

## **Security Azure DevOps assignment**

- Download the simplest Java Spring project from [spring.io](https://spring.io) or a similar site
  - store the project in Azure DevOps (including Readme.md) and create a build pipeline (nice to have)
  - Build the project using Maven
  - Store the resulting jar (+ config if it exists) in Azure DevOps
  - Create a deployment pipeline using an Ansible script
  - Deploy the jar (and config if exists) on an RHEL VM
  - Trigger an API call towards your server via an HTTP client (Postman, Insomnia)
- 
- Document every step that you took (commands, screenshots, what you think is best) in a file or Readme.md in the project
-

1. First step was to sign into Azure using Github account and create a new project.

**Create new project**

Project name \*  
Basic Spring RESTful Web Service ✓

Description  
Just a basic spring web service

Visibility

☒ **Public**  
Anyone on the internet can view the project. Certain features like TFVC are not supported.

☐ **Private**  
Only people you give access to will be able to view this project.

By creating this project, you agree to the Azure DevOps [code of conduct](#)

^ Advanced

Version control ?  
Git

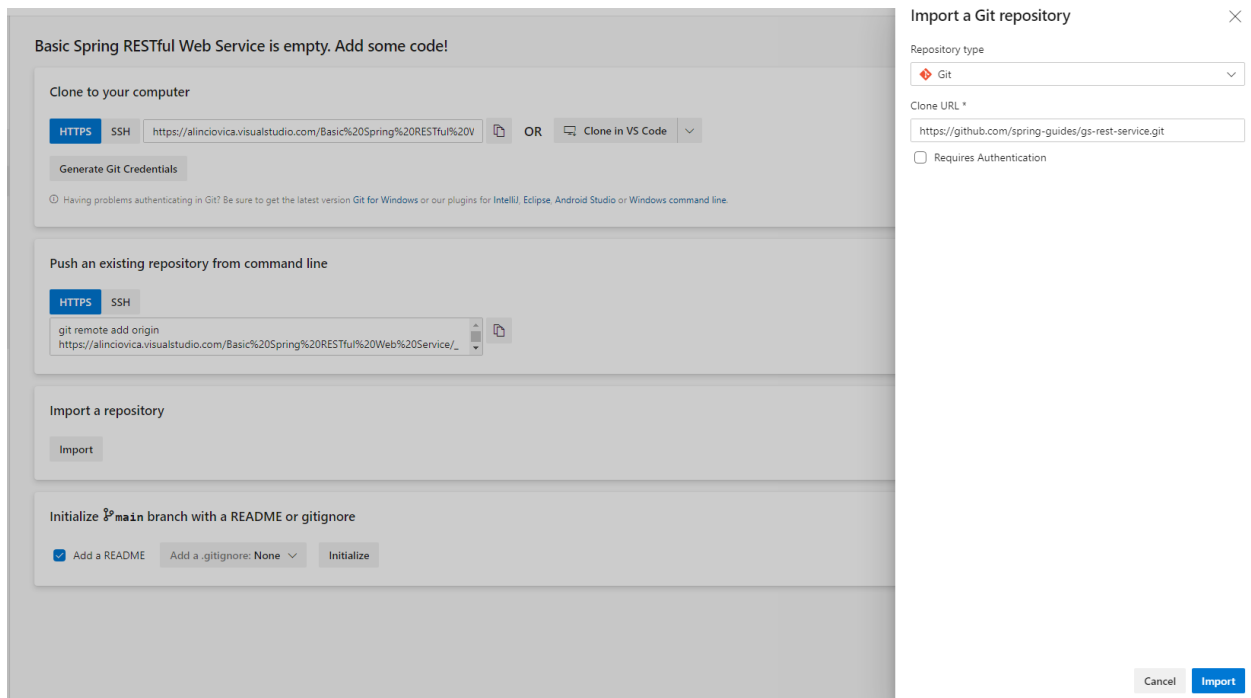
Work item process ?  
Basic

I also had Microsoft Visual Studio Code installed so I will be using it as IDE for this project.

2. Used this tutorial for the spring application: [link](#)

## Trying the project on the local environment

Installed JDK 15.0.1

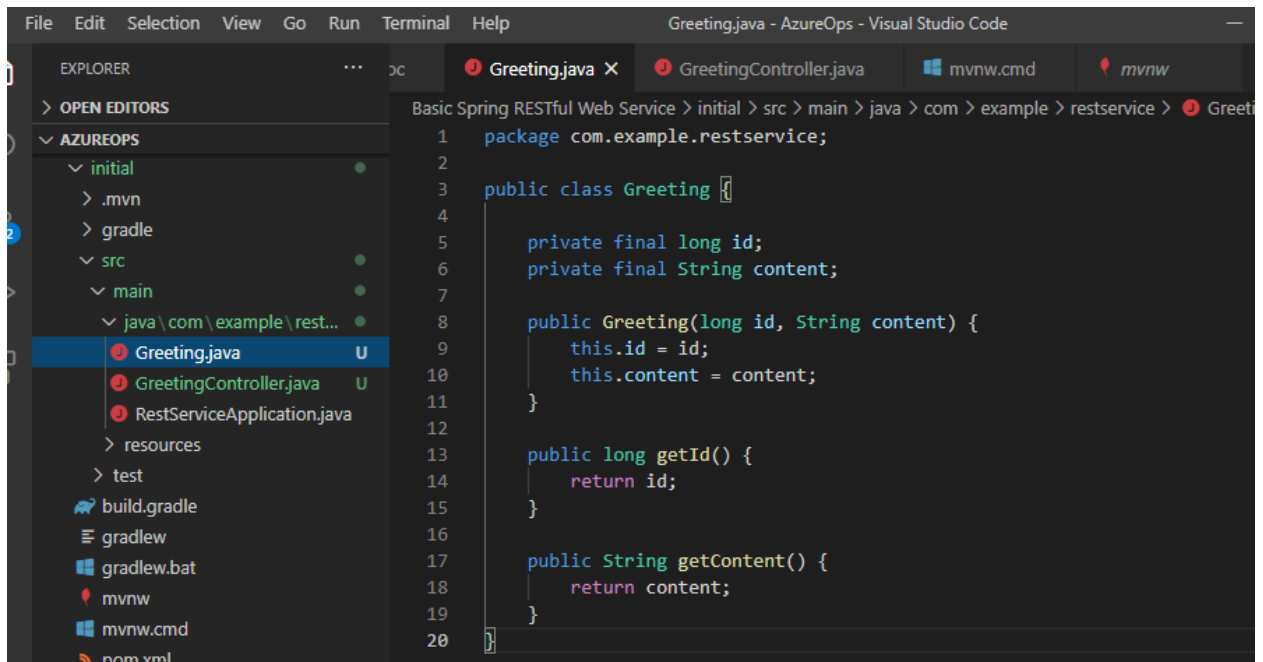


Imported Spring Project from git repository using git clone.  
Opened a new branch called **alincio-uat** based on **master** branch.

