

CMS-Controlled Fail2Ban Jail

Configuration and Details

Objective

To have the CMS handle user login banning in an attempt to deter brute force attacks.

CMS Configuration Page

The following settings are accessible from the CMS administrative backend.

The screenshot shows the 'MEMBERS CONFIGURATION' window with the 'Login Settings' tab selected. The settings are as follows:

| Setting | Value |
|---------------------------------|-------|
| Maximum Reset Count | 2 |
| Time in Hours (reset count) | 1 |
| Maximum Failed Login Attempts | 3 |
| Time in Hours (failed attempts) | 1 |
| Accounts per IP | 25 |
| Time in Hours (accounts per IP) | 1 |

Allow User Registration

If set to Yes, new Users allowed to self-register.

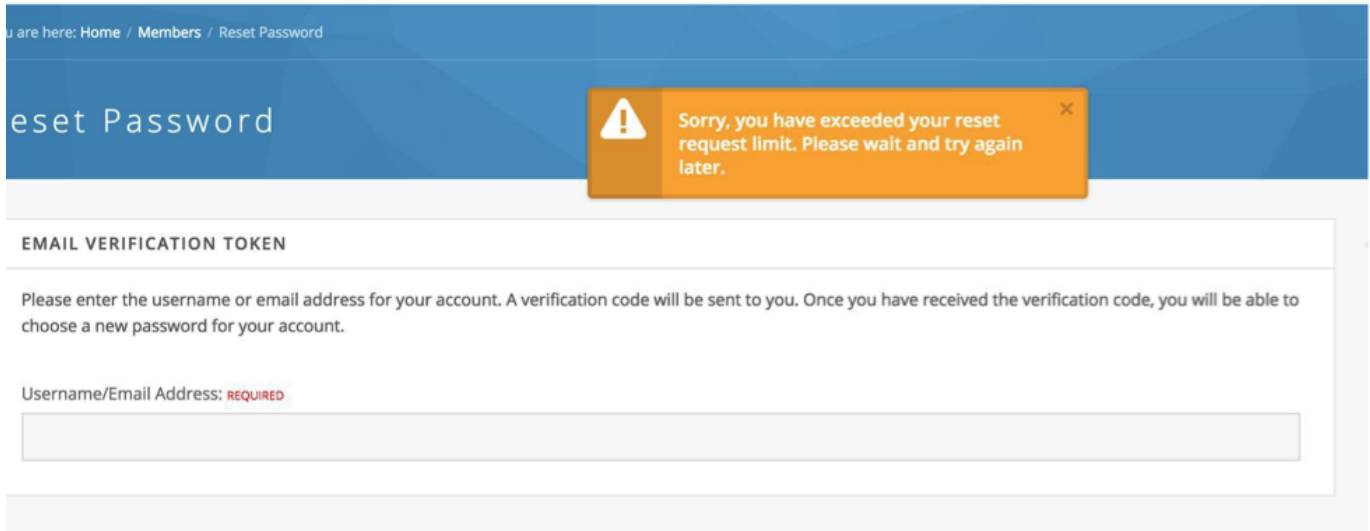
New User Registration Group

The default group that will be applied to New Users Registering via the frontend.

These options are accessible by going to the User Menu Members and Member Options.

