Password Cracking using John the Ripper

Introduction

John the Ripper is an Open Source password security auditing and password recovery tool available for many operating systems. It is one of the most popular password testing and breaking programs. JtR autodetects the encryption on the hashed data and compares it against a large plain-text file that contains popular passwords, hashing each password, and then stopping it when it finds a match. JtR also includes its own wordlists of common passwords for 20+ languages. These wordlists provide JtR with thousands of possible passwords from which it can generate the corresponding hash values to make a high-value guess of the target password. Since most people choose easy-to-remember passwords, JtR is often very effective even with its out-of-the-box wordlists of passwords.

We already have John the Ripper installed in our server, if you wish to download and install JtR, you can go to Openwall's Website here or from the Official John the Ripper Repo here.

Required resources

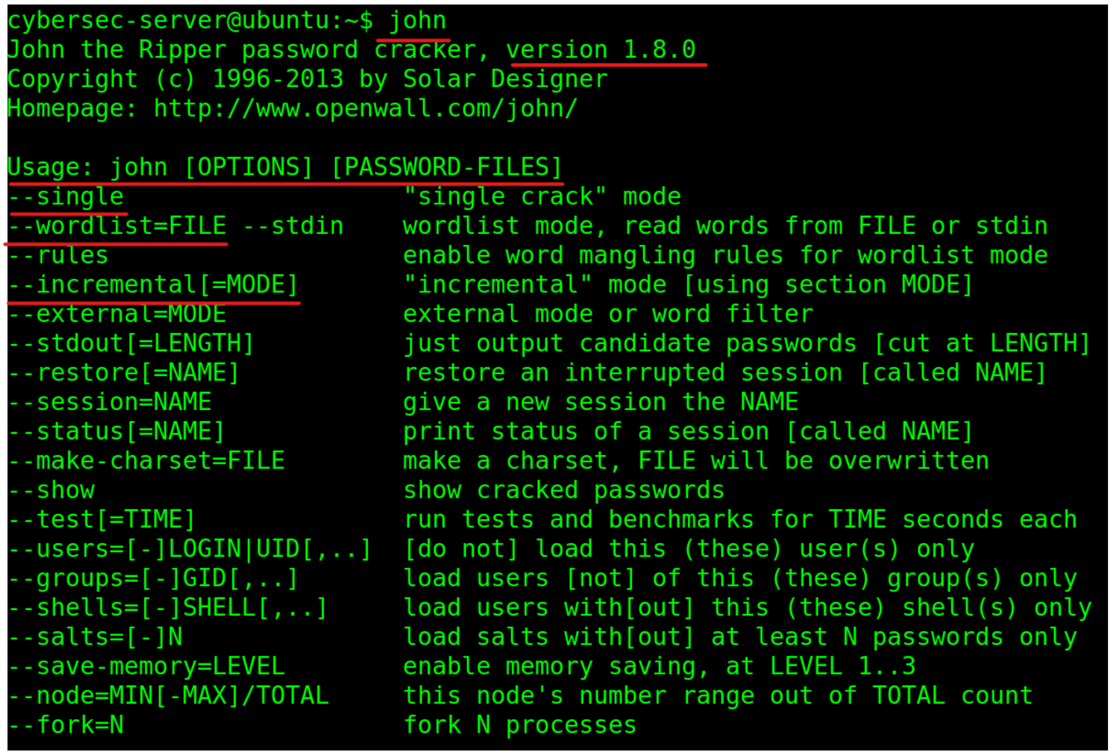
We are going to use the Cybersec-Server for this lab.

Task

Use John the Ripper to crack password

Step 1: Run John the Ripper.

a. To see a list of commands in JtR:



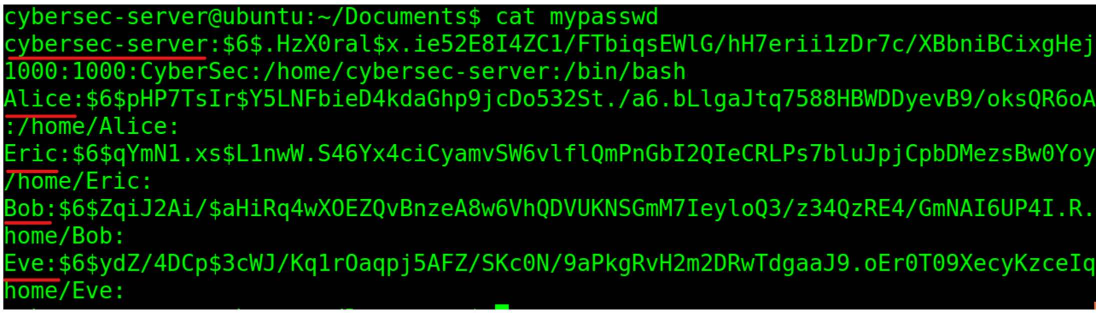
```
cybersec-server@ubuntu:~$ john
John the Ripper password cracker, version 1.8.0
Copyright (c) 1996-2013 by Solar Designer
Homepage: http://www.openwall.com/john/

Usage: john [OPTIONS] [PASSWORD-FILES]
--single                  "single crack" mode
--wordlist=FILE --stdin   wordlist mode, read words from FILE or stdin
--rules                   enable word mangling rules for wordlist mode
--incremental[=MODE]      "incremental" mode [using section MODE]
--external=MODE           external mode or word filter
--stdout[=LENGTH]         just output candidate passwords [cut at LENGTH]
--restore[=NAME]          restore an interrupted session [called NAME]
--session=NAME            give a new session the NAME
--status[=NAME]           print status of a session [called NAME]
--make-charset=FILE       make a charset, FILE will be overwritten
--show                    show cracked passwords
--test[=TIME]             run tests and benchmarks for TIME seconds each
--users=[-]LOGIN|UID[,..] [do not] load this (these) user(s) only
--groups=[-]GID[,..]      load users [not] of this (these) group(s) only
--shells=[-]SHELL[,..]    load users with[out] this (these) shell(s) only
--salts=[-]N              load salts with[out] at least N passwords only
--save-memory=LEVEL       enable memory saving, at LEVEL 1..3
--node=MIN[-MAX]/TOTAL    this node's number range out of TOTAL count
--fork=N                  fork N processes
```

