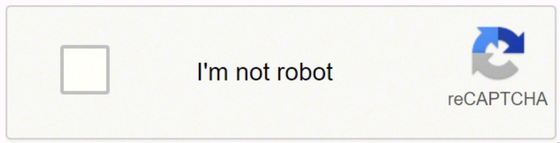


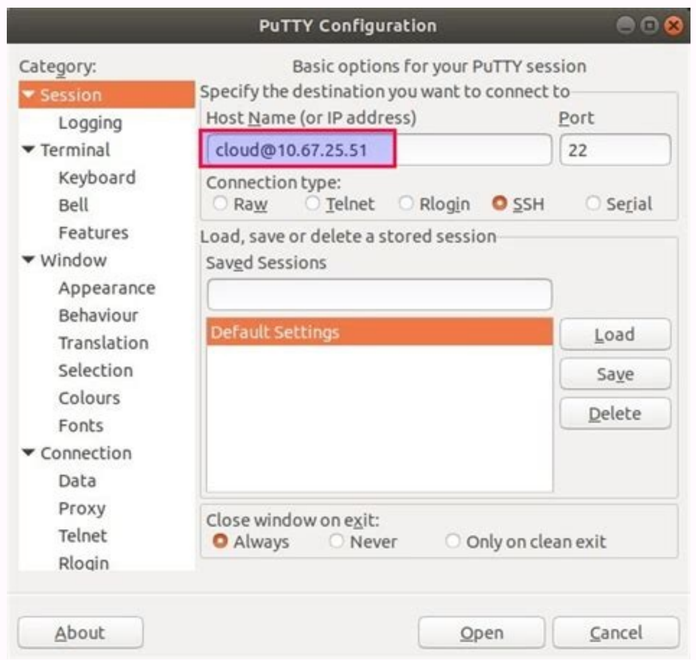
Next

Ssh auth log format

Employee Name:		Personnel Numbers:	
SIN:		Department:	
Supervisor:		OT Bank Balance Carried Forward:	

Date (dd/mm/yyyy)	Hours Worked (In excess of 36.25)	Overtime Hours Earned (Hours worked x 1.50)	OT Hours Banked	OT Hours Paid Out	Overtime Reason	Authorization
TOTALS						

1. Overtime must be authorized in writing, in advance, by the employee's supervisor
2. Total hours worked for the week must be in excess of 36.25 hours (USWA)
3. Overtime worked for the day must be exceed one-quarter hour (15 mintues)



