



System Management Fundamentals

PowerShell 简介

Intro to PowerShell

Apr 2021

Microsoft Reactor | Ryan Chung

```
led by player to  
s.load_image("kg.png")  
  
[self]:  
ialize Dog object and create Text o  
g, self).__init__(image = Dog.image  
x = games.mouse.x  
bottom = games.sc  
  
re = games.Text(value = 0, size = 24  
top = 5, right = gam  
  
reen.add(self.score)  
1 = games.Text(value = 0, size = 24  
top = 5, left = gam
```



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Reactor



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PowerShell 简介

58 分钟 · 模块 · 9 单元

★★★★☆ 4.6 (302)

对其进行评级

初级

开发人员

学生

Visual Studio

了解 PowerShell 的基础知识。此跨平台命令行 shell 和脚本语言是专为任务自动化和配置管理设计的。你将了解一些基础知识，例如 PowerShell 的涵义、它的用途以及使用方法。

学习目标

完成此模块后，你将能够：

- 了解 PowerShell 的涵义及其用途。
- 了解 cmdlet
- 在管道中构造一系列 cmdlet。
- 对命令应用健全的筛选和格式设置原则。

先决条件

- 基本熟悉如何使用命令行 shell（如命令提示符或 Git Bash）
- 已安装 Visual Studio Code
- 能够安装 Visual Studio Code 扩展
- 如果不使用 Windows 操作系统，则能够在计算机上安装软件

学习目标

- 了解PowerShell与其用途
- 使用Cmdlet
- 使用Cmdlet与管线
- 指令应用格式原则

PowerShell = 命令列介面 + Script 语言

- 比图形介面快
- 任务自动化的好帮手(批次多行执行)
- 指令可重复利用

```
PowerShell 7.1.3  
Copyright (c) Microsoft Corporation.  
  
https://aka.ms/powershell  
Type 'help' to get help.
```

安裝PowerShell

- Windows
 - 已內建
- Mac
 - `brew install --cask powershell`
- Visual Studio Code
 - 可安裝PowerShell Extension



Hello PowerShell!

- 开启PowerShell
 - Windows作业系统内建，直接搜寻Windows PowerShell
 - 其他作业系统可于终端机中使用pwsh指令开启
- 确认开启后，输入第一个指令\$PSVersionTable
 - 显示版本资讯

Name	Value
----	-----
PSVersion	7.1.3
PSEdition	Core

单纯看版本号

- 指令：`$PSVersionTable.PSVersion`

Major	Minor	Patch	PreReleaseLabel	BuildLabel
-----	-----	-----	-----	-----
7	1	3		

Cmdlet

- 已编译的指令
- 动词-名词(怎么做-什么事)

查看可以做的动作

· 指令：Get-Verb

Verb	AliasPrefix	Group	Description
----	-----	-----	-----
Add	a	Common	Adds a resource to a container, or attaches an ...
Clear	cl	Common	Removes all the resources from a container but ...
Close	cs	Common	Changes the state of a resource to make it inac...
Copy	cp	Common	Copies a resource to another name or to another...
Enter	et	Common	Specifies an action that allows the user to mov...
Exit	ex	Common	Sets the current environment or context to the ...
Find	fd	Common	Looks for an object in a container that is unkn...
Format	f	Common	Arranges objects in a specified form or layout
Get	g	Common	Specifies an action that retrieves a resource

查看所有的指令(动词-名词)

· 指令：Get-Command

CommandType	Name	Version	Source
-----	----	-----	-----
Function	cd..		
Function	cd\		
Function	Clear-Host		
Function	Compress-Archive	1.2.5	Microsof...
Function	Configuration	2.0.5	PSDesire...
Function	Expand-Archive	1.2.5	Microsof...
Function	Find-Command	2.2.5	PowerShe...
Function	Find-DSCResource	2.2.5	PowerShe...
Function	Find-Module	2.2.5	PowerShe...

