TECHMENTOR MICROSOFT HQ 2022

PowerShell from Scratch - Learn the Basics

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Principal Technologist
Cohesity

Level: Beginner

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Get-Mike

mikenelsonio

nelmedia

mikenelson-io

- 35+ years in tech
- Principal Technologist @ Cohesity
- Experience from Helpdesk to Architect
- Scripter, not a coder
- Passion for community, teaching, learning
- Beer, BBQ, & Gadgets

Microsoft Most Valuable Professional MVP

Citrix Technology Advocate CTA

vmware vEXPERT

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Wis·con·sin

wəˈskänsən

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THE DANE DISPATCH
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SUNDAY
THE GREAT DANE
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MADISON, WI
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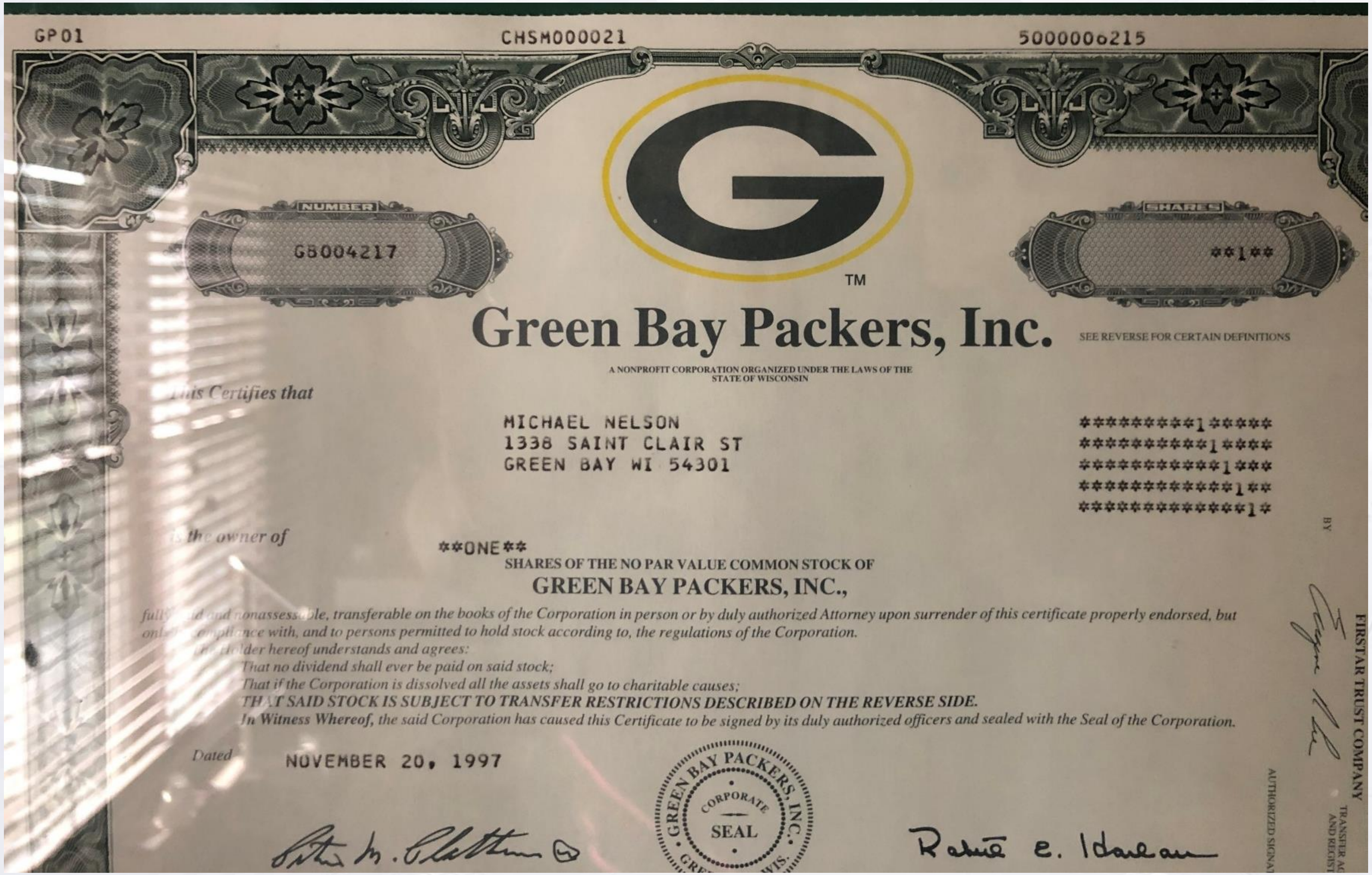