Cloned the repository to VS Code.

The project contains complete and initial versions.

I manually created Greeting.java and GreetingController.java into the initial version(folder) and executed maven from the terminal in order to build the project.



The screenshot shows the VS Code editor interface. On the left, the Explorer sidebar displays the project structure: 'initial' (root), '.mvn', 'gradle', 'src' (expanded), 'main' (expanded), 'java \ com \ example \ rest...' (expanded), 'Greeting.java', 'GreetingController.java' (selected), 'RestServiceApplication.java', 'resources', and 'test'. The main editor area shows the code for 'GreetingController.java' with the following content:

```
1 package com.example.restservice;
2
3 import java.util.concurrent.atomic.AtomicLong;
4
5 import org.springframework.web.bind.annotation.GetMapping;
6 import org.springframework.web.bind.annotation.RequestParam;
7 import org.springframework.web.bind.annotation.RestController;
8
9 @RestController
10 public class GreetingController {
11
12     private static final String template = "Hello, %s!";
13     private final AtomicLong counter = new AtomicLong();
14
15     @GetMapping("/greeting")
16     public Greeting greeting(@RequestParam(value = "name", defaultValue = "World") String name) {
17         return new Greeting(counter.incrementAndGet(), String.format(template, name));
18     }
19 }
```

The screenshot shows the VS Code terminal window with the 'TERMINAL' tab selected. The terminal displays the following output:

```
d----- 1/18/2021 9:07 PM gradle
d----- 1/18/2021 9:07 PM src
-a----- 1/18/2021 9:07 PM 538 build.gradle
-a----- 1/18/2021 9:07 PM 6148 gradlew
-a----- 1/18/2021 9:07 PM 2942 gradlew.bat
-a----- 1/18/2021 9:07 PM 10200 mvnw
-a----- 1/18/2021 9:07 PM 6473 mvnw.cmd
-a----- 1/18/2021 9:07 PM 1461 pom.xml
-a----- 1/18/2021 9:07 PM 35 settings.gradle
```

The terminal prompt shows the command `PS D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial> ./mvnw spring-boot:run` being entered.

### 3. Encountered JAVA\_HOME not found

*Error: JAVA\_HOME not found in your environment.*

*Please set the JAVA\_HOME variable in your environment to match the location of your Java installation.*

The screenshot shows the VS Code terminal window with the following output:

```
PS D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial> ./mvnw spring-boot:run

Error: JAVA_HOME not found in your environment.
Please set the JAVA_HOME variable in your environment to match the
location of your Java installation.

PS D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial>
```

I added JAVA\_HOME in Environment variables and also in Path variable, restarted VS Code and this issue got fixed.

Maven is now executed with: `./mvnw spring-boot:run`.

```
PS D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial> ./mvnw spring-boot:run
Found "D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial\.mvn\wrapper\maven-wrapper.jar"
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:rest-service >-----
[INFO] Building rest-service 0.0.1-SNAPSHOT
[INFO] -----[ jar ]-----
[INFO]
[INFO] >>> spring-boot-maven-plugin:2.3.2.RELEASE:run (default-cli) > test-compile @ rest-service
>>>
Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-web/2.3.2.RELEASE/spring-boot-starter-web-2.3.2.RELEASE.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-web/2.3.2.RELEASE/spring-boot-starter-web-2.3.2.RELEASE.pom (3.0 kB at 2.9 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-bo
```

First attempt led to this build failure:

```
[INFO] BUILD FAILURE
[INFO] -----
[INFO] Total time: 30:50 min
[INFO] Finished at: 2021-01-19T11:12:32+02:00
[INFO] -----
[ERROR] Failed to execute goal on project rest-service: Could not resolve dependencies for project com.example:rest-service:jar:0.0.1-SNAPSHOT: Could not transfer artifact org.springframework.boot:spring-boot-autoconfigure:jar:2.3.2.RELEASE from/to central (https://repo.maven.apache.org/maven2): GET request of: org/springframework/boot/spring-boot-autoconfigure/2.3.2.RELEASE/spring-boot-autoconfigure-2.3.2.RELEASE.jar from central failed: Read timed out -> [Help 1]
[ERROR]
```

Solution:

change the version of spring boot parent

32

```
<parent>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-parent</artifactId>
  <version>1.4.2.RELEASE</version>
</parent>
```

Share Improve this answer Follow

answered Mar 24 '17 at 11:19



Nithin

415 ● 5 ● 9

4 I spent 2 hours on this. YOu made my day. – Xelian Sep 12 '17 at 19:46

3 It might be useful to precise that you need to set the latest version of Spring Boot. This is stupid, but I had to check the version of Spring Boot in the question just to be sure that it was about updating the version and not an issue with a specific version of SB, because the answer doesn't explain what's wrong... – Carm Nov 11 '17 at 7:42

