu versión de Java?

a.1) Y para la versión 8?

a.2) Y para la versión 21?

b) ¿Qué otros servidores de aplicaciones hay en el mercado? ¿Cuáles son software libre y cuales productos comerciales?

c) Una de las cuestiones a tener en cuenta es el rendimiento de las aplicaciones. ¿Sabrías indicar alguna herramienta para pruebas de carga?

d) Otra de las cuestiones a tener en cuenta es la monitorización del servidor de aplicaciones. ¿Sabrías indicarme alguna herramienta para monitorizar tomcat u otro servidor de aplicaciones? ¿Qué indicadores puede interesar monitorizar?

Pistas:

Apache Tomcat monitoring and integration with Zabbix

Apache Tomcat Monitoring Guide & 5 Best Tools for 2024 (comparitech.com)

Apache Tomcat - Nagios Exchange

JMeter vs Other Performance Testing Tools | automateNow

List of application servers - Wikipedia

List of application servers - Wikipedia (aimultiple.com)

WebLogic Server | Oracle España

WebSphere Application Server | IBM

WildFly