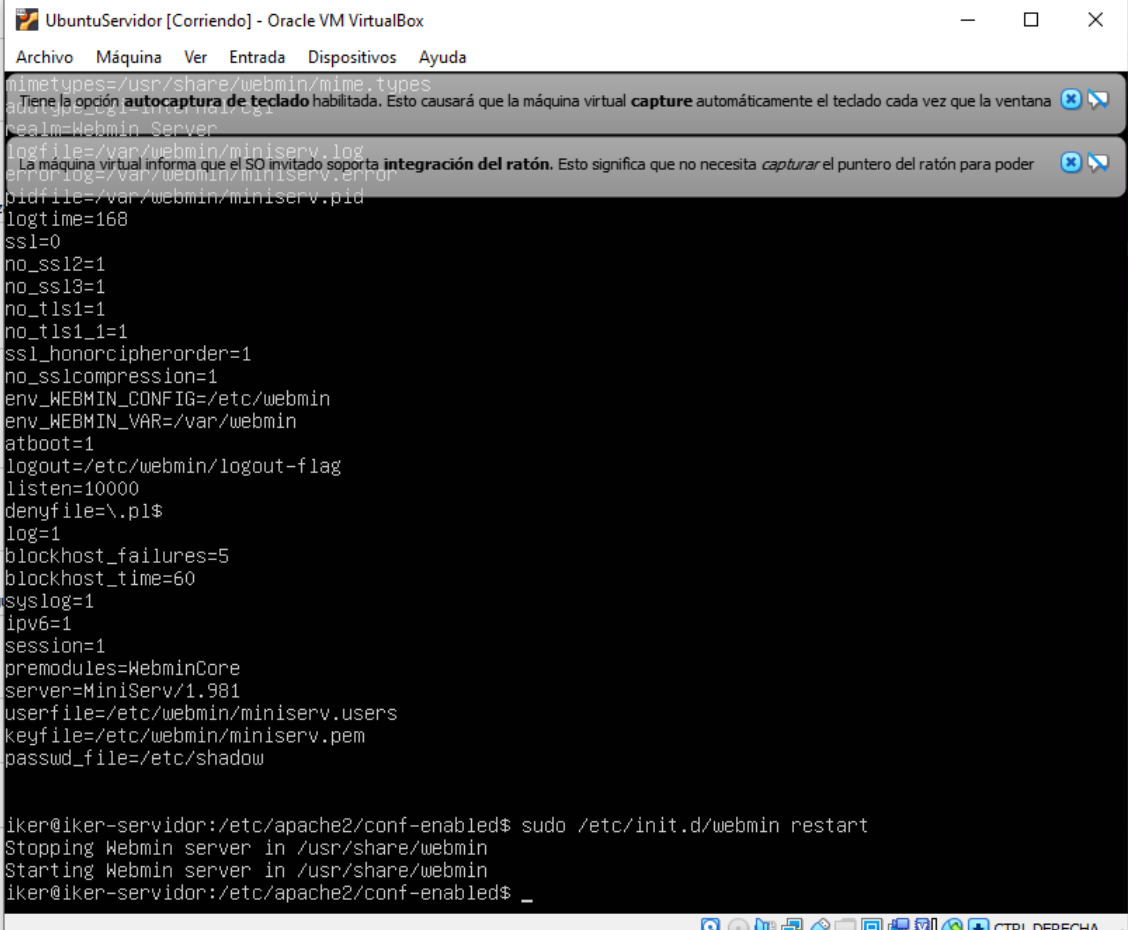


A) Tenemos este escenario inicial:

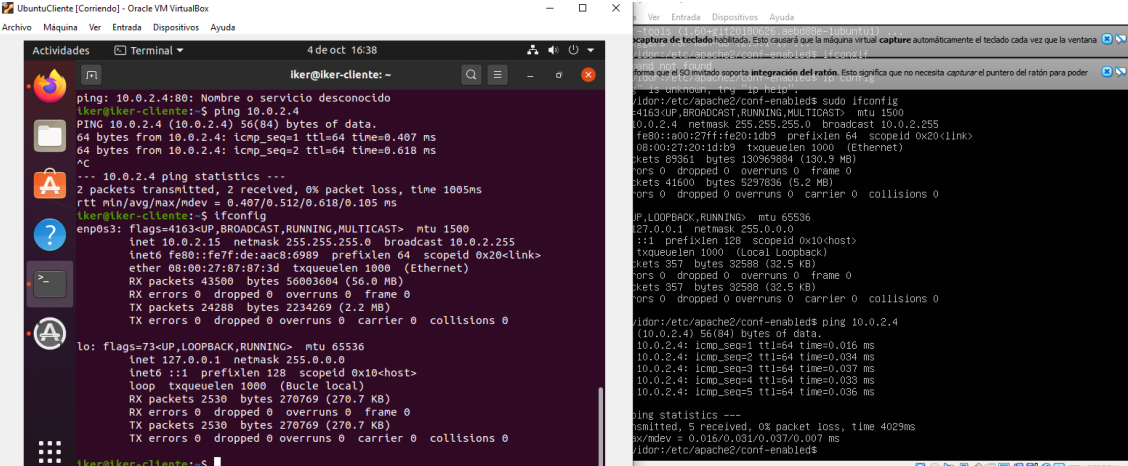
a. Tendremos una VM con Ubuntu Server



```
UbuntuServidor [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
ninetypes=/usr/share/webmin/mime.types
tiene la opción captura de teclado habilitada. Esto causará que la máquina virtual capture automáticamente el teclado cada vez que la ventana
autologin=1
realm=Webmin-Server
logfile=/var/webmin/miniserv.log
error_log=/var/webmin/miniserv.error
pidfile=/var/webmin/miniserv.pid
logtime=168
ssl=0
no_ssl2=1
no_ssl3=1
no_tls1=1
no_tls1_1=1
ssl_honorcipherorder=1
no_sslcompression=1
env_WEBMIN_CONFIG=/etc/webmin
env_WEBMIN_VAR=/var/webmin
atboot=1
logout=/etc/webmin/logout-flag
listen=10000
denyfile=.pl$
log=1
blockhost_failures=5
blockhost_time=60
syslog=1
ipv6=1
session=1
premodules=WebminCore
server=MiniServ/1.981
userfile=/etc/webmin/miniserv.users
keyfile=/etc/webmin/miniserv.pem
passwd_file=/etc/shadow

iker@iker-servidor:/etc/apache2/conf-enabled$ sudo /etc/init.d/webmin restart
Stopping Webmin server in /usr/share/webmin
Starting Webmin server in /usr/share/webmin
iker@iker-servidor:/etc/apache2/conf-enabled$ _
```