Good solution but the reason? – Chalpat Mar 17 '20 at 21:06

add a comment

Checked the latest version from the repository in order to modify the pom.xml

<https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-parent/>

```
ADME.adoc  Greeting.java  GreetingController.java  mvnw.cmd  pom.xml x
Basic Spring RESTful Web Service > initial > pom.xml
1  <?xml version="1.0" encoding="UTF-8"?>
2  <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/
3      xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 https://maven.apache
4      <modelVersion>4.0.0</modelVersion>
5      <parent>
6          <groupId>org.springframework.boot</groupId>
7          <artifactId>spring-boot-starter-parent</artifactId>
8          <version>2.4.2</version>
9          <relativePath/> <!-- lookup parent from repository -->
10     </parent>
11     <groupId>com.example</groupId>
12     <artifactId>rest-service</artifactId>
13     <version>0.0.1-SNAPSHOT</version>
14     <name>rest-service</name>
15     <description>Demo project for Spring Boot</description>
16
17     <properties>
18         <java.version>1.8</java.version>
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: java

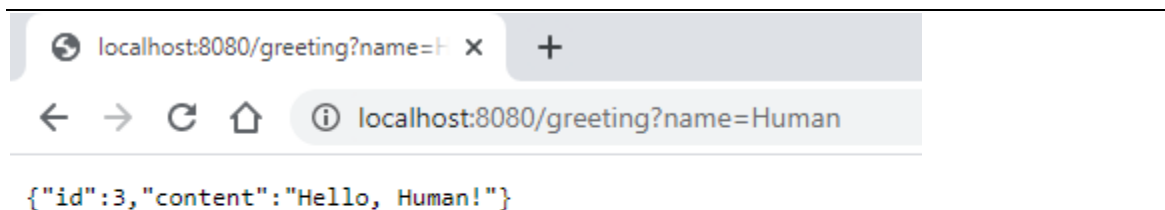
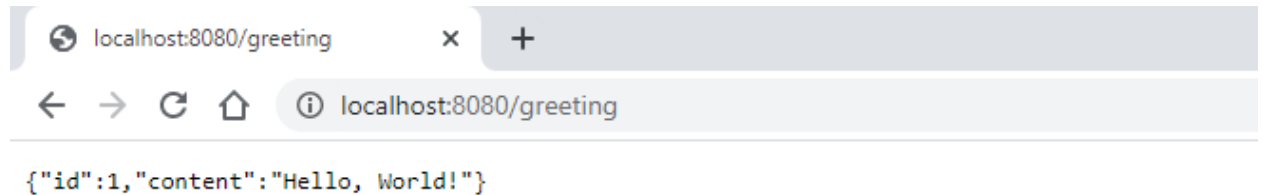
Downloaded from central: <https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-starter-parent/>

Found 2.4.2 instead of 2.3.2.RELEASE

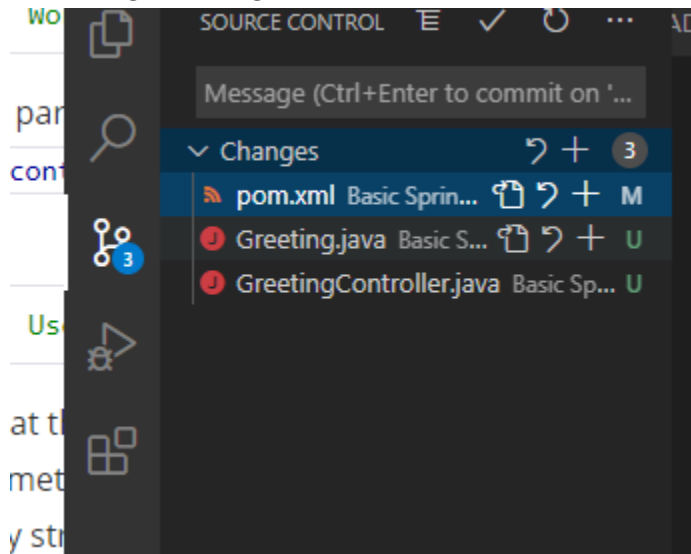
Second attempt is successful:

```
2021-01-19 12:11:27.528 INFO 8540 --- [      main]
o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port(s): 8080 (http) with
context path "/"
2021-01-19 12:11:27.552 INFO 8540 --- [      main] c.e.restservice.RestServiceApplication :
Started RestServiceApplication in 3.172 seconds (JVM running for 3.775)
```

Testing the service is successful:



Committing the changes to Azure



Because the clone on VS Code was accidentally created from **master** branch, after committing in Azure I need to make a pull request from **master** to **alincio-uat** branch created at the beginning.

Configuring Maven Pipeline on Azure

New pipeline

## Configure your pipeline



### Maven

Build your Java project and run tests with Apache Maven.



### Maven package Java project Web App to Linux on Azure

Build your Java project and deploy it to Azure as a Linux web app



### Starter pipeline

Start with a minimal pipeline that you can customize to build and deploy your code.



### Existing Azure Pipelines YAML file

Select an Azure Pipelines YAML file in any branch of the repository.

Show more



First attempt:

##[error]Unhandled: Not found mavenPOMFile: /home/vsts/work/1/s/pom.xml

### Jobs in run #20210119.1

Basic Spring RESTful Web Service

✖ Job	5s
✔ Initialize job	1s
✔ Checkout Basic Spring RESTful We...	2s
✖ Maven	<1s
✔ Post-job: Checkout Basic Spring ...	<1s
✔ Finalize Job	<1s
✔ Report build status	<1s

### ✖ Maven

```
1 Starting: Maven
2 =====
3 Task      : Maven
4 Description : Build, test, and deploy with Apache Maven
5 Version    : 3.179.0
6 Author     : Microsoft Corporation
7 Help       : https://docs.microsoft.com/azure/devops/pipelines/tasks/build/maven
8 =====
9 ##[error]Unhandled: Not found mavenPOMFile: /home/vsts/work/1/s/pom.xml
10 Finishing: Maven
```

Added the correct path for the pom.xml (on the 9<sup>th</sup> attempt 😊)

mavenPomFile: 'initial/pom.xml'

### Jobs in run #20210119.9

Basic Spring RESTful Web Service

✔ Job	28s
✔ Initialize job	2s
✔ Checkout Basic Spring RESTful We...	1s
✔ CmdLine	<1s
✔ Maven	23s
✔ Post-job: Checkout Basic Spring ...	<1s
✔ Finalize Job	<1s
✔ Report build status	<1s

### ✔ Job

```
1 ##[warning]Ubuntu-latest pipelines will use Ubuntu-20.04 soon.
2 Pool: Azure Pipelines
3 Image: ubuntu-latest
4 Queued: Just now [manage_parallel_jobs]
5 Agent: Hosted Agent
6 Started: Just now
7 Duration: 28s
8
9 The agent request is already running or has already completed.
10 ▶ Job preparation parameters
11 A 100% tests passed
12 Job live console data:
13 Starting: Job
14 Finishing: Job
```

It seems that I cannot continue the development on Azure (some features are premium)  
I will Build the Spring Project locally and commit JAR to Azure.

### Building JAR with Maven

```
./mvnw clean package
```

### Started with executable JAR:

```
java -jar target/rest-service-0.0.1-SNAPSHOT.jar
```

```
PS D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial> java -jar target\rest-service-0.0.1-SNAPSHOT.jar

:: Spring Boot :: (v2.4.2)












2021-01-19 16:28:26.497 INFO 9360 --- [main] c.e.restservice.RestServiceApplication : Starting RestServiceApplication v0.0.1-SNAPSHOT using Java 15.0.1 on DESKTOP-21A5QD2 with PID 9360 (D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial\target\rest-service-0.0.1-SNAPSHOT.jar started by AlinC in D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial)
```

*Started RestServiceApplication in 5.598 seconds (JVM running for 6.579)*

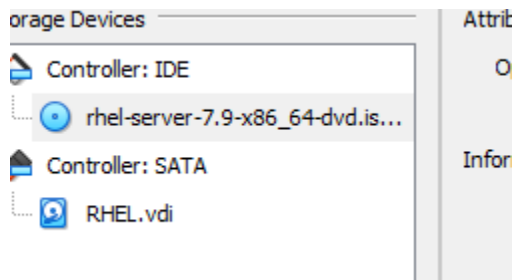
Added the Executable on Azure DevOps (alincio-uat branch)