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1338 SAINT CLAIR ST
GREEN BAY WI 54301

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That if the Corporation is dissolved all the assets shall go to charitable causes;

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Dated NOVEMBER 20, 1997

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PowerShell (PoSH)

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

The default CLI automation standard for Microsoft products & their ecosystems.

Open source.

Why use PowerShell?

Get-History

- Jeffrey Snover, Bruce Payette, & James Truher
- Project Monad in 2002
- The “Monad Manifesto”
- Jeffrey was demoted after creating Monad
- R.I.P. Jeffrey + Microsoft July 31, 2022

Get-Version

<=5.1

Windows

.Net Framework

powershell.exe

~~6.x~~

7.x

Windows-Linux-MacOS

.NET Core

pwsh.exe

-UseWindowsPowerShell

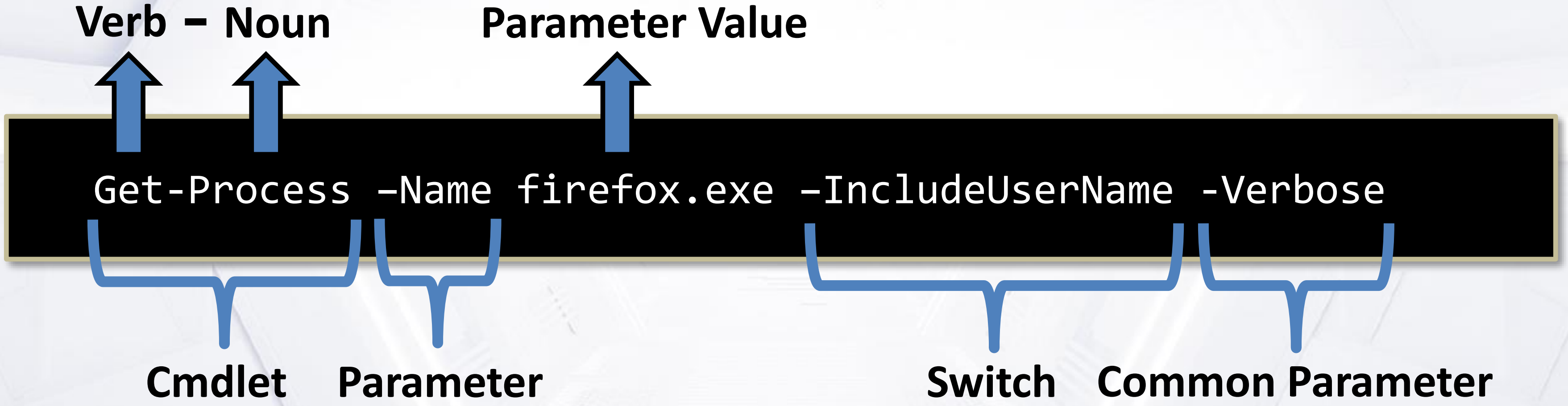
Show-Profile

- The PowerShell profile is a script that runs when a PowerShell session is started (unless the –noprofile switch is used)
- Basically, it is a logon script for PowerShell containing commands, aliases, variables, drives, functions, modules, etc.
- Profiles can be for all users, the current user, all hosts, and the current host. You can have a mix of none, some, or all of these and there is a precedence order.
- There is no default profile
- Your current user profile is stored in the $profile variable. To edit your current user profile with VSCode, type code $profile at a PowerShell prompt.