User Password Reset Limit

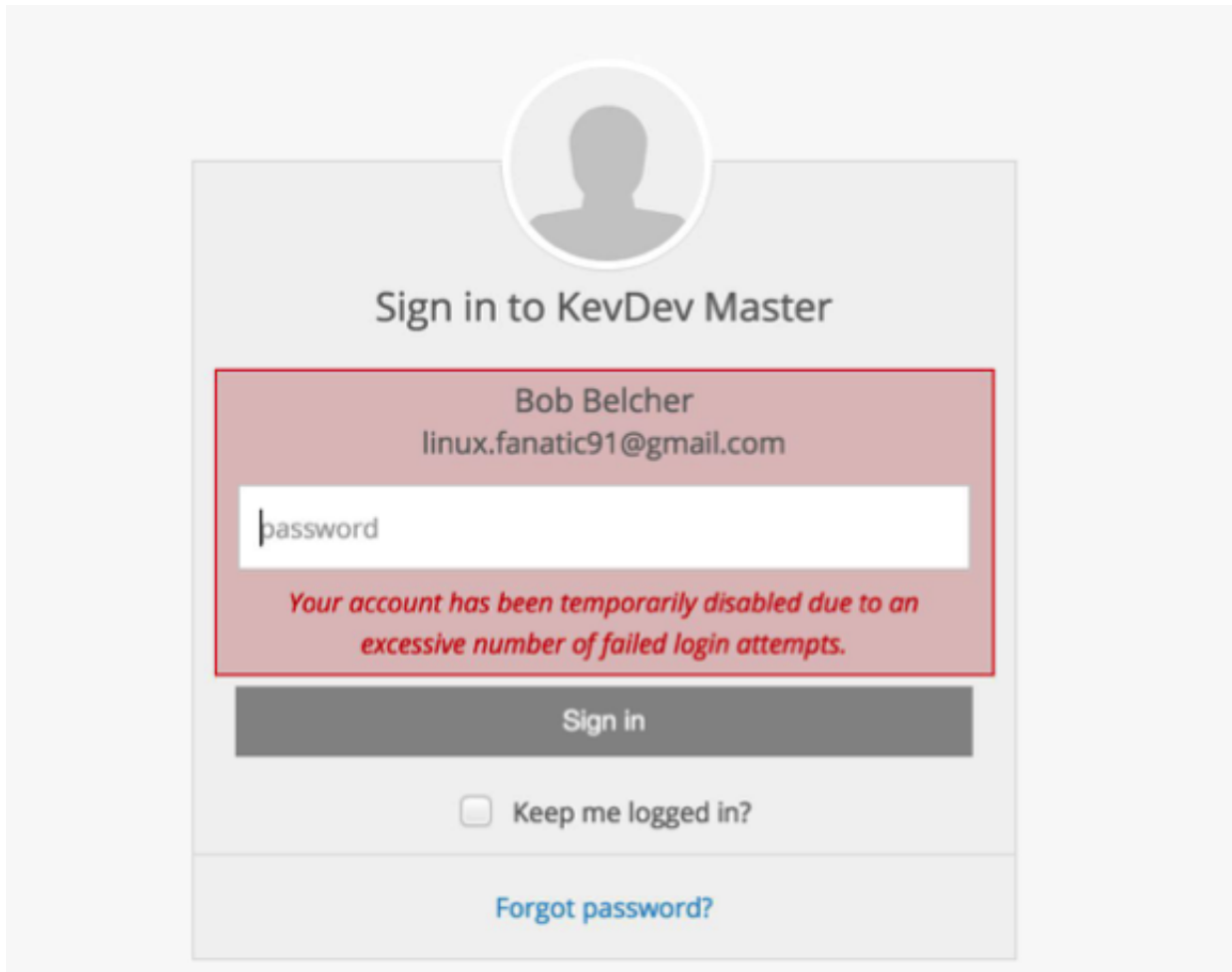
The number of password resets per time period is limited. If the user attempts to reset their password at a threshold deemed by the HUB administrator as excessive, the following message is displayed.



The screenshot shows a web interface for password reset. At the top, a blue header contains the breadcrumb "You are here: Home / Members / Reset Password" and the page title "Reset Password". An orange error message box is overlaid on the header, containing a warning icon and the text: "Sorry, you have exceeded your reset request limit. Please wait and try again later." Below the header, the page is titled "EMAIL VERIFICATION TOKEN". The instructions state: "Please enter the username or email address for your account. A verification code will be sent to you. Once you have received the verification code, you will be able to choose a new password for your account." A form field is labeled "Username/Email Address: REQUIRED" and is currently empty.

