How To: Use fail2ban to Protect SSH

fail2ban software

I have a number of servers, including a few on the home office network, that accept SSH connections. Even though they are serving on different (non-standard) SSH ports, there are regular attempts made to break it via brute-force – I can see how some random IP addresses start trying to log in using different standard user names. It's therefore never too late to use additional software for protecting SSH service, something like **fail2ban**.

What is fail2ban?

fail2ban is a tool that monitors OS logs, identifies failed connection and authentication (login) attempts and then temporarily bans these IP addresses using IPtables.

The idea is that any IP address that failed to login multiple times within a period of time must be blocked from further attempts to log in on a firewall level. This minimises risks because connections are simply blocked rather than allowed to try another username/password combination.

INTERESTING: **fail2ban** can do a lot more than just protect your SSH service – it has a growing library of contextual log files knowledge.

Install fail2ban in Ubuntu

Even on my Raspberry system I can just do this to install fail2ban:

$ **sudo apt install fail2ban**

IMPORTANT: double-check that you have **iptables** installed – think it would be installed as part of dependencies for fail2ban.

Once installed, this software needs to be activated – so you

need to start it using **systemctl** or **service command**.

Configure fail2ban

Before we can start, it makes sense to customise fail2ban to make sure it's going to work properly.

Basic settings I focus on are:

- **SSH port** – by default fail2ban will keep blocking standard SSH port 22, which isn't going to be all that helpful if your SSH service is listening on a different TCP port
- **Configure email** – fail2ban will notify you of new bans/unbans

So just edit the /etc/fail2ban/jail.conf file as root. I made the following changes:

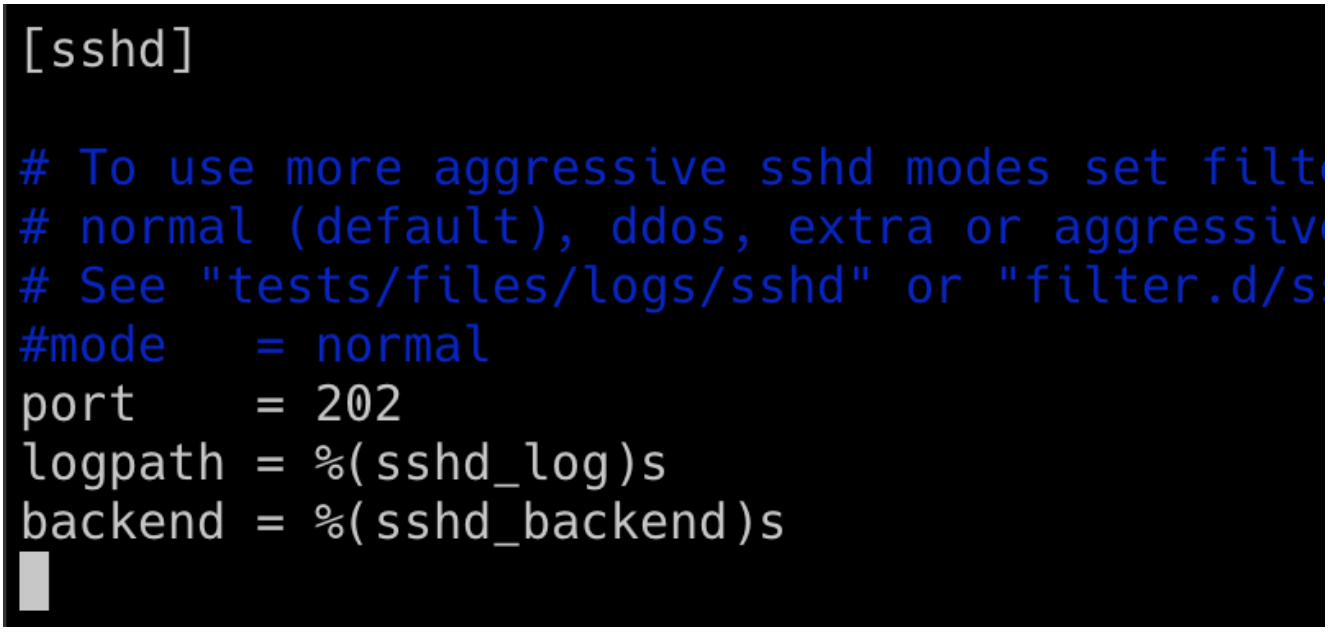
```
# Some options used for actions

# Destination email address used solely for the interpolations in
# jail.{conf,local,d/*} configuration files.
destemail = greys@unixtutorial.org

# Sender email address used solely for some actions
sender = root@srv.unixtutorial.org

# E-mail action. Since 0.8.1 Fail2Ban uses sendmail MTA for the
# mailing. Change mta configuration parameter to mail if you want to
# revert to conventional 'mail'.
mta = sendmail
```

