Under the Wire... PowerShell Training for the People!
PS C:\Users\Administrator>

Under the Wire

The PowerShell training for the people https://www.underthewire.tech

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What is it?

Mission

Under the Wire trains experienced, developing, and novice information security professionals to use Windows PowerShell through innovative and fun wargames.

Objectives

- Game play remains in the PowerShell command line environment or scripting environment. Add about SSH still uses PS Cmdline
- Game play emulates real interactions with PowerShell in Windows Enterprise environments or Windows based Small Office/Home Office (SOHO) Environments.
- Game play is engaging and challenging at specific levels of expertise.
- Game play promotes self-education without discouraging use of PowerShell.

The Under the Wire project was a collaboration between co-workers to bring the majesty of PowerShell to the public.

- Peter Di Giorgio @DiGiorgio00
 - 18 years in the Department of Defense with 5 years of cyber security experience.
 - Developed an appreciation for PowerShell, especially in large Windows enterprise networks
- Fernando Tomlinson @Wired Pulse
 - 17 years of forensics, incident response, and information technology experience with the Department of Defense
 - PowerShell enthusiast; developing and coding in the language for 4 years
- Alex Dierkes @StillWorthLess
 - Retired CW4 US Army, 20+ years in forensics, network analysis, incident response, and defense
 - Got into PowerShell because I am lazy, hate repetitive tasks. 8 years experience

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What do you need?

Your Computer

Internet Connection

Windows OS or SSH Client



Figure 1: Hoope's Computer Science Lab. http://hoopoe-tours.com/

M Administrator: Windows PowerShell

Windows PowerShell

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How does it Work?

- Connect to SSID: underthewire
- Browse to: www.underthewire.tech
- Follow instructions for game connection
- From PowerShell

```
$webRequest = [Net.WebRequest]::Create("https://games.underthewire.tech:5986/wsman")
try { $webRequest.GetResponse() } catch {}
$cert = $webRequest.ServicePoint.Certificate
$store = New-Object System.Security.Cryptography.X509Certificates.X509Store -ArgumentList "Root", "CurrentUser"
$store.Open('ReadWrite') $store.Add($cert) $store.Close()
Test-WSMan -ComputerName games.underthewire.tech -port 5986 -UseSSL
```

- Enter-PSSession -ComputerName games.underthewire.tech -port 5986 -Credential (Get-Credential)
- From SSH Client

ssh workshop@games.underthewire.tech

Madministrator: Windows PowerShell

Windows PowerShell

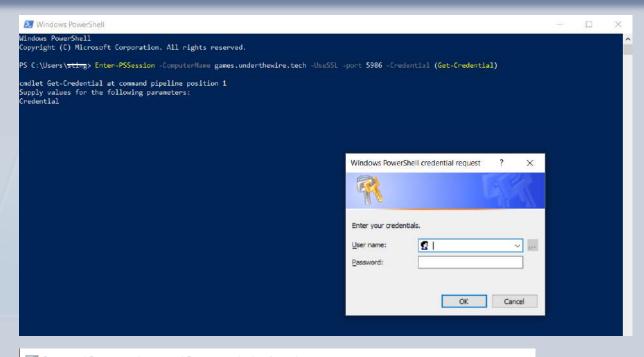
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Let's do this!

- From Windows
- ***** *****
- Type "powershell"

From a SSH Client



Command Prompt - ssh century1@games.underthewire.tech C:\Users\sting>ssh century1@games.underthewire.tech century1@games.underthewire.tech's password:

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Login

- Login with workshop/workshop
- ssh workshop@games.underthewire.tech
- · cd c:\users\century1\desktop
- cd ..\century2\desktop
- cd ..\trebek2\desktop

Administrator: Windows PowerShell

Windows PowerShell

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Website Demo



Mac Administrator: Windows PowerShell

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Get-Help

NAME

Get-Help

SYNOPSIS

Displays information about Windows PowerShell commands and concepts.

SYNTAX

Get-Help [[-Name] <String>] [-Category {Alias | Cmdlet | Provider | General | FAQ | Glossary | HelpFile | ScriptCommand | Function | Filter | ExternalScript | All | DefaultHelp | Workflow | DscResource | Class | Configuration}] [-Component <String[]>] -Detailed [-Functionality <String[]>] [-Path <String>] [-Role <String[]>] [<CommonParameters>]

DESCRIPTION

The Get-Help cmdlet displays information about Windows PowerShell concepts and commands, including cmdlets, functions, CIM commands, workflows, providers, aliases and scripts.