b. Podremos acceder mediante un cliente web al servidor.



```
UbuntuCliente [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda

Actividades Terminal 4 de oct 16:38
iker@iker-cliente: ~
ping: 10.0.2.4:80: Nombre o servicio desconocido
iker@iker-cliente:~$ ping 10.0.2.4
PING 10.0.2.4 (10.0.2.4) 56(84) bytes of data:
64 bytes from 10.0.2.4: icmp_seq=1 ttl=64 time=0.407 ms
64 bytes from 10.0.2.4: icmp_seq=2 ttl=64 time=0.618 ms
^C
--- 10.0.2.4 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1005ms
rtt min/avg/max/ndev = 0.407/0.512/0.618/0.105 ms
iker@iker-cliente:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::fe7f:de:aac8:9989 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:87:87:3d txqueuelen 1000 (Ethernet)
    RX packets 43500 bytes 56003604 (56.0 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 24288 bytes 2234269 (2.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Bucle local)
    RX packets 2530 bytes 270769 (270.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2530 bytes 270769 (270.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

iker@iker-cliente:~$

UbuntuServidor [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda

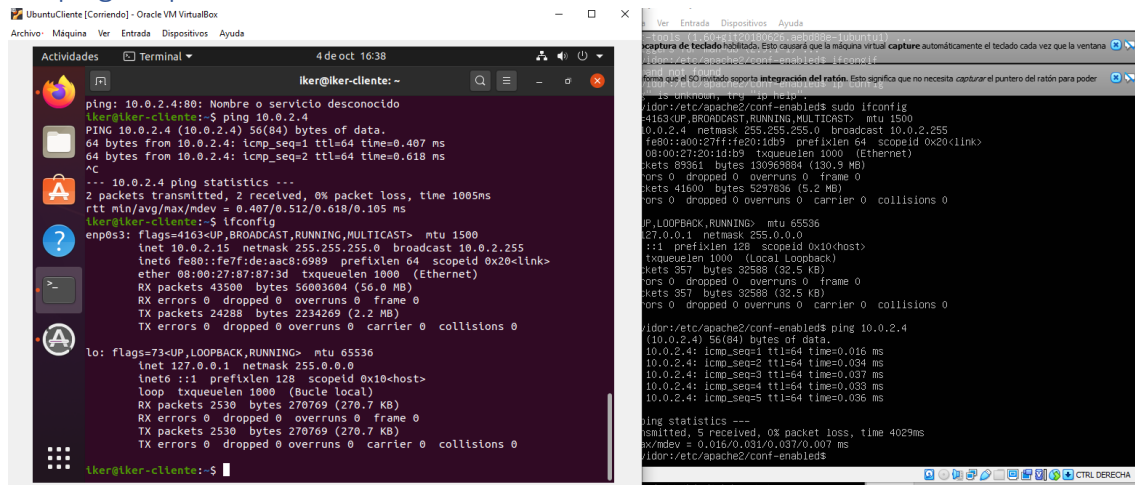
iker@iker-servidor:/etc/apache2/conf-enabled$ sudo ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.4 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::a002:27ff:fe20:10d9 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:20:10:d9 txqueuelen 1000 (Ethernet)
    RX packets 89361 bytes 130969884 (130.9 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 41800 bytes 5297836 (5.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 357 bytes 32588 (32.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 357 bytes 32588 (32.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

iker@iker-servidor:/etc/apache2/conf-enabled$ ping 10.0.2.4
PING 10.0.2.4 (10.0.2.4) 56(84) bytes of data:
10.0.2.4: icmp_seq=1 ttl=64 time=0.016 ms
10.0.2.4: icmp_seq=2 ttl=64 time=0.034 ms
10.0.2.4: icmp_seq=3 ttl=64 time=0.037 ms
10.0.2.4: icmp_seq=4 ttl=64 time=0.033 ms
10.0.2.4: icmp_seq=5 ttl=64 time=0.035 ms
^C
ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4029ms
rtt min/avg/max/ndev = 0.016/0.031/0.037/0.007 ms
iker@iker-servidor:/etc/apache2/conf-enabled$
```