User Failed Login Limit

The number of failed logins per time period is limited. If the user attempts to reset their password at a threshold deemed by the HUB administrator as excessive, the following message is displayed. This means that an individual's account is temporarily blocked until the time period expires.



IPbased Blocked User Limit

When the threshold of blocked user accounts per IP network is met, the CMS will trigger a Fail2Ban rule which will block incoming requests from an IP address for a period of time. This is the last line of defense as blocking an IP address may have unintended consequences such as blocking a NATed IP address which several valid users are using to access the hub.

Assumptions

This approach assumes that the system administrator has configured a jail and a system user account to execute (with sudo) Fail2Ban via the fail2banclient utility.

On Debian Hosts, Fail2Ban should be version 0.9.5.

0.9.51~nd70+1 from <http://neuro.debian.net/debian/> wheezy/main amd64 Packages

Setup & Configuration

There are a number of subsystems which need to be configured for this scheme to work properly.

sudo Configuration

A privileged user which can execute:

```
(root) NOPASSWD: /usr/bin/fail2banclient set hublogin banip [09.]* (root) NOPASSWD:  
/usr/bin/fail2banclient set hublogin unbanip [09.]*
```

This can be accomplished by adding a sudoers rule in `/etc/sudoers.d/` that looks like:

```
wwwdata ALL=(root)NOPASSWD: /usr/bin/fail2banclient set hublogin banip [09.]*
```

Fail2Ban Configuration

The system administrator should configure Fail2Ban to create jails which the CMS can add offending IP address into. The amount of time that the ban is valid is configured in Fail2Ban.

The CMS will simply add IP addresses to the Fail2Ban jail which will trigger the Ban Action as specified in the rule set.

The following configuration are more of an example than anything. A seasoned system

administrator will have crafted better rules.

[Sample] Jail Configuration

#

JAILS

/etc/fail2ban/jail.local

#

[hublogin] enabled = true

port = http,https filter = hublogin

logpath = /var/log/messages banaction = hubloginfailure bantime = 600

findtime = 1

maxretry = 1

[Sample] Filter Configuration

/etc/fail2ban/filter.d/hublogin.conf

Fail2Ban configuration file

#

[Definition]

CMS-CONTROLLED FAIL2BAN JAIL

Option: failregex

Notes.: Regexp to catch known spambots and software alike. Please verify

that it is your intent to block IPs which were driven by

abovementioned bots.

Values: TEXT

#

#We choose something that will never happen

Since the CMS will control IP's placed in the jails failregex =
^<HOST>thisfilterwillneverbefound

Option: ignoreregex

Notes.: regex to ignore. If this regex matches, the line is ignored.

Values: TEXT

#

ignoreregex =

[Sample] Action Configuration

Fail2Ban configuration file

cat /etc/fail2ban/action.d/hubloginfailure.conf [INCLUDES]

before = iptablescommon.conf

[Definition]

Option: actionstart

Notes.: command executed once at the start of Fail2Ban.

Values: CMD

#

actionstart = iptables N fail2banhublogin

iptables A INPUT j DROP

iptables I INPUT p tcp j fail2banhublogin

Option: actionstop

Notes.: command executed once at the end of Fail2Ban

Values: CMD

#

actionstop = iptables D fail2banhublogin p tcp j fail2banhublogin iptables F fail2banhublogin