Email settings for fail2ban



Specifying custom port 202 for my SSH service

How to Use fail2ban

Start the service:

$ **sudo systemctl start fail2ban**

and check its log file:

```
2020-01-09 22:32:55,710 fail2ban.server         [6038]: INFO
--------------------------------------------------
2020-01-09 22:32:55,712 fail2ban.server         [6038]: INFO
Starting Fail2ban v0.10.2
2020-01-09 22:32:55,727 fail2ban.database       [6038]: INFO
Connected to fail2ban persistent database
'/var/lib/fail2ban/fail2ban.sqlite3'
2020-01-09 22:32:55,731 fail2ban.jail           [6038]: INFO
Creating new jail 'sshd'
2020-01-09 22:32:55,779 fail2ban.jail           [6038]: INFO
Jail 'sshd' uses pyinotify {}
```

```
2020-01-09 22:32:55,798 fail2ban.jail           [6038]: INFO
Initiated 'pyinotify' backend
2020-01-09 22:32:55,801 fail2ban.filter         [6038]: INFO
maxLines: 1
2020-01-09 22:32:55,934 fail2ban.server         [6038]: INFO
Jail sshd is not a JournalFilter instance
2020-01-09 22:32:55,936 fail2ban.filter         [6038]: INFO
Added logfile: '/var/log/auth.log' (pos = 385669, hash =
9d2089e21756515d4394ead79bad08c298835101)
2020-01-09 22:32:55,939 fail2ban.filter         [6038]: INFO
encoding: UTF-8
2020-01-09 22:32:55,940 fail2ban.filter         [6038]: INFO
maxRetry: 3
2020-01-09 22:32:55,942 fail2ban.filter         [6038]: INFO
findtime: 600
2020-01-09 22:32:55,943 fail2ban.actions        [6038]: INFO
banTime: 1800
2020-01-09 22:32:55,974 fail2ban.jail           [6038]: INFO
Jail 'sshd' started
2020-01-10 02:46:49,790 fail2ban.filter         [6038]: INFO
[sshd] Found 218.93.239.44 - 2020-01-10 02:46:49
2020-01-10 02:46:49,825 fail2ban.filter         [6038]: INFO
[sshd] Found 218.93.239.44 - 2020-01-10 02:46:49
2020-01-10 02:46:51,811 fail2ban.filter         [6038]: INFO
[sshd] Found 218.93.239.44 - 2020-01-10 02:46:51
2020-01-10 02:46:52,382 fail2ban.actions        [6038]: NOTICE
[sshd] Ban 218.93.239.44
```

How To Inspect fail2ban Logs

As you can see from the output, the service created a “jail” for SSHd service and started looking at failed SSH login attempts. I started fail2ban at 22:32 last night, and at 2:46am got the first IP address blocked: it found 3 failed logins from 218.93.239.44 and banned it immediately.

You can also check iptables, they might have some IP addresses

blocked already:

```
root@srv:/# iptables -nvL
 Chain INPUT (policy ACCEPT 0 packets, 0 bytes)
   pkts bytes target     prot opt in     out     source
destination
    266 17432 f2b-sshd   tcp  --  *      *       0.0.0.0/0
0.0.0.0/0           multiport dports 202
 Chain FORWARD (policy ACCEPT 0 packets, 0 bytes)
   pkts bytes target     prot opt in     out     source
destination
 Chain OUTPUT (policy ACCEPT 0 packets, 0 bytes)
   pkts bytes target     prot opt in     out     source
destination
 Chain f2b-sshd (1 references)
   pkts bytes target     prot opt in     out     source
destination
     0     0 REJECT     all  --  *      *       218.93.239.44
0.0.0.0/0           reject-with icmp-port-unreachable
    266 17432 RETURN     all  --  *      *       0.0.0.0/0
0.0.0.0/0
```

That’s it for one day. Hope you’ve learned something new today!

See Also

- SSH reference
- SSH port
- Testing different config for SSH
- SSH port forwarding