B) Instalación de TOMCAT:

a. apt-get update

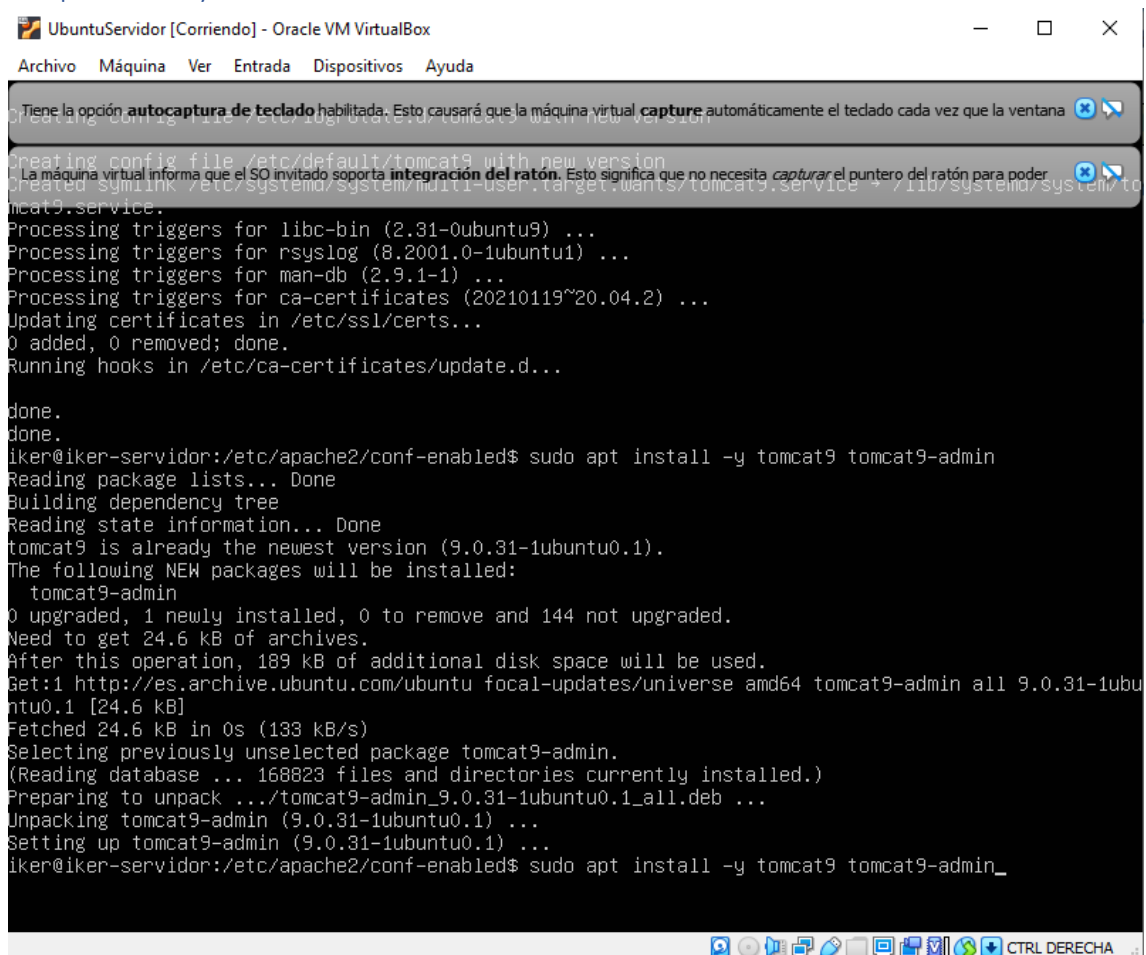


```
iker@iker-cliente:~$ ping 10.0.2.4
PING 10.0.2.4 (10.0.2.4): 56(84) bytes of data:
64 bytes from 10.0.2.4: icmp_seq=1 ttl=64 time=0.407 ms
64 bytes from 10.0.2.4: icmp_seq=2 ttl=64 time=0.618 ms
^C
--- 10.0.2.4 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1005ms
rtt min/avg/max/mdev = 0.407/0.512/0.618/0.105 ms
iker@iker-cliente:~$ ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::fe7f:de:aac8:9989 prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:8b:77:3d txqueuelen 1000 (Ethernet)
    RX packets 43500 bytes 56003604 (56.0 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 24288 bytes 2234269 (2.2 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Bucle local)
    RX packets 2530 bytes 270769 (270.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 2530 bytes 270769 (270.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

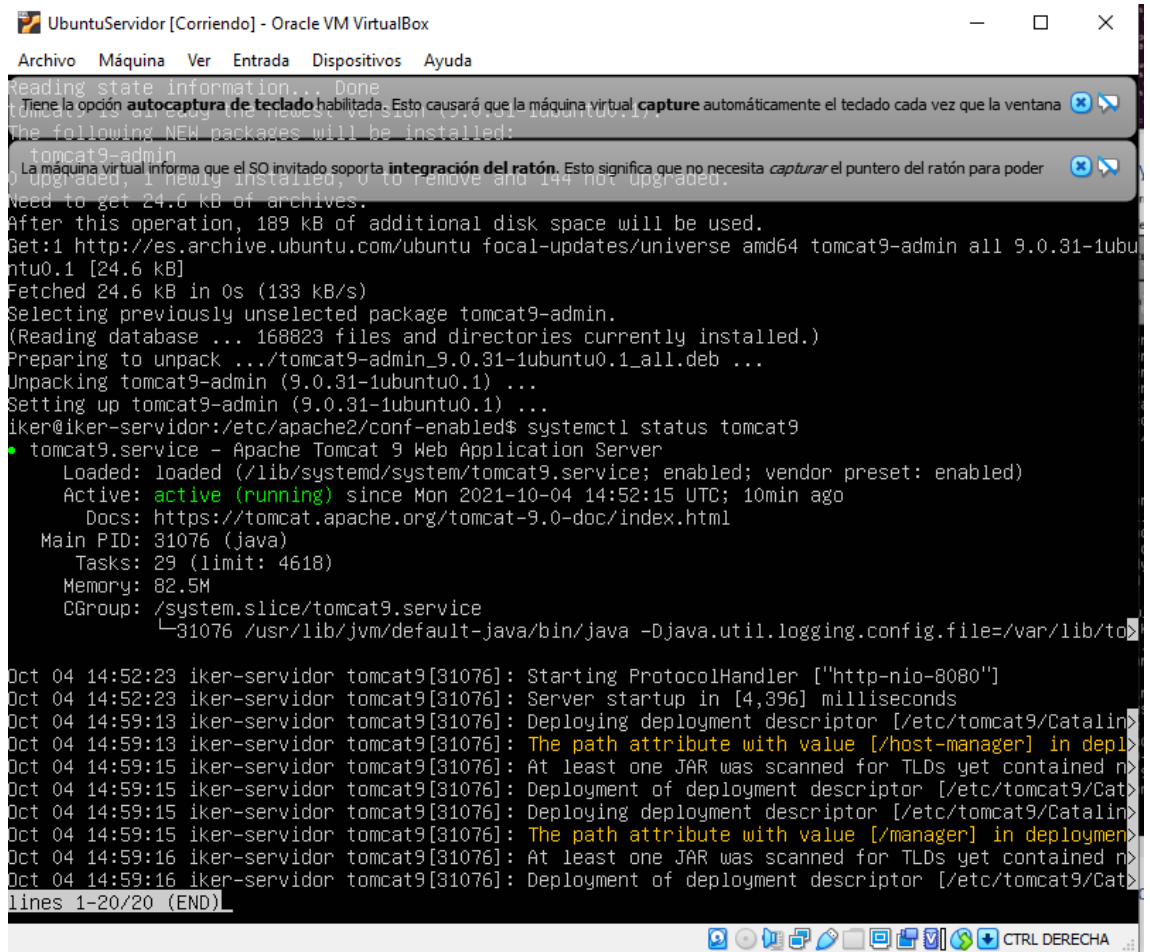
iker@iker-cliente:~$
```