iptables X fail2banhublogin

Option: actioncheck

Notes.: command executed once before each actionban command

Values: CMD

#

CMS-CONTROLLED FAIL2BAN JAIL

```
actioncheck = iptables n L fail2banhublogin | grep q fail2banhublogin
```

```
# Option: actionban
```

```
# Notes.: command executed when banning an IP. Take care that the
```

```
# command is executed with Fail2Ban user rights.
```

```
# Tags: <ip> IP address
```

```
# <failures> number of failures
```

```
# <time> unix timestamp of the ban time
```

```
# Values: CMD
```

```
#
```

```
actionban = iptables I fail2banhublogin p tcp dport 443 s <ip> j DROP
```

```
iptables I fail2banhublogin p tcp dport
```

```
80 s <ip> j DROP
```

```
# Option: actionunban
```

```
# Notes.: command executed when unbanning an IP. Take care that the
```

```
# command is executed with Fail2Ban user rights.
```

```
# Tags: <ip> IP address
```

```
# <failures> number of failures
```

```
# <time> unix timestamp of the ban time
```

```
# Values: CMD
```

```
#
```

```
actionunban = iptables D fail2banhublogin p tcp dport 443 s <ip> j DROP iptables D fail2ban-  
hublogin p tcp dport 80 s <ip> j DROP
```


[Init]

Defaut name of the chain

#

name = DEFAULT

Option: protocol

Notes.: internally used by config reader for interpolations.

Values: [tcp | udp | icmp | all] Default: tcp

#

protocol = tcp

Option: chain

Notes specifies the iptables chain to which the fail2ban rules should be

added

Values: STRING Default: INPUT chain = INPUT

[Sample] Banned IP address results root@example:/var/www/example# fail2banclient status
hublogin Status for the jail: hublogin

| Filter

CMS-CONTROLLED FAIL2BAN JAIL

| | Currently failed: 0

| | Total failed: 4

| ` File list: /var/log/messages

` Actions

| Currently banned: 1

| Total banned: 4

` Banned IP list: 192.168.226.1

root@example:/var/www/example# iptables L Chain INPUT (policy DROP)

```
target prot opt source destination fail2banhublogin tcp anywhere
anywhere ACCEPT all anywhere anywhere
```

```
ACCEPT all anywhere anywhere state RELATED,ESTABLISHED
```

| | | | | | |
|--------|------|--|----------|----------|-----------------|
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:ssh |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:smtp |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:mysql |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:ldap |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:http |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:https |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:httpalt |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpts:830:831 |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:http |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:https |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:httpalt |
| ACCEPT | tcp | | anywhere | anywhere | tcpdpt:1170 |
| ACCEPT | icmp | | anywhere | anywhere | |
| DROP | all | | anywhere | anywhere | |

Chain FORWARD (policy DROP)

| | | | | | | |
|--------|------|-----|-----|------------|-------------|----------|
| target | prot | all | opt | source | destination | anywhere |
| ACCEPT | all | | | 10.0.0.0/8 | anywhere | |
| ACCEPT | | | | anywhere | | |

| | | | | | |
|--|--|--|--|--|---------|
| | | | | | ctstate |
|--|--|--|--|--|---------|

| RELATED, ESTABLISHED, DNAT | | | | | |
|----------------------------|-----|--|----------|----------|------------------|
| ACCEPT | tcp | | anywhere | anywhere | tcp dpts:830:831 |
| ACCEPT | tcp | | anywhere | anywhere | tcp dpt:http |
| ACCEPT | tcp | | anywhere | anywhere | tcp dpt:https |
| ACCEPT | udp | | anywhere | anywhere | udp dpt:domain |

Chain OUTPUT (policy ACCEPT)

target prot opt source destination

| Chain fail2banhublogin (1 references) | | | | | |
|---------------------------------------|------|-----|---------------------|-------------|---------------|
| target | prot | opt | source | destination | |
| DROP | tcp | | container.localhost | anywhere | tcp dpt:http |
| DROP | tcp | | container.localhost | anywhere | tcp dpt:https |

root@example:/var/www/example#

User Impact

When a large number of people intend on using the CMS, it may be wise to temporarily disable this feature (e.g. conference, class activity, etc). In the past, many conference goers have mistyped their password in a short period of time creating a false positive for normal Fail2Ban operation. This risk is mitigated by the fact that the number of blocked users is observed before triggering Fail2Ban.