



PowerShell & PowerCLI Starting from Scratch

TORONTO VMUG USERCON

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Meet Mike



mikenelsonio



nelmedia



mikenelson-io

- 35+ years in tech
- Experience from Helpdesk to Architect
- Scripter, not a coder
- Passion for community, teaching, learning
- Midwest USA husband & dad
- Beer, BBQ, & Gadgets



Get-Content

- PowerShell Basics
- PowerCLI
- Demos



PowerShell (PoSH)

Started as a scripting framework for automation & evolved into a command line interface (CLI) and a scripting language

Native executables, cmdlets, scripts, functions, aliases, modules, help, profiles, parameters, and more



Get-History

- Jeffrey Snover, Bruce Payette, & James Truher
- Project Monad in 2002
- The “Monad Manifesto”



 SIGN IN

The  Register®

{* OFFBEAT *}

Jeffrey Snover claims Microsoft demoted him for inventing PowerShell

Twitter thread reveals Redmondian machinations

Get- SnoverQuips

“This is rock science, not rocket science.”

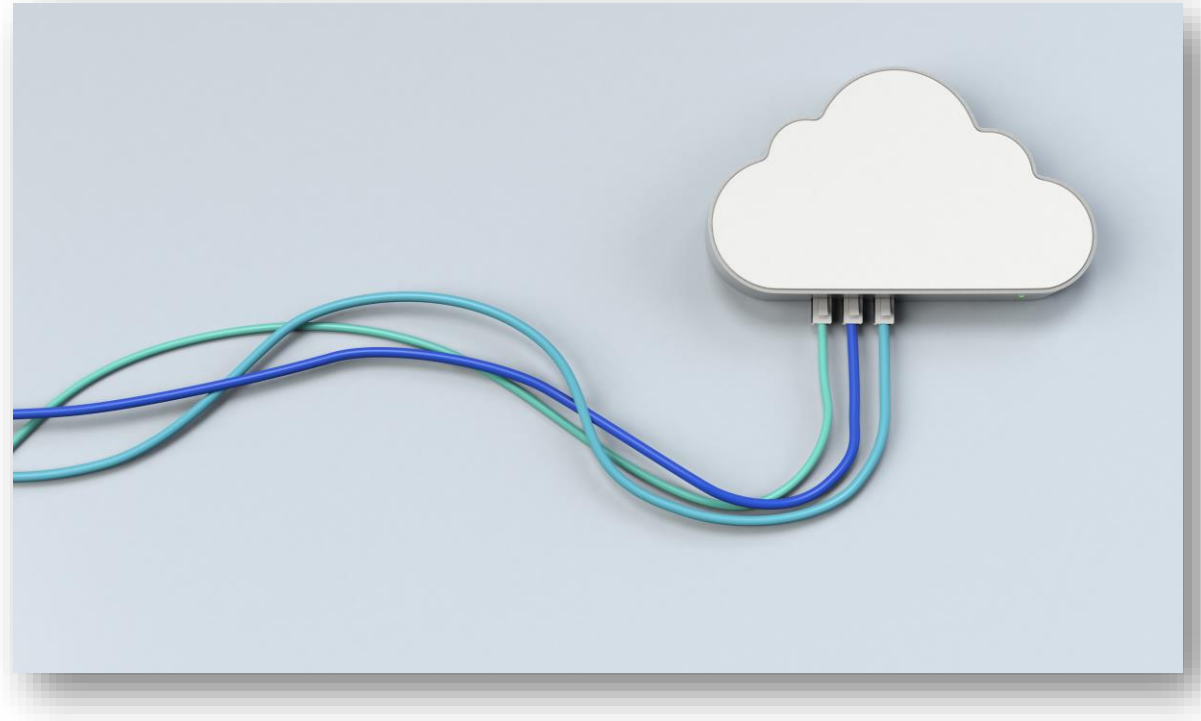
“PowerShell is a such a great product because I am a deeply flawed human being.”

“When in trouble, fear, or doubt - run in circles, scream, and shout.”



Start-Install

- Pre-installed
- Microsoft Store
- PowerShell GitHub Repository
- Windows Update (7.2.1+)
- Chocolatey
- Snap



