

Windows PowerShell: Scripting Language Workshop for Beginners



Workshop

Target audience:

- Administrators and programmers without knowledge of PowerShell, who want to gain deep knowledge of those PowerShell scripting language areas, which are required to effectively start to use this scripting technology.

Overview

The content of this introductory workshop is designed to cover all features and capabilities of PowerShell scripting language that are required to effectively use the PowerShell both to interactively manage various infrastructure and application technologies and to automate arbitrary administrative tasks using PowerShell scripts.

Technical highlights

After finishing this workshop, students will be able to understand and effectively use many PowerShell features and capabilities, namely:

- More than 100 PowerShell cmdlets
- Generic concept of PowerShell provider and drive that can be immediately utilized to manage technologies such as Active Directory on Windows domain controller, SQL Server, IIS and many other
- Integration with .Net framework and COM technologies
- All language constructs (decision statements, loops, functions, script blocks) that are needed to create optimal PowerShell code
- Error handling
- Use of PowerShell pipeline
- PowerShell remoting that can be used to manage simultaneously one or more remote systems

Syllabus

Module 1

PowerShell version 3.0
overview

- What is Windows PowerShell, history of the technology
 - Current support of Windows PowerShell technology by various operating systems and applications
 - Windows PowerShell version 3 availability on various OS; Windows Management Framework prerequisites and installation on different operating system
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Module 2

PowerShell technology
usage

- PowerShell console host description, command line editing rules
 - Using PowerShell Integrated Script Environment (ISE)
 - Working with PowerShell scripts – 10 basic rules
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Module 3

PowerShell commands

- Categorization of PowerShell commands – cmdlets, functions, aliases, PowerShell scripts, native OS commands
 - Categorization of PowerShell cmdlets
 - Adding cmdlets to the PowerShell session through external modules and snap-ins
 - using cmdlets, providing parameters to cmdlets, getting and understanding help for cmdlets
 - Working with strings – static and dynamic strings, basic rules for string composition
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Module 4

PowerShell providers and
drives

- PowerShell provider concepts, getting list of providers
 - Inspecting PowerShell provider capabilities
 - PSDrive – basic concepts, default PSDrives
 - PSDrive management – creation and removal of PSDrives
 - Path navigation cmdlets
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Module 5

Working with basic types
of hierarchical
repositories supported by
PowerShell providers

- Working with file system
 - Working with registry keys and values
 - Working with environment variables
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Module 6

Objects in Windows
PowerShell

- Description of Windows PowerShell adaptation layer
 - Anatomy of Windows PowerShell object
 - Using get-member cmdlet to inspect properties and methods of Windows PowerShell objects
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Module 7

PowerShell variables

- Working with PowerShell variables
- Understanding variable scope
- Understanding the variable: drive

Module 8

PowerShell pipeline

- Description of PowerShell object-oriented pipeline
 - Pipeline processing cmdlets – where-object, foreach-object, sort-object, select-object, group-object, tee-object, compare-object, measure-object
 - How pipeline works – inspection of pipeline initialization, processing and finalization
 - Formatting pipeline output – format-list, format-table, format wide, format-custom
 - System of PowerShell pipelines – success, warning, error, verbose and debug pipelines and their control
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Module 9

PowerShell, .Net integration and common data type system, COM integration

- .Net framework concepts, namespaces, classes and objects, MSDN documentation
 - Numeric data types, datetime data types and related operators
 - Using new-object cmdlet
 - COM integration
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Module 11

Arrays

- Array – basic concepts
 - Array initialization, accessing array items using index
 - Processing array using foreach-object cmdlet and foreach and for loops
 - Multidimensional arrays – initialization and processing
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Module 12

Working with functions and script blocks

- Function and script block – description, common features and differences
 - Regular and pipeline oriented functions and script blocks
 - Different methods of passing data to the functions – \$Args variable, param statement, function definition header
 - Passing data by value and by reference
 - Generating output data within function and processing of this output
 - Pipeline processing functions and script blocks - Begin, Process and End sections, Filters
 - Functions and scope
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Module 13

Using PowerShell remoting capabilities

- Remoting concepts
 - Invoking remote commands, processing output
 - Session concept and management basics
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Module 14

Objects in Windows PowerShell

- Error handling concepts, terminating and non-terminating errors
 - Handling errors using \$?, \$Error and \$lastExitCode variables
 - ErrorRecord object anatomy
 - Example implementation of error handling code
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Module 15

Working with textual files

- Saving information into textual and csv files
- Reading information from textual and csv files