Show-Variables

- A unit of memory in which a value is stored
- PowerShell variables are text strings represented by the dollar sign “$”prefix (ex. $a, $my_var, $var1, etc.)
- Although special characters and spaces allowed, variable names should be kept simple
- Types of variables:
  - User – user defined and deleted on exit (add to your PowerShell Profile to sustain)
  - Automatic – defined by Posh & not editable (ex. $PSHOME)
  - Preference – defaults defined & are user editable
- Get-Variable to show all variables defined in a session

Get-Syntax



```
Get-Process -Name firefox.exe -IncludeUserName -Verbose
```

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Cmdlets (command-lets)

- A type of command in PowerShell
- Common syntax & options
- Usually take object input & return objects
- Run standalone, combined, or stored in .ps1 file as scripts

Show-Parameters

- Allow for users to provide input or options
- A pre-hyphen ("-") is not always necessary (ie. positional)
- Some parameters have default values (dev decision)
- Different Types:
  - Named -> default full name of parameter
  - Positional -> typed in a relative order (caution)
  - Dynamic -> only available under special conditions
  - Common -> built-in parameters
  - Sets -> expose different parameters & return different information

Show-Pipelining

Pipeline operator

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

Object returned by first cmdlet sent to second cmdlet

"One-liner"

Show-Functions

A list of PowerShell statements that run like you had entered them on the command line.

```
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
}
```

To run a function, you call it by name on the command line, in a script, or in a module.

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

Show-Modules

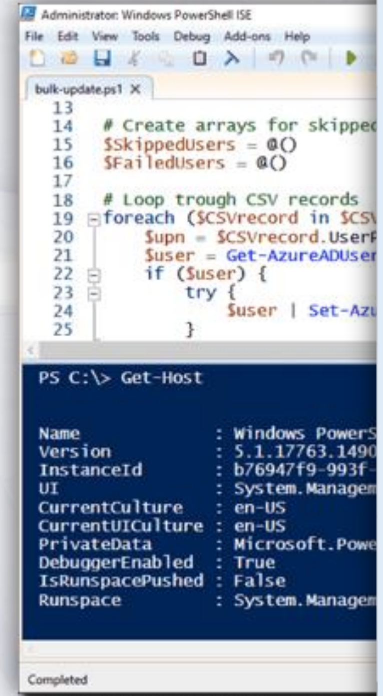
- Modules are a .psm1 file or a .dll that contain commands, providers, variables, functions, help context, aliases, & workflows
- Imported as itself (automatically via autoloading or manually via the Import-Module cmdlet) or launched from .psd1 manifest file (see next slide)
- Can be stored anywhere, but common paths is best (ex. $env:PSModulePath)
- Easy lifecycle management with Install-Module & Update-Module

Show-ModuleManifest

- Module can be defined by a manifest file which has an extension of .psd1
- A manifest is not required for a module.
- Manifests are made up of a hash table of keys and values that describe the contents & attributes of a module, define prerequisites, and determine how components are processed.
- Think of it as a glossary and instruction set for a module for PowerShell.

Get-Editor

ISE (<=v5.1)


Administrator: Windows PowerShell ISE
File Edit View Tools Debug Add-ons Help
bulk-update.ps1
Completed

