

PowerShell Fundamentals

Introduction

Hello World

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You

Get-User

Get-Expectation

Agenda

PowerShell Command Structure

Finding Commands

.NET Framework

Variables

Input & Output

Pipelines

PSDrives

Working with Text

Script Flow - Conditions & Loops

PowerShell Remoting

Tools

Version Control

Scripting Best Practices

Bring Your Own Lab

What is PowerShell

History

Why use PowerShell?

Versions

Windows PowerShell

PowerShell Core

PowerShell

Modules

Execution Policy

Safety - Not Security!

Lab 01 - Install PowerShell & VSCode

PowerShell Command Structure

- Verbs
- Nouns
- Parameters
 - Common Parameters
 - WhatIf
 - Custom Parameters
- Lab 02 - Running Commands

Finding Commands

- Get/Update/Save -Help
- Get-Command
- Get-Verb
- Aliases
- Show-Command
 - How to Install for Cross-Platform
- Lab 03 - PowerShell Help

.NET Framework

- Objects
 - PowerShell Objects
 - Types
 - Members
 - Properties
 - Methods
 - Referencing Properties or Calling Methods
- Get-Member
- Lab 04 - Commands and Methods

Variables

- Goal: Don't Repeat Yourself!
- Types
 - Numbers
 - Text
 - Lists
 - Array
 - Hashtables
- Parentheses
- Casting
 - Implicit
 - Explicit
- Environment Variables
- Output Variables
- Built-In Variables
 - Preferences
 - Error
 - ErrorView
 - PSVersionTable
 - Env:PSModulePath
- Get-ChildItem Variable:
- Lab 05 – Variables

Input & Output

Input

- Read-Host

 - Can handle secure input!

- Parameters

Output

- Write-Host & Write-Output

- Streams

 - Output

 - Verbose

 - Debug

 - Warning

 - Error

 - Get-Error

 - Information

Lab 06 - Input & Output

Pipelines

Linking Commands

- Pipeline Input

Formatting

- Format-Table

- Format-List

- Changes Output

Filtering

- Select-Object

- Where-Object

- Sort-Object

- Group-Object

 - AsHashTable

Out-GridView

- Passthrough

\$PSItem/\$_

Begin Process End

Lab 07 – Pipelines

PSDrives

Providers

- FileSystem

- Registry

- Cert

- AD

- Azure

Navigation and Exploration

- Get-Command *Item*

- Get-ChildItem

- Get/Set -Location

Lab 08 – PSDrives

Working with Text

- Variables in Text

 - Single vs Double Quotes

 - Implicit ToString()

 - Expressions

- Multiline Strings

- String Manipulation

 - Replace

 - Trim

 - Split

 - Join

 - Case Sensitivity

- Regex

 - Match

 - Replace

- Commands

 - *-Content

 - Raw

 - Tail

 - Out-File

 - Select-String

 - Recursive File Search

 - AllMatches

 - ConvertTo-* / ConvertFrom-*

 - Export-* / Import-*

- Encoding

 - \$OutputEncoding

- Text Types

 - JSON

 - XML

 - HTML

- Lab 09 – Text

Script Flow

- Loops

 - ForEach-Object

 - \$PSItem/\$_

 - foreach

 - for

- Keywords

 - break

 - continue

 - return

 - Behaviors in Pipelines

- Conditions

 - Operators

 - Comparisons

 - eq / -ne

 - gt / -lt

 - ge / -le

 - like / -notlike

 - contains / -notcontains

 - in / -notin

 - Case Sensitivity

 - Compare-Object

 - Explicit / Implicit

 - Logical

 - and / -or

 - not

 - Range

 - if

 - switch

- Loops with Conditions

 - while

 - do while

 - do until

- Lab 10 - Conditions & Loops

PowerShell Remoting

- PSSessions

- Invoke-Command

 - Parallel

- Using: Local Variables

- Security

 - Network Logon

 - Mutual Trust

 - Encryption

- HTTP / HTTPS / SSH

- Lab 11 – Remoting

Tools

- Editor
 - ISE (Deprecated)
 - VS Code
 - Move Line
 - Change All Occurences
 - Format Document
- PSGallery

Version Control

- git
 - GitHub
 - Azure DevOps
 - GitLab
 - Bitbucket
- Svn

Best Practices

- Performance
 - Filter left - Format right
 - Measure-Command
 - Pipelines
 - Avoid Console Output
 - Arrays
- Readability
 - Verb-Noun
 - \$null on left side comparison
- VSCoExtensions

Megalab

More Reading

PowerShell Documentation <https://docs.microsoft.com/en-us/powershell/>
PSKoans <https://github.com/vexx32/PSKoans>
Community Best Practices <https://github.com/PoshCode/PowerShellPracticeAndStyle>
Learn PowerShell in a Month of Lunches, Linux and macOS Edition