P6

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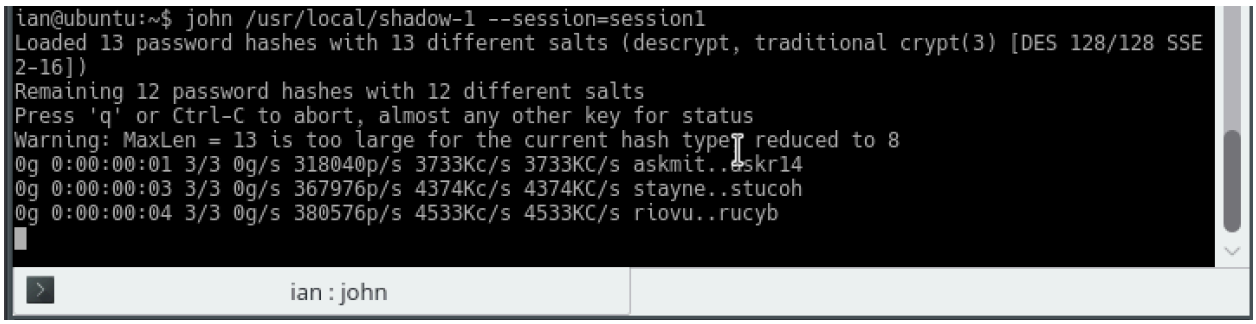
Github: https://github.com/IanDavis1995/P6