b. apt install -y tomcat9 tomcat9-admin



```
iker@iker-servidor:/etc/apache2/conf-enabled$ sudo apt install -y tomcat9 tomcat9-admin
Reading package lists... Done
Building dependency tree
Reading state information... Done
tomcat9 is already the newest version (9.0.31-1ubuntu0.1).
The following NEW packages will be installed:
  tomcat9-admin
0 upgraded, 1 newly installed, 0 to remove and 144 not upgraded.
Need to get 24.6 kB of archives.
After this operation, 189 kB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu focal-updates/universe amd64 tomcat9-admin all 9.0.31-1ubu
ntu0.1 [24.6 kB]
Fetched 24.6 kB in 0s (133 kB/s)
Selecting previously unselected package tomcat9-admin.
(Reading database ... 168823 files and directories currently installed.)
Preparing to unpack .../tomcat9-admin_9.0.31-1ubuntu0.1_all.deb ...
Unpacking tomcat9-admin (9.0.31-1ubuntu0.1) ...
Setting up tomcat9-admin (9.0.31-1ubuntu0.1) ...
iker@iker-servidor:/etc/apache2/conf-enabled$ sudo apt install -y tomcat9 tomcat9-admin_
```

c. El estado del servicio se comprobará con `systemctl status tomcat9`

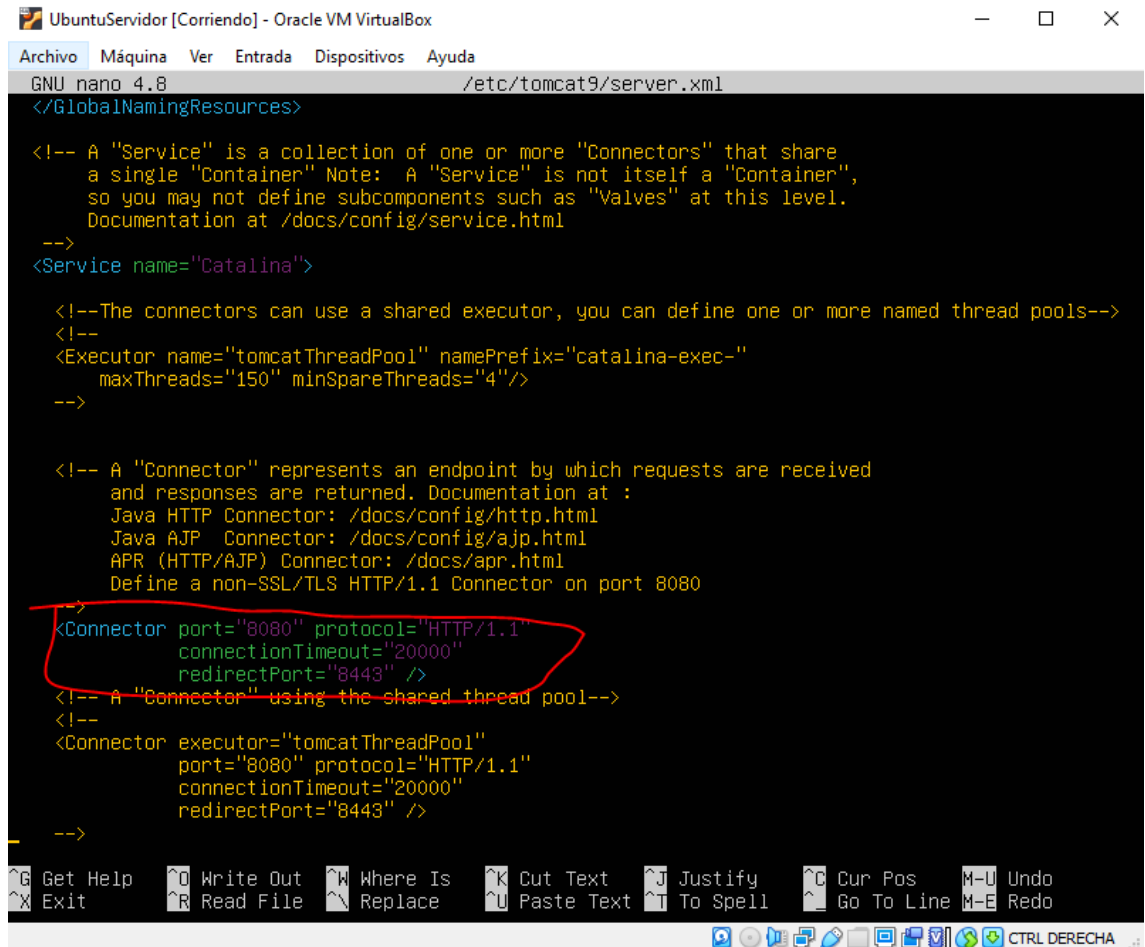


The screenshot shows a terminal window titled "UbuntuServidor [Corriendo] - Oracle VM VirtualBox". The terminal output includes the following text:

```
Reading state information... Done
tomcat9 is already the newest version (9.0.31-1ubuntu0.1).
The following NEW packages will be installed:
  tomcat9-admin
La máquina virtual informa que el SO invitado soporta integración del ratón. Esto significa que no necesita capturar el puntero del ratón para poder
) upgraded, 1 newly installed, 0 to remove and 144 not upgraded.
Need to get 24.6 kB of archives.
After this operation, 189 kB of additional disk space will be used.
Get:1 http://es.archive.ubuntu.com/ubuntu focal-updates/universe amd64 tomcat9-admin all 9.0.31-1ubuntu0.1 [24.6 kB]
Fetched 24.6 kB in 0s (133 kB/s)
Selecting previously unselected package tomcat9-admin.
(Reading database ... 168823 files and directories currently installed.)
Preparing to unpack .../tomcat9-admin_9.0.31-1ubuntu0.1_all.deb ...
Unpacking tomcat9-admin (9.0.31-1ubuntu0.1) ...
Setting up tomcat9-admin (9.0.31-1ubuntu0.1) ...
iker@iker-servidor:/etc/apache2/conf-enabled$ systemctl status tomcat9
● tomcat9.service - Apache Tomcat 9 Web Application Server
   Loaded: loaded (/lib/systemd/system/tomcat9.service; enabled; vendor preset: enabled)
   Active: active (running) since Mon 2021-10-04 14:52:15 UTC; 10min ago
     Docs: https://tomcat.apache.org/tomcat-9.0-doc/index.html
   Main PID: 31076 (java)
    Tasks: 29 (limit: 4618)
   Memory: 82.5M
   CGroup: /system.slice/tomcat9.service
           └─31076 /usr/lib/jvm/default-java/bin/java -Djava.util.logging.config.file=/var/lib/to>

Oct 04 14:52:23 iker-servidor tomcat9[31076]: Starting ProtocolHandler ["http-nio-8080"]
Oct 04 14:52:23 iker-servidor tomcat9[31076]: Server startup in [4,396] milliseconds
Oct 04 14:59:13 iker-servidor tomcat9[31076]: Deploying deployment descriptor [/etc/tomcat9/Catalin>
Oct 04 14:59:13 iker-servidor tomcat9[31076]: The path attribute with value [/host-manager] in depl>
Oct 04 14:59:15 iker-servidor tomcat9[31076]: At least one JAR was scanned for TLDs yet contained n>
Oct 04 14:59:15 iker-servidor tomcat9[31076]: Deployment of deployment descriptor [/etc/tomcat9/Cat>
Oct 04 14:59:15 iker-servidor tomcat9[31076]: Deploying deployment descriptor [/etc/tomcat9/Catalin>
Oct 04 14:59:15 iker-servidor tomcat9[31076]: The path attribute with value [/manager] in deploymen>
Oct 04 14:59:16 iker-servidor tomcat9[31076]: At least one JAR was scanned for TLDs yet contained n>
Oct 04 14:59:16 iker-servidor tomcat9[31076]: Deployment of deployment descriptor [/etc/tomcat9/Cat>
lines 1-20/20 (END)
```

