

How to fix HTTP 500 Internal Server Error

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This Postmortem article is based on one of my Holberton School projects, where we have to fix a server which has a **500 internal error**.

The response code** 500 Hypertext Transfer Protocol (HTTP) Internal Server Error** indicates that the server has encountered an unexpected condition that prevents it from completing the request. So let's get started.

```

root@8ad3107e1b0f:/var/www/html# cd
root@8ad3107e1b0f:~# curl -sI 127.0.0.1
HTTP/1.0 500 Internal Server Error
Date: Mon, 21 Feb 2022 23:48:02 GMT
Server: Apache/2.4.7 (Ubuntu)
X-Powered-By: PHP/5.5.9-1ubuntu4.21
Connection: close
Content-Type: text/html

```

Here is an image showing the **500 error** we were talking about before, to start debugging we are going to use the "**ps auxf**" tool which will display the status of a Process. Remember that the output of "**ps auxf**" is a table where each row is a process and the columns contain the following information:

- **USER:** user under which the process is running
- **PID:** ID of the process
- **%CPU:** percentage of time the process has been running since it was started
- **%MEM :** percentage of physical memory used
- **VSZ:** virtual memory of the process measured in KiB
- **RSS:** "resident set size", it is the amount of physical memory not swapped that the task has used (in KiB)
- **TT:** terminal controlling the process (tty)
- **STAT :** status code of the process (detailed information below)
- **STARTED :** start date of the process
- **TIME:** accumulated CPU time
- **COMMAND:** command with all its arguments

```

root@8ad3107e1b0f:~# ps auxf
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root      1405  0.0  0.0  18184  3072 pts/6    Ss   17:48   0:00 /bin/bash
root      1426  0.0  0.0  15560  2076 pts/6    R+   17:49   0:00 \_ ps auxf
root      1378  0.0  0.0  18188  1340 pts/5    Ss+  Feb21   0:00 /bin/bash
root      1364  0.0  0.0  18176  1060 pts/2    Ss+  Feb21   0:00 /bin/bash
root      661  0.0  0.0  18172   380 pts/0    Ss   Feb16   0:00 /bin/bash
root      742  0.0  0.0  24228   368 pts/0    S+   Feb16   0:00 \_ tmux
root       1  0.0  0.0  17956   336 ?        Ss   Feb16   0:00 /bin/bash ./tmp/run.sh
root      13  0.0  0.0  61380   396 ?        S    Feb16   0:00 /usr/sbin/sshd -D
root      63  0.0  0.0  4444    240 ?        S    Feb16   0:00 /bin/sh /usr/bin/mysqld_safe
mysql     443  0.0  0.0 640384  2132 ?        Sl   Feb16   4:08 \_ /usr/sbin/mysqld --basedir=/usr --datadir=/var/li
www-data  176  0.0  0.0      0      0 ?        Z    Feb16   0:00 [apache2] <defunct>
root      744  0.0  0.0  24936   924 ?        Ss   Feb16   3:57 tmux
root      745  0.0  0.0  18296   376 pts/1    Ss+  Feb16   0:00 \_ -bash
root      935  0.0  0.0  18300   388 pts/3    Ss+  Feb17   0:00 \_ -bash
root      958  0.0  0.0  4744    0 pts/3    T    Feb17   0:00 | \_ strace -p 176
root      973  0.0  0.0  18200   392 pts/4    Ss+  Feb17   0:00 \_ -bash
root      988  0.0  0.0  86464    0 pts/4    T    Feb17   0:00 \_ curl -sI 127.0.0.1
root     1350  0.0  0.0 276396   456 ?        Ss   Feb17   0:17 /usr/sbin/apache2 -k start
www-data 1354  0.0  0.3 280404 14048 ?        S    Feb17   0:00 \_ /usr/sbin/apache2 -k start
www-data 1358  0.0  0.5 284260 21080 ?        S    Feb17   0:00 \_ /usr/sbin/apache2 -k start
root@8ad3107e1b0f:~#

```

note that in the results of the **COMMAND** column we find** apache2** information with two PIDs at the bottom, with the **USER www-data** and the **PID 1354** , and also the **USER www-data** and the **PID 1358 **

taking into account the above we are going to use another of our debugging tools, in this case we are talking about "**strace**" which will allow us to trace the system calls and the signals received during the execution of the process and return the results of the command with the errors it found. We will do it in the following way **strace -p <PID> ** and in another terminal window we will execute again our command **curl -sI 127.0.0.1** , as I show in the following image testing each one of our **PID** until we get something related to the **error 500** . we use **tmux** to detach the window, for more information on configuring tmux [here](#).