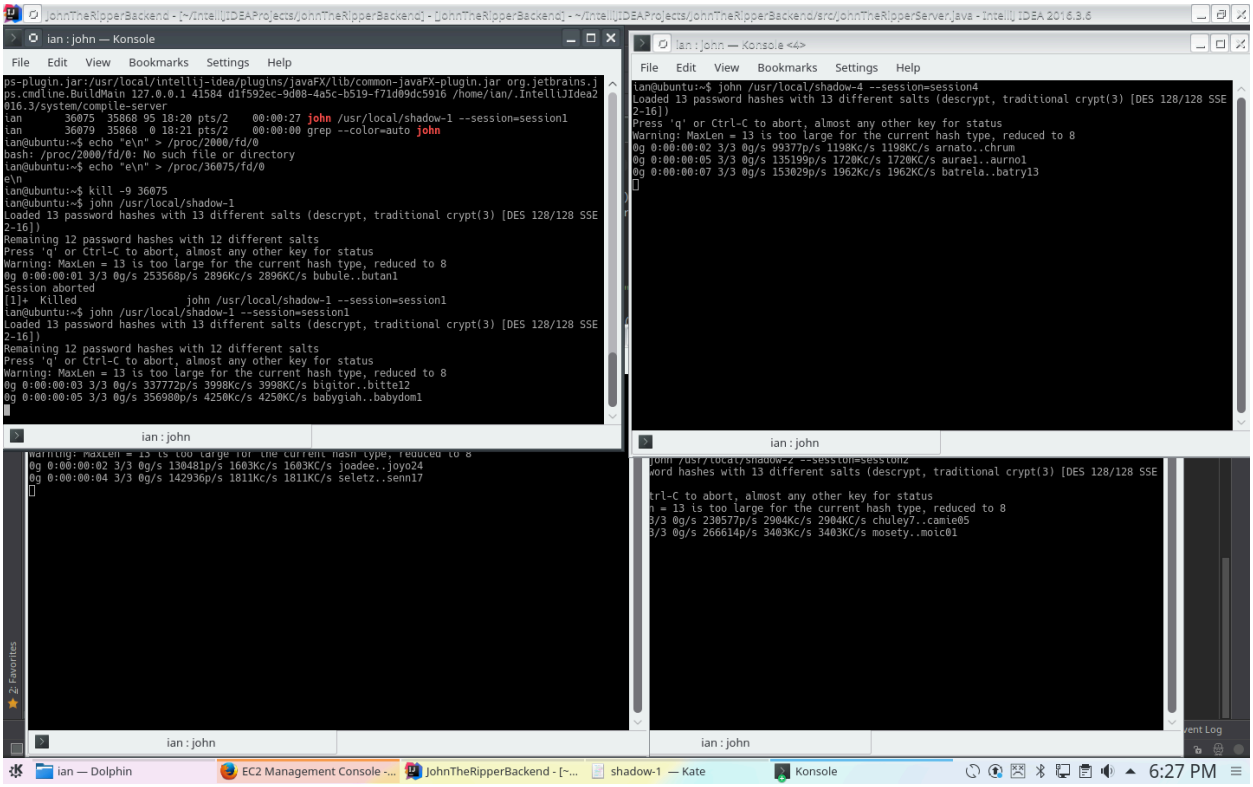
Task 1

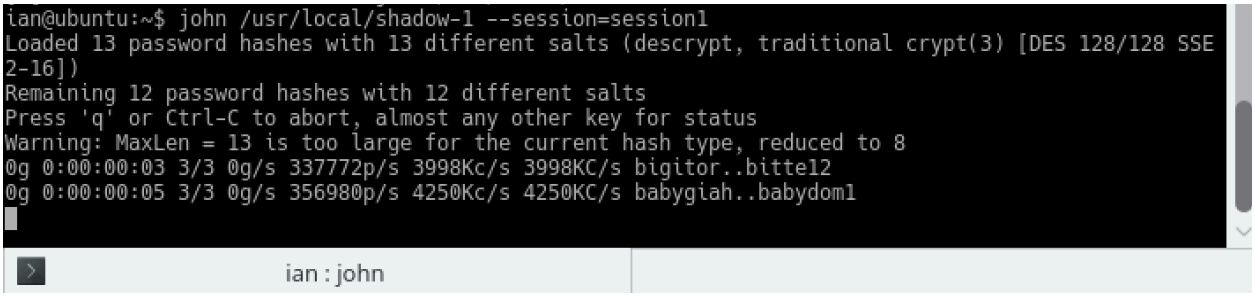
Ubuntu-Only

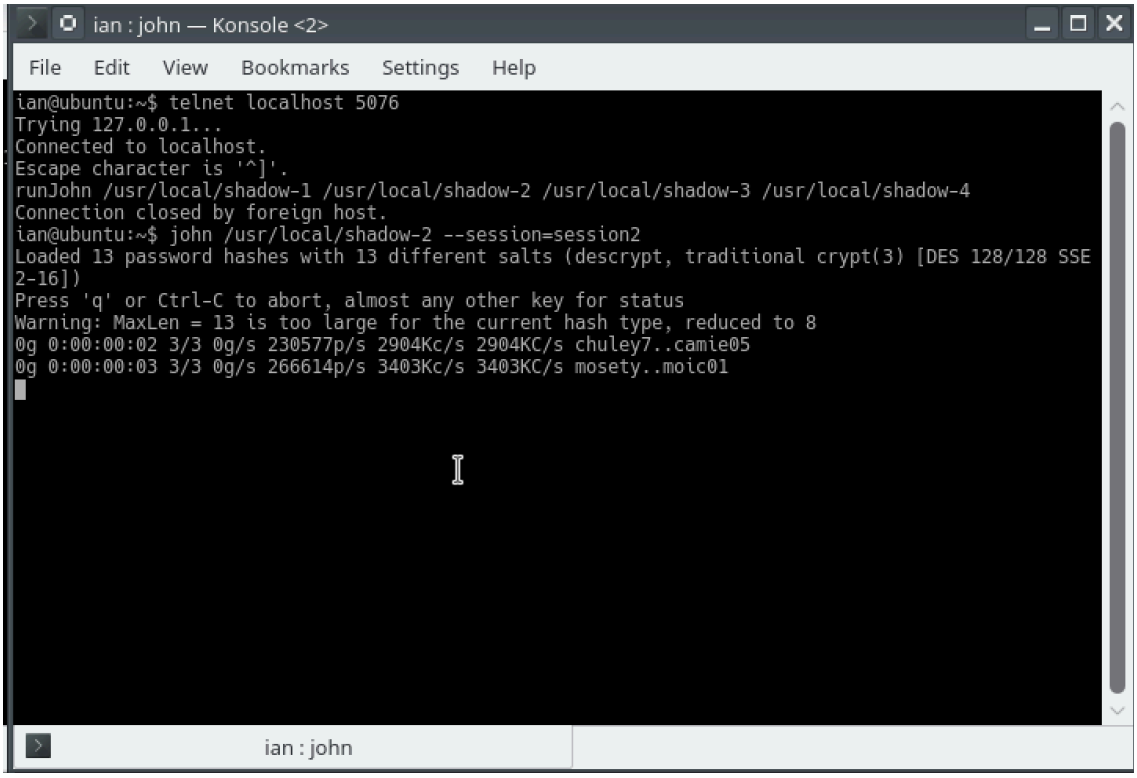
Solo

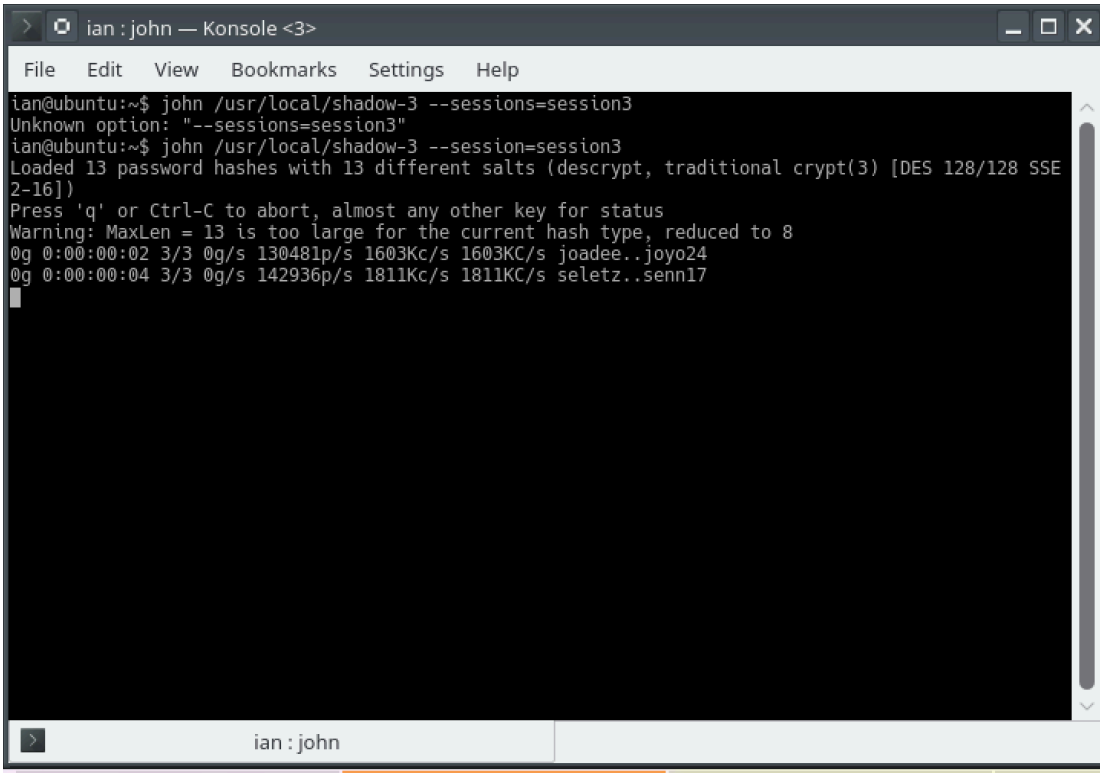


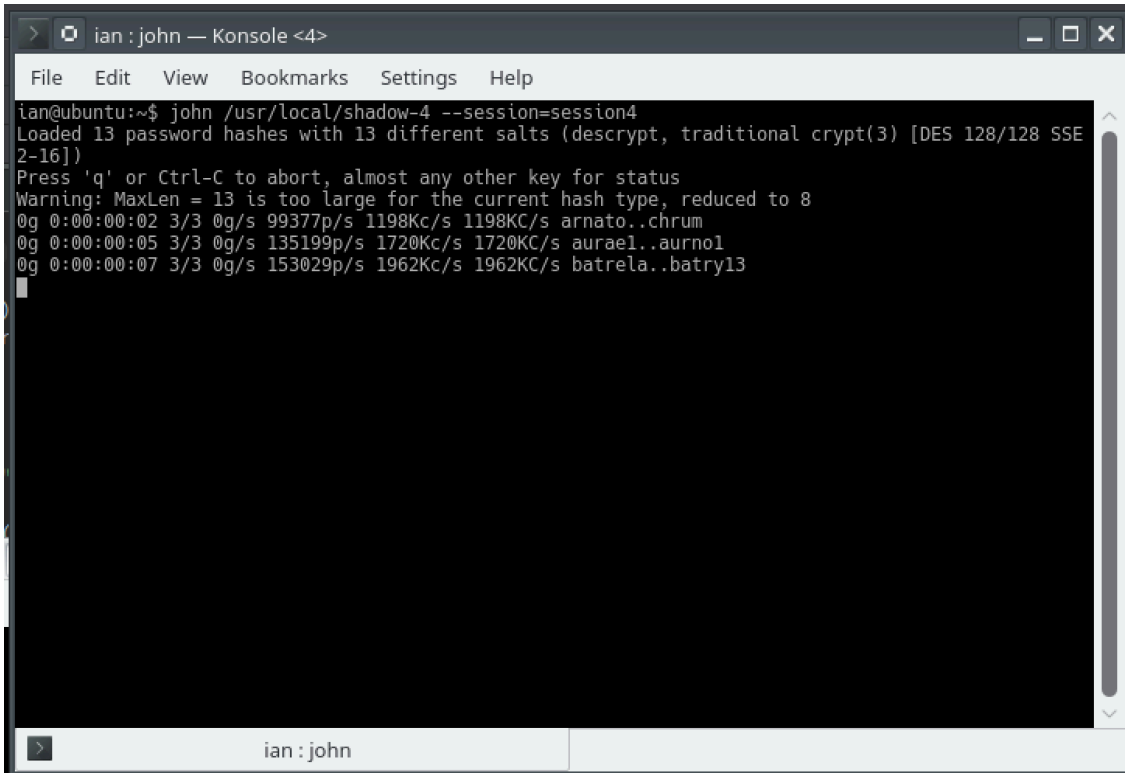
Multi-processing

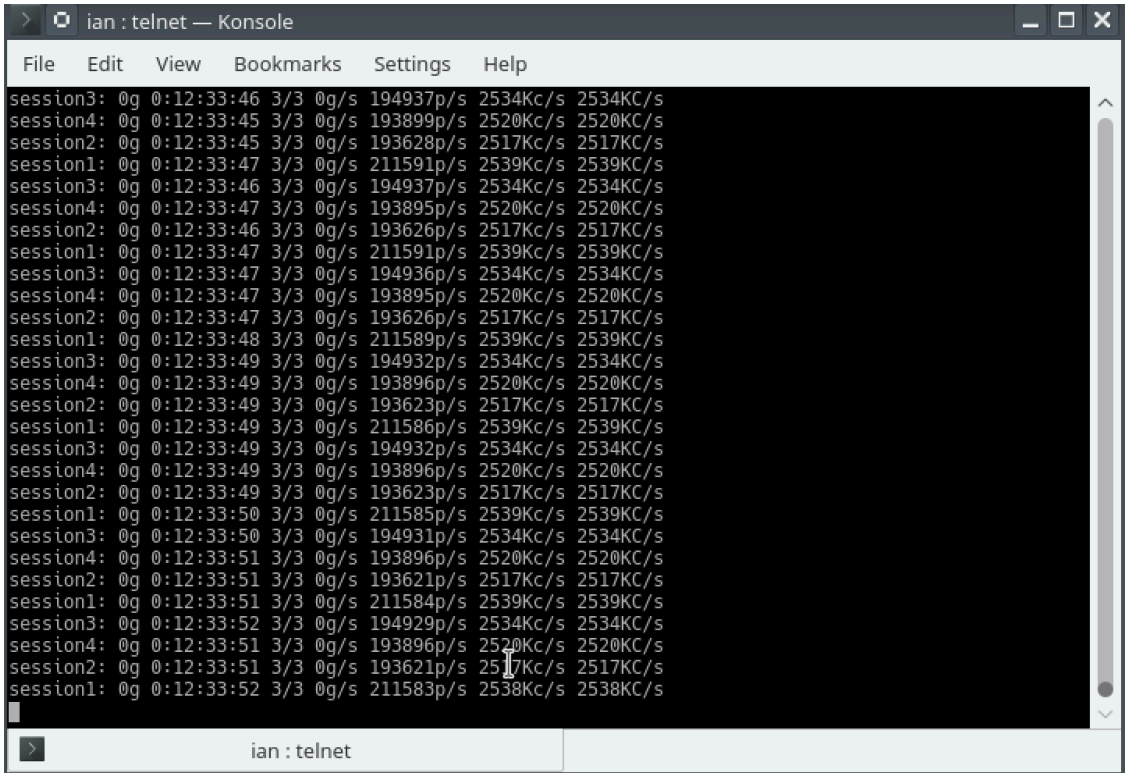




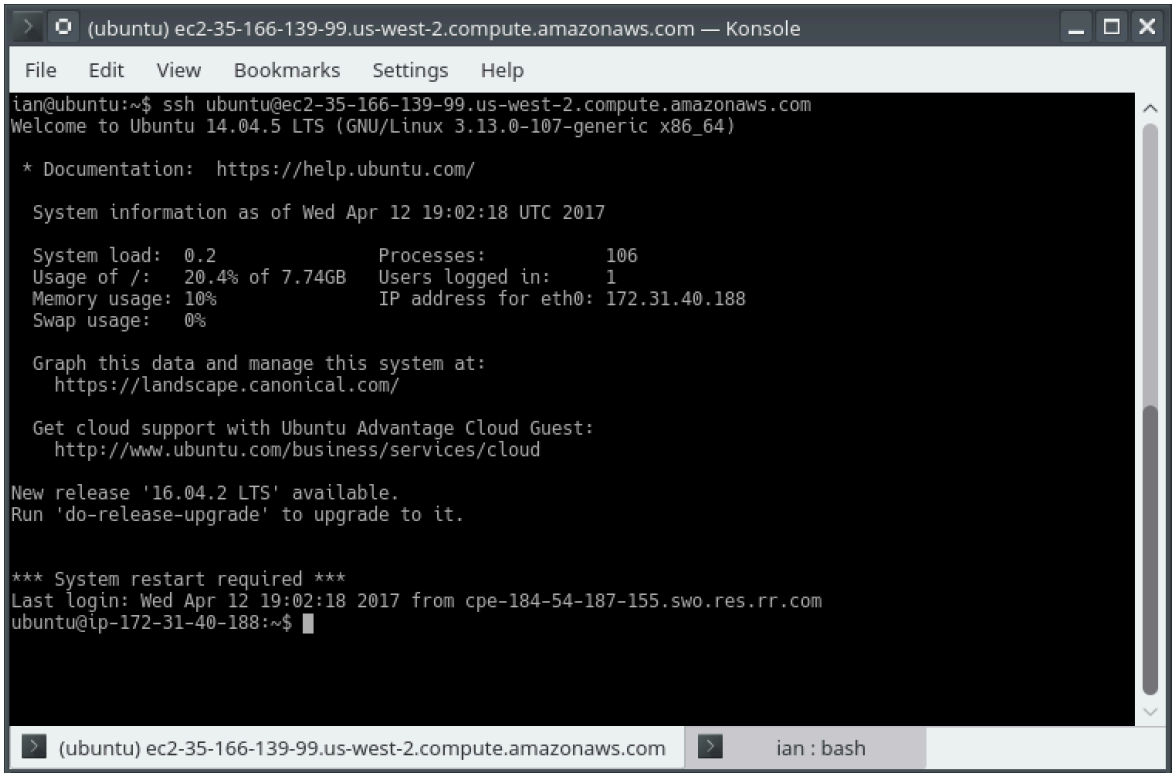

ian : john — Konsole <2>
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ telnet localhost 5076
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
runJohn /usr/local/shadow-1 /usr/local/shadow-2 /usr/local/shadow-3 /usr/local/shadow-4
Connection closed by foreign host.
ian@ubuntu:~$ john /usr/local/shadow-2 --session=session2
Loaded 13 password hashes with 13 different salts (descrypt, traditional crypt(3) [DES 128/128 SSE
2-16])
Press 'q' or Ctrl-C to abort, almost any other key for status
Warning: MaxLen = 13 is too large for the current hash type, reduced to 8
0g 0:00:00:02 3/3 0g/s 230577p/s 2904Kc/s 2904KC/s chuley7..camie05
0g 0:00:00:03 3/3 0g/s 266614p/s 3403Kc/s 3403KC/s mosety..moic01
ian : john

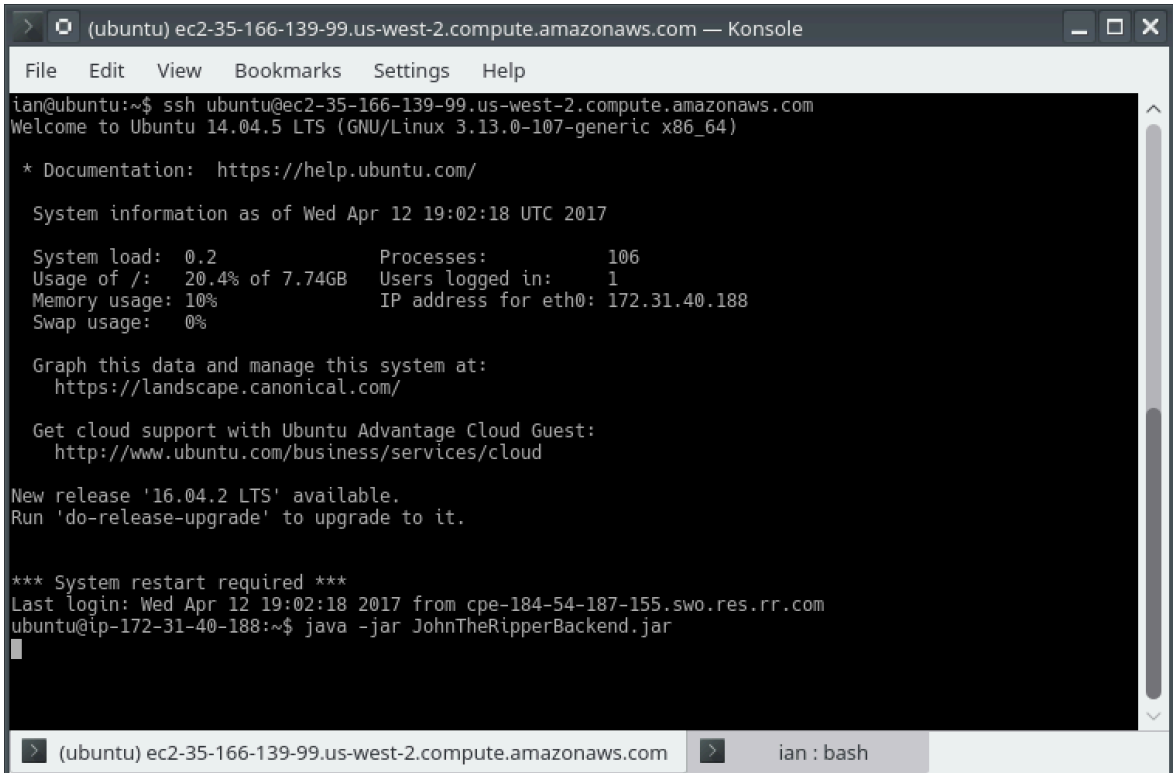

ian : john — Konsole <3>
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ john /usr/local/shadow-3 --sessions=session3
Unknown option: "--sessions=session3"
ian@ubuntu:~$ john /usr/local/shadow-3 --session=session3
Loaded 13 password hashes with 13 different salts (descrypt, traditional crypt(3) [DES 128/128 SSE
2-16])
Press 'q' or Ctrl-C to abort, almost any other key for status
Warning: MaxLen = 13 is too large for the current hash type, reduced to 8
0g 0:00:00:02 3/3 0g/s 130481p/s 1603Kc/s 1603KC/s joadee..joyo24
0g 0:00:00:04 3/3 0g/s 142936p/s 1811Kc/s 1811KC/s seletz..senn17
ian : john