- d. Editamos el archivo `/etc/tomcat9/server.xml` y en la directiva `Connector` comprobamos que el puerto por defecto en `port` es 8080



```
UbuntuServidor [Corriendo] - Oracle VM VirtualBox
GNU nano 4.8 /etc/tomcat9/server.xml
</GlobalNamingResources>

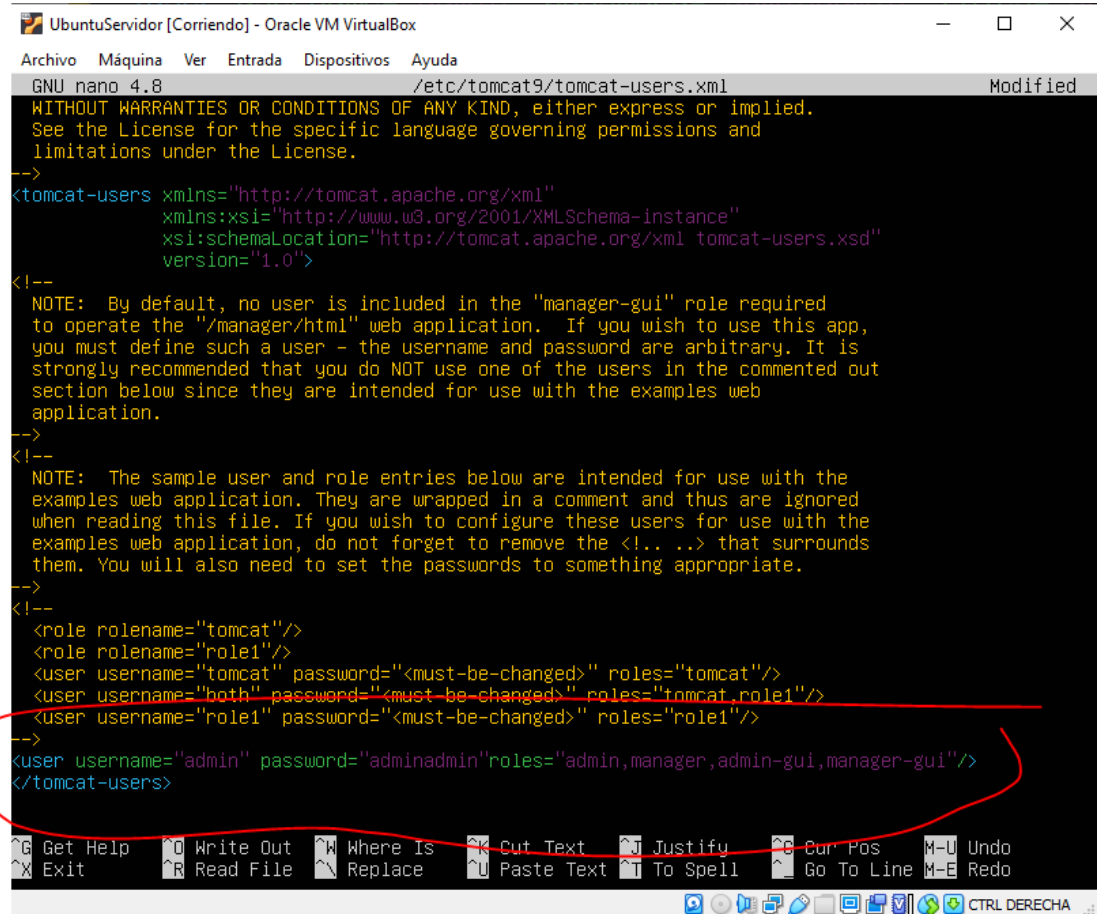
<!-- A "Service" is a collection of one or more "Connectors" that share
a single "Container" Note: A "Service" is not itself a "Container",
so you may not define subcomponents such as "Valves" at this level.
Documentation at /docs/config/service.html
-->
<Service name="Catalina">

  <!--The connectors can use a shared executor, you can define one or more named thread pools-->
  <!--
  <Executor name="tomcatThreadPool" namePrefix="catalina-exec-"
    maxThreads="150" minSpareThreads="4"/>
  -->

