PowerShell Fundamentals

Introduction

- Hello World
  - Emanuel
  - Björn
  - Simon
  - John
  - Emil
  - Jens
  - Stefan
  - Erik
  - Robin
  - You
    - Get-Participant
    - Get-Expectation
- Agenda
  - Schedules and plans
  - 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 (1-5)
    - PowerShell Core (6)
    - PowerShell (7)
  - Modules
  - Execution Policy
    - Safety - Not Security!
- Lab 00 - Install PowerShell & VSCode (link)

Try Along!

PowerShell Command Structure

- Verbs
- Nouns
- Parameters
  - Common Parameters
    - -WhatIf
  - Custom Parameters
- Lab 01 - Running Commands

Finding Commands

- Get/Update/Save -Help
- Get-Command
- Get-Verb
- Aliases
- Show-Command

- How to Install for Cross-Platform
- Lab 02 - PowerShell Help

.NET Framework

- Objects
  - PowerShell Objects
  - Types
  - Members
  - Properties
  - Methods
  - Referencing Properties or Calling Methods
- Get-Member
  - -InputObject
  - $MyObject | Get-Member
- Lab 03 - 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 04 - 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
  - Out-* commands
- Lab 05 - Input & Output

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
  - Select-String
    - Recursive File Search
    - AllMatches
  - ConvertTo-* / ConvertFrom-*
- Files
  - PSDrives
    - Navigation and Exploration
      - Get-Command *Item*
      - Get-ChildItem
      - Get/Set -Location
  - Out-File
  - *-Content
    - -Raw
    - -Tail
  - Export-* / Import-*
  - Encoding
    - $OutputEncoding
- Text Types
  - JSON
  - XML
  - HTML
- Lab 06 - Text

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
- $PSItem/$_
- Lab 06 - Pipelines

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 09 - Conditions & Loops

Tools

- Editor
  - ISE (Deprecated)
  - VS Code
    - Workspace
    - Create Scripts
    - Move Line
    - Change All Occurences
    - Format Document
- PSGallery
- Windows Terminal

Version Control

- git
  - hosts
    - GitHub
    - Azure DevOps
    - Bitbucket
    - GitLab
  - Quick start
    - git clone
    - git add
    - git commit -m 'message'
    - git push
- svn

Best Practices

- Performance
  - Filter left - Format right
  - Measure-Command
  - Pipelines

- Avoid Console Output
- Arrays
- Readability
  - Don't Use Aliases
- Verb-Noun
- $null on left side comparison
- VSCode Extensions
- Don't run unknown code!

Megalab

More Reading

- PowerShell Documentation (link)
- PSKoans (link)
- Community Best Practices (link)
- Learn PowerShell in a Month of Lunches, Linux and macOS Edition
- PowerShell User Group Sweden (link)
- Automate administrative tasks by using PowerShell - Learn (link)
- Higway to PowerShell, Simon Wåhlin, Youtube