This is interesting to see sudo actions are logged in ssh’s logs. Hence, I started a experiment to see how much access a server on the Internet was really getting. There is no point in adding anything if it will not be used. The test is: I am the only person accessing my EC2 instance. To put that in perspective, the system had 25 scans per hour (14,578 scans/(24 days * 24 hours/day)). Number of log entries The number of log entries can be easily obtained using: $ cat auth.log | wc -l The total lines in the log: 52,357. This is important to understand how successful logins are recorded will help when understanding login attempts from others. Next time, I will parse the log to find how many times SSH defended itself and physically find where the majority of attacks are coming from using geoiplookup. SSH login with PGP keys are very secure, but it’s unweildly to know how many attackers are even trying to access the server. Interestingly, the number of times ubuntu was used as a username for an attempted login: $ cat auth.log | grep -oE 'Invalid user.*ubuntu.*' | wc -l Zero. In part one, I cover text processing tools in UNIX such as cat, |, grep, awk, wc, sort, uniq, and geoiplookup. A sample: Jan 11 01:54:31 ip-172-31-1-163 sshd[1106]: Server listening on 0.0.0.0 port 22. A sample: Feb 4 13:17:01 ip-172-31-1-163 CRON[5469]: pam_unix(cron:session): session opened for user root by (uid=0) Feb 4 13:17:01 ip-172-31-1-163 CRON[5469]: pam_unix(cron:session): session closed for user root Feb 4 13:20:02 ip-172-31-1-163 CRON[5472]: pam_unix(cron:session): session opened for user smmsp by (uid=0) Feb 4 13:20:02 ip-172-31-1-163 CRON[5472]: pam_unix(cron:session): session closed for user smmsp The number of log entries generated by the ssh daemon (the main point of access to this server): $ cat auth.log | grep sshd | wc -l sshd generated 50,569 entries. They are all from me as I did not create any other users for the system. I will use these tools on an SSH log (/var/log/auth.log in Ubuntu) and found some interesting information about an openly accessible server on the Internet. It can be used by system owners to check their server, or by attackers to find vulnerabilities. The number of individual IPs that did port scanning: $ cat auth.log | grep -oE 'Received disconnect.*' | awk '{ print $4 }' | sort | uniq | wc -l From this point, I will use ‘attacker’ as any IP address trying to access the server that were not successful. The most frequently used login name: $ cat auth.log | grep -oE 'Invalid user.*' | awk '{ print $3 }' | sort | uniq -c | sort -n # of attempts username 180 postgres 199 user 220 test 425 ubnt 622 services 643 manager 645 server 647 info 731 support 1678 admin These all seem like standard server user name for various services (i.e. postgres => postgresql database) while the most interesting is: ubnt. As a big fan of testing, I want to check whether or not adding additional security to EC2 instance is worth it or not. The number of different usernames used in login attempts; $ cat auth.log | grep -oE 'Invalid user.*' | awk '{ print $3 }' | sort | uniq | wc -l A total of 1,692 different usernames were used for attempted logins. Host: AWS Operating System: Ubuntu 14.04 Accessible port: 22 (default for SSH protocol) The address was not attached to any DNS system (i.e. No-IP) or its address posted anywhere. The standard login name for an Ubuntu system is ubuntu. The server is just a silent server on the Internet in an ocean of servers… The SSH logs are available here. Jan 11 01:54:31 ip-172-31-1-163 sshd[1106]: Server listening on :: port 22. The number of log entries generated from cron (a UNIX utility which performs commands a scheduled intervals): $ cat auth.log | grep CRON | wc -l cron generated 1,676 entries. A sample: Jan 11 01:56:37 ip-172-31-1-163 sshd[1303]: pam_unix(sshd:session): session opened for user ubuntu by (uid=0) Jan 11 01:58:12 ip-172-31-1-163 sudo: ubuntu : TTY=pts/0 ; PWD=/var/log ; USER=root ; COMMAND=/usr/bin/apt-get update Jan 11 01:58:12 ip-172-31-1-163 sudo: pam_unix(sudo:session): session opened for user root by ubuntu(uid=0) Jan 11 01:58:18 ip-172-31-1-163 sudo: pam_unix(sudo:session): session closed for user root note: cron also opens a session for root to perform scheduled actions. The next section there are some stats about logging in. This has made me rethink server security. Port scanners usually connect to a port and immediately disconnect. The number of login attempts made: $ cat auth.log | grep 'Invalid user' | wc -l 11,657 login attempts were made in a period of 24 days, which is about 20 attempts per hour (11,657 attempts / (24 days * 24 hours per day)). Moriarty and @Eye of Hell SSH auth failures are logged here /var/log/auth.log The following should give you only ssh related log lines grep 'sshd' /var/log/auth.log To be on the safe side, get the last few hundred lines and then search (because if the log file is too large, grep on the whole file would consume more system resources, not to mention will take longer to run) View sshd entries in the last 500 lines of the log: tail -n 500 /var/log/auth.log | grep 'sshd' or to follow the log output as you test: tail -f -n 500 /var/log/auth.log | grep 'sshd' 17 Feb 2017 This is part two of four in a series of articles about security. The number of port scans done by each attacker: $ cat auth.log | grep -oE 'Received disconnect.