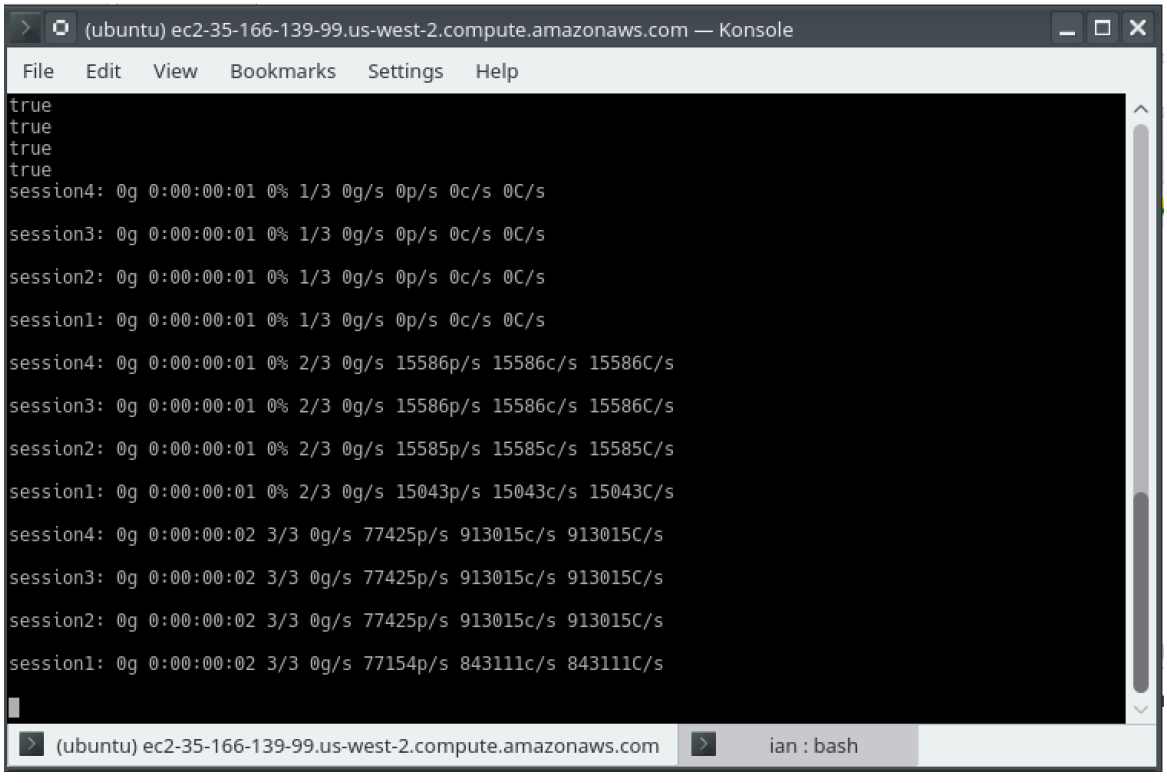

ian : john — Konsole <4>
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ john /usr/local/shadow-4 --session=session4
Loaded 13 password hashes with 13 different salts (descrypt, traditional crypt(3) [DES 128/128 SSE
2-16])
Press 'q' or Ctrl-C to abort, almost any other key for status
Warning: MaxLen = 13 is too large for the current hash type, reduced to 8
0g 0:00:00:02 3/3 0g/s 99377p/s 1198Kc/s 1198KC/s arnato..chrum
0g 0:00:00:05 3/3 0g/s 135199p/s 1720Kc/s 1720KC/s aurae1..aurno1
0g 0:00:00:07 3/3 0g/s 153029p/s 1962Kc/s 1962KC/s batrela..batry13
ian : john


ian : telnet — Konsole
File Edit View Bookmarks Settings Help
session3: 0g 0:12:33:46 3/3 0g/s 194937p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:45 3/3 0g/s 193899p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:45 3/3 0g/s 193628p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:47 3/3 0g/s 211591p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:46 3/3 0g/s 194937p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:47 3/3 0g/s 193895p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:46 3/3 0g/s 193626p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:47 3/3 0g/s 211591p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:47 3/3 0g/s 194936p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:47 3/3 0g/s 193895p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:47 3/3 0g/s 193626p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:48 3/3 0g/s 211589p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:49 3/3 0g/s 194932p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:49 3/3 0g/s 193896p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:49 3/3 0g/s 193623p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:49 3/3 0g/s 211586p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:49 3/3 0g/s 194932p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:49 3/3 0g/s 193896p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:49 3/3 0g/s 193623p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:50 3/3 0g/s 211585p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:50 3/3 0g/s 194931p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:51 3/3 0g/s 193896p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:51 3/3 0g/s 193621p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:51 3/3 0g/s 211584p/s 2539Kc/s 2539KC/s
session3: 0g 0:12:33:52 3/3 0g/s 194929p/s 2534Kc/s 2534KC/s
session4: 0g 0:12:33:51 3/3 0g/s 193896p/s 2520Kc/s 2520KC/s
session2: 0g 0:12:33:51 3/3 0g/s 193621p/s 2517Kc/s 2517KC/s
session1: 0g 0:12:33:52 3/3 0g/s 211583p/s 2538Kc/s 2538KC/s
ian : telnet

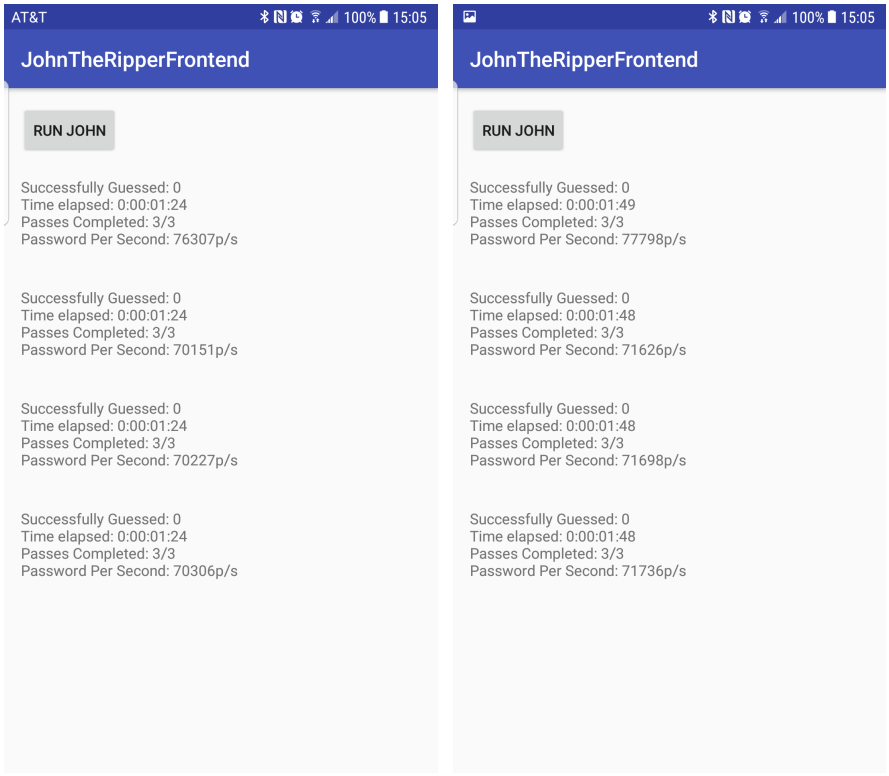
Cloud


(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com — Konsole
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ ssh ubuntu@ec2-35-166-139-99.us-west-2.compute.amazonaws.com
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 3.13.0-107-generic x86_64)
* Documentation: https://help.ubuntu.com/
System information as of Wed Apr 12 19:02:18 UTC 2017
System load: 0.2 Processes: 106
Usage of /: 20.4% of 7.74GB Users logged in: 1
Memory usage: 10% IP address for eth0: 172.31.40.188
Swap usage: 0%
Graph this data and manage this system at:
https://landscape.canonical.com/
Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud
New release '16.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
*** System restart required ***
Last login: Wed Apr 12 19:02:18 2017 from cpe-184-54-187-155.swo.res.rr.com
ubuntu@ip-172-31-40-188:~$
(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com
ian : bash


(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com — Konsole
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ ssh ubuntu@ec2-35-166-139-99.us-west-2.compute.amazonaws.com
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 3.13.0-107-generic x86_64)
* Documentation: https://help.ubuntu.com/
System information as of Wed Apr 12 19:02:18 UTC 2017
System load: 0.2 Processes: 106
Usage of /: 20.4% of 7.74GB Users logged in: 1
Memory usage: 10% IP address for eth0: 172.31.40.188
Swap usage: 0%
Graph this data and manage this system at:
https://landscape.canonical.com/
Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud
New release '16.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
*** System restart required ***
Last login: Wed Apr 12 19:02:18 2017 from cpe-184-54-187-155.swo.res.rr.com
ubuntu@ip-172-31-40-188:~$ java -jar JohnTheRipperBackend.jar
(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com
ian : bash


(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com — Konsole
File Edit View Bookmarks Settings Help
true
true
true
true
session4: 0g 0:00:00:01 0% 1/3 0g/s 0p/s 0c/s 0C/s
session3: 0g 0:00:00:01 0% 1/3 0g/s 0p/s 0c/s 0C/s
session2: 0g 0:00:00:01 0% 1/3 0g/s 0p/s 0c/s 0C/s
session1: 0g 0:00:00:01 0% 1/3 0g/s 0p/s 0c/s 0C/s
session4: 0g 0:00:00:01 0% 2/3 0g/s 15586p/s 15586c/s 15586C/s
session3: 0g 0:00:00:01 0% 2/3 0g/s 15586p/s 15586c/s 15586C/s
session2: 0g 0:00:00:01 0% 2/3 0g/s 15585p/s 15585c/s 15585C/s
session1: 0g 0:00:00:01 0% 2/3 0g/s 15043p/s 15043c/s 15043C/s
session4: 0g 0:00:00:02 3/3 0g/s 77425p/s 913015c/s 913015C/s
session3: 0g 0:00:00:02 3/3 0g/s 77425p/s 913015c/s 913015C/s
session2: 0g 0:00:00:02 3/3 0g/s 77425p/s 913015c/s 913015C/s
session1: 0g 0:00:00:02 3/3 0g/s 77154p/s 843111c/s 843111C/s
(ubuntu) ec2-35-166-139-99.us-west-2.compute.amazonaws.com
ian : bash

Android



Solo/Multi-process Comparison

Running john as both a solo and a multi-process ran for 8+ hours and had not completed, so the elapsed time between the two did not seem to be “measurably slower”. However, john reports statistics about how many passwords are being checked per second, and all 4 of the simultaneous instances reported the same passwords per second as the solo instance, so this leads me to believe that running 4 simultaneous instances would indeed be 4 times faster, but whether it’s 4 times faster than a week, month, or year is uncertain. Running the process in the cloud (Amazon EC2 instance) seemed to run surprisingly slower than on my laptop. I’m not sure if this is due to free-tier processing limits of AWS or something else. For comparison, john reported about 300,000 passwords/second/process on my laptop, but only about 198,000 passwords/second/process on the EC2 instance.

Status Report

Getting john up and running from the command line and the cloud was simple, however I was unsuccessful in getting them to complete even after 8+ hours on two separate occasions (with presumed session continuation by john). I have the majority of a cloud-based java server that will launch john instances via a socket request (to be used by an android APK when finished), but am having some issues trying to get john to update stdout periodically with status reports. I am spawning john processes in java via the Process class (and Runtime.getRuntime().exec()), and then attempting to pass a character through the stdin of the spawned process to get it to spit out a progress update, but I can't seem to get it to recognize it. I've tried appending a newline character to the end of the text I'm writing to stdin (john updates when any key is typed so I wouldn't assume it would matter what I give it, but for reference, I'm piping it an 'e' character), and calling flush in several different configurations on the BufferedWriter instance I'm using, to no avail. I looked through the documentation on john to see if maybe there was an option to force it to just periodically spit out progress updates automatically, but there doesn't appear to be such a feature. I will continue to search for a different option, but at the end of the day I may have to settle for just passing back "pseudo" progress updates to the apk via the socket so long as the process is still running.

UPDATE: I resolved the issues with getting status updates from the running john instances, the solution was to spawn up separate processes, one that sends a SIGHUP to john (via kill -1) and another that runs a john –-status command with the session name to get the status line that john normally provides. This is then piped back via the client socket to the android APK/whomever the client may be.