REMARKS

To see the examples, type: "get-help Get-Help -examples". For more information, type: "get-help Get-Help -detailed". For technical information, type: "get-help Get-Help -full". For online help, type: "get-help Get-Help -online"

Windows PowerShell PS C:\Users\sting> get-help help NAME Get-Help SYNOPSIS Displays information about Windows PowerShell commands and concepts. Administrator: Windows PowerShell

Windows PowerShell

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Get-Command

NAME

Get-Command

SYNOPSIS

Gets all commands.

SYNTAX

Get-Command [[-Name] <String[]>] [[-ArgumentList] <Object[]>] [-All] [-CommandType {Alias | Function |
Filter | Cmdlet | ExternalScript | Application | Script | Workflow | Configuration | All}] [-FullyQualifiedModule

<ModuleSpecification[]>] [-ListImported] [-Module <String[]>] [-ParameterName <String[]>]

[-ParameterType <PSTypeName[]>] [-ShowCommandInfo] [-Syntax] [-TotalCount <Int32>] [<CommonParameters>]

DESCRIPTION

The Get-Command cmdlet gets all commands that are installed on the computer, including cmdlets, aliases, functions, workflows, filters, scripts, and applications. Get-Command gets the commands from Windows PowerShell modules and snap-ins and commands that were imported from other sessions. To get only commands that have been imported into the current session, use the ListImported parameter.

REMARKS

To see the examples, type: "get-help Get-Command -examples".

For more information, type: "get-help Get-Command -detailed".

For technical information, type: "get-help Get-Command -full".

For online help, type: "get-help Get-Command -online"

Administrator: Windows PowerShell

PS C:\users\wolf> Get-Help Get-Command

NAME

Get-Command

SYNOPSIS

Gets all commands.

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Get-Member

NAME

Get-Member

SYNOPSIS

Gets the properties and methods of objects.

SYNTAX

Get-Member [[-Name] <String[]>] [-Force] [-InputObject <PSObject>] [-MemberType {AliasProperty |

CodeProperty | Property | NoteProperty | ScriptProperty | Properties | PropertySet | Method | CodeMethod |

ScriptMethod | Methods | ParameterizedProperty | MemberSet | Event | Dynamic |

All}] [-Static] [-View {Extended | Adapted | Base | All}] [<CommonParameters>]

DESCRIPTION

The Get-Member cmdlet gets the members, the properties and methods, of objects.

To specify the object, use the InputObject parameter or pipe an object to Get-Member. To get information about static members, the members of the class, not of the instance, use the Static parameter. To get only certain types of members, such as NoteProperties, use the MemberType parameter.

REMARKS

To see the examples, type: "get-help Get-Member -examples".

For more information, type: "get-help Get-Member -detailed".

For technical information, type: "get-help Get-Member -full".

For online help, type: "get-help Get-Member -online"

Administrator: Windows PowerShell

PS C:\users\wolf> Get-Help Get-Member

NAME

Get-Member

SYNOPSIS

Gets the properties and methods of objects.

Host

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- As a group we will go through four challenges.
- We will give you two minutes to complete the challenge then we will present the solution and answer.
- After these four challenges we will let you run for 10 minutes doing the challenges by yourself and at the end of the time we will go through the answers.
- During that time we will be walking around to provide assistance if you get stuck.

Build Version

CENTURY 1

PS C:\Users\Administrator>

- What is the build version?
- · NOTE:
 - The format is as follows: **.*.****.
 - Include all periods

Build Version

CENTURY 1

- What is the build version?
- · NOTE:
 - The format is as follows: **.*.****
 - Include all periods

2 Min

Build Version

CENTURY 1

- What is the build version?
- · NOTE:
 - The format is as follows: **.*.****
 - Include all periods



Build Version

CENTURY 1

- What is the build version?
- · NOTE:
 - The format is as follows: **.*.****
 - Include all periods



Build Version

CENTURY 1

- What is the build version?
- · NOTE:
 - The format is as follows: **.*.****
 - Include all periods



Build Version

- Answer
 - · 10.0.14393.693
- Solution
- **PS C:\> \$psversiontable**
- PS C:\> \$psversiontable.buildversion
 - Powershell breaks up the build version...how do we bring them together?
- PS C:\> \$psversiontable.buildversion
 - "\$(\$psversiontable.buildversion.Major).\$(\$psversiontable.buildversion.Minor).\$(\$psversiontable.buildversion.Build).\$(\$psversiontable.buildversion.Revision)"

