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PowerShellMagazine

Update-Help Downloads and installs newest help files Get-Help Displays information about commands and concepts Get-Command Gets all commands Get-Member Gets the properties and methods of objects Get-Module Gets the modules that have been imported or that can be imported

Operators

into the current session

Assignment Operators

=, +=, -=, *=, /=, %=, ++, -- Assigns one or more values

to a variable

Comparison Operators

-eq, -ne Equal, not equal

-gt, -ge Greater than, greater than

or equal to

-lt, -le Less than, less than or

equal to

-replace changes the specified

elements of a value

"abcde" -replace "bc", "TEST"

cmatch (case-sensitive match

-match, -notmatch Regular expression match

-like, -notlike Wildcard matching

-contains, -notcontains Returns TRUE if the scalar

value on its right is contained in the array on

its left

1,2,3,4,5 -contains 3

-in, -notin Returns TRUE only when

test value exactly matches at least one of the

reference values.

"Windows"-in "Windows","PowerShell"

Bitwise Operators

-band Bitwise AND

-bor Bitwise OR (inclusive)
-bxor Bitwise OR (exclusive)

-bnot Bitwise NOT

-shl, -shr Bitwise shift operators. Bit

shift left, bit shift right (arithmetic for signed, logical for unsigned values)

Other Operators

-Split Splits a string

"abcdefghi" -split "de"

-join Joins multiple strings

"abc","def","ghi" -join ";"

.. Range operator

1..10 | foreach {\$_ * 5}

-is, -isnot Type evaluator (Boolean).

Tells whether an object is an instance of a specified .NET

Framework type.

42 -is [int]

-as Type convertor. Tries to

convert the input object to

the specified .NET Framework type.

a = 42 - as [String]

-f Formats strings by using the

format method of string

objects

1..10 | foreach { "{0:N2}" -f \$_ }

[] Cast operator. Converts or

limits objects to the specified type

[datetime]\$birthday = "1/10/66"

Comma operator (Array

constructor)

. Dot-sourcing operator runs a script in the current scope

. c:\scripts\sample.ps1

\$() Subexpression operator

@() Array subexpression operator & The call operator, also known as

the "invocation operator," lets you run commands that are stored in variables and

represented by strings.

\$a = "Get-Process"

& \$a

\$sb = { Get-Process | Select –First 2 }

& \$sb

Logical Operators

-and, -or, -xor, -not, ! Connect expressions and

statements, allowing you to test

for multiple conditions

Redirection Operators

>, >> The redirection operators enable

you to send particular types of output (success, error, warning, verbose, and debug) to files and to the success output stream

to the success output stream.

Output streams * All output

1 Success output

2 Errors

3 Warning messages

4 Verbose output

5 Debug messages

Writes warning output to warning.txt

Do-Something 3> warning.txt

Appends verbose.txt with the verbose output

Do-Something 4>> verbose.txt

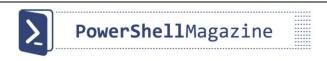
Writes debug output to the output stream

Do-Something 5>&1

Redirects all streams to out.txt

Do-Something *> out.txt

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A	rrays
"a", "b", "c"	Array of strings
1,2,3	Array of integers
@()	Empty array
@(2)	Array of one element
1,(2,3),4	Array within array
/,"hi"	Array of one element
\$arr[5]	Sixth element of array*
\$arr[220]	Returns elements 3 thru 21
\$arr[-1]	Returns the last array
	element
\$arr[-31]	Displays the last three
	elements of the array
\$arr[1,4+69]	Displays the elements at
	index positions 1,4, and 6
	through 9
@(Get-Process)	Forces the result to an
(a) (b) (b)	array using the array sub-
@(Get-Process)	expression operator
\$arr=110	
\$arr[(\$arr.length-1)0]	Reverses an array
\$arr[1] += 200	Adds to an existing value of
	the second array item
	(increases the value of the
	element)
\$b = \$arr[0,1 + 36]	Creates a new array based
	on selected elements of an
	existing array
\$z = \$arr + \$b	Combines two arrays into a
	single array, use the plus
	operator (+)
*Arrays are zero-based	

Associative Arrays	(Hash tables)

 $hash = @{}$ Creates empty hash table $m{foo=1; bar='value2'}$ Creates and initialize a

hash table

[ordered]@{a=1; b=2; c=3}Creates an ordered

dictionary

\$hash.key1 = 1 Assigns 1 to key key1

\$hash.key1 Returns value of key1
\$hash["key1"] Returns value of key1
\$hash.GetEnumerator | sort Key Sorts a hash table by the Key property
[pscustomobject]@{x=1; y=2} Creates a custom

object

\$a.Substring(0,3)

\$a | Get-Member - MemberType Method - Static

Static methods are callable with the "::" operator.