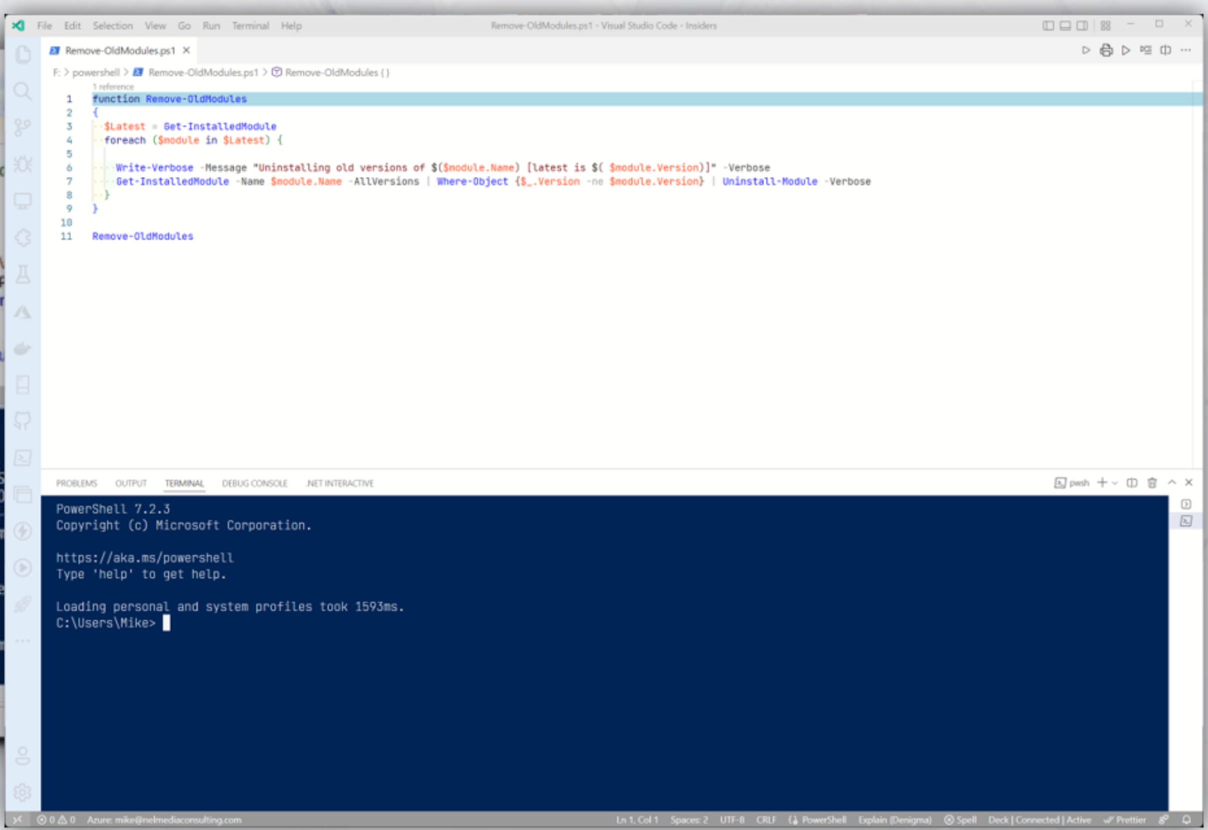
```
# Create arrays for skipped
$SkippedUsers = @()
$FailedUsers = @()

# Loop trough CSV records
foreach ($CSVrecord in $CSV
    $upn = $CSVrecord.UserP
    $user = Get-AzureADUser
    if ($user) {
        try {
            $user | Set-Azu
        }
```

```
PS C:\> Get-Host


Name             : Windows PowerS
Version          : 5.1.17763.1490
InstanceId       : b76947f9-993f-
UI               : System.Managem
CurrentCulture   : en-US
CurrentUICulture : en-US
PrivateData      : Microsoft.Powe
DebuggerEnabled  : True
IsRunspacePushed : False
Runspace         : System.Managem
```

VSCode


File Edit Selection View Go Run Terminal Help
Remove-OldModules.ps1 - Visual Studio Code - Insiders
Remove-OldModules.ps1
F: > powershell > Remove-OldModules.ps1 > Remove-OldModules { }
1 reference
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE .NET INTERACTIVE
pwsh
Azure: mike@nelmediaconsulting.com
Ln 1, Col 1 Spaces: 2 UTF-8 CRLF PowerShell Spell Prettier

```
function Remove-OldModules
{
  $Latest = Get-InstalledModule
  foreach ($module in $Latest) {

    Write-Verbose -Message "Uninstalling old versions of $($module.Name) [latest is $( $module.Version)]" -Verbose
    Get-InstalledModule -Name $module.Name -AllVersions | Where-Object {$_.Version -ne $module.Version} | Uninstall-Module -Verbose
  }
}

Remove-OldModules
```

```
PowerShell 7.2.3
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https://aka.ms/powershell
Type 'help' to get help.

Loading personal and system profiles took 1593ms.
C:\Users\Mike>
```

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Core Cmdlets to Know

- Get-Help
- Update-Help
- Get-Command
- Show-Command
- Get-Member
- Update-Module

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Demo Stuff

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Thank you!

@mikenelsonio
Github - mikenelson-io
LinkedIn - nelmedia

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