```
git add -f initial\target
```

You updated [alincio-uat](#) Just now

Name ↑	Last change	Commits
 .mvn	Aug 6, 2020	5f578137 Update versions Jay Bryant
 gradle	Aug 6, 2020	5f578137 Update versions Jay Bryant
 src	3h ago	c4346ced first Alin Ciovisa
 <b>target</b>	Just now	8dc9634a Added JAR Alin Ciovisa
 build.gradle	Aug 3, 2020	09b96393 Upgrade to Spring Boot 2.3.2.RELEASE Sergio Vitorino
 gradlew	Oct 24, 2019	f1a5c3c3 Upgraded to Spring Boot 2.2 Jay Bryant
 gradlew.bat	Oct 24, 2019	f1a5c3c3 Upgraded to Spring Boot 2.2 Jay Bryant
 mvnw	Aug 6, 2020	5f578137 Update versions Jay Bryant
 mvnw.cmd	Aug 6, 2020	5f578137 Update versions Jay Bryant
 pom.xml	3h ago	c4346ced first Alin Ciovisa
 settings.gradle	Oct 1, 2019	acd0d5aa Use the Spring Initializr Jay Bryant

Installed RedHat 7.9 Linux on a virtual machine



Having issues logging into the system so I had to run the rescue procedure to restore the root password.

```
Rescue

The rescue environment will now attempt to find your Linux installation and
mount it under the directory : /mnt/sysimage. You can then make any changes
required to your system. Choose '1' to proceed with this step.
You can choose to mount your file systems read-only instead of read-write by
choosing '2'.
If for some reason this process does not work choose '3' to skip directly to a
shell.

1) Continue
2) Read-only mount
3) Skip to shell
4) Quit (Reboot)

Please make a selection from the above: 1
=====
Rescue Mount

Your system has been mounted under /mnt/sysimage.

If you would like to make your system the root environment, run the command:

    chroot /mnt/sysimage
Please press <return> to get a shell.
When finished, please exit from the shell and your system will reboot.
sh-4.2# chroot /mnt/sysimage_
[anacondal 1:main* 2:shell 3:log 4:storage-log 5:program-log Switch tab: Alt+Tab | Help: F1]
```

```
RHEL [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Red Hat Enterprise Linux Server 7.9 (Maipo)
Kernel 3.10.0-1160.el7.x86_64 on an x86_64

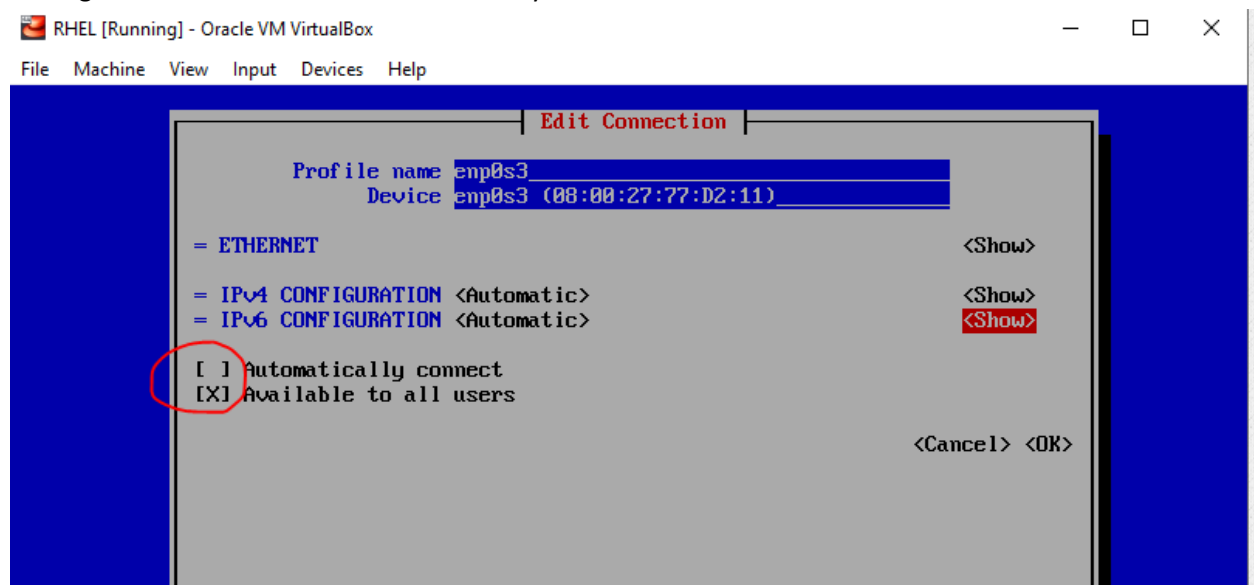
localhost login: root
Password:
Last failed login: Tue Jan 19 12:23:30 EST 2021 on tty1
There were 5 failed login attempts since the last successful login.
[root@localhost ~]# _
```

Tried `$ sudo yum install ansible` but found the following issue:

```
[root@localhost ~]# nmcli device status
DEVICE  TYPE      STATE      CONNECTION
enp0s3  ethernet  disconnected --
lo       loopback  unmanaged  --
[root@localhost ~]# _
```

`$ nmtui`

editing Ethernet connection to automatically connect.



There were no repositories available for YUM and I needed to register the machine to redhat servers.

```
[root@localhost ~]# subscription-manager register --username=alin.ciovica --password=  
Registering to: subscription.rhsm.redhat.com:443/subscription  
The system has been registered with ID: 75e75a33-edb3-4f7a-b952-7bb84480cdf6  
The registered system name is: localhost.localdomain  
[root@localhost ~]# _
```


```
sudo subscription-manager register --username=<USERNAME> --password=<PWD>
```

```
sudo subscription-manager list --available //here we can find pool-id
```

```
sudo subscription-manager attach --pool=<Pool-ID>
```

```
sudo yum upgrade
```

```
Subscription Type: Standard  
Starts: 01/19/2021  
Ends: 01/18/2022  
Entitlement Type: Physical  
  
[root@localhost ~]# sudo subscription-manager attach --pool=8a85f99976fc363201771b68235e0502  
Successfully attached a subscription for: Red Hat Developer Subscription  
[root@localhost ~]# sudo yum upgrade  
Loaded plugins: product-id, search-disabled-repos, subscription-manager  
rhel-7-server-rpms | 3.5 kB 00:00:00  
(1/3): rhel-7-server-rpms/7Server/x86_64/group | 631 kB 00:00:01  
(2/3): rhel-7-server-rpms/7Server/x86_64/updateinfo | 3.9 MB 00:00:01  
(3/3): rhel-7-server-rpms/7Server/x86_64/primary_db | 78 MB 00:00:09  
-
```