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Count Files

· CENTURY 3

Count the number of files on the user's desktop

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PS C:\Users\Administrator>

Count Files

· CENTURY 3

Count the number of files on the user's desktop

2 Min

Count Files

· CENTURY 3

Count the number of files on the user's desktop

1.5 Min

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PS C:\Users\Administrator>

Count Files

· CENTURY 3

Count the number of files on the user's desktop

1 Min

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PS C:\Users\Administrator>

Count Files

· CENTURY 3

Count the number of files on the user's desktop

30 Sec

Count Files

- Answer
 - · 919
- Solution

PS C:\> (Get-ChildItem -file c:\users\century3\desktop).count

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Count Directories

· CENTURY 6

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Count Directories

· CENTURY 6



Under the Wire... PowerShell Training for the People! PS C:\Users\Administrator>

Count Directories

· CENTURY 6



Under the Wire... PowerShell Training for the People! PS C:\Users\Administrator>

Count Directories

· CENTURY 6



Under the Wire... PowerShell Training for the People! PS C:\Users\Administrator>

Count Directories

· CENTURY 6

Count the number of directories on the user's desktop.

30 Sec

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PS C:\Users\Administrator>

Count Directories

- Answer
 - · 967
- Solution

PS C:\> (Get-ChildItem -directory c:\users\century6\desktop).count

On Your Own

Now you will do a couple of sets of questions for 10/12 minutes each After 10/12 minutes we will go through the answers for each section.

Domain

- Work on the following challenges:
 - Oracle 5
 - Oracle 13

Ten minutes go

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Commands

- Get-Command
- Get-Item
- Get-ChildItem
- **Get-Content**
- · Get-AD....
- **Get-DNS...**
- **Get-ItemProperty**
- **Get-WmiObject**
- **Get-NetFirewallRule**
- **Compare-Object**

- **Get-Help**
- **Get-Member**
- **Get-ComputerInfo**
- **Get-SmbShare**
- Get-WinEvent
- **Get-GPO**
- **Get-FileHash**
- **Get-AppLockerPolicy**
- Select-String
- EventIDs: 4727,4699,4624,4722,4720,1102,4728
- [System.Text.Encoding]::UTF8.GetString([System.Convert]::FromBase64String(\$data))
- [System.Text.Encoding]::UNICODE.GetString([System.Convert]::FromBase64String(\$data))
- [system.Convert]::ToBase64String([System.Text.Encoding]::UTF8.GetBytes(\$data))

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Commands

- Get-Command
- Get-Item
- Get-ChildItem
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Administrator: Windows PowerSh

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Commands

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PS C:\Users\Administrator>

- Get-Command
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Domain

Oracle 5

- What is the name of the GPO that contains a description of "I_am_Groot"
- Answer

PS C:\> Get-help GPO

PS C:\> Get-GPO -All

The description is where we want to find I_am_Groot

PS C:\> Get-GPO -All | Where-Object {\$_.Description -like 'i_am_groot'}

```
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PS C:\Users\Oracle5\documents> ((get-gpo -all | select DisplayName, Description | Where-Object {$_.Description -eq "I_am_Groot"}).DisplayName).tolower()
charlie
PS C:\Users\Oracle5\documents>
```

_ 0

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PS C:\Users\Administrator>

Domain

Oracle 13

 What is the name of the user who created the Galaxy security group as depicted in the event logs on the desktop

Answer

PS C:\> Set-Location C:\Users\Oracle13\Desktop\

PS C:\> Get-WinEvent -Path .\security.evtx

Looking for Windows Event ID for creation of a security group (4727)

PS C:\> Get-WinEvent -Path .\security.evtx | Where-Object {\$_.Id -eq '4727'}

```
PS C:\Users\Oracle13\Documents> Get-WinEvent -FilterHashTable @{Path="../Desktop /Security.evtx";ID="4727"} | Select *

Message : A security-enabled global group was created.

Subject:
Security ID:
Security ID:
S-1-5-21-2268727836-2773903800-2952248001-1621
Account Name:
Gamora
Account Domain:
UNDERTHEWIRE
Logon ID:

0xBC24FF
```

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Application

- Work on the following challenges:
 - Oracle 8
 - Groot 8

Ten minutes go

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Application

Oracle 8

 What is the name of the file in the GET Request from www.guardian.galaxy.com within the log file on the desktop?