[DateTime]::IsLeapYear(2012)

Comments

This is a comment because # is the first character of a token

\$a = "#This is not a comment..." \$a = "something" # ...but this is.

Write-Host Hello#world

Block Comments

<# This is

A multi-line comment #>

Strings

"This is a string, this \$variable is expanded as is \$(2+2)" 'This is a string, this \$variable is not expanded'

@"

This is a here-string can contain anything including carriage returns and quotes. Expressions are evaluated: \$(2+2*5). Note that the end marker of the here-string must be at the beginning of a line!

"@

aka triple quotes in python

ത'

Here-strings with single quotes do not evaluate expressions: \$(2+2*5)

'@

Object Properties

An object's properties can be referenced directly with the "." operator.

\$a = Get-Date

\$a | Get-Member – Member Type Property

\$a.Date

\$a.TimeOfDay.Hours

\$a | Get-Member - MemberType Property - Static

Static properties can be referenced with the "::" operator.

[DateTime]::Now

Variables

Format: \$[scope:]name or \${anyname} or \${any path}

\$path = "C:\Windows\System32"

Get-ChildItem \${env:ProgramFiles(x86)}

\$processes = Get-Process

\$global:a =1 # visible everywhere

\$local:a = 1 # defined in this scope and visible to children

\$private:a = 1 # same as local but invisible to child scopes

\$script:a = 1 # visible to everything is this script

Using scope indicates a local variable in remote commands

and with Start-Job

\$localVar = Read-Host "Directory, please"

Invoke-Command -ComputerName localhost -ScriptBlock {

dir \$using:localVar }

Start-Job { dir \$using:localVar -Recurse}

\$env:Path += ";D:\Scripts"

Methods

Methods can be called on objects.

\$a = "This is a string"

\$a | Get-Member - MemberType Method

\$a.ToUpper()

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Get-Command -Noun Variable # the Variable Cmdlets Get-ChildItem variable: # listing all variables using the variable drive

strongly-typed variable (can contain only integers) [int]\$number=8

attributes can be used on variables
[ValidateRange(1,10)][int]\$number = 1
\$number = 11 #returns an error

flip variables \$a=1;\$b=2; \$a,\$b = \$b,\$a

multi assignment \$a,\$b,\$c = 0 \$a,\$b,\$c = 'a','b','c' \$a,\$b,\$c = 'a b c'.split()

create read only variable (can be overwritten with - Force)

Set-Variable -Name ReadOnlyVar -Value 3 -Option ReadOnly

create Constant variable (cannot be overwritten) Set-Variable -Name Pi -Value 3.14 -Option Constant

Windows PowerShell Automatic Variables (not exhaustive)		
\$\$	Last token of the previous	
	command line	
\$?	Boolean status of last command	
\$^	First token of the previous	
	command line	
\$_, \$PSItem	Current pipeline object	
\$Args	Arguments to a script or function	
\$Error	Array of errors from previous	
	commands	
\$ForEach	Reference to the enumerator in a	
	foreach loop	
\$Home	The user's home directory	
\$Host	Reference to the application	
	hosting the PowerShell language	

\$Input	Enumerator of objects piped to a scrip
\$LastExitCode	Exit code of last program or script
\$Matches	Stores a hash table of string values
	matched by the -match or -notmatch
	comparison operators.
\$MyInvocation	An object with information about the
	current command
\$PSHome	The installation location of Windows
	PowerShell
\$profile	The standard profile (may not be
	present)
\$Switch	Enumerator in a switch statement
\$True	Boolean value for TRUE
\$False	Boolean value for FALSE
\$PSCulture	Current culture
\$PSUICulture	Current UI culture
${\bf \$PsVersion Table}$	Details about the version of Windows
	PowerShell
\$Pwd	The full path of the current directory

Windows PowerShell Preference Variables	
(not exhaustive)	