Experience Report

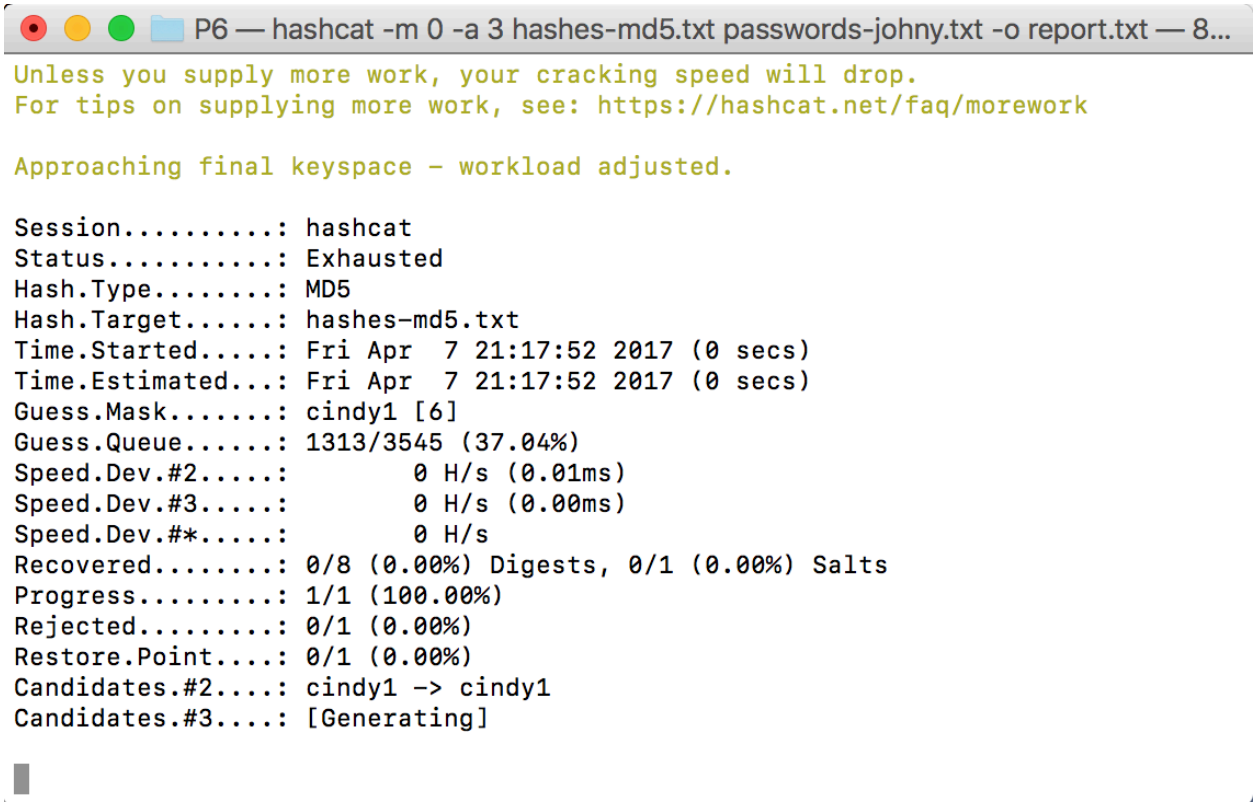
John itself seems to be a pretty powerful tool, but it seems to take a very long time to crack reasonably sized password dumps. After two sessions of 8+ hours each (with at least claimed status resuming) I was still unable to get through the shadow file provided fully. It has also proven to be quite the challenge to interact with john processes spawned programmatically via Java (as detailed in status report).

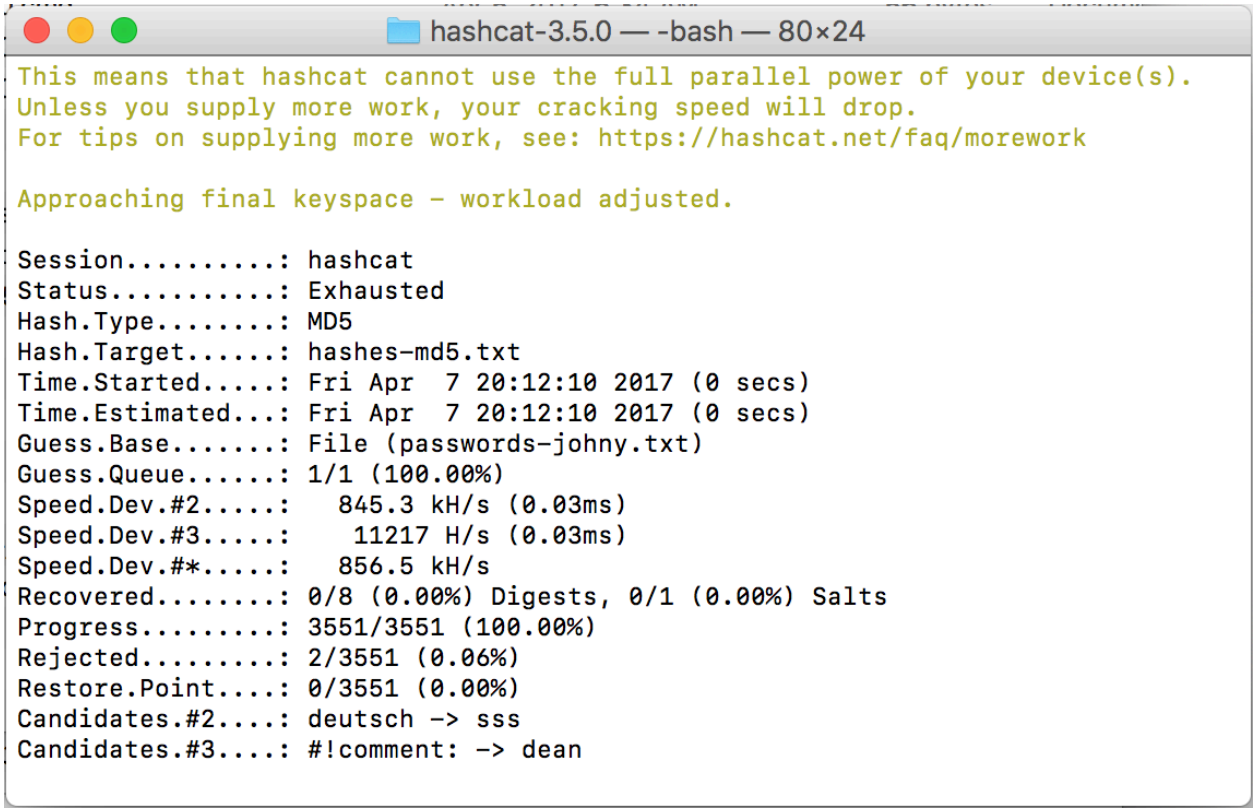
UPDATE: After another 12 hour session running overnight, John managed to crack one password from the first fourth of the blocks.

Task 2

- Screenshots pg. 10-12
- Status Report pg. 12-13
- Experience Report pg. 13

Not Working


P6 — hashcat -m 0 -a 3 hashes-md5.txt passwords-johny.txt -o report.txt — 8...
Unless you supply more work, your cracking speed will drop.
For tips on supplying more work, see: https://hashcat.net/faq/morework
Approaching final keyspace - workload adjusted.
Session..........: hashcat
Status...........: Exhausted
Hash.Type........: MD5
Hash.Target......: hashes-md5.txt
Time.Started.....: Fri Apr 7 21:17:52 2017 (0 secs)
Time.Estimated...: Fri Apr 7 21:17:52 2017 (0 secs)
Guess.Mask.......: cindy1 [6]
Guess.Queue......: 1313/3545 (37.04%)
Speed.Dev.#2.....:   0 H/s (0.01ms)
Speed.Dev.#3.....:   0 H/s (0.00ms)
Speed.Dev.#*.....:   0 H/s
Recovered........: 0/8 (0.00%) Digests, 0/1 (0.00%) Salts
Progress.........: 1/1 (100.00%)
Rejected.........: 0/1 (0.00%)
Restore.Point....: 0/1 (0.00%)
Candidates.#2....: cindy1 -> cindy1
Candidates.#3....: [Generating]

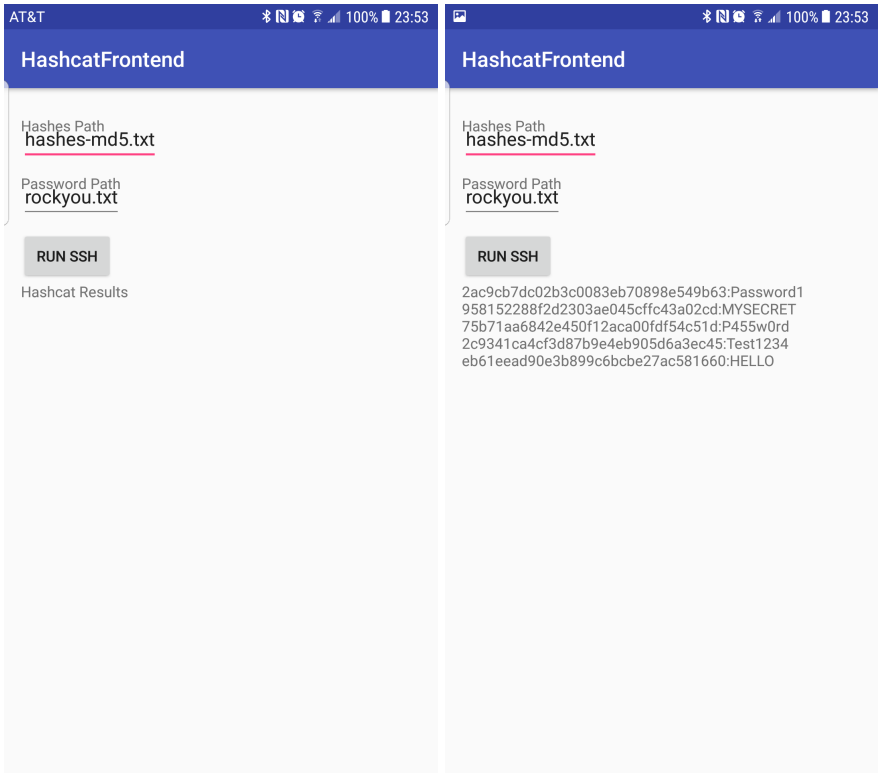

hashcat-3.5.0 — -bash — 80×24
This means that hashcat cannot use the full parallel power of your device(s).
Unless you supply more work, your cracking speed will drop.
For tips on supplying more work, see: https://hashcat.net/faq/morework
Approaching final keyspace - workload adjusted.
Session..........: hashcat
Status...........: Exhausted
Hash.Type........: MD5
Hash.Target......: hashes-md5.txt
Time.Started.....: Fri Apr 7 20:12:10 2017 (0 secs)
Time.Estimated...: Fri Apr 7 20:12:10 2017 (0 secs)
Guess.Base.......: File (passwords-johny.txt)
Guess.Queue......: 1/1 (100.00%)
Speed.Dev.#2.....:   845.3 kH/s (0.03ms)
Speed.Dev.#3.....:   11217 H/s (0.03ms)
Speed.Dev.#*.....:   856.5 kH/s
Recovered........: 0/8 (0.00%) Digests, 0/1 (0.00%) Salts
Progress.........: 3551/3551 (100.00%)
Rejected.........: 2/3551 (0.06%)
Restore.Point....: 0/3551 (0.00%)
Candidates.#2....: deutsch -> sss
Candidates.#3....: #!comment: -> dean

```
P6 — hashcat -m 0 -a 3 hashes-md5.txt passwords-johny.txt -o report.txt — 8...
Unless you supply more work, your cracking speed will drop.
For tips on supplying more work, see: https://hashcat.net/faq/morework

Approaching final keyspace - workload adjusted.

Session..........: hashcat
Status...........: Exhausted
Hash.Type........: MD5
Hash.Target......: hashes-md5.txt
Time.Started.....: Fri Apr  7 21:22:51 2017 (0 secs)
Time.Estimated...: Fri Apr  7 21:22:51 2017 (0 secs)
Guess.Mask.......: legal [5]
Guess.Queue......: 3040/3545 (85.75%)
Speed.Dev.#2.....:        0 H/s (0.01ms)
Speed.Dev.#3.....:        0 H/s (0.00ms)
Speed.Dev.#*.....:        0 H/s
Recovered........: 0/8 (0.00%) Digests, 0/1 (0.00%) Salts
Progress.........: 1/1 (100.00%)
Rejected.........: 0/1 (0.00%)
Restore.Point....: 0/1 (0.00%)
Candidates.#2....: legal -> legal
Candidates.#3....: [Generating]
```

