

How to Use PowerShell to Become a Windows and Cloud Management SuperHero - 2022 Edition

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Agenda

- Visualize, understand and work with Powershell objects
 - This is what you do always with Powershell. Understand this and be Hero ;)
- import/export and **convert** objects
 - In the end, it's always Powershell objects!
- Putting it all together working with Graph API

DEMO Files

- Some demos will be on my GitHub
- <https://www.github.com/petripaavola>

Petri Paavola

Microsoft MVP –
Windows and Devices for IT

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Skills

- › Powershell
- › Windows Deployment and Management
- › Windows Autopilot + Intune + Intune for Education
- › On-Prem Domain management and automation
- › Consulting
- › Training



@petripaavola

Over 20 years of work
experience

Current:

- › Yodamiitti Oy / Owner
Consulting / Training

Past:

- › Aalto-university / IT Services
Workstation Service Owner

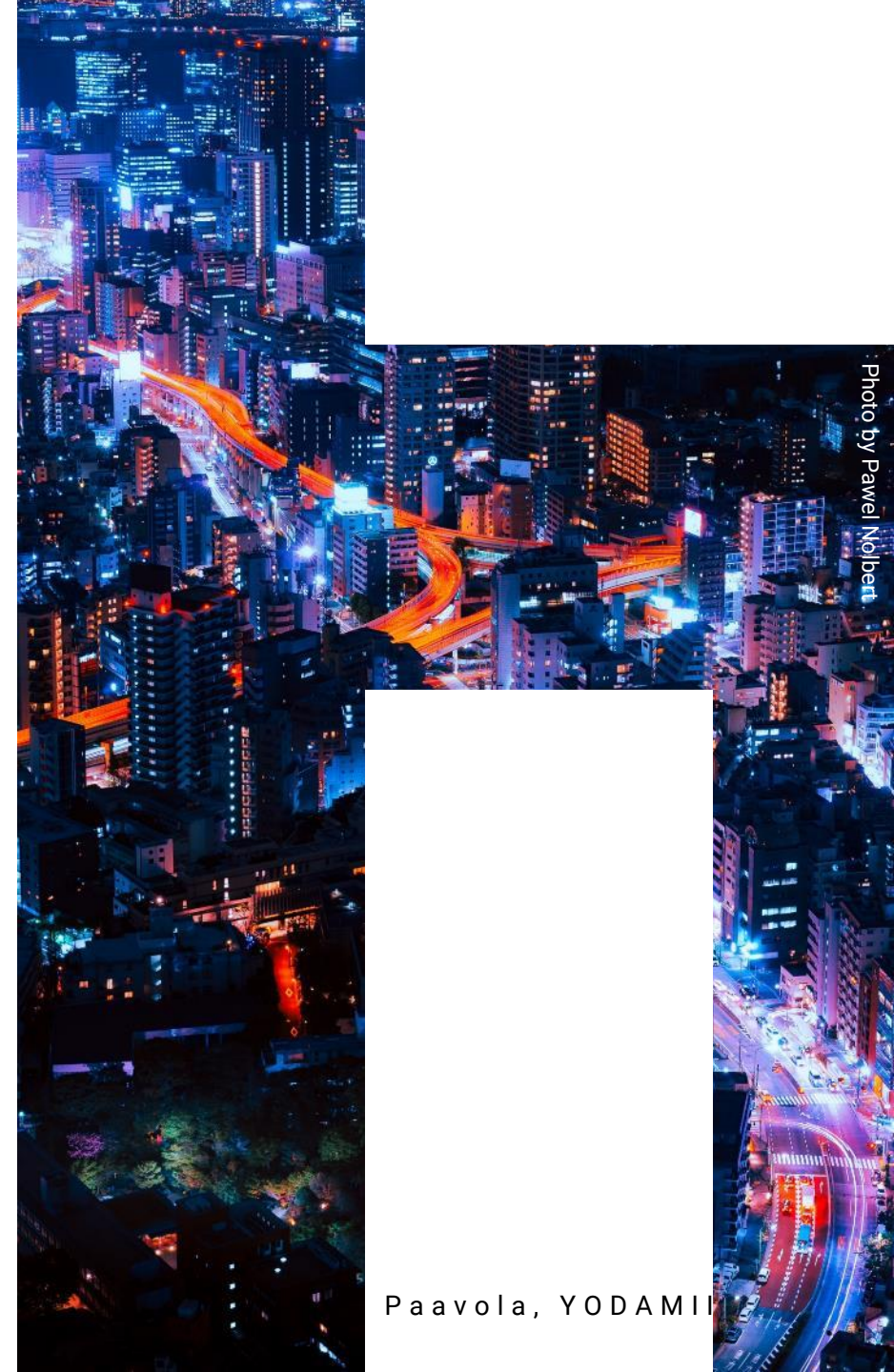


Photo by Pawel Nolbert

Paavola, YODAMIITTI

It's all about the process

...how to get to the end result

It's all about the process

- 95% of the scripts follow the same logic/pattern
- Get data **Get**
- Filter data **Where-Object**
- Process data **Foreach**