Get-Versions

.Net Framework



≤ 5.1

Windows Server
Windows Client

.NET Core



6.x



7.x

Windows Client
Windows Server
Linux
MacOS



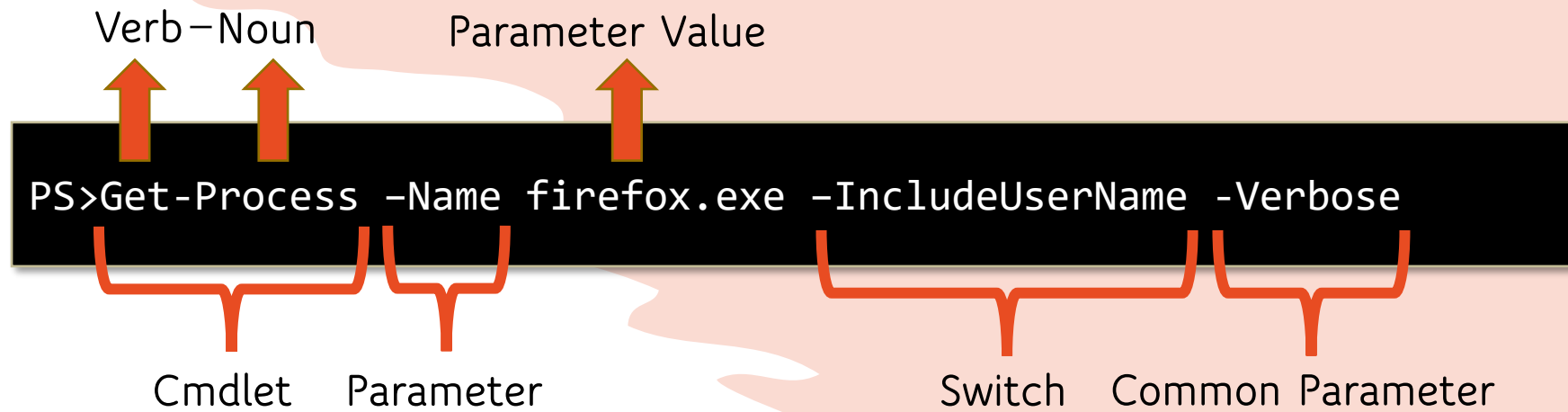
Cmdlets

“commandlets”

- A type of command in PowerShell
- Common syntax & options
- Usually take object input & return objects
- Created as .NET class objects
- Repeatable and auditable
- Stored in .ps1 file for scripts



Get-Syntax



Parameters

Named

Positional

Dynamic

Common

Sets

- Allow for users to provide input or options
- Used by cmdlets, functions, and scripts
- They do not have to be named
- Hyphen “-” signals PoSH to a parameter
- Some parameters do not accept or require a value
- Parameter Sets



Pipelining

Pipeline operator



```
PS>Get-Process -Name firefox.exe -IncludeUserName | Stop-Process
```

Object returned by first cmdlet sent to second cmdlet

“One-liner”



Functions

- A list of PowerShell statements that run like you had entered them on the command line
- Like other programming language functions
- Can have parameters like cmdlets
- Can also act like cmdlets
- Can be simple to complex

```
function Get-FirefoxProcess { Get-Process firefox.exe }  
function Get-FirefoxProcess {  
    $a = Get-Process firefox.exe  
    if ($a -eq $null) {  
        Write-Host "No Firefox process present"}  
    return $a  
}
```



Modules

- .psm1 file
 - Imported as itself or launched from .psd1 file (a module manifest file)
 - Commands, providers, variables, functions, help context, aliases, workflows
- Auto-Loading capability
- Stored in \$env:PSModulePath
- Easy lifecycle management with PowerShell Gallery (Install-Module & Update-Module)



Creating / Editing / Running

```
Administrator: Windows PowerShell ISE
File Edit View Tools Debug Add-ons Help
bulk-update.ps1 X
13
14 # Create arrays for skipped and failed users
15 $SkippedUsers = @()
16 $FailedUsers = @()
17
18 # Loop through CSV records
19 foreach ($CSVrecord in $CSVrecords) {
20     $upn = $CSVrecord.UserPrincipalName
21     $user = Get-AzureADUser -Filter "userPrincipalName eq '$upn'"
22     if ($user) {
23         try {
24             $user | Set-AzureADUser -Department $CSVrecord.Department -Teleph
25         }
26     }
27 }
28
29 PS C:\> Get-Host
30
31 Name           : Windows PowerShell ISE Host
32 Version        : 5.1.17763.1490
33 InstanceId     : b76947f9-993f-4f21-a072-ab27af7f927f
34 UI             : System.Management.Automation.Internal.Host.InternalHostUserInter
35 CurrentCulture : en-US
36 CurrentUICulture : en-US
37 PrivateData    : Microsoft.PowerShell.Host.ISE.ISEOptions
38 DebuggerEnabled : True
39 IsRunspacePushed : False
40 Runspace       : System.Management.Automation.Runspaces.LocalRunspace
41
42 Completed
```

```
Remove-OldModules.ps1 - Visual Studio Code - Insiders
File Edit Selection View Go Run Terminal Help
Remove-OldModules.ps1 X
F: > powershell > Remove-OldModules.ps1 > Remove-OldModules {}
1 reference
1 function Remove-OldModules
2 {
3     $Latest = Get-InstalledModule
4     foreach ($module in $Latest) {
5
6         Write-Verbose -Message "Uninstalling old versions of $($module.Name) [latest is $($module.Version)]" -Verbose
7         Get-InstalledModule -Name $module.Name -AllVersions | Where-Object {$_.Version -ne $module.Version} | Uninstall-Module -Verbose
8     }
9 }
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11 Remove-OldModules
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6 Core Commands to Know

Get-Command

Get-Help

Update-Help

Update-Module

Get-Member

Show-Command



PowerCLI

- Install-Module VMware.PowerCLI
 - -Allow-Clobber, -Force & -SkipPublisherCheck may be necessary