Working

```
Documents — -bash — 80×24
[Ians-MBP:Documents ian$ hashcat -m 0 -a 0 --show --quiet hashes-md5.txt rockyou.]
txt
2ac9cb7dc02b3c0083eb70898e549b63:Password1
958152288f2d2303ae045cffc43a02cd:MYSECRET
75b71aa6842e450f12aca00fdf54c51d:P455w0rd
2c9341ca4cf3d87b9e4eb905d6a3ec45:Test1234
eb61eead90e3b899c6bcbe27ac581660:HELLO
[Ians-MBP:Documents ian$ hashcat -m 0 -a 0 --show -o cracked.txt hashes-md5.txt r]
ockyou.txt
[Ians-MBP:Documents ian$ ls                                                     ]
Applications                    Videos
Code                            Virtual Machines.localized
Games                           cracked.txt
Icon?                           formatted_output.txt
JohnTheRipperServer.java        hashes-md5.txt
Main.java                       passwords-johny.txt
School                          rockyou.txt
[Ians-MBP:Documents ian$ cat cracked.txt                                        ]
2ac9cb7dc02b3c0083eb70898e549b63:Password1
958152288f2d2303ae045cffc43a02cd:MYSECRET
75b71aa6842e450f12aca00fdf54c51d:P455w0rd
2c9341ca4cf3d87b9e4eb905d6a3ec45:Test1234
eb61eead90e3b899c6bcbe27ac581660:HELLO
Ians-MBP:Documents ian$
```

Android APK



Status Report

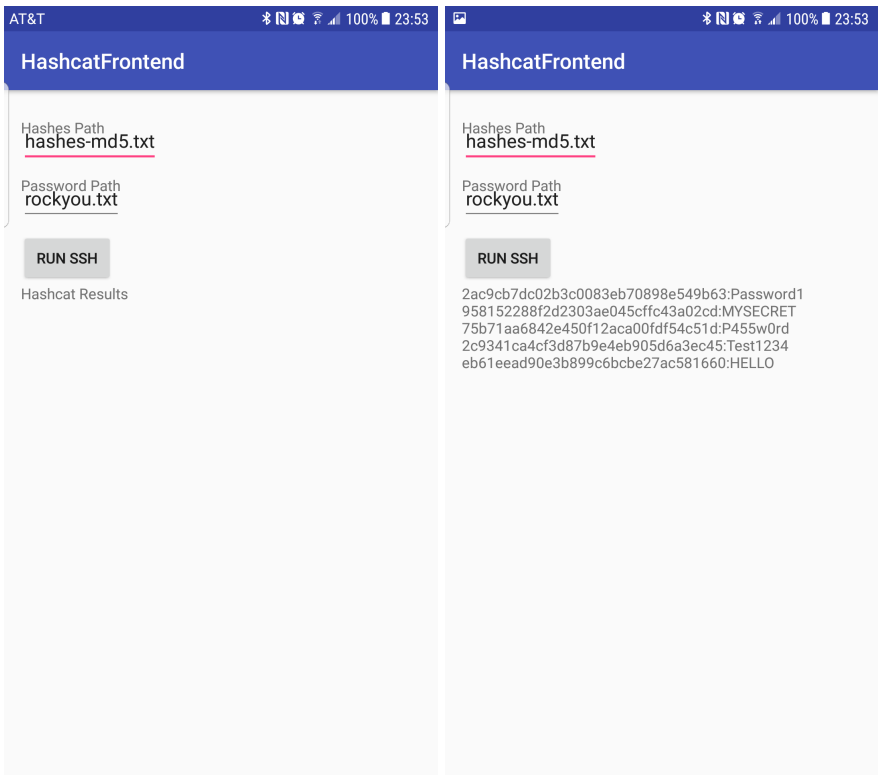
I was not able to get hashcat to install through apt-get, no package was found. I downloaded the binaries from their website and used those instead. I use a linux VM on my laptop, and through my VM hashcat could not see any graphics card drivers that it could use. I tried a couple solutions online to allow hashcat to run via the CPU but could not get them to function. Instead, I installed hashcat (via source) on my host Mac machine, which was able to access the GPU drivers and ran successfully. After that, I had troubles with the wordlist provided with P6, it complained that there were not enough words and appeared to be unsuccessful in hacking any passwords, as was mentioned in a pilot discussion, I found the rockyou.txt wordlist online (https://wiki.skullsecurity.org/Passwords) and used that, which solved this issue and allowed

hashcat to successfully crack all password hashes given in hashes-md5.txt. To implement the Android APK, I kept a generic SSH Client implementation that runs hashcat remotely on either my laptop or an Amazon EC2 instance running in the cloud (to solve this and task 3 together). I was unsure on the specifications of the Upload URL portion of the settings dialog, so I opted to simply have two text edits that specified the files on the remote server that would be used by the command. When considering how to upload files to the server, I wasn't sure where the files would be supplied on the android device. Whether a file picker should be shown for each item, should they be embedded in the android APK, etc? Documentation on the rules files used by hashcat (via hashcat's wiki) were a little bit lackluster, and didn't quite describe the overall flow of the process. Despite that, I was able to piece together one of the larger rules files provided in the hashcat source code distribution with in-line comments explaining what each command tries to do (included on Github repo as rules.txt).

Experience Report

Installing and getting hashcat to run on my laptop was quite a pain, but once I got the proper libraries setup and everything configured I was able to breeze through this task. This task took approximately 5 hours to complete fully.

Task 3



Status Report

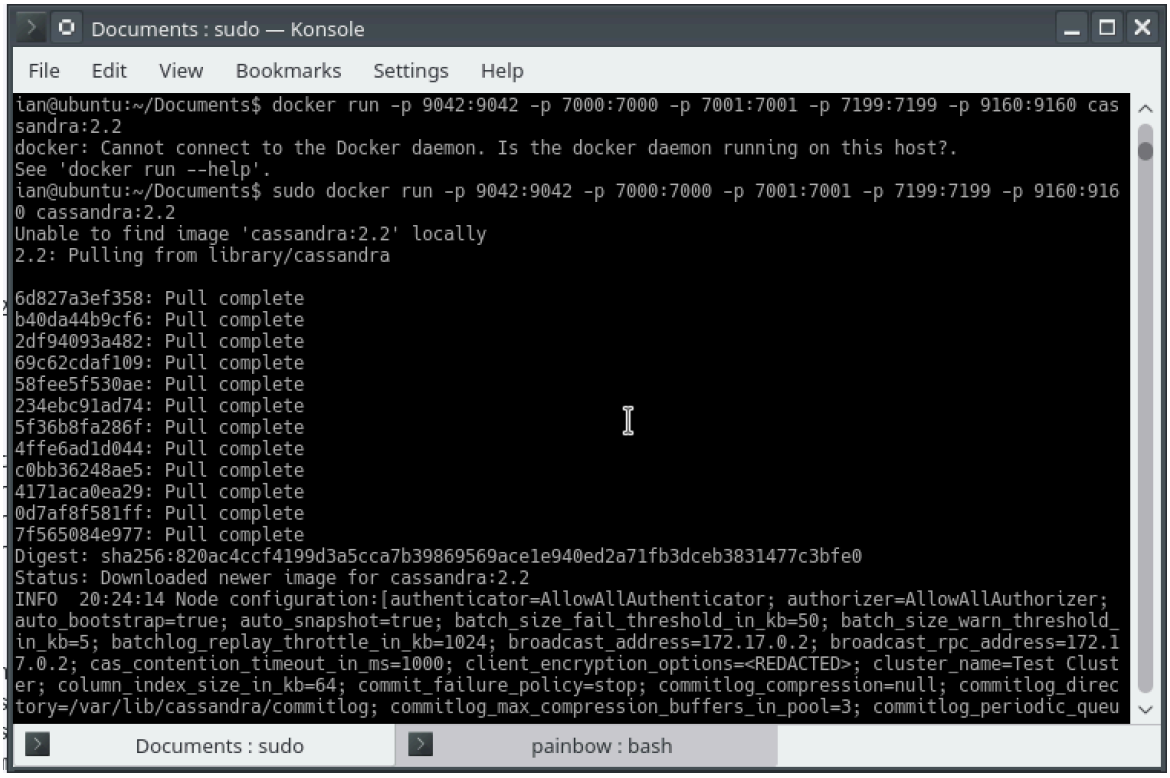
This task was completely solved in conjunction with the end of Task 2. However, in addition to the apk that runs hashcat via an ssh connection, I had to find a working solution to the issue I had running hashcat on my VM, as my Amazon EC2 instance (obviously) had no GPU drivers, or a GPU for that matter. I managed to find links on their website to the Intel OpenCL drivers that allow the CPU to behave(?) like a GPU as far as hashcat is concerned (by my understanding). Installing these fixed hashcat and it ran correctly from my EC2 instance.