  <!-- A "Connector" represents an endpoint by which requests are received
and responses are returned. Documentation at :
Java HTTP Connector: /docs/config/http.html
Java AJP  Connector: /docs/config/ajp.html
APR (HTTP/AJP) Connector: /docs/apr.html
Define a non-SSL/TLS HTTP/1.1 Connector on port 8080
-->
  <Connector port="8080" protocol="HTTP/1.1"
    connectionTimeout="20000"
    redirectPort="8443" />
  <!-- A "Connector" using the shared thread pool-->
  <!--
  <Connector executor="tomcatThreadPool"
    port="8080" protocol="HTTP/1.1"
    connectionTimeout="20000"
    redirectPort="8443" />
  -->
</Service>

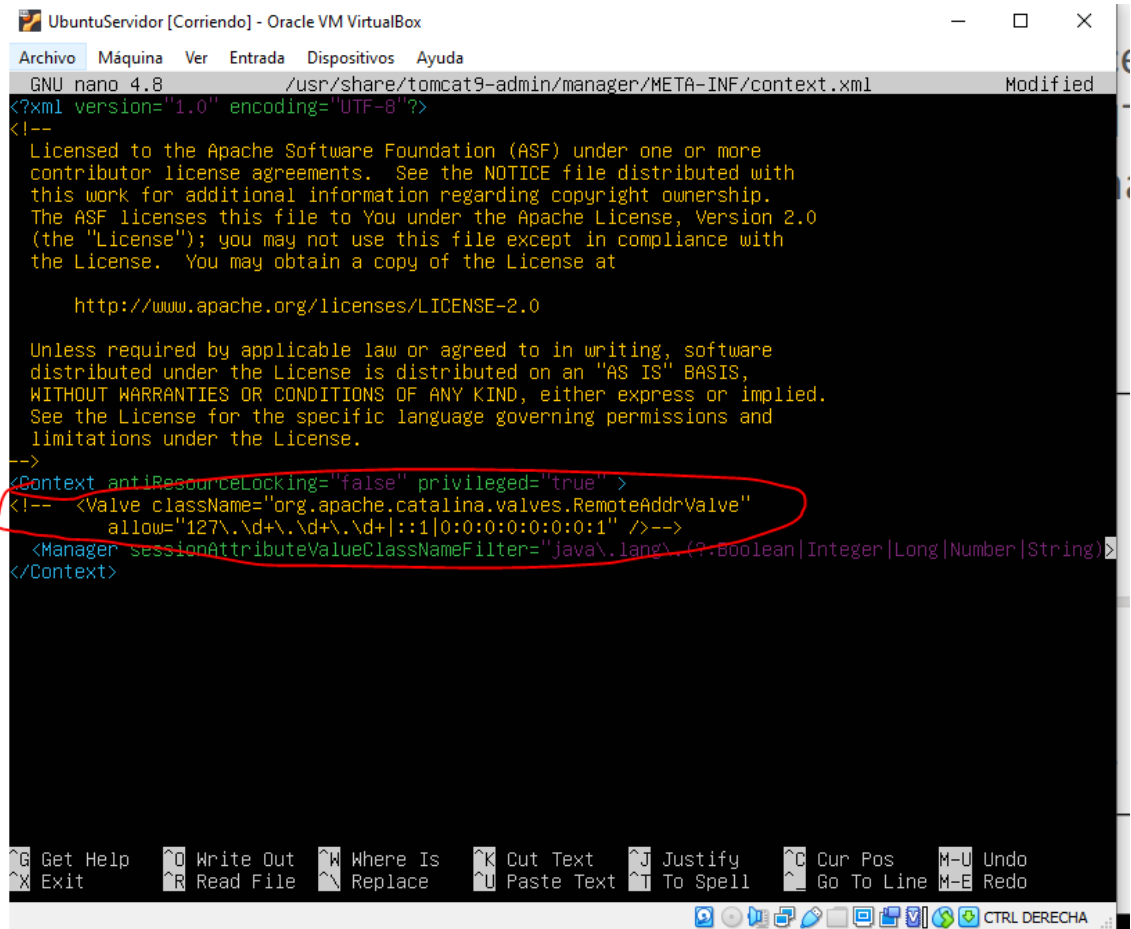
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify     ^C Cur Pos     M-U Undo
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text  ^T To Spell    ^_ Go To Line  M-E Redo
CTRL DERECHA
```