We can see the version we have is 1.8.0 and the usage of JtR. John the Ripper works in 3 distinct modes to crack passwords:

- Single mode: is the fastest and best mode if you have a full password file to crack.
- Wordlist mode: compares the hash to a known list of potential password matches.
- Incremental mode: is brute force mode that tries every possible character combination until find a possible result.

b. Change to **Documents** directory, you will find “mypasswd” file, check the content of the mypasswd.



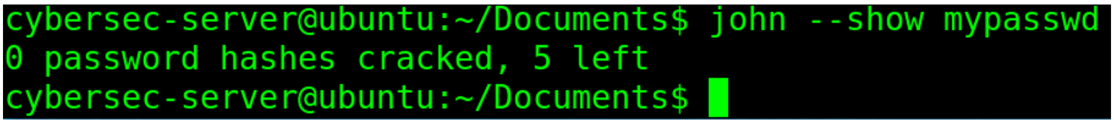
```
cybersec-server@ubuntu:~/Documents$ cat mypasswd
cybersec-server:$6$.HzX0ral$x.ie52E8I4ZC1/FTbiqsEWlG/hH7erii1zDr7c/XBbniBCixgHej
1000:1000:CyberSec:/home/cybersec-server:/bin/bash
Alice:$6$pHP7TsIr$Y5LNFbieD4kdaGhp9jcDo532St./a6.bLlgaJtq7588HBWDDyevB9/oksQR6oA
:/home/Alice:
Eric:$6$qYmN1.xs$L1nwW.S46Yx4ciCyamvSW6vlflQmPnGbI2QIeCRLPs7bluJpjCpbDMezsBw0Yoy
/home/Eric:
Bob:$6$ZqiJ2Ai/$aHiRq4wXOEZQvBnzeA8w6VhQDVUKNSGmM7IeyloQ3/z34QzRE4/GmNAI6UP4I.R.
home/Bob:
Eve:$6$ydZ/4DCp$3cWJ/Kq1rOaqpj5AFZ/SKc0N/9aPkgRvH2m2DRwTdgaaJ9.oEr0T09XecyKzceIq
home/Eve:
```

This file includes user’s name and their encrypted password

Step 2: Recover Passwords.

a. Type the following command in terminal:

cybersec-server@ubuntu:~$ **john --show mypasswd**

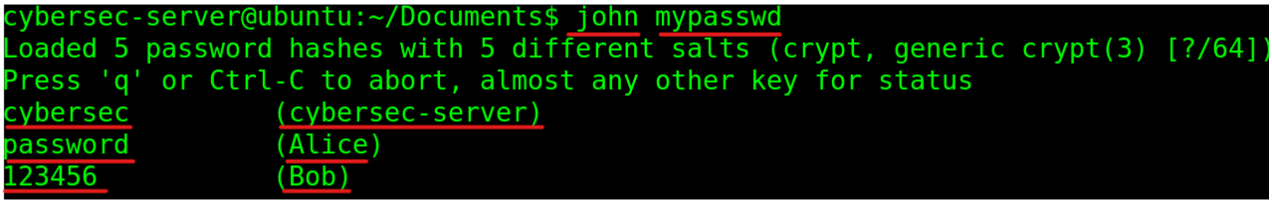


```
cybersec-server@ubuntu:~/Documents$ john --show mypasswd
0 password hashes cracked, 5 left
cybersec-server@ubuntu:~/Documents$
```

As shown above, there are no cracked passwords at this point.

b. At the command prompt, enter john mypasswd to use single crack mode. You can see the password for cybersec-server is cracked instantly, user Alice and Bob’s password are cracked in seconds.