```
sudo subscription-manager repos --enable rhel-7-server-ansible-2.9-rpms
```

```
sudo yum install ansible
```

```
sudo yum install git -y
```

My approach will be to install tomcat on RHEL machine and deploy .WAR package so I added War packaging in pom.xml and made another maven build

The screenshot shows the Visual Studio Code interface with a project named 'Basic Spring RESTful Web Service'. The file explorer on the left shows the project structure, including a 'target' directory. The 'pom.xml' file is open in the editor, showing the following configuration:

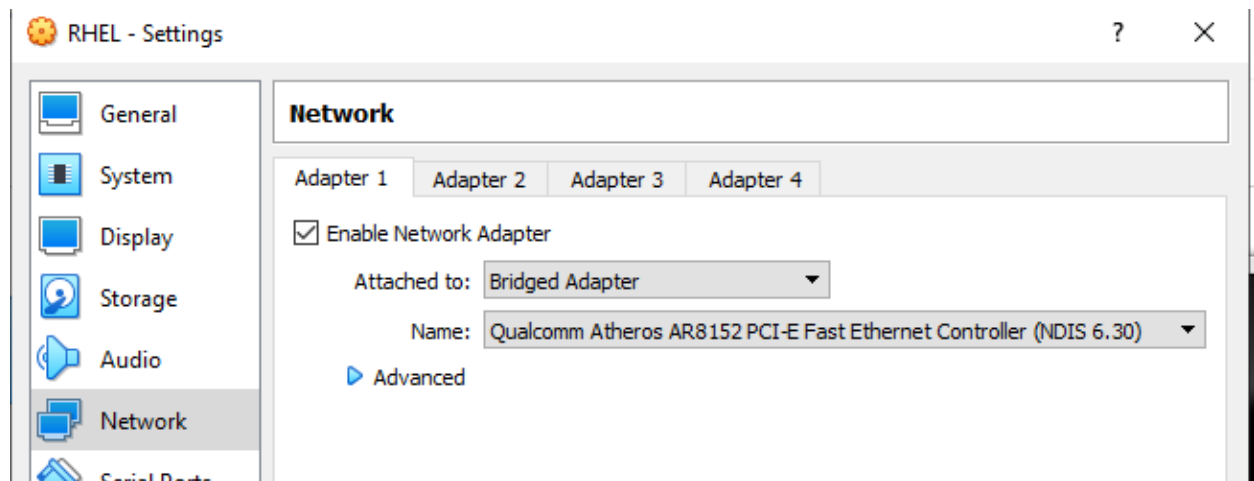
```
10 </parent>
11 <groupId>com.example</groupId>
12 <artifactId>rest-service</artifactId>
13 <version>0.0.1-SNAPSHOT</version>
14 <name>rest-service</name>
15 <packaging>war</packaging>
16 <description>Demo project for Spring Boot</description>
17
18 <properties>
19     <java.version>1.8</java.version>
20 </properties>
21
22 <dependencies>
23     <dependency>
24         <groupId>org.springframework.boot</groupId>
25         <artifactId>spring-boot-starter-web</artifactId>
```

The terminal window at the bottom shows the output of a Maven build. It includes the following information:

- Downloaded from central: <https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-mapping-3.0.0.jar> (11 kB at 32 kB/s)
- Downloaded from central: <https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-filtering-3.1.1.jar> (51 kB at 96 kB/s)
- Downloaded from central: <https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-archiver-4.2.2.jar> (194 kB at 272 kB/s)
- [INFO] Packaging webapp
- [INFO] Assembling webapp [rest-service] in [D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial\target\rest-service-0.0.1-SNAPSHOT]
- [INFO] Processing war project
- [INFO] Building war: D:\WorkEnvs\AzureOps\Basic Spring RESTful Web Service\initial\target\rest-service-0.0.1-SNAPSHOT.war
- [INFO] --- spring-boot-maven-plugin:2.4.2:repackage (repackage) @ rest-service ---
- [INFO] Replacing main artifact with repackaged archive
- [INFO] BUILD SUCCESS
- [INFO] Total time: 36.423 s
- [INFO] Finished at: 2021-01-19T22:48:07+02:00

The status bar at the bottom indicates the file encoding is UTF-8 and the tab size is 4.

Changed the Network configuration from NAT to Bridge Adapter in order to get the machine set its own IP on the network.



Verifying that ansible is working:

```
[root@localhost ~]# ansible localhost -m ping
localhost | SUCCESS => {
  "changed": false,
  "ping": "pong"
}
```

Added LAN IP on ansible hosts and successfully pinged into it.

```
## db-[99:101]-node.example.com
[rhell]
root@192.168.100.34

[ Wrote 45 lines ]

[root@localhost ~]# ansible rhel -m ping
root@192.168.100.34 | UNREACHABLE! => {
  "changed": false,
  "msg": "Failed to connect to the host via ssh: Permission denied (publickey).",
  "unreachable": true
}
[root@localhost ~]# ansible rhel -m ping --ask-pass
SSH password:
root@192.168.100.34 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
[root@localhost ~]#
```

I have found a good ansible template on the official docs and I want to work on that.

```
[root@localhost ~]# git clone https://github.com/alincio/ansible-examples.git /opt/repos
Cloning into '/opt/repos'...
remote: Enumerating objects: 3469, done.
Receiving objects: 33% (1161/3469), 24.54 MiB | 3.43 MiB/s
```

```
[root@localhost ~]# cd /opt/repos/
[root@localhost repos]# ll
total 8
drwxr-xr-x. 4 root root 158 Jan 20 06:59 jboss-standalone
drwxr-xr-x. 5 root root 159 Jan 20 06:59 lamp-haproxy
drwxr-xr-x. 4 root root 101 Jan 20 06:59 lamp-simple
drwxr-xr-x. 4 root root 101 Jan 20 06:59 lamp-simple-rhel7
drwxr-xr-x. 9 root root 4096 Jan 20 06:59 language-features
drwxr-xr-x. 6 root root 132 Jan 20 06:59 mongodb
drwxr-xr-x. 2 root root 177 Jan 20 06:59 phillips_hue
-rw-r--r--. 1 root root 122 Jan 20 06:59 README.md
drwxr-xr-x. 4 root root 71 Jan 20 06:59 rust-module-hello-world
drwxr-xr-x. 4 root root 101 Jan 20 06:59 tomcat-memcached-failover
drwxr-xr-x. 4 root root 101 Jan 20 06:59 tomcat-standalone
drwxr-xr-x. 4 root root 188 Jan 20 06:59 windows
drwxr-xr-x. 4 root root 109 Jan 20 06:59 wordpress-nginx
drwxr-xr-x. 4 root root 109 Jan 20 06:59 wordpress-nginx-rhel7
[root@localhost repos]# cd tomcat-standalone/_
```

\$ ansible-playbook -i hosts site.yml --ask-pass