```
Install-Package: The following commands are already available on this system: 'Export-VM, Get-VM, Get-VMHost, Move-VM, New-VM, Remove-VM, Restart-VM, Set-VM, Set-VMHost, Start-VM, Stop-VM, Suspend-VM'. This module 'VMware.VimAutomation.Core' may override the existing commands. If you still want to install this module 'VMware.VimAutomation.Core', use -AllowClobber parameter.
```

- If certificate error, Update-Module will not work
- Cmdlet collisions such as Get-VM
- 800+ cmdlets in 15+ modules
- Set-PowerCLIConfiguration creates PowerCLI_Settings.xml file
 - For Connect-VIServer certificate errors, use -InvalidCertificateAction Ignore



```
# Modules that must be imported into the global environment prior to importing this module
RequiredModules = @(
@{"ModuleName"="VMware.VimAutomation.Sdk";"ModuleVersion"="12.5.0.19093564"}
@{"ModuleName"="VMware.VimAutomation.Common";"ModuleVersion"="12.6.0.19600917"}
@{"ModuleName"="VMware.Vim";"ModuleVersion"="7.0.3.19601056"}
@{"ModuleName"="VMware.VimAutomation.Core";"ModuleVersion"="12.6.0.19601570"}
@{"ModuleName"="VMware.VimAutomation.Srm";"ModuleVersion"="12.6.0.19609133"}
@{"ModuleName"="VMware.VimAutomation.License";"ModuleVersion"="12.0.0.15939670"}
@{"ModuleName"="VMware.VimAutomation.Vds";"ModuleVersion"="12.5.0.19167830"}
@{"ModuleName"="VMware.CloudServices";"ModuleVersion"="12.6.0.19606210"}
@{"ModuleName"="VMware.VimAutomation.Vmc";"ModuleVersion"="12.6.0.19609014"}
@{"ModuleName"="VMware.VimAutomation.Nsxt";"ModuleVersion"="12.5.0.19168180"}
@{"ModuleName"="VMware.VimAutomation.vROps";"ModuleVersion"="12.5.0.19167825"}
@{"ModuleName"="VMware.VimAutomation.Cis.Core";"ModuleVersion"="12.6.0.19601368"}
@{"ModuleName"="VMware.VimAutomation.HorizonView";"ModuleVersion"="12.5.0.19033914"}
@{"ModuleName"="VMware.VimAutomation.Cloud";"ModuleVersion"="12.0.0.15940183"}
@{"ModuleName"="VMware.DeployAutomation";"ModuleVersion"="7.0.3.19599828"}
@{"ModuleName"="VMware.ImageBuilder";"ModuleVersion"="7.0.3.19599828"}
@{"ModuleName"="VMware.VimAutomation.Storage";"ModuleVersion"="12.6.0.19609013"}
@{"ModuleName"="VMware.VimAutomation.StorageUtility";"ModuleVersion"="1.6.0.0"}
@{"ModuleName"="VMware.VumAutomation";"ModuleVersion"="12.1.0.16941488"}
@{"ModuleName"="VMware.VimAutomation.Security";"ModuleVersion"="12.3.0.17833870"}
@{"ModuleName"="VMware.VimAutomation.Hcx";"ModuleVersion"="12.6.0.19606303"}
@{"ModuleName"="VMware.VimAutomation.WorkloadManagement";"ModuleVersion"="12.4.0.18627055"}
@{"ModuleName"="VMware.Sdk.Runtime";"ModuleVersion"="1.0.106.18628394"}
@{"ModuleName"="VMware.Sdk.vSphere";"ModuleVersion"="1.0.104.18678708"}
@{"ModuleName"="VMware.PowerCLI.VCenter";"ModuleVersion"="12.6.0.19600125"}
@{"ModuleName"="VMware.Sdk.Nsx.Policy";"ModuleVersion"="3.2.0.19610335"}
)
```

<https://developer.vmware.com/docs/powercli/latest/products/>

vmw

VMware Developer Documentation BETA

API Reference

PowerCLI Reference

[← Back Home](#)

VMware PowerCLI Cmdlets

By Products ▾

VMware vSphere and vSAN

VMware Cloud Director

vRealize Operations Manager

VMware Cloud Services

VMware Cloud on AWS

VMware HCX


VMware Horizon

VMware NSX-T Data Center

VMware Site Recovery Manager


Search PowerCLI

VMware PowerCLI Cmdlets by Product




VMware vSphere and vSAN

Provides cmdlets for automated administration of the vSphere environment.




VMware Cloud Director

Provides cmdlets for automating vCloud Director features.




vRealize Operations Manager

Provides cmdlets for automating vRealize Operations Manager features.




VMware Cloud Services

Provides cmdlets for managing VMware Cloud Services.




VMware Cloud on AWS

Provides cmdlets for managing VMware Cloud on AWS features.




VMware HCX

Provides cmdlets for managing VMware HCX features.




VMware Horizon

Provides cmdlets for automating VMware Horizon features.



VMware NSX-T Data Center

Provides cmdlets for managing NSX-T servers.



VMware Site Recovery Manager

Provides cmdlets for managing VMware Site Recovery Manager features.

PURE
CODE()

Demos





Thank you!

@MIKENELSONIO