太多了，可使用筛选

- 范例指令：Get-Command -Noun J*
- 列出所有名词为J开头的Cmdlet

CommandType	Name	Version	Source
-----	----	-----	-----
Cmdlet	ConvertFrom-Json	7.0.0.0	Microsof...
Cmdlet	ConvertTo-Json	7.0.0.0	Microsof...
Cmdlet	Debug-Job	7.1.3.0	Microsof...
Cmdlet	Get-Job	7.1.3.0	Microsof...
Cmdlet	Receive-Job	7.1.3.0	Microsof...
Cmdlet	Remove-Job	7.1.3.0	Microsof...
Cmdlet	Start-Job	7.1.3.0	Microsof...
Cmdlet	Stop-Job	7.1.3.0	Microsof...
Cmdlet	Test-Json	7.0.0.0	Microsof...
Cmdlet	Wait-Job	7.1.3.0	Microsof...

太多了，可使用筛选

- 范例指令：Get-Command -Verb Get -Noun C*
- 列出所有动词是Get、名词为C开头的Cmdlet

CommandType	Name	Version	S
			o
			u
			r
			c
			e
-----	----	-----	-
Function	Get-CredsFromCredentialProvider	2.2.5	P
Cmdlet	Get-ChildItem	7.0.0.0	M
Cmdlet	Get-Clipboard	7.0.0.0	M
Cmdlet	Get-CmsMessage	7.0.0.0	M
Cmdlet	Get-Command	7.1.3.0	M
Cmdlet	Get-Content	7.0.0.0	M
Cmdlet	Get-Credential	7.0.0.0	M
Cmdlet	Get-Culture	7.0.0.0	M

开启协助系统

- 指令：Get-Help

TOPIC

PowerShell Help System

SHORT DESCRIPTION

Displays help about PowerShell cmdlets and concepts.

LONG DESCRIPTION

PowerShell Help describes PowerShell cmdlets, functions, scripts, and modules, and explains concepts, including the elements of the PowerShell language.

单一指令细节查询

- 指令：Get-Help -Name Get-Content
 - 查询名为Get-Content的Cmdlet资讯

NAME

Get-Content

SYNOPSIS

Gets the content of the item at the specified location.

SYNTAX

```
Get-Content [-Path] <System.String[]> [-ReadCount <System.Int64>]  
[-TotalCount <System.Int64>] [-Tail <System.Int32>] [-Filter  
<System.String>] [-Include <System.String[]>] [-Exclude <System.String[]>]  
[-Force] [-Credential <System.Management.Automation.PSCredential>]  
[-Delimiter <System.String>] [-Wait] [-Raw] [-Encoding {ASCII |
```

单一指令细节特定内容查询

- 指令：Get-Help Get-Content -Examples
 - 查看Get-Content的协助资讯中的示例

```
NAME
    Get-Content

SYNOPSIS
    Gets the content of the item at the specified location.

----- Example 1: Get the content of a text file -----

1..100 | ForEach-Object { Add-Content -Path .\LineNumbers.txt -Value "This
is line $_." }
Get-Content -Path .\LineNumbers.txt

This is Line 1
This is Line 2
...
This is line 99.
This is line 100.
```

单一指令细节特定内容查询

- 指令：Get-Help Cmdlet_Name -XXX
 - Full
 - 标准版 + 参数、输入、输出
 - Detailed
 - 标准版 + 参数
 - Examples
 - 示例说明
 - Online
 - 开启该指令网页
 - Parameter
 - 需指定参数名称

查看目前正在这台主机上的执行程序

· 指令：Get-Process

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	0.00	0.00	0	...	66
0	0.00	0.00	0.00	1	1	
0	0.00	0.00	0.00	62	62	
0	0.00	0.00	0.00	63	63	
0	0.00	0.00	0.00	66	66	
0	0.00	0.00	0.00	67	67	
0	0.00	0.00	0.00	68	68	

检视一个执行程序

- 指令：Get-Process ThisProcessName

```
PS > Get-Process Terminal
```

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	57.32	31.51	56362	1	Terminal