```
[root@localhost tomcat-standalone]# ansible-playbook -i hosts site.yml --ask-pass
SSH password:
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv to see details

PLAY [tomcat-servers] *****

TASK [Gathering Facts] *****
ok: [root@192.168.100.34]

TASK [selinux : Download EPEL Repo - Centos/RHEL 6] *****
skipping: [root@192.168.100.34]

TASK [selinux : Install EPEL Repo - Centos/RHEL 6] *****
skipping: [root@192.168.100.34]

TASK [selinux : Download EPEL Repo - Centos/RHEL 7] *****
changed: [root@192.168.100.34]

TASK [selinux : Install EPEL Repo - Centos/RHEL 7] *****
```

I will paste the tasks from the pipeline below:

---

- name: Install Java 1.7  
yum: name=java-1.7.0-openjdk state=present
- name: add group "tomcat"  
group: name=tomcat
- name: add user "tomcat"  
user: name=tomcat group=tomcat home=/usr/share/tomcat createhome=no



```

    become: True
    become_method: sudo
- name: Download Tomcat
    get_url: url=http://archive.apache.org/dist/tomcat/tomcat-7/v7.0.61/bin/apache-
tomcat-7.0.61.tar.gz dest=/opt/apache-tomcat-7.0.61.tar.gz
- name: Extract archive
    command: chdir=/usr/share /bin/tar xvf /opt/apache-tomcat-7.0.61.tar.gz -C /opt/
creates=/opt/apache-tomcat-7.0.61
- name: Symlink install directory
    file: src=/opt/apache-tomcat-7.0.61 path=/usr/share/tomcat state=link
- name: Change ownership of Tomcat installation
    file: path=/usr/share/tomcat/ owner=tomcat group=tomcat state=directory recurse=yes
- name: Configure Tomcat server
    template: src=server.xml dest=/usr/share/tomcat/conf/
    notify: restart tomcat
- name: Configure Tomcat users
    template: src=tomcat-users.xml dest=/usr/share/tomcat/conf/
    notify: restart tomcat
- name: Install Tomcat init script
    copy: src=tomcat-initscript.sh dest=/etc/init.d/tomcat mode=0755
- name: Start Tomcat
    service: name=tomcat state=started enabled=yes
- name: deploy iptables rules
    template: src=iptables-save dest=/etc/sysconfig/iptables
    when: "ansible_os_family == 'RedHat' and ansible_distribution_major_version == '6'"
    notify: restart iptables
- name: insert firewalld rule for tomcat http port
    firewalld: port={{ http_port }}/tcp permanent=true state=enabled immediate=yes
    when: "ansible_os_family == 'RedHat' and ansible_distribution_major_version == '7'"
- name: insert firewalld rule for tomcat https port
    firewalld: port={{ https_port }}/tcp permanent=true state=enabled immediate=yes
    when: "ansible_os_family == 'RedHat' and ansible_distribution_major_version == '7'"
- name: wait for tomcat to start
    wait_for: port={{http_port}}

```

---

I will need to add a task that copies my Java application from Azure and Deploys it into the Tomcat Server.

```

PLAY RECAP *****
root@192.168.100.34 : ok=19  changed=16  unreachable=0    failed=0    skipped=3    rescued=
0      ignored=0

[root@localhost tomcat-standalone]# cd /opt/apache-tomcat-7.0.61
[root@localhost apache-tomcat-7.0.61]# ll
total 96
drwxr-xr-x. 2 tomcat tomcat 4096 Jan 20 07:22 bin
drwxr-xr-x. 3 tomcat tomcat 174 Jan 20 07:22 conf
drwxr-xr-x. 2 tomcat tomcat 4096 Jan 20 07:22 lib
-rw-r--r--. 1 tomcat tomcat 56812 Mar 27 2015 LICENSE
drwxr-xr-x. 2 tomcat tomcat 197 Jan 20 07:22 logs
-rw-r--r--. 1 tomcat tomcat 1192 Mar 27 2015 NOTICE
-rw-r--r--. 1 tomcat tomcat 8965 Mar 27 2015 RELEASE-NOTES
-rw-r--r--. 1 tomcat tomcat 16204 Mar 27 2015 RUNNING.txt
drwxr-xr-x. 2 tomcat tomcat 30 Jan 20 07:22 temp
drwxr-xr-x. 7 tomcat tomcat 81 Mar 27 2015 webapps
drwxr-xr-x. 3 tomcat tomcat 22 Jan 20 07:22 work
[root@localhost apache-tomcat-7.0.61]# _


```

And the GUI result is (192.168.100.34:8080 – accessible over LAN IP):


▲ Not secure | 192.168.100.34:8080 ☆

Home Documentation Configuration Examples Wiki Mailing Lists Find Help

## Apache Tomcat/7.0.61

 The Apache Software Foundation  
http://www.apache.org/

If you're seeing this, you've successfully installed Tomcat. Congratulations!



Recommended Reading:

- [Security Considerations HOW-TO](#)
- [Manager Application HOW-TO](#)
- [Clustering/Session Replication HOW-TO](#)

[Server Status](#)  
[Manager App](#)  
[Host Manager](#)

**Developer Quick Start**

[Tomcat Setup](#)  
[First Web Application](#)

[Realms & AAA](#)  
[JDBC DataSources](#)

[Examples](#)

[Servlet Specifications](#)  
[Tomcat Versions](#)

I am adding two more tasks in ansible in order to deploy the WAR.



alincio committed 2 minutes ago Verified

Showing 1 changed file with 11 additions and 0 deletions.

```
11 tomcat-standalone/roles/tomcat/tasks/main.yml
@@ -33,6 +33,17 @@
33 33 - name: Install Tomcat init script
34 34   copy: src=tomcat-initscript.sh dest=/etc/init.d/tomcat mode=0755
35 35
36 + - name: Git checkout from Azure
37 +   git:
38 +     repo: 'https://alinciovica.visualstudio.com/Basic%20Spring%20RESTful%20Web%20
39 +     dest: /opt/git_co/
40 +
41 + - name: Copying .War from git checkout with permissions
42 +   ansible.builtin.copy:
43 +     src: /opt/git_co/initial/target/rest-service-0.0.1-SNAPSHOT.war
44 +     dest: /opt/apache-tomcat-7.0.61/webapps
45 +     mode: '0777'
46 +
36 47 - name: Start Tomcat
37 48   service: name=tomcat state=started enabled=yes
38 49
```

Git cloning again the newer ansible.