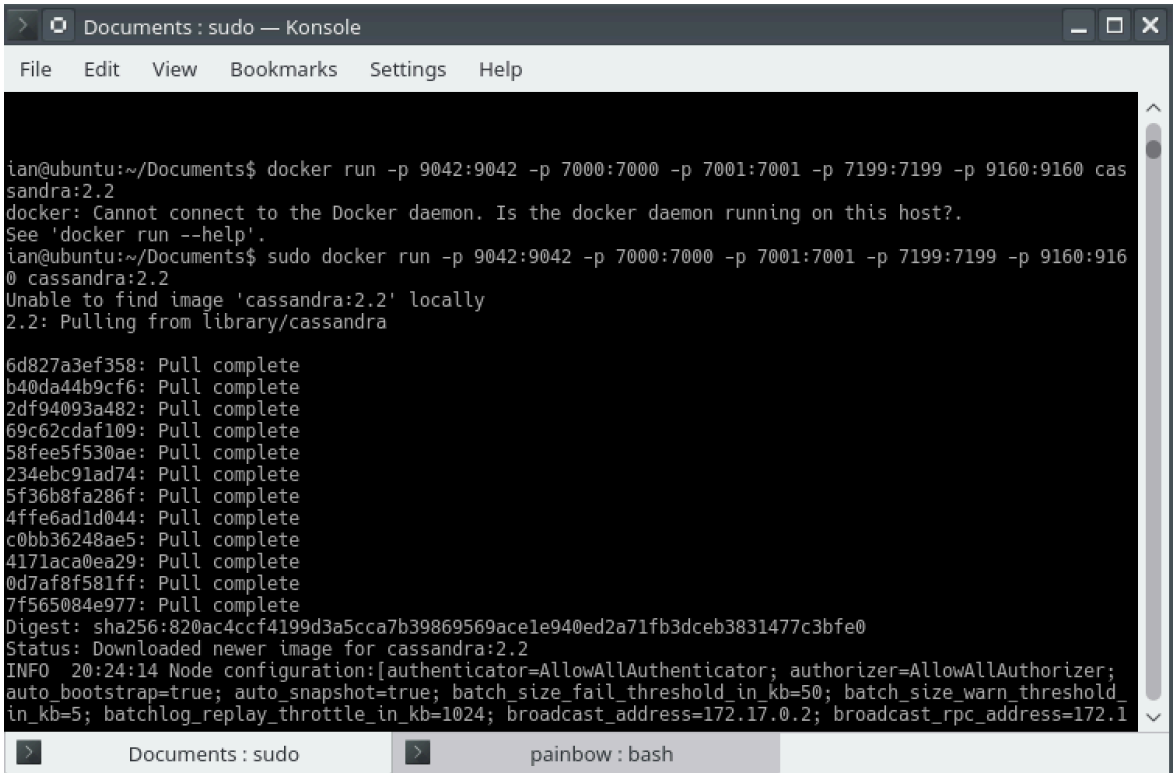
Experience Report

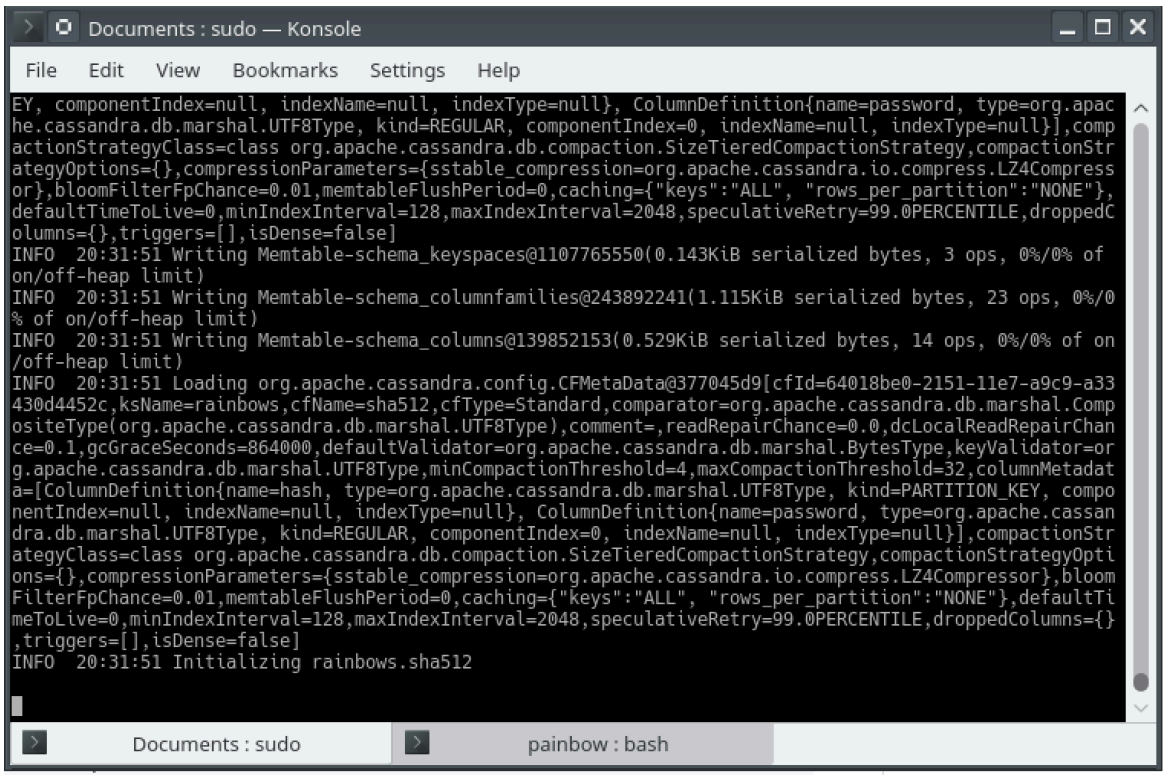
This task fit very closely together with Task 2, and only took me an hour or so to resolve the issues with the hashcat drivers. The bonus task was not attempted.

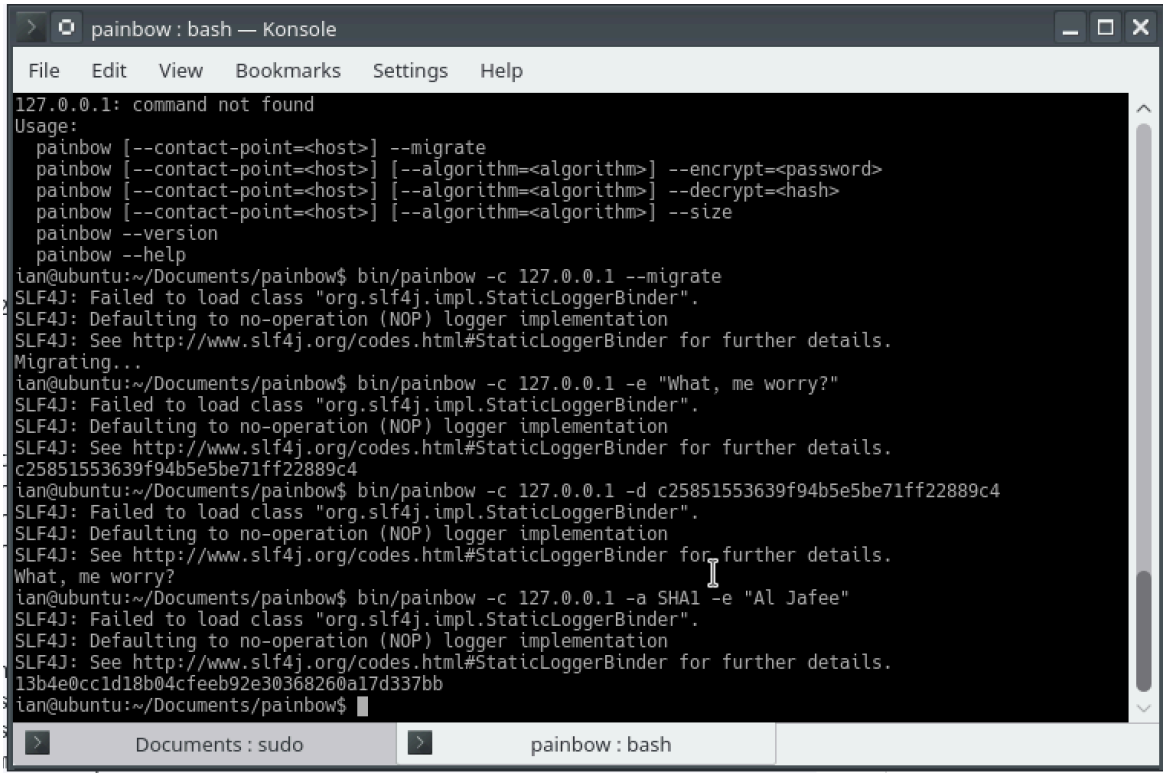
Task 4

Laptop

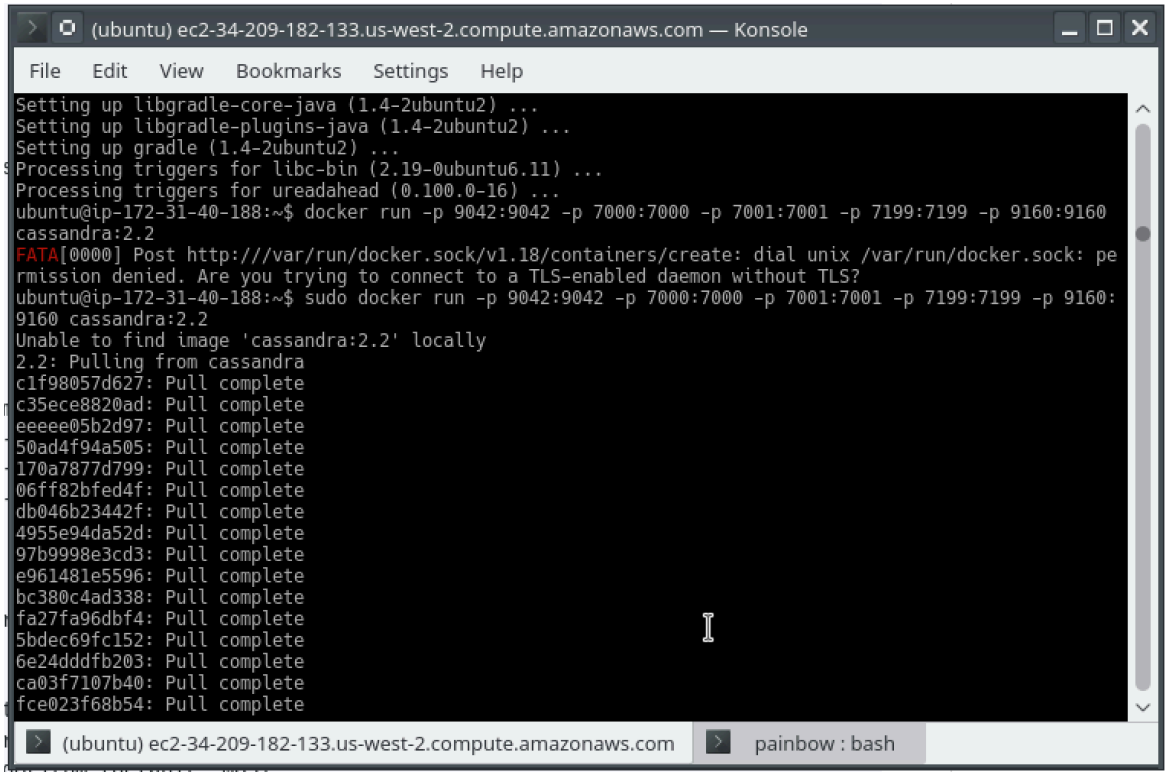

Documents : sudo — Konsole
File Edit View Bookmarks Settings Help
ian@ubuntu:~/Documents$ docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:9160 cas
sandra:2.2
docker: Cannot connect to the Docker daemon. Is the docker daemon running on this host?.
See 'docker run --help'.
ian@ubuntu:~/Documents$ sudo docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:916
0 cassandra:2.2
Unable to find image 'cassandra:2.2' locally
2.2: Pulling from library/cassandra
6d827a3ef358: Pull complete
b40da44b9cf6: Pull complete
2df94093a482: Pull complete
69c62cdaf109: Pull complete
58fee5f530ae: Pull complete
234ebc91ad74: Pull complete
5f36b8fa286f: Pull complete
4ffe6ad1d044: Pull complete
c0bb36248ae5: Pull complete
4171aca0ea29: Pull complete
0d7af8f581ff: Pull complete
7f565084e977: Pull complete
Digest: sha256:820ac4ccf4199d3a5cca7b39869569ace1e940ed2a71fb3dceb3831477c3bfe0
Status: Downloaded newer image for cassandra:2.2
INFO 20:24:14 Node configuration:[authenticator=AllowAllAuthenticator; authorizer=AllowAllAuthorizer;
auto_bootstrap=true; auto_snapshot=true; batch_size_fail_threshold_in_kb=50; batch_size_warn_threshold_
in_kb=5; batchlog_replay_throttle_in_kb=1024; broadcast_address=172.17.0.2; broadcast_rpc_address=172.1
7.0.2; cas_contention_timeout_in_ms=1000; client_encryption_options=<REDACTED>; cluster_name=Test Clust
er; column_index_size_in_kb=64; commit_failure_policy=stop; commitlog_compression=null; commitlog_direc
tory=/var/lib/cassandra/commitlog; commitlog_max_compression_buffers_in_pool=3; commitlog_periodic_queu
Documents : sudo
painbow : bash

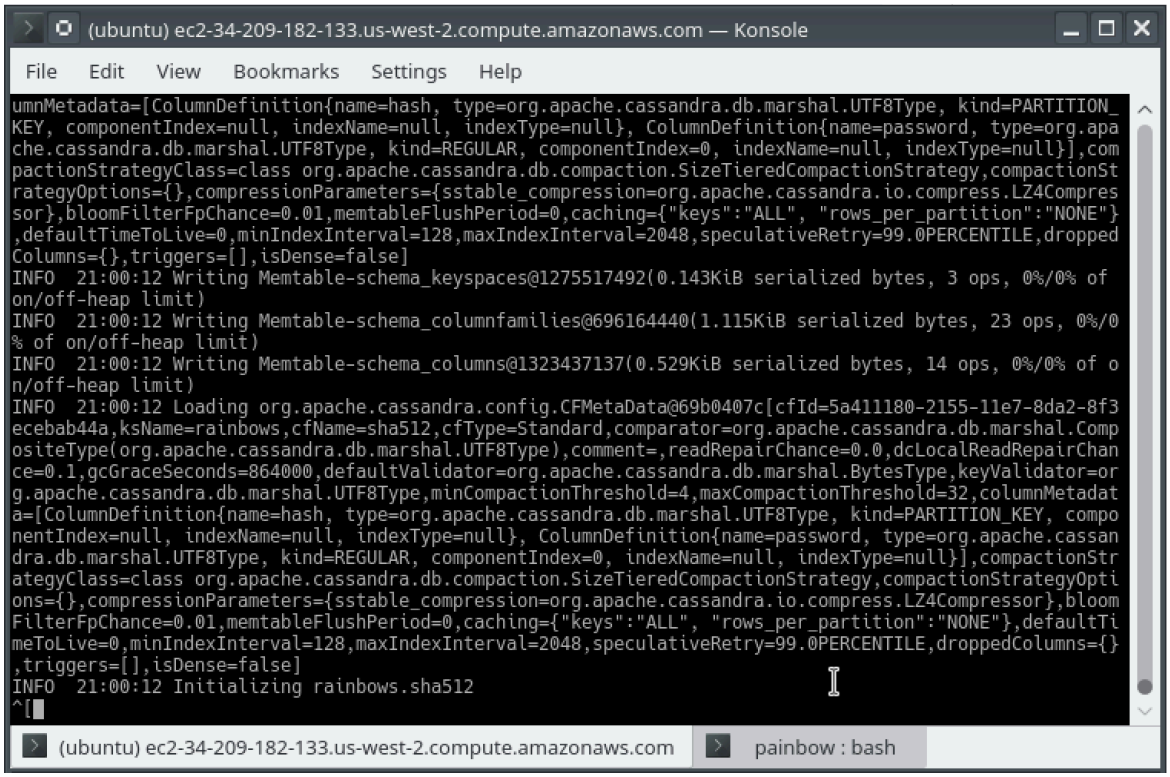

Documents : sudo — Konsole
File Edit View Bookmarks Settings Help
ian@ubuntu:~/Documents$ docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:9160 cas
sandra:2.2
docker: Cannot connect to the Docker daemon. Is the docker daemon running on this host?.
See 'docker run --help'.
ian@ubuntu:~/Documents$ sudo docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:916
0 cassandra:2.2
Unable to find image 'cassandra:2.2' locally
2.2: Pulling from library/cassandra
6d827a3ef358: Pull complete
b40da44b9cf6: Pull complete
2df94093a482: Pull complete
69c62cdaf109: Pull complete
58fee5f530ae: Pull complete
234ebc91ad74: Pull complete
5f36b8fa286f: Pull complete
4ffe6ad1d044: Pull complete
c0bb36248ae5: Pull complete
4171aca0ea29: Pull complete
0d7af8f581ff: Pull complete
7f565084e977: Pull complete
Digest: sha256:820ac4ccf4199d3a5cca7b39869569ace1e940ed2a71fb3dceb3831477c3bfe0
Status: Downloaded newer image for cassandra:2.2
INFO 20:24:14 Node configuration:[authenticator=AllowAllAuthenticator; authorizer=AllowAllAuthorizer;
auto_bootstrap=true; auto_snapshot=true; batch_size_fail_threshold_in_kb=50; batch_size_warn_threshold_
in_kb=5; batchlog_replay_throttle_in_kb=1024; broadcast_address=172.17.0.2; broadcast_rpc_address=172.1
Documents : sudo
painbow : bash