检视一个执行程序的属性与方法

- 指令：Get-Process ThisProcessName | Get-Member

```
[PS /Users/ryan403> Get-Process Terminal | Get-Member

TypeName: System.Diagnostics.Process

Name                MemberType          Definition
----                -
Handles             AliasProperty       Handles = Handlecount
Name                 AliasProperty       Name = ProcessName
NPM                  AliasProperty       NPM = NonpagedSystemMemorySize64
PM                   AliasProperty       PM = PagedMemorySize64
SI                   AliasProperty       SI = SessionId
VM                   AliasProperty       VM = VirtualMemorySize64
WS                   AliasProperty       WS = WorkingSet64
```

检视一个执行程序的属性与方法，并照类型筛选

- 指令：Get-Process ThisProcessName | Get-Member -MemberType TypeName

```
PS > Get-Process Terminal | Get-Member -MemberType Event
```

TypeName: System.Diagnostics.Process

Name	MemberType	Definition
----	-----	-----
Disposed	Event	System.EventHandler Disposed(System.Object, Syst...
ErrorDataReceived	Event	System.Diagnostics.DataReceivedEventHandler Erro...
Exited	Event	System.EventHandler Exited(System.Object, System...
OutputDataReceived	Event	System.Diagnostics.DataReceivedEventHandler Outp...

练习

- 列出名词是File开头相关的Cmdlet

练习

- 列出名词是File开头且动词是Get的Cmdlet

练习

- 取得Get-FileHash的指令介绍

练习

- 取得Get-FileHash的示例

练习

- 列出目前本地端正在运行的程序

练习

- 请只列出目前本地端正在运行的某一个程序

练习

- 请搭配管线，将该程序的属性、方法以及回传类型列出

再论管线 Pipeline

- 管线评估
- 建构辅助器
- 过滤与格式化

再论管线 Pipeline

- 管线评估
 - 什么样的管线输入值是合法的?
 - 参数处理的顺序
 - 如何提供数据
- 建构辅助器
- 过滤与格式化

管线评估 – 以 Get-Process 为例

- 什么是 Get-Process
 - help Get-Process -Full

```
NAME
    Get-Process

SYNOPSIS
    Gets the processes that are running on the local computer.

SYNTAX
    Get-Process [[-Name] <System.String[]>] [-FileVersionInfo] [-Module]
    [<CommonParameters>]

    Get-Process [-FileVersionInfo] -Id <System.Int32[]> [-Module]
    [<CommonParameters>]

    Get-Process [-FileVersionInfo] -InputObject
    <System.Diagnostics.Process[]> [-Module] [<CommonParameters>]

    Get-Process -Id <System.Int32[]> -IncludeUserName [<CommonParameters>]

    Get-Process [[-Name] <System.String[]>] -IncludeUserName
    [<CommonParameters>]
```

观察 PARAMETERS 与 INPUTS ， 以下的共同点是？

- Parameters

- Id <System.Int32[]>
- InputObject <System.Diagnostics.Process[]>
- Name <System.String[]>

- Inputs

- System.Diagnostics.Process

观察 PARAMETERS 与 INPUTS，以下的共同点是：

- Parameters

- Id <System.Int32[]>

- Accept pipeline input? True (ByPropertyName)

- InputObject <System.Diagnostics.Process[]>

- Accept pipeline input? True (ByValue)

- Name <System.String[]>

- Accept pipeline input? True (ByPropertyName)

- Inputs

- System.Diagnostics.Process

- You can pipe a process object to this cmdlet.

管线如何确认输入值是否合法？

- By Value (by Type)
 - 例如，检查输入值是否像是`System.Diagnostics.Process[]`
- By Property Name
 - 如本例，是否为Name 或 Id

模拟管线测试

- 制造一个管线的输入
 - [pscustomobject]@{Name='pkd'} | Get-Process

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	6.57	40.12	649	1	pkd

管线辅助器

- 例：找到名称符合tccd的程序
 - `Get-Process | Where-Object Name -eq tccd`

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	4.61	7.93	634	1	tccd

Operator

- eq 相等
- gt 大于
- lt 小于
- Match 是否吻合该正则表达式(Regular Expression)
 - 例：以World开头的程序
 - Get-Process | Where-Object Name -Match "^World.*"