```
[root@localhost webapps]# git clone https://github.com/alincio/ansible-examples.git /opt/repos
Cloning into '/opt/repos'...
remote: Enumerating objects: 7, done.
remote: Counting objects: 100% (7/7), done.
remote: Compressing objects: 100% (6/6), done.
Receiving objects: 94% (3268/3476), 49.52 MiB | 3.38 MiB/s
```

\$ ansible-playbook -i hosts site.yml --ask-pass

Running above again from tomcat-standalone location

```

[root@localhost tomcat-standalone]# ansible-playbook -i hosts site.yml --ask-pass
SSH password:
[WARNING]: Invalid characters were found in group names but not replaced, use -vvvv
PLAY [tomcat-servers] *****

TASK [Gathering Facts] *****
ok: [root@192.168.100.34]

TASK [selinux : Download EPEL Repo - Centos/RHEL 6] *****
skipping: [root@192.168.100.34]

TASK [selinux : Install EPEL Repo - Centos/RHEL 6] *****
skipping: [root@192.168.100.34]

TASK [selinux : Download EPEL Repo - Centos/RHEL 7] *****
ok: [root@192.168.100.34]

TASK [selinux : Install EPEL Repo - Centos/RHEL 7] *****
ok: [root@192.168.100.34]

TASK [Install libselinux-python] *****
ok: [root@192.168.100.34]

TASK [tomcat : Install Java 1.7] *****
ok: [root@192.168.100.34]

TASK [add group "tomcat"] *****
ok: [root@192.168.100.34]

TASK [add user "tomcat"] *****
ok: [root@192.168.100.34]

TASK [tomcat : Download Tomcat] *****
_

```

First attempt failed

```

TASK [tomcat : Git checkout from Azure] *****
changed: [root@192.168.100.34]

TASK [tomcat : Copying .War from git checkout with permissions] *****
An exception occurred during task execution. To see the full traceback, use -vvv. The error was: If
you are using a module and expect the file to exist on the remote, see the remote_src option
fatal: [root@192.168.100.34]: FAILED! => {"changed": false, "msg": "Could not find or access '/opt/g
it_co/initial/target/rest-service-0.0.1-SNAPSHOT.war' on the Ansible Controller.\nIf you are using a
module and expect the file to exist on the remote, see the remote_src option"}

PLAY RECAP *****
root@192.168.100.34 : ok=15  changed=1  unreachable=0  failed=1  skipped=2  rescued=
0  ignored=0

```

Target folder is missing from the checkout:

```



[root@localhost tomcat-standalone]# ll /opt/git_co/
total 32
drwxr-xr-x. 5 root root 183 Jan 20 09:03 complete
-rw-r--r--. 1 root root 133 Jan 20 09:03 CONTRIBUTING.adoc
drwxr-xr-x. 5 root root 163 Jan 20 09:03 initial
-rw-r--r--. 1 root root 11360 Jan 20 09:03 LICENSE.txt
-rw-r--r--. 1 root root 106 Jan 20 09:03 LICENSE.writing.txt
-rw-r--r--. 1 root root 9117 Jan 20 09:03 README.adoc
drwxr-xr-x. 2 root root 20 Jan 20 09:03 test
[root@localhost tomcat-standalone]# ll /opt/git_co/initial/
build.gradle      gradlew          .mvn/           mvnw.cmd        settings.gradle
gradle/           gradlew.bat      mvnw            pom.xml         src/
[root@localhost tomcat-standalone]# ll /opt/git_co/initial/_

```

We are going to blame .gitignore rules:

## .gitignore

[Contents](#) [History](#) [Compare](#) [Blame](#)

 You updated  alincio-uat Yesterday

```

1 *.DS_Store
2 *.sw?
3 .#*
4 *#
5 *~
6 .classpath
7 .project
8 .settings
9 bin
10 build
11 target
12 dependency-reduced-pom.xml
13 *.sublime-*
14 /scratch
15 .gradle
16 README.html
17 *.iml
18 .idea
19

```

Second attempt, same issue.

After checking again, I have decided to add branch name into the git checkout task.

```
1 tomcat-standalone/roles/tomcat/tasks/main.yml
@@ -37,6 +37,7 @@
37     git:
38         repo: 'https://alinciovica.visualstudio.com/Basic%20Spring
39         dest: /opt/git_co/
40     +   version: alincio-uat
40     41
41     - name: Copying .War from git checkout with permissions
42     42     ansible.builtin.copy:
```

Bingo!

```
TASK [tomcat : Git checkout from Azure] *****
changed: [root@192.168.100.34]

TASK [tomcat : Copying .War from git checkout with permissions] *****
changed: [root@192.168.100.34]
```

```
PLAY RECAP *****
root@192.168.100.34 : ok=20  changed=2  unreachable=0  failed=0  skipped=3  resc
0  ignored=0

[root@localhost tomcat-standalone]# _
```

Project is now deployed

```
[root@localhost tomcat-standalone]# cd /opt/apache-tomcat-7.0.61/webapps/
[root@localhost webapps]# ll
total 16636
drwxr-xr-x. 14 tomcat tomcat  4096 Jan 20 07:22 docs
drwxr-xr-x.  7 tomcat tomcat   111 Jan 20 07:22 examples
drwxr-xr-x.  5 tomcat tomcat    87 Jan 20 07:22 host-manager
drwxr-xr-x.  5 tomcat tomcat   103 Jan 20 07:22 manager
drwxr-xr-x.  5 tomcat tomcat    48 Jan 20 09:21 rest-service-0.0.1-SNAPSHOT
-rwxrwxrwx.  1 root  root 17024872 Jan 20 09:21 rest-service-0.0.1-SNAPSHOT.war
drwxr-xr-x.  3 tomcat tomcat  4096 Jan 20 07:22 ROOT
[root@localhost webapps]# cd rest-service-0.0.1-SNAPSHOT
```

Still not there yet. Following issues arises when starting the application.

FAIL - Application at context path /rest-service-0.0.1-SNAPSHOT could not be started  
FAIL - Encountered exception org.apache.catalina.LifecycleException: Failed to start component  
[StandardEngine[Catalina].StandardHost[localhost].StandardContext[/rest-service-0.0.1-SNAPSHOT]]

I am suspecting some dependencies from the spring boot application.

Added:

```
2   <repositories>
3     <repository>
4       <id>central</id>
5       <url>https://repo.maven.apache.org/maven2/</url>
6     </repository>
7   </repositories>
8
9   <dependencies>
10    <dependency>
11      <groupId>javax.xml.bind</groupId>
12      <artifactId>jaxb-api</artifactId>
13      <version>2.3.1</version>
14    </dependency>
15    <dependency>
16      <groupId>com.sun.xml.bind</groupId>
17      <artifactId>jaxb-impl</artifactId>
18      <version>2.3.1</version>
19    </dependency>
20  </dependencies>
```

Multiple modifications to the spring project (pom.xml, main.java app) in order to work .WAR deployment on apache tomcat 9.0.41 locally.

I extended the ServiceApp with ServletInitializer as a recommendation from SpringBoot deployment to Tomcat.

✓  **RestServiceApplication.java -1 +2**  
/initial/src/main/java/com/example/restservice/RestServiceApplication.java