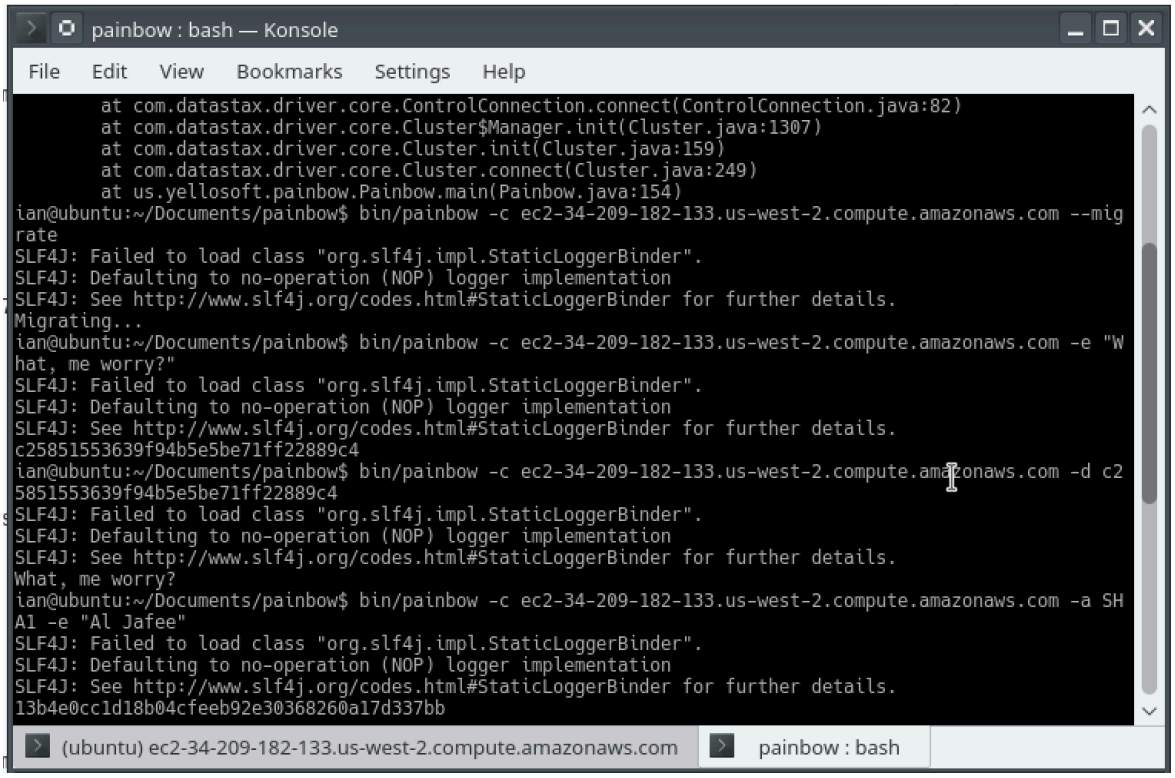

Documents : sudo — Konsole
File Edit View Bookmarks Settings Help
EY, componentIndex=null, indexName=null, indexType=null}, ColumnDefinition{name=password, type=org.apac
he.cassandra.db.marshal.UTF8Type, kind=REGULAR, componentIndex=0, indexName=null, indexType=null}],comp
actionStrategyClass=class org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy,compactionStr
ategyOptions={},compressionParameters={sstable_compression=org.apache.cassandra.io.compress.LZ4Compress
or},bloomFilterFpChance=0.01,memtableFlushPeriod=0,caching={"keys":"ALL", "rows_per_partition":"NONE"},
defaultTimeToLive=0,minIndexInterval=128,maxIndexInterval=2048,speculativeRetry=99.0PERCENTILE,droppedC
olumns={},triggers=[],isDense=false]
INFO 20:31:51 Writing Memtable-schema_keyspaces@1107765550(0.143KiB serialized bytes, 3 ops, 0%/0% of
on/off-heap limit)
INFO 20:31:51 Writing Memtable-schema_columnfamilies@243892241(1.115KiB serialized bytes, 23 ops, 0%/0
% of on/off-heap limit)
INFO 20:31:51 Writing Memtable-schema_columns@139852153(0.529KiB serialized bytes, 14 ops, 0%/0% of on
/off-heap limit)
INFO 20:31:51 Loading org.apache.cassandra.config.CFMetaData@377045d9[cfId=64018be0-2151-11e7-a9c9-a33
430d4452c,ksName=rainbows,cfName=sha512,cfType=Standard,comparator=org.apache.cassandra.db.marshal.Comp
ositeType(org.apache.cassandra.db.marshal.UTF8Type),comment=,readRepairChance=0.0,dcLocalReadRepairChan
ce=0.1,gcGraceSeconds=864000,defaultValidator=org.apache.cassandra.db.marshal.BytesType,keyValidator=or
g.apache.cassandra.db.marshal.UTF8Type,minCompactionThreshold=4,maxCompactionThreshold=32,columnMetadat
a=[ColumnDefinition{name=hash, type=org.apache.cassandra.db.marshal.UTF8Type, kind=PARTITION_KEY, compo
nentIndex=null, indexName=null, indexType=null}, ColumnDefinition{name=password, type=org.apache.cassan
dra.db.marshal.UTF8Type, kind=REGULAR, componentIndex=0, indexName=null, indexType=null}],compactionStr
ategyClass=class org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy,compactionStrategyOpti
ons={},compressionParameters={sstable_compression=org.apache.cassandra.io.compress.LZ4Compressor},bloom
FilterFpChance=0.01,memtableFlushPeriod=0,caching={"keys":"ALL", "rows_per_partition":"NONE"},defaultTi
meToLive=0,minIndexInterval=128,maxIndexInterval=2048,speculativeRetry=99.0PERCENTILE,droppedColumns={}
,triggers=[],isDense=false]
INFO 20:31:51 Initializing rainbows.sha512
Documents : sudo
painbow : bash

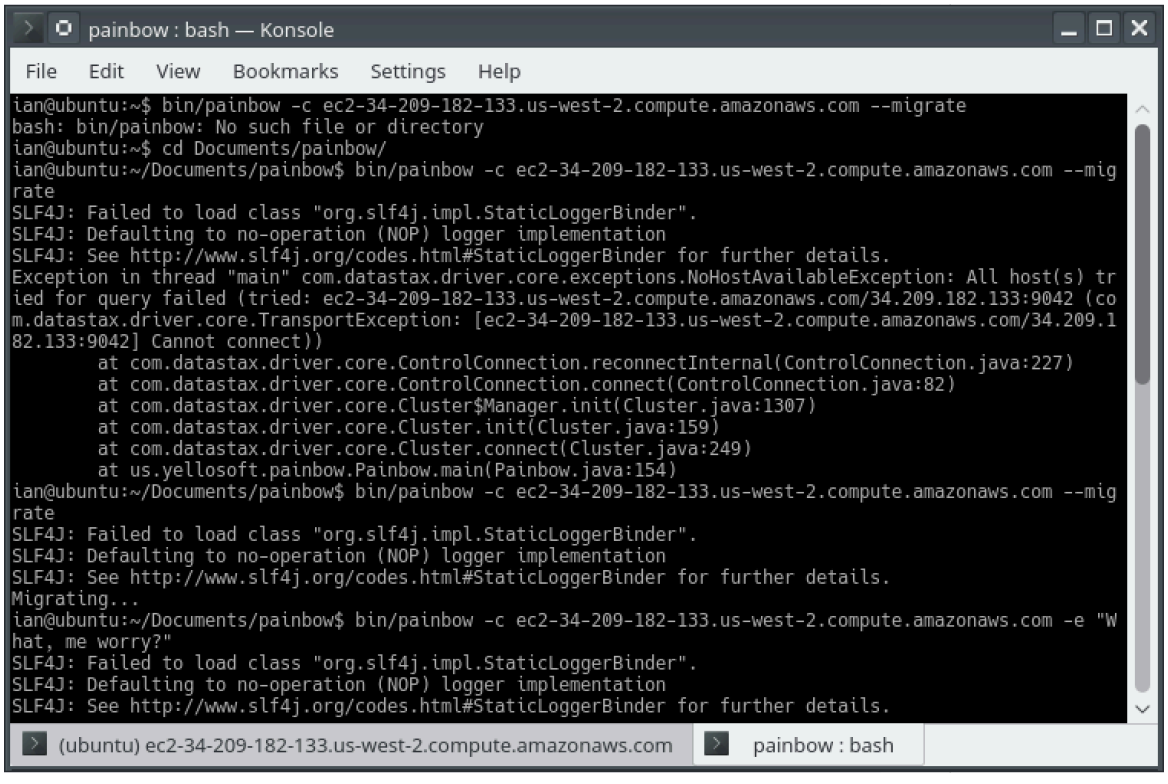

painbow : bash — Konsole
File Edit View Bookmarks Settings Help
127.0.0.1: command not found
Usage:
painbow [--contact-point=<host>] --migrate
painbow [--contact-point=<host>] [--algorithm=<algorithm>] --encrypt=<password>
painbow [--contact-point=<host>] [--algorithm=<algorithm>] --decrypt=<hash>
painbow [--contact-point=<host>] [--algorithm=<algorithm>] --size
painbow --version
painbow --help
ian@ubuntu:~/Documents/painbow$ bin/painbow -c 127.0.0.1 --migrate
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Migrating...
ian@ubuntu:~/Documents/painbow$ bin/painbow -c 127.0.0.1 -e "What, me worry?"
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
c25851553639f94b5e5be71ff22889c4
ian@ubuntu:~/Documents/painbow$ bin/painbow -c 127.0.0.1 -d c25851553639f94b5e5be71ff22889c4
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
What, me worry?
ian@ubuntu:~/Documents/painbow$ bin/painbow -c 127.0.0.1 -a SHA1 -e "Al Jafee"
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
13b4e0cc1d18b04cfeeb92e30368260a17d337bb
ian@ubuntu:~/Documents/painbow$
Documents : sudo
painbow : bash

Cloud


(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com — Konsole
File Edit View Bookmarks Settings Help
Setting up libgradle-core-java (1.4-2ubuntu2) ...
Setting up libgradle-plugins-java (1.4-2ubuntu2) ...
Setting up gradle (1.4-2ubuntu2) ...
Processing triggers for libc-bin (2.19-0ubuntu6.11) ...
Processing triggers for ureadahead (0.100.0-16) ...
ubuntu@ip-172-31-40-188:~$ docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:9160
cassandra:2.2
FATA[0000] Post http:///var/run/docker.sock/v1.18/containers/create: dial unix /var/run/docker.sock: pe
rmission denied. Are you trying to connect to a TLS-enabled daemon without TLS?
ubuntu@ip-172-31-40-188:~$ sudo docker run -p 9042:9042 -p 7000:7000 -p 7001:7001 -p 7199:7199 -p 9160:
9160 cassandra:2.2
Unable to find image 'cassandra:2.2' locally
2.2: Pulling from cassandra
c1f98057d627: Pull complete
c35ece8820ad: Pull complete
eeeee05b2d97: Pull complete
50ad4f94a505: Pull complete
170a7877d799: Pull complete
06ff82bfed4f: Pull complete
db046b23442f: Pull complete
4955e94da52d: Pull complete
97b9998e3cd3: Pull complete
e961481e5596: Pull complete
bc380c4ad338: Pull complete
fa27fa96dbf4: Pull complete
5bdec69fc152: Pull complete
6e24dddfb203: Pull complete
ca03f7107b40: Pull complete
fce023f68b54: Pull complete
(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com
painbow : bash