- e. Editamos /etc/tomcat9/tomcat-users.xml y analizamos e implementamos un usuario que nos permita tener permiso al admin-gui y al manager-gui



```
GNU nano 4.8 /etc/tomcat9/tomcat-users.xml Modified
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<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">
  <!--
    NOTE: By default, no user is included in the "manager-gui" role required
    to operate the "/manager/html" web application.  If you wish to use this app,
    you must define such a user - the username and password are arbitrary.  It is
    strongly recommended that you do NOT use one of the users in the commented out
    section below since they are intended for use with the examples web
    application.
  -->
  <!--
    NOTE: The sample user and role entries below are intended for use with the
    examples web application.  They are wrapped in a comment and thus are ignored
    when reading this file.  If you wish to configure these users for use with the
    examples web application, do not forget to remove the <!-- .. --> that surrounds
    them.  You will also need to set the passwords to something appropriate.
  -->
  <!--
    <role rolename="tomcat"/>
    <role rolename="role1"/>
    <user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
    <user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
    <user username="role1" password="<must-be-changed>" roles="role1"/>
  -->
  <user username="admin" password="adminadmin" roles="admin,manager,admin-gui,manager-gui"/>
</tomcat-users>
```

- f. Para evitar problemas de acceso a las herramientas administrativas agregamos un comentario HTML a la directiva Valve en el archivo `usr/share/tomcat9-admin/manager/META-INF/context.xml`

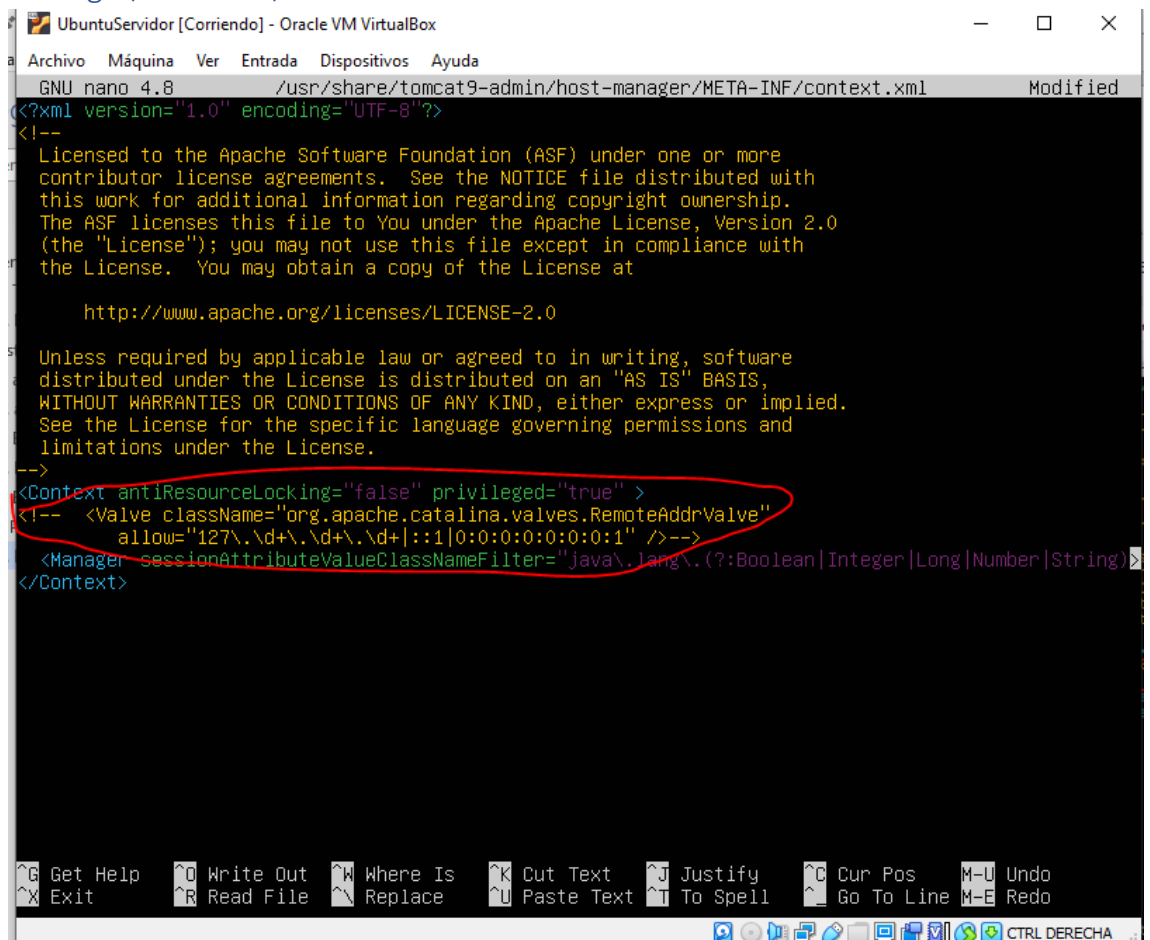


```
GNU nano 4.8 /usr/share/tomcat9-admin/manager/META-INF/context.xml Modified
<?xml version="1.0" encoding="UTF-8"?>
<!--
 Licensed to the Apache Software Foundation (ASF) under one or more
 contributor license agreements.  See the NOTICE file distributed with
 this work for additional information regarding copyright ownership.
 The ASF licenses this file to You under the Apache License, Version 2.0
 (the "License"); you may not use this file except in compliance with
 the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

 Unless required by applicable law or agreed to in writing, software
 distributed under the License is distributed on an "AS IS" BASIS,
 WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 See the License for the specific language governing permissions and
 limitations under the License.
-->
<Context antiResourceLocking="false" privileged="true" >
<!-- <Valve className="org.apache.catalina.valves.RemoteAddrValve"
      allow="127\.0\.0\.1" />-->
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?!\Boolean|Integer|Long|Number|String)" />
</Context>
```