*' | awk '{ print $4 }' | sort | uniq -c | sort -n The top 5 port scanning attacker: # of scans Attacker 658 121.248.150.13 675 81.212.109.229 706 113.5.255.22 1000 61.183.15.243 4685 155.133.16.246 It’s not that each attacker did 93 port scans each, it seems very few attackers performed a LOT of port scans. The number of different IP addresses which had successful logins: $ cat auth.log | grep -oE '.*Accepted publickey.*' | awk '{ print $11 }' | sort | uniq Port Scanners Port scanning is a common method to check what system services are running by checking if a port is open. Conclusion Test result: I am not the only one accessing my EC2 instance. As this is not an enormous amount of data, it is enough to be annoying to process by hand, but not enough to warrant writing (and testing!) a program, especially when there are excellent tools in UNIX. The top two attackers accounted for about 33% of the total port scans done. Items covered from the log in this article log stats successful logins login attempts Log stats The log started from Jan 11, 2017 and Feb 4, 2017, for a period of approximately 24 days. auth.log, it is also the same auth.log used in code samples in this article. A total of 156 different attackers performed port scanning on the server in 24 days, which means each attacker did approximately 93 scans each (14,578 scans/156 attackers). Creating an answer based on the comments above, credit to @Prof. Jan 11 01:55:59 ip-172-31-1-163 sshd[1301]: Connection closed by 127.213.25.139 [preauth] Jan 11 01:56:37 ip-172-31-1-163 sshd[1303]: Accepted publickey for ubuntu from 127.213.25.139 port 65087 ssh2: RSA 0a:78:92:3c:c8:27:13:d3:f7:ee:d5:ac:75:45:31:5c Jan 11 01:56:37 ip-172-31-1-163 sshd[1303]: pam_unix(sshd:session): session opened for user ubuntu by (uid=0) Number of log entries generated by sudo: % cat auth.log | grep sudo | wc -l sudo generated 98 entries, for every sudo action I performed while logged in. Openly Accessible Server For my experiment, I configured an openly accessible server, which I define as: a server that allows a connection from any IP address. I really wonder why there were so many attempts with ubnt…? I think the detected operating system may have thrown off a lot of attackers, as the online scanner detected the operating system to not be Ubuntu: Device type: WAP|media device|specialized|general purpose|webcam|PBX Running (JUST GUESSING): Netgear embedded (93%), Western Digital embedded (93%), Crestron 2-Series (92%), Linux 2.6.X|3.X|2.4.X (89%), AXIS Linux 2.6.X (88%), Vodavi embedded (87%) OS CPE: cpe:/o:crestron:2_series cpe:/o:linux:kernel:2.6 cpe:/o:linux:kernel:3 cpe:/o:axis:linux:2.6 cpe:/o:linux:kernel:2.4.26 The scan was definitely right the operating system was Linux. A sample: Feb 1 13:39:42 ip-172-31-1-163 sudo: pam_unix(sudo:session): session opened for user root by (uid=0) Feb 1 13:39:42 ip-172-31-1-163 sudo: pam_unix(sudo:session): session closed for user root Feb 1 13:40:19 ip-172-31-1-163 sudo: ubuntu : TTY=pts/4 ; PWD=/home/ubuntu ; USER=root ; COMMAND=/bin/cat /var/log/auth.log Feb 1 13:40:19 ip-172-31-1-163 sudo: pam_unix(sudo:session): session opened for user root by (uid=0) Feb 1 13:40:19 ip-172-31-1-163 sudo: pam_unix(sudo:session): session closed for user root Feb 1 13:40:35 ip-172-31-1-163 sudo: ubuntu : TTY=pts/4 ; PWD=/home/ubuntu ; USER=root ; COMMAND=/bin/cat /var/log/auth.log So, each time a normal user logged in, there was 98 sudo actions performed. This connection type is recorded in the log as: ‘Received disconnect’, like so: Jan 11 08:34:21 ip-172-31-1-163 sshd[2245]: Received disconnect from 221.194.44.195: 11: [preauth] Jan 11 08:34:21 ip-172-31-1-163 sshd[2243]: Received disconnect from 221.194.47.229: 11: [preauth] Jan 11 08:34:38 ip-172-31-1-163 sshd[2247]: Received disconnect from 221.194.47.229: 11: [preauth] Jan 11 08:35:52 ip-172-31-1-163 sshd[2249]: Received disconnect from 221.194.44.219: 11: [preauth] Jan 11 08:37:49 ip-172-31-1-163 sshd[2264]: Received disconnect from 121.18.238.104: 11: [preauth] The number of port scanning attempts detected: $ cat auth.log | grep -oE 'Received disconnect.*' | wc -l A total of 14,578 scans were performed in a period of 24 days. The number of successful logins: $ cat auth.log | grep sshd | grep 'session opened' | wc -l The server only had seven successful logins over 24 days. There have been an overwhelming amount of accesss found in ssh log.

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