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	3.92	575.03	1534	...34	WorldClockWidge

Filtering Left 尽快筛选，提升效率

- 哪一个比较好？为什么？

```
Get-Process | Select-Object Name | Where-Object Name -eq tcdd
```

```
Get-Process | Where-Object Name -eq tcdd | Select-Object Name
```

练习

- 抓出本地端主机，最吃CPU资源的前三个程序

```
Get-Process | Where-Object CPU -gt 100 | Sort-Object CPU -Descending | Select-Object -First 3
```

列出执行程序 -> 找到执行程序CPU值超过100的 -> 依CPU值从大排到小 -> 取出前3个

NPM(K)	PM(M)	WS(M)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	--	--	-----
0	0.00	292.16	5,086.27	48293	1	Google Chrome
0	0.00	166.04	4,132.21	845	1	Dropbox
0	0.00	231.76	2,660.25	48304	1	Google Chrome H

练习

- 列出一个字符串的属性与方法

"a string" | Get-Member

TypeName: System.String		
Name	MemberType	Definition
----	-----	-----
Clone	Method	System.Object Clone(), System.Object ICloneable.Clone()
CompareTo	Method	int CompareTo(System.Object value), int CompareTo(string st...
Contains	Method	bool Contains(string value), bool Contains(string value, Sy...
CopyTo	Method	void CopyTo(int sourceIndex, char[] destination, int destin...
EndsWith	Method	bool EndsWith(string value), bool EndsWith(string value, Sy...
EnumerateRunes	Method	System.Text.StringRuneEnumerator EnumerateRunes()
Equals	Method	bool Equals(System.Object obj), bool Equals(string value), ...
GetEnumerator	Method	System.CharEnumerator GetEnumerator(), System.Collections.I...

练习

- 列出一个字符串的属性与方法，并以格式化列表呈现

"a string" | Get-Member | Format-List

```
TypeName      : System.String
Name          : Clone
MemberType    : Method
Definition    : System.Object Clone(), System.Object ICloneable.Clone()

TypeName      : System.String
Name          : CompareTo
MemberType    : Method
Definition    : int CompareTo(System.Object value), int CompareTo(string strB), int
                IComparable.CompareTo(System.Object obj), int IComparable[string].CompareTo(string other)

TypeName      : System.String
Name          : Contains
MemberType    : Method
Definition    : bool Contains(string value), bool Contains(string value, System.StringComparison
                comparisonType), bool Contains(char value), bool Contains(char value,
                System.StringComparison comparisonType)
```

知识检查

1. 使用帮助系统时，哪个命令或函数对于查找有关命令的详细信息提供的体验最佳？

- ☐ `{your command} --help`
- ☐ `Get-Help {your command}`
- ☐ `help {your command}`

2. 哪一项表述最佳描述了“筛选左侧”原则？

- ☐ `Get-Process | Select-Object Name | Where-Object Name -eq name-of-process`
- ☐ `Get-Process | Where-Object Name -eq name-of-process | Select-Object name-of-process`
- ☐ `Get-Process -Name name-of-process | Select-Object Name`

3. 哪句话最佳描述了从命令查找返回类型？

- ☐ `{command} --type`
- ☐ `{command} | Get-Member`
- ☐ `{command} | Get-Type`
- ☐ `{command} Get-Member`

Summary

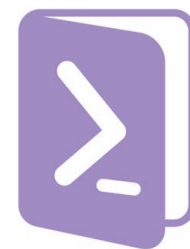
- Cmdlet的结构是由动词+名词所组成
- 善用管线(Pipeline, |)，将回传结果变成另一指令的输入
- Filtering Left, Formatting Right 先筛选、后格式化



PowerShell



PowerShell



PowerShell



Reactor



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议程结束 感谢聆听



请记得填写课程回馈问卷 (Event ID : **XXXXXX**)
<https://aka.ms/Reactor/Survey>

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