Answer

PS C:\> Set-Location ..\desktop

Then list what is in the directory (Get-ChildItem)

PS C:\> Get-content logs.txt

PS C:\> Get-content logs.txt | Select-string 'guardian.galaxy.com'

```
PS C:\Users\Oracle8\documents> get-content ../desktop/logs.txt | select-string
guardian.galaxy.com'
guardian.galaxy.com - - [28/Jul/1995:13:03:55 -0400] "GET
/images/star-lord.gif HTTP/1.0" 200 786
```

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Application

Groot 8

- What is the description of the firewall rule blocking MySQL
- Answer
- PS C:\> Get-help firewallrule
- PS C:\> Get-netfirewallrule
 - · As we see the displayname is where we want to find MySQL
- PS C:\> Get-NetFirewallRule | Where-Object {\$_.DisplayName -like '*mysql*'}

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Break

BREAK TIME 15 Minutes

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Registry/System

- Work on the following challenges:
 - Groot 1
 - Oracle 1
 - Oracle 12

12 minutes go

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Registry/System

Groot 1

- What is the last five digits of the MD5 hash of this system's hosts file
- Answer
- PS C:\> Get-Help Get-FileHash
- PS C:\> Get-FileHash C:\windows\system32\drivers\etc\hosts -Algorithm MD5
- PS C:\> (Get-FileHash C:\windows\system32\drivers\etc\hosts -Algorithm MD5).Hash
- PS C:\> (Get-FileHash C:\windows\system32\drivers\etc\hosts` -Algorithm MD5).Hash.substring(27,5)

```
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PS C:\Users\Groot1\documents> (get-filehash -Algorithm MD5 C:\windows\system32\d
rivers\etc\hosts).Hash.substring(27,5).tolower()
464c3
```

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PS C:\Users\Administrator>

Registry/System

Oracle 1

- What is the timezone in which this system is set to
- Answer

PS C:\> Get-PSDrive

PS C:\> Get-Childitem HKLM:\System\CurrentControlSet\Control\TimezoneInformation

PS C:\> Get-ItemProperty HKLM:\System\CurrentControlSet\Control\TimezoneInformation

PS C:\> (Get-ItemProperty HKLM:\System\CurrentControlSet\Control\` TimezoneInformation).TimeZoneKeyName

PS C:\Users\Oracle1\documents> (get-itemproperty hklm:\system\currentcontrolset\
control\timezoneinformation).TimeZoneKeyName
UTC

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Registry/System

Oracle 12

 What is the IP of the system that this user has previously established a remote desktop with

Answer

PS C:\> Get-PSDrive

PS C:\> Get-ChildItem "HKCU:\software\microsoft\terminal server client"

PS C:\> (Get-ChildItem "HKCU:\software\microsoft\terminal server client")

PS C:\> (Get-ChildItem "HKCU:\software\microsoft\terminal server ` client").pschildname

```
PS C:\Users\Oracle12\documents> ((Get-ChildItem "HKCU:\software\microsoft\termin
  server client").Name).split("\")[4]
192.168.2.3
```

Z Administrator: Windows PowerShell

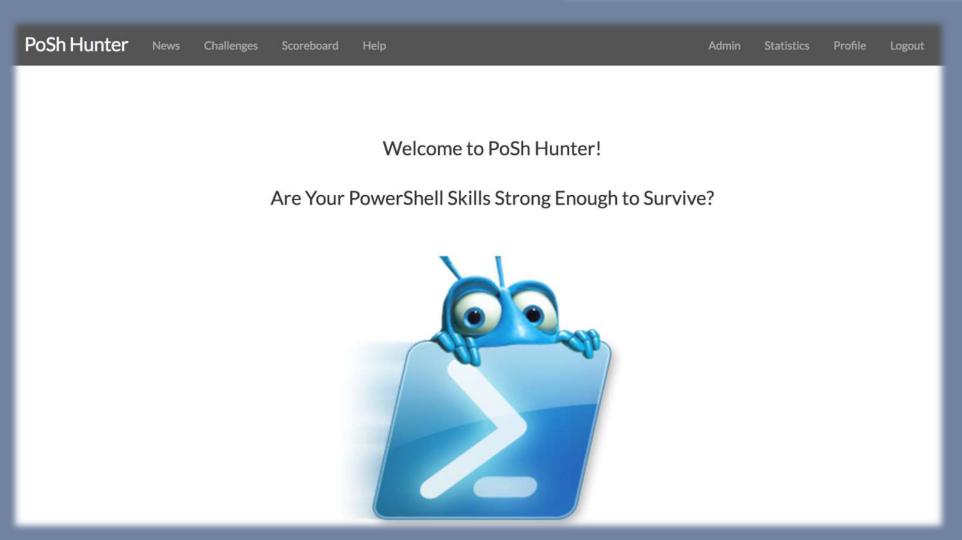
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PoshHunter



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