(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com — Konsole
File Edit View Bookmarks Settings Help
umnMetadata=[ColumnDefinition{name=hash, type=org.apache.cassandra.db.marshal.UTF8Type, kind=PARTITION_
KEY, componentIndex=null, indexName=null, indexType=null}, ColumnDefinition{name=password, type=org.apa
che.cassandra.db.marshal.UTF8Type, kind=REGULAR, componentIndex=0, indexName=null, indexType=null}],com
pactionStrategyClass=class org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy,compactionSt
rategyOptions={},compressionParameters={sstable_compression=org.apache.cassandra.io.compress.LZ4Compres
sor},bloomFilterFpChance=0.01,memtableFlushPeriod=0,caching={"keys":"ALL", "rows_per_partition":"NONE"}
,defaultTimeToLive=0,minIndexInterval=128,maxIndexInterval=2048,speculativeRetry=99.0PERCENTILE,dropped
Columns={},triggers=[],isDense=false]
INFO 21:00:12 Writing Memtable-schema_keyspaces@1275517492(0.143KiB serialized bytes, 3 ops, 0%/0% of
on/off-heap limit)
INFO 21:00:12 Writing Memtable-schema_columnfamilies@696164440(1.115KiB serialized bytes, 23 ops, 0%/0
% of on/off-heap limit)
INFO 21:00:12 Writing Memtable-schema_columns@1323437137(0.529KiB serialized bytes, 14 ops, 0%/0% of o
n/off-heap limit)
INFO 21:00:12 Loading org.apache.cassandra.config.CFMetaData@69b0407c[cfId=5a411180-2155-11e7-8da2-8f3
ecebab44a,ksName=rainbows,cfName=sha512,cfType=Standard,comparator=org.apache.cassandra.db.marshal.Comp
ositeType(org.apache.cassandra.db.marshal.UTF8Type),comment=,readRepairChance=0.0,dcLocalReadRepairChan
ce=0.1,gcGraceSeconds=864000,defaultValidator=org.apache.cassandra.db.marshal.BytesType,keyValidator=or
g.apache.cassandra.db.marshal.UTF8Type,minCompactionThreshold=4,maxCompactionThreshold=32,columnMetadat
a=[ColumnDefinition{name=hash, type=org.apache.cassandra.db.marshal.UTF8Type, kind=PARTITION_KEY, compo
nentIndex=null, indexName=null, indexType=null}, ColumnDefinition{name=password, type=org.apache.cassan
dra.db.marshal.UTF8Type, kind=REGULAR, componentIndex=0, indexName=null, indexType=null}],compactionStr
ategyClass=class org.apache.cassandra.db.compaction.SizeTieredCompactionStrategy,compactionStrategyOpti
ons={},compressionParameters={sstable_compression=org.apache.cassandra.io.compress.LZ4Compressor},bloom
FilterFpChance=0.01,memtableFlushPeriod=0,caching={"keys":"ALL", "rows_per_partition":"NONE"},defaultTi
meToLive=0,minIndexInterval=128,maxIndexInterval=2048,speculativeRetry=99.0PERCENTILE,droppedColumns={}
,triggers=[],isDense=false]
INFO 21:00:12 Initializing rainbows.sha512
^[
(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com
painbow : bash


painbow : bash — Konsole
File Edit View Bookmarks Settings Help
at com.datastax.driver.core.ControlConnection.connect(ControlConnection.java:82)
at com.datastax.driver.core.Cluster$Manager.init(Cluster.java:1307)
at com.datastax.driver.core.Cluster.init(Cluster.java:159)
at com.datastax.driver.core.Cluster.connect(Cluster.java:249)
at us.yellosoft.painbow.Painbow.main(Painbow.java:154)
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com --mig
rate
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Migrating...
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com -e "W
hat, me worry?"
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
c25851553639f94b5e5be71ff22889c4
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com -d c2
5851553639f94b5e5be71ff22889c4
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
What, me worry?
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com -a SH
A1 -e "Al Jafee"
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
13b4e0cc1d18b04cfeeb92e30368260a17d337bb
(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com
painbow : bash


painbow : bash — Konsole
File Edit View Bookmarks Settings Help
ian@ubuntu:~$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com --migrate
bash: bin/painbow: No such file or directory
ian@ubuntu:~$ cd Documents/painbow/
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com --mig
rate
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Exception in thread "main" com.datastax.driver.core.exceptions.NoHostAvailableException: All host(s) tr
ied for query failed (tried: ec2-34-209-182-133.us-west-2.compute.amazonaws.com/34.209.182.133:9042 (co
m.datastax.driver.core.TransportException: [ec2-34-209-182-133.us-west-2.compute.amazonaws.com/34.209.1
82.133:9042] Cannot connect))
at com.datastax.driver.core.ControlConnection.reconnectInternal(ControlConnection.java:227)
at com.datastax.driver.core.ControlConnection.connect(ControlConnection.java:82)
at com.datastax.driver.core.Cluster$Manager.init(Cluster.java:1307)
at com.datastax.driver.core.Cluster.init(Cluster.java:159)
at com.datastax.driver.core.Cluster.connect(Cluster.java:249)
at us.yellosoft.painbow.Painbow.main(Painbow.java:154)
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com --mig
rate
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
Migrating...
ian@ubuntu:~/Documents/painbow$ bin/painbow -c ec2-34-209-182-133.us-west-2.compute.amazonaws.com -e "W
hat, me worry?"
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
(ubuntu) ec2-34-209-182-133.us-west-2.compute.amazonaws.com
painbow : bash

Status Report

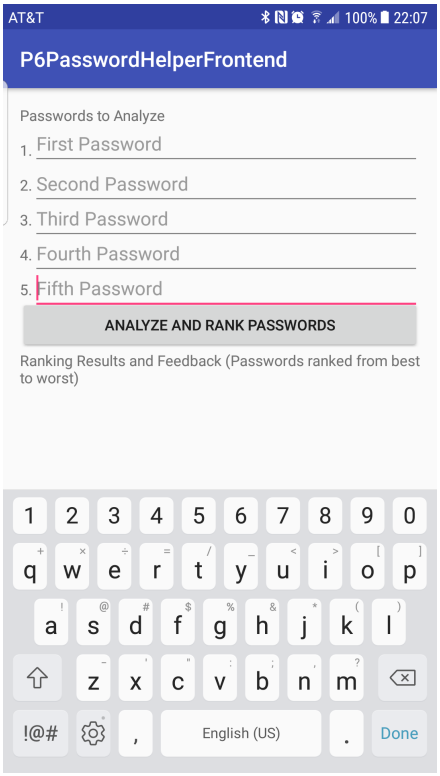
Setting up the docker container locally was a breeze, but for some reason I ended up having to run it as root, or it would complain about not being able to connect to the docker daemon (which was running). There were a few extra issues setting up in the cloud, namely with getting all the dependencies that painbow needed. After adding a repository to apt-get and installing a few items, this was resolved. Although, I was unable to build the painbow executable on the cloud, and had to copy one built locally up in order to get it running.

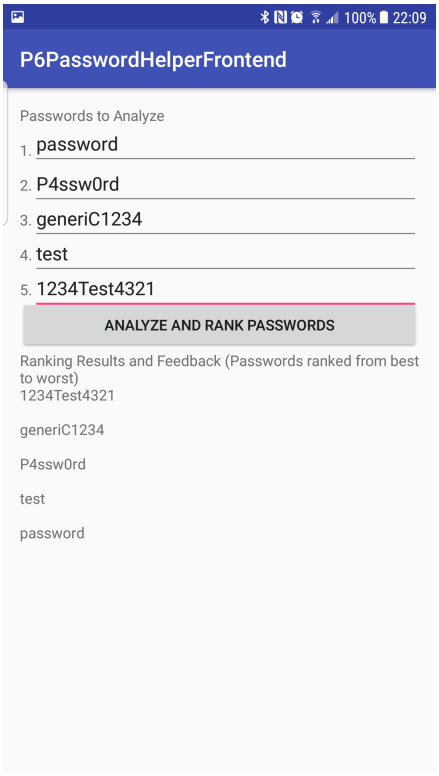
Experience Report

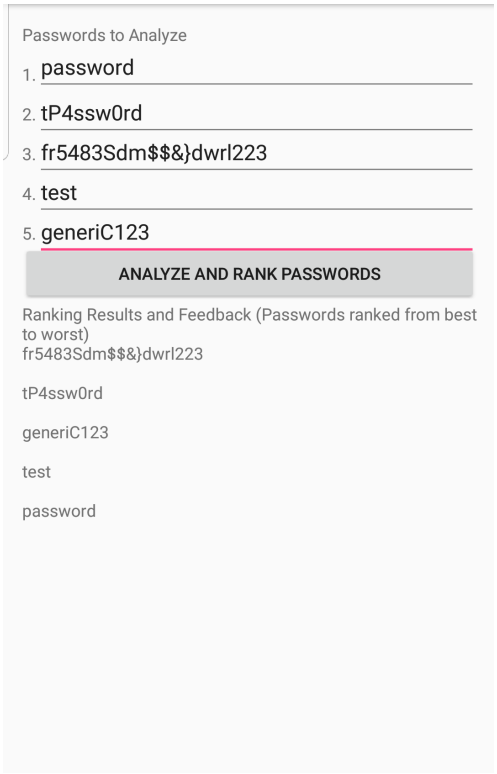
Other than a few troubleshooting and dependency issues in the cloud, this task was very easy and only took about an hour to complete.

Task 5

- Screenshots pg. 21-22
- Status Report pg. 22
- Experience Report pg. 22


AT&T
100% 22:07
P6PasswordHelperFrontend
Passwords to Analyze
1. First Password
2. Second Password
3. Third Password
4. Fourth Password
5. Fifth Password
ANALYZE AND RANK PASSWORDS
Ranking Results and Feedback (Passwords ranked from best to worst)
1 2 3 4 5 6 7 8 9 0
q w e r t y u i o p
a s d f g h j k l
z x c v b n m
!@# , English (US) . Done


100% 22:09
P6PasswordHelperFrontend
Passwords to Analyze
1. password
2. P4ssw0rd
3. generiC1234
4. test
5. 1234Test4321
ANALYZE AND RANK PASSWORDS
Ranking Results and Feedback (Passwords ranked from best to worst)
1234Test4321
generiC1234
P4ssw0rd
test
password


Passwords to Analyze
1. password
2. tP4ssw0rd
3. fr5483Sdm$$&}dwrl223
4. test
5. generiC123
ANALYZE AND RANK PASSWORDS
Ranking Results and Feedback (Passwords ranked from best to worst)
fr5483Sdm$$&}dwrl223
tP4ssw0rd
generiC123
test
password

Status Report

There were a few issues incorporating the Password Strength Estimator as a library into my backend project, but adding it as a remote Maven project resolved these issues. Beyond that, I had some trouble setting up messaging between my backend and frontend. Initially, I was adding in feedback messages to the apk results view for each password. After some initial testing, however, it turned out that the feedback (or the way I was retrieving the feedback) was almost identical for every password supplied. I decided to remove this feedback from the display because of this, as it wasn't very helpful. The internal messaging with this feedback is still in place, however, so it could be easily reincorporated if this issue were resolved. As of now, the app takes 5 passwords from the user, sends a message to a backend running on an Amazon EC2 instance in the cloud with those passwords, and the instance runs it through the estimator library, sorts all 5 passwords based on their Entropy value, and returns a sorted list of best->worst passwords out of the 5 given.

Experience Report

This task was the most interesting out of P6. I was unclear on all the details of providing tutorial web pages, etc. I decided to implement the password estimator as suggested, taking 5 possible passwords and ranking them based on their strength. Overall this task took me about 4 hours to complete.