(not	exhaustive)
\$ConfirmPreference	Determines whether Windows PowerShell automatically prompts you for confirmation before running a cmdlet or function
\$DebugPreference	Determines how Windows PowerShell responds to debugging
\$ErrorActionPreference	Determines how Windows PowerShell responds to a non- terminating error
\$FormatEnumerationLimi	tDetermines how many enumerated items are included in a display
\$MaximumHistoryCount	Determines how many commands are saved in the command history for the

current session

mail messages

Specifies the default e-mail server that is used to send e-

\$PSEmailServer

\$OFS	Output Field Separator. Specifies the character that separates the elements of an array when the array is converted to a string. The
	default value is Space.
\$PSDefaultParameterVal	ues Specifies default values for the
	parameters of cmdlets and
	advanced functions
\$PSModuleAutoLoadingPreference Enables and disables	
	automatic importing of modules
	in the session. "All" is the default.
\$PSSessionApplicationName Specifies the default application	
	name for a remote command tha
	uses WS-Management technology
\$PSSessionConfigurationName Specifies the default session	
	configuration that is used for
	PSSessions created in the current
4500	session
\$PSSessionOption	Establishes the default values for
	advanced user options in a
¢\/arbasaDrafaransa	remote session
\$VerbosePreference	Determines how Windows
	PowerShell responds to verbose messages generated by a script,
	cmdlet or provider
\$WarningPreference	Determines how Windows
y v arming reference	PowerShell responds to warning
	messages generated by a script,
	cmdlet or provider
\$WhatIfPreference	Determines whether WhatIf is
	automatically enabled for every
	command that supports it

Collection Filtering

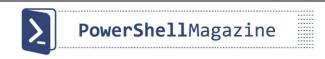
Collection filtering by using a method syntax is supported.
.Where({ expression } [, mode [, numberToReturn]])
.ForEach({ expression } [, arguments...])

\$Services = Get-Service \$Services.Where({\$.Status -eq 'Stopped'}, 'First', 3)

\$Services.ForEach{\$_.Name.ToUpper()}

(1..5).ForEach({\$args[0] + \$ },'Server')

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WINDOWS POWERSHELL LEARNING RESOURCES

Microsoft Resources

Scripting with Windows PowerShell

http://technet.microsoft.com/library/bb978526.aspx

Windows PowerShell Team Blog

http://blogs.msdn.com/PowerShell

Microsoft Script Center

http://technet.microsoft.com/scriptcenter/default

Windows PowerShell Forum

http://social.technet.microsoft.com/Forums/en-US/winserverpowershell/

Hey, Scripting Guy! Blog

http://blogs.technet.com/b/heyscriptingguy/

Windows PowerShell Survival Guide

http://social.technet.microsoft.com/wiki/contents/articles/183.windows-powershell-survival-guide-en-us.aspx

Windows PowerShell ISE Add-on Tools

http://social.technet.microsoft.com/wiki/contents/articles/2969.windows-powershell-ise-add-on-tools.aspx

Windows PowerShell Customer Connection: Submit bugs and feature requests

https://connect.microsoft.com/powershell

Report Windows PowerShell documentation bugs by email

write-help@microsoft.com

Community Resources

PowerShell Code Repository: http://poshcode.org

PowerShell.com Community: http://powershell.com

PowerShell.org Community: http://powershell.org

PowerGUI Community: http://en.community.dell.com/techcenter/powergui/

The PowerShell Community Toolbar: http://powershell.ourtoolbar.com/

PowerScripting Podcast: http://powerscripting.net

PowerShell Magazine: http://powershellmagazine.com

irc.freenode.net #PowerShell

Free eBooks and Guides

Mastering PowerShell, Second Edition - Dr. Tobias Weltner

http://powershell.com/cs/blogs/ebookv2/default.aspx

PowerShell.org Free eBooks

http://powershell.org/wp/ebooks/

Effective Windows PowerShell - Keith Hill

http://rkeithhill.wordpress.com/2009/03/08/effective-windows-powershell-the-free-ebook/

Popular Community Projects

PowerShell Community Extensions (PSCX)

http://pscx.codeplex.com/

PSReadLine - A bash inspired readline implementation for PowerShell

https://github.com/lzybkr/PSReadLine

TabExpansionPlusPlus - PowerShell module to improve tab expansion and Intellisense

https://github.com/lzybkr/TabExpansionPlusPlus

PowerSploit - A PowerShell Post-Exploitation Framework

https://github.com/mattifestation/PowerSploit

PoshSec - PowerShell module focused on security in the Windows environment

https://github.com/PoshSec/PoshSec

Posh-SecMod - PowerShell module with security-related cmdlets

https://github.com/darkoperator/Posh-SecMod

Pester - PowerShell BDD-style testing framework

https://github.com/pester/Pester