```
! 2
! 3 import org.springframework.boot.SpringApplication;
! 4 import org.springframework.boot.autoconfigure.SpringBootApplication;
! 5 + import org.springframework.boot.web.servlet.support.SpringBootServletInitializer;
! 6
! 7 @SpringBootApplication
! 8 - public class RestServiceApplication {
! 9 + public class RestServiceApplication extends SpringBootServletInitializer {
! 10
! 11     public static void main(String[] args) {
!       SpringApplication.run(RestServiceApplication.class, args);
!     }
```

+other artifacts for the same reason

```
-----
19         <java.version>1.8</java.version>
20     </properties>
21
22 +     <repositories>
23 +         <repository>
24 +             <id>central</id>
25 +             <url>https://repo.maven.apache.org/maven2</url>
26 +         </repository>
27 +     </repositories>
28 +
29     <dependencies>
30         <dependency>
31 +             <groupId>javax.xml.bind</groupId>
32 +             <artifactId>jaxb-api</artifactId>
33 +             <version>2.3.1</version>
34 +         </dependency>
35 +         <dependency>
36 +             <groupId>com.sun.xml.bind</groupId>
37 +             <artifactId>jaxb-impl</artifactId>
38 +             <version>2.3.1</version>
39 +         </dependency>
40 +         <dependency>
41             <groupId>org.springframework.boot</groupId>
42             <artifactId>spring-boot-starter-web</artifactId>
43         </dependency>
44 -
45         <dependency>
46 +             <groupId>org.springframework.boot</groupId>
47 +             <artifactId>spring-boot-starter-tomcat</artifactId>
48 +         </dependency>
49 +         <!-- <dependency>
50             <groupId>org.springframework.boot</groupId>
51             <artifactId>spring-boot-starter-test</artifactId>
52             <scope>test</scope>
53             <exclusions>
```

More details about the commits on the public azure repository:

<https://alinciovica.visualstudio.com/Basic%20Spring%20RESTful%20Web%20Service>



I managed to run the app on Tomcat 9.0.41 locally so I had to update the pipeline to the proper tomcat version ( was 7.0.61)

**updated tomcat version to -9.0.41**  
master

alincio committed 17 seconds ago Verified 1 parent 3f57f38 commit 91e97ef053395926

Showing 1 changed file with 4 additions and 4 deletions.

tomcat-standalone/roles/tomcat/tasks/main.yml

↑	@@ -11,13 +11,13 @@
11	11 become_method: sudo
12	12
13	13 - name: Download Tomcat
14	- get_url: url=http://archive.apache.org/dist/tomcat/tomcat-7/v7.0.61/bin/apache-tomcat-7.0.61.tar.gz dest=/opt/apache-tomcat-7.0.61.tar.gz
14	+ get_url: url=http://archive.apache.org/dist/tomcat/tomcat-9/v9.0.41/bin/apache-tomcat-9.0.41.tar.gz dest=/opt/apache-tomcat-9.0.41.tar.gz
15	15
16	16 - name: Extract archive
17	- command: chdir=/usr/share /bin/tar xvf /opt/apache-tomcat-7.0.61.tar.gz -C /opt/ creates=/opt/apache-tomcat-7.0.61
17	+ command: chdir=/usr/share /bin/tar xvf /opt/apache-tomcat-9.0.41.tar.gz -C /opt/ creates=/opt/apache-tomcat-9.0.41
18	18
19	19 - name: Symlink install directory
20	- file: src=/opt/apache-tomcat-7.0.61 path=/usr/share/tomcat state=link
20	+ file: src=/opt/apache-tomcat-9.0.41 path=/usr/share/tomcat state=link
21	21
22	22 - name: Change ownership of Tomcat installation
23	23 file: path=/usr/share/tomcat/ owner=tomcat group=tomcat state=directory recurse=yes
↑	@@ -42,7 +42,7 @@
42	42 - name: Copying .War from git checkout with permissions
43	43 ansible.builtin.copy:
44	44 src: /opt/git_co/initial/target/rest-service-0.0.1-SNAPSHOT.war
45	- dest: /opt/apache-tomcat-7.0.61/webapps
45	+ dest: /opt/apache-tomcat-9.0.41/webapps
46	46 mode: '0777'

Error returned while trying to start apache 9.0.41 → Unsupported major.minor version 52.0

It's seems Java version is too old, need to change from 1.7 to:

- name: Install Java 1.8

yum: name=java-1.8.0-openjdk state=present

Tomcat is still not starting, and the issue was a deprecated setting in server.xml

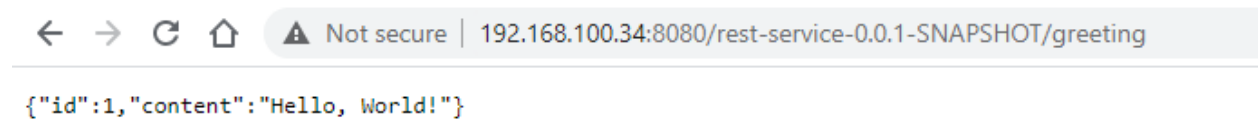
Remove line from server.xml `<Listener className="org.apache.catalina.core.JasperListener"`

1

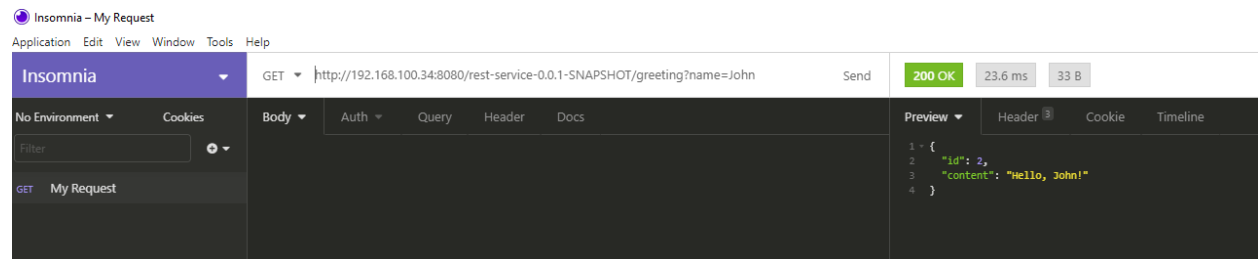
simply REMOVE obsolete setting from server.xml

It's only relevant for Tomcat 7

Finally



## Made a GET Request using Insomnia API Client



---

This project was made with passion by [Alin Ciovica](#)  
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