<pre>root@8ad3107e1b0f:~# strace -p 1354 Process 1354 attached accept4(3,</pre>	<pre>root@8ad3107e1b0f:~# curl -sI 127.0.0.1 HTTP/1.0 500 Internal Server Error Date: Tue, 22 Feb 2022 19:15:09 GMT Server: Apache/2.4.7 (Ubuntu) X-Powered-By: PHP/5.5.9-1ubuntu4.21 Connection: close Content-Type: text/html root@8ad3107e1b0f:~# █</pre>
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run the **curl -sI 127.0.0.1** again in the other window and now we will see the errors and now let's take a look.

<pre>write(12, "\32\0\0\0\3SELECT @@SESSION.sql_mode", 30) = 30 read(12, "\1\0\0\1\1(\0\0\2\3def\0\0\0\22@@SESSION.sql_m"... , 16384) = 72 poll([{fd=12, events=POLLIN POLLPRI}], 1, 0) = 0 (Timeout) write(12, "\n\0\0\0\2wordpress", 14) = 14 read(12, "\7\0\0\1\0\0\0\2\0\0\0", 16384) = 11 access("/var/www/html/wp-content/object-cache.php", F_OK) = -1 ENOENT (No such file or directory) lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae527fc0) = -1 ENOENT (No such file or directory) lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae527e90) = -1 ENOENT (No such file or directory) lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae52a0c0) = -1 ENOENT (No such file or directory) lstat("/var/www/html/wp-includes", {st_mode=S_IFDIR 0755, st_size=33, ...}) = 0 lstat("/var/www/html", {st_mode=S_IFDIR 0755, st_size=66, ...}) = 0 lstat("/var/www", {st_mode=S_IFDIR 0755, st_size=18, ...}) = 0 lstat("/var", {st_mode=S_IFDIR 0755, st_size=52, ...}) = 0 open("/var/www/html/wp-includes/class-wp-locale.php", O_RDONLY) = -1 ENOENT (No su ch file or directory) chdir("/") = 0 write(12, "\1\0\0\0\1", 5) = 5 shutdown(12, SHUT_RDWR) = 0 close(12) = 0 setitimer(ITIMER_PROF, {it_interval={0, 0}, it_value={0, 0}}, NULL) = 0 fcntl(8, F_SETLK, {type=F_UNLCK, whence=SEEK_SET, start=0, len=0}) = 0 setitimer(ITIMER_PROF, {it_interval={0, 0}, it_value={0, 0}}, NULL) = 0 writev(11, [{"HTTP/1.0 500 Internal Server Err"... , 187}], 1) = 187 write(7, "127.0.0.1 - - [22/Feb/2022:19:18"... , 87) = 87 times({tms_utime=26, tms_stime=13, tms_cutime=0, tms_cstime=0}) = 1929983353 shutdown(11, SHUT_WR) = 0 poll([{fd=11, events=POLLIN}], 1, 2000) = 1 ([{fd=11, revents=POLLIN POLLHUP}]) read(11, "", 512) = 0 close(11) = 0 read(4, 0x7ffdae52f267, 1) = -1 EAGAIN (Resource temporarily unavailab le) accept4(3,</pre>	<pre>X-Powered-By: PHP/5.5.9-1ubuntu4.21 Connection: close Content-Type: text/html root@8ad3107e1b0f:~# clear root@8ad3107e1b0f:~# curl -sI 127.0.0.1 HTTP/1.0 500 Internal Server Error Date: Tue, 22 Feb 2022 19:17:58 GMT Server: Apache/2.4.7 (Ubuntu) X-Powered-By: PHP/5.5.9-1ubuntu4.21 Connection: close Content-Type: text/html root@8ad3107e1b0f:~# curl -sI 127.0.0.1 HTTP/1.0 500 Internal Server Error Date: Tue, 22 Feb 2022 19:18:00 GMT Server: Apache/2.4.7 (Ubuntu) X-Powered-By: PHP/5.5.9-1ubuntu4.21 Connection: close Content-Type: text/html root@8ad3107e1b0f:~# █</pre>
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this was part of the **strace** output but let's take a closer look at part of it..

```
access("/var/www/html/wp-content/object-cache.php", F_OK) = -1 ENOENT (No such file
or directory)
lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae527fc0) = -1 ENOENT
(No such file or directory)
lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae527e90) = -1 ENOENT
(No such file or directory)
lstat("/var/www/html/wp-includes/class-wp-locale.php", 0x7ffdae52a0c0) = -1 ENOENT
(No such file or directory)
lstat("/var/www/html/wp-includes", {st_mode=S_IFDIR|0755, st_size=33, ...}) = 0
lstat("/var/www/html", {st_mode=S_IFDIR|0755, st_size=66, ...}) = 0
lstat("/var/www", {st_mode=S_IFDIR|0755, st_size=18, ...}) = 0
lstat("/var", {st_mode=S_IFDIR|0755, st_size=52, ...}) = 0
open("/var/www/html/wp-includes/class-wp-locale.php", O_RDONLY) = -1 ENOENT (No suc
h file or directory)
```