It's all about the process

- 99% of the time **you** follow the same process
- Get data **Get**
- **Understand the data**
 - **Manual work**
 - **Visualization**
 - **Testing, debugging, figuring out what to do with the data**
- Filter data **Where-Object**
- Process data **Foreach**
- Create solution **Powershell script**

Visualize Powershell objects

- Visualize objects easily with
 - **Out-GridView**
 - **ConvertTo-Json | Set-Clipboard**

Windows Powershell Rocks!!!

```
PS C:\powershell> Get-CimInstance Win32_PnPSignedDriver | Out-GridView
```

Get-CimInstance Win32_PnPSignedDriver | Out-GridView

Filter

+ Add criteria ▼

DeviceName	DevLoader	DriverDate	DriverName	DriverProviderName	DriverVersion	FriendlyName	HardwareID
Hyper-V Virtual Ethernet Adapter		21.6.2006 3.00.00	Microsoft		10.0.18362.1	Hyper-V Virtual Ethernet Adapter #2	vms_mp
Hyper-V Virtual Ethernet Adapter		21.6.2006 3.00.00	Microsoft		10.0.18362.1	Hyper-V Virtual Ethernet Adapter #5	vms_mp
Hyper-V Virtual Switch Extension Adapter		21.6.2006 3.00.00	Microsoft		10.0.18362.1	Hyper-V Virtual Switch Extension Adapter	vms_vsmpp
Hyper-V Virtual Switch Extension Adapter		21.6.2006 3.00.00	Microsoft		10.0.18362.1	Hyper-V Virtual Switch Extension Adapter #2	vms_vsmpp
Hyper-V Virtual Switch Extension Adapter		21.6.2006 3.00.00	Microsoft		10.0.18362.1	Hyper-V Virtual Switch Extension Adapter #3	vms_vsmpp
Intel Processor		21.4.2009 3.00.00	Microsoft		10.0.18362.1049	Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz	ACPI\GenuineIntel_-_Intel64_Family_6_Model_158
Intel Processor		21.4.2009 3.00.00	Microsoft		10.0.18362.1049	Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz	ACPI\GenuineIntel_-_Intel64_Family_6_Model_158
Intel Processor		21.4.2009 3.00.00	Microsoft		10.0.18362.1049	Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz	ACPI\GenuineIntel_-_Intel64_Family_6_Model_158
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Intel Processor		21.4.2009 3.00.00	Microsoft		10.0.18362.1049	Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz	ACPI\GenuineIntel_-_Intel64_Family_6_Model_158
Intel Processor		21.4.2009 3.00.00	Microsoft		10.0.18362.1049	Intel(R) Core(TM) i7-8700K CPU @ 3.70GHz	ACPI\GenuineIntel_-_Intel64_Family_6_Model_158
Intel(R) 300 Series Chipset Family LPC Controller (Z3...		18.7.1968 3.00.00	INTEL		10.1.1.44		PCI\VEN_8086&DEV_A2C9&SUBSYS_872F1043&REV_00
Intel(R) 300 Series Chipset Family SATA AHCI Control...		7.8.2017 3.00.00	Intel Corporation		15.8.1.1007		PCI\VEN_8086&DEV_A282&SUBSYS_872F1043&REV_00
Intel(R) Dynamic Application Loader Host Interface		6.8.2020 3.00.00	Intel		1.38.2020.805		SWC\3C4852D6-D47B-4F46-B05E-B5EDC1AA440E
Intel(R) Ethernet Connection (2) I219-V		12.6.2018 3.00.00	Microsoft		12.17.10.8	Intel(R) Ethernet Connection (2) I219-V	PCI\VEN_8086&DEV_15B8&SUBSYS_86721043&REV_00

Windows Powershell Rocks!!!

```
PS C:\powershell> $Connection = Test-NetConnection  
PS C:\powershell> $Connection | ConvertTo-Json | Set-Clipboard
```

Untitled - Notepad

```
{  
  "ComputerName": "internetbeacon.msedge.net",  
  "RemoteAddress": {  
    "Address": 872704781,  
    "AddressFamily": 2,  
    "ScopeId": null,  
    "IsIPv6Multicast": false,  
    "IsIPv6LinkLocal": false,  
    "IsIPv6SiteLocal": false,  
    "IsIPv6Teredo": false,  
    "IsIPv4MappedToIPv6": false  
  },  
  "ResolvedAddresses": [  
    {  
      "Address": 872704781,  
      "AddressFamily": 2,  
      "ScopeId": null,  
      "IsIPv6Multicast": false,  
      "IsIPv6LinkLocal": false,  
      "IsIPv6SiteLocal": false,  