- g. Idem para /usr/share/tomcat9-admin/host-manager/META-INF/context.xml



```
GNU nano 4.8 /usr/share/tomcat9-admin/host-manager/META-INF/context.xml Modified
<?xml version="1.0" encoding="UTF-8"?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements.  See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

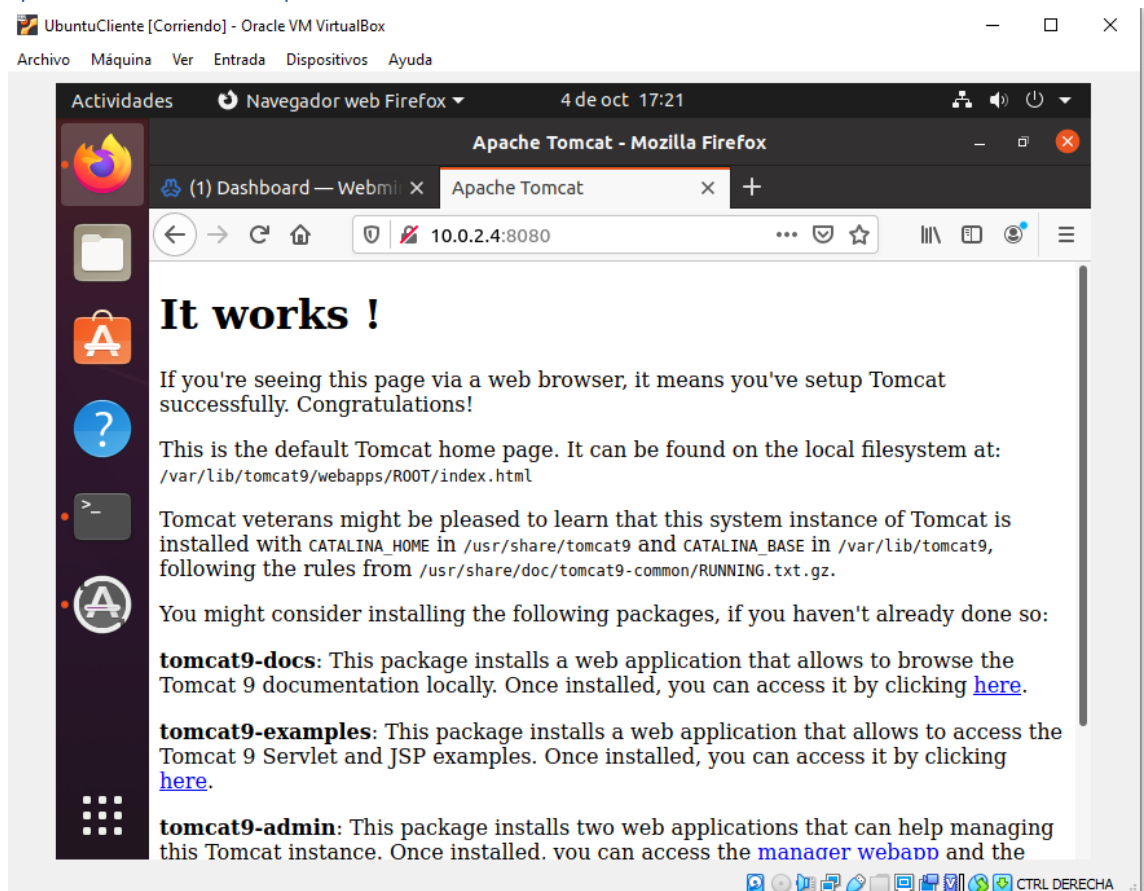
Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<Context antiResourceLocking="false" privileged="true" >
<!-- <Valve className="org.apache.catalina.valves.RemoteAddrValve"
      allow="127.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />-->
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long|Number|string)"
/>Context>
```

- h. Reinicia TOMCAT

```
iker@iker-servidor:/etc/apache2/conf-enabled$ sudo systemctl restart tomcat9
iker@iker-servidor:/etc/apache2/conf-enabled$
```

C) Lanzamiento de TOMCAT:

- Accede a la IP de tu servidor en el puerto 8080 y observa gráficamente que el servidor de aplicaciones está corriendo.



- b. Verifica que puedes acceder al administrador gui y al de la máquina virtual autenticándote con el usuario creado en el apartado B)e.