You will see that the strace will not generate any more output at which point we can stop our search, at this point we can see that there is an **ENOENT** error. which is short for **Error NO ENTry (or Error NO ENtity)** , and can actually be used for more than just files/directories. that is to say, the file that we are looking for is

not found or does not exist, for that we go to the path where this error appears and we will look for the file as such.

```
root@8ad3107e1b0f:/var/www/html/wp-includes# ls class-wp-lo*
class-wp-locale-switcher.php  class-wp-locale.php
root@8ad3107e1b0f:/var/www/html/wp-includes#
```

yes, the file exists, so that was not the problem, the problem was that where the file is called was misspelled as **class-wp-locale.phpp** so it did not recognise the file. so we researched the name of that file on the internet and found out that it was a **WordPress** configuration file, we also found out that there are two **WordPress** configuration files, with sensitive and important information that will make your site work correctly or even not work, these files are called **wp-config.php** and **wp-settings.php**

Now we will use the **grep 'word' filename** command to help us find any lines containing the word **class-wp-locale.phpp** in the file. note that the configuration files are in the **html** directory as shown below.

```
root@8ad3107e1b0f:/var/www/html# ls
index.php      wp-blog-header.php  wp-cron.php      wp-mail.php
license.txt    wp-comments-post.php wp-includes       wp-settings.php
readme.html    wp-config-sample.php wp-links-opml.php wp-signup.php
wp-activate.php wp-config.php        wp-load.php      wp-trackback.php
wp-admin       wp-content           wp-login.php     xmlrpc.php
root@8ad3107e1b0f:/var/www/html# grep class-wp-locale.phpp wp-config.php
root@8ad3107e1b0f:/var/www/html# grep class-wp-locale.phpp wp-settings.php
require_once( ABSPATH . WPINC . '/class-wp-locale.phpp' );
root@8ad3107e1b0f:/var/www/html#
```

we have found the error !!!! and as we can see we have checked both files and the error is in the **wp-settings.php** file.

Now we just need to access the file and change that word to the correct one, it can be done manually but for this project we will use a **puppet file** like the following one:

```
1 # find the error and fix it
2
3 exec { 'delete a letter':
4   .command => 'sed -i s/class-wp-locale.phpp/class-wp-locale.php/g /var/www/html/wp-settings.php',
5   .provider => shell,
6 }
```

to be able to run it we will do it in the following way **puppet apply <file.pp>** like this:

```
root@8ad3107e1b0f:~# puppet apply fix_php.pp
Notice: Compiled catalog for 8ad3107e1b0f.ec2.internal in environment production in 0.21 seconds
Notice: /Stage[main]/Main/Exec[delete a letter]/returns: executed successfully
Notice: Finished catalog run in 0.60 seconds
root@8ad3107e1b0f:~#
```

we checked with the **curl -sI 127.0.0.1** command and successfully **fixed the 500 error !!!**

```
root@8ad3107e1b0f:~# curl -sI 127.0.0.1
HTTP/1.1 200 OK
Date: Tue, 22 Feb 2022 20:36:46 GMT
Server: Apache/2.4.7 (Ubuntu)
X-Powered-By: PHP/5.5.9-1ubuntu4.21
Link: <http://127.0.0.1/?rest_route=/>; rel="https://api.w.org/"
Content-Type: text/html; charset=UTF-8

root@8ad3107e1b0f:~#
```

I hope you found it useful, have a excellent day!

<https://www.linode.com/docs/guides/use-the-ps-aux-command-in-linux/>

<https://man7.org/linux/man-pages/man1/strace.1.html>

<https://www.hamvocke.com/blog/a-quick-and-easy-guide-to-tmux/>

<https://wordpress.org/support/article/editing-wp-config-php/#:~:text=One%20of%20the%20most%20important,WordPress%2C%20the%20wp%2Dconfig.>

<https://www.cyberciti.biz/faq/howto-use-grep-command-in-linux-unix/>

<https://www.puppetcookbook.com/posts/exec-a-command-in-a-manifest.html>

<https://linuxhint.com/use-linux-strace-command/>