

Windows PowerShell Scripting and Toolmaking



Purpose of the training

This course is intended for administrators in a Microsoft-centric environment who want to build reusable units of automation, automate business processes, and enable less-technical colleagues to accomplish administrative tasks.



Benefits of completing the training

After completing this course, students will be able to:

- Describe the correct patterns for building modularized tools in Windows PowerShell
- Build highly modularized functions that comply with native PowerShell patterns
- Build controller scripts that expose user interfaces and automate business processes
- Manage data in a variety of formats
- Write automated tests for tools
- Debug tools



Expected Listener Preparation

Before attending this course, students must have:

- Experience at basic Windows administration
- Experience using Windows PowerShell to query and modify system information
- Experience using Windows PowerShell to discover commands and their usage
- Experience using WMI and/or CIM to query system information



Training Language

- Training: English
- Materials: English



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Training agenda

1. Module 1: Tool Design
 - Tools do one thing
 - Tools are flexible
 - Tools look native
2. Module 2: Start with a Command
 - Why start with a command?
 - Discovery and experimentation
3. Module 3: Build a Basic Function and Module
 - Start with a basic function
 - Create a script module
 - Check prerequisites
 - Run the new command
4. Module 4: Adding CmdletBinding and Parameterizing
 - About CmdletBinding and common parameters
 - Accepting pipeline input
 - Mandatory-ness
 - Parameter validation
 - Parameter aliases
5. Module 5: Emitting Objects as Output
 - Assembling information
 - Constructing and emitting output
 - Quick tests
6. Module 6: An Interlude: Changing Your Approach

- Examining a script
 - Critiquing a script
 - Revising the script
7. Module 7: Using Verbose, Warning, and Informational Output
- Knowing the six channels
 - Adding verbose and warning output
 - Doing more with verbose output
 - Informational output
8. Module 8: Comment-Based Help
- Where to put your help
 - Getting started
 - Going further with comment-based help
 - Broken help
9. Module 9: Handling Errors
- Understanding errors and exceptions
 - Bad handling
 - Two reasons for exception handling
 - Handling exceptions in our tool
 - Capturing the actual exception
 - Handling exceptions for non-commands
 - Going further with exception handling
 - Deprecated exception handling
10. Module 10: Basic Debugging
- Two kinds of bugs
 - The ultimate goal of debugging
 - Developing assumptions
 - Write-Debug
 - Set-PSBreakpoint
 - The PowerShell ISE
11. Module 11: Going Deeper with Parameters
- Parameter positions
 - Validation
 - Multiple parameter sets
 - Value from remaining arguments
 - Help messages
 - Aliases
 - More CmdletBinding
12. Module 12: Writing Full Help
- External help
 - Using PlatyPs

- Supporting online help
 - “About” topics
 - Making your help updatable
13. Module 13: Unit Testing Your Code
- Sketching out the test
 - Making something to test
 - Expanding the test
 - Going further with Pester
14. Module 14: Extending Output Types
- Understanding types
 - The Extensible Type System
 - Extending an object
 - Using Update-TypeData
15. Module 15: Analyzing Your Script
- Performing a basic analysis
 - Analyzing the analysis
16. Module 16: Publishing Your Tools
- Begin with a manifest
 - Publishing to PowerShell Gallery
 - Publishing to private repositories
17. Module 17: Basic Controllers: Automation Scripts and Menus
- Building a menu
 - Using UIChoice
 - Writing a process controller
18. Module 18: Proxy Functions
- A proxy example
 - Creating the proxy base
 - Modifying the proxy
 - Adding or removing parameters
19. Module 19: Working with XML Data
- Simple: CliXML
 - Importing native XML
 - ConvertTo-XML
 - Creating native XML from scratch
20. Module 20: Working with JSON Data
- Converting to JSON
 - Converting from JSON
21. Module 21: Working with SQL Server Data
- SQL Server terminology and facts
 - Connecting to the server and database

- Writing a query
- Running a query
- Invoke-SqlCmd
- Thinking about tool design patterns