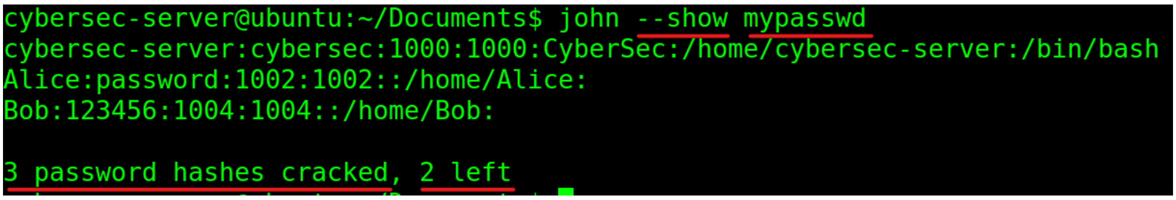
cybersec-server@ubuntu:~$ **john mypasswd**



```
cybersec-server@ubuntu:~/Documents$ john mypasswd
Loaded 5 password hashes with 5 different salts (crypt, generic crypt(3) [?/64])
Press 'q' or Ctrl-C to abort, almost any other key for status
cybersec         (cybersec-server)
password         (Alice)
123456           (Bob)
```

Password cracking is CPU-intensive and a very long process, so the time it takes will depend on your system and the strength of the password. It can take days. If the password is not cracked for days with a powerful CPU, it is a very good password.

Use Ctrl-C to abort the program after couple of minutes, then use john –show to check the same file again, we find there are 3 passwords cracked, 2 left.

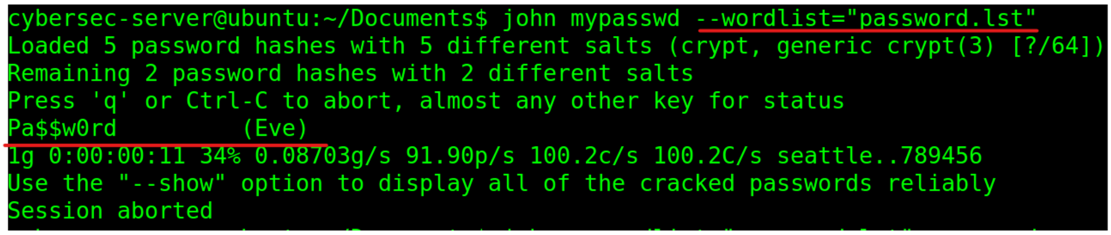


```
cybersec-server@ubuntu:~/Documents$ john --show mypasswd
cybersec-server:cybersec:1000:1000:CyberSec:/home/cybersec-server:/bin/bash
Alice:password:1002:1002::/home/Alice:
Bob:123456:1004:1004::/home/Bob:

3 password hashes cracked, 2 left
```

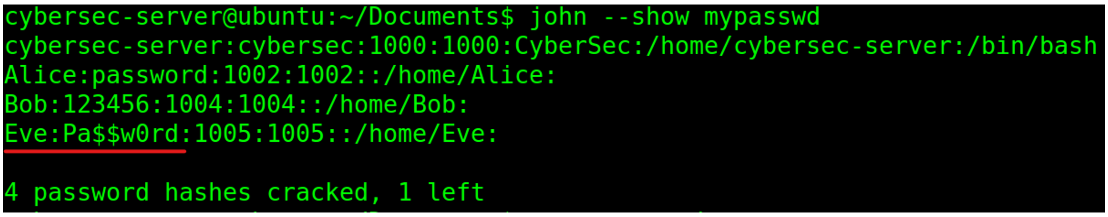
c. JtR uses a predefined dictionary called password.lst(in /usr/share/john directory) with a standard set of predefined “rules” for handling the dictionary and retrieves all password hashes of both md5crypt and crypt type, we have copied this file to our working directory and modified it.

Now let’s use wordlist mode to crack the remaining passwords. This time user Eve’s password is cracked instantly, that is because the password.lst file include this password.



```
cybersec-server@ubuntu:~/Documents$ john mypasswd --wordlist="password.lst"
Loaded 5 password hashes with 5 different salts (crypt, generic crypt(3) [?/64])
Remaining 2 password hashes with 2 different salts
Press 'q' or Ctrl-C to abort, almost any other key for status
Pa$$w0rd         (Eve)
1g 0:00:00:11 34% 0.08703g/s 91.90p/s 100.2c/s 100.2C/s seattle..789456
Use the "--show" option to display all of the cracked passwords reliably
Session aborted
```

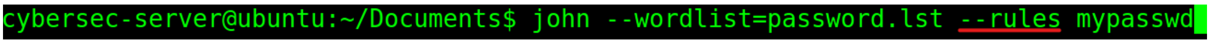
The results below display the passwords for each account.



```
cybersec-server@ubuntu:~/Documents$ john --show mypasswd
cybersec-server:cybersec:1000:1000:CyberSec:/home/cybersec-server:/bin/bash
Alice:password:1002:1002::/home/Alice:
Bob:123456:1004:1004::/home/Bob:
Eve:Pa$$w0rd:1005:1005::/home/Eve:

4 password hashes cracked, 1 left
```

Mangling is a preprocessor in JtR that optimizes the wordlist to make the cracking process faster. Use the –rules parameter to set the mangling rules if you wish.



```
cybersec-server@ubuntu:~/Documents$ john --wordlist=password.lst --rules mypasswd
```

Challenge:

Can you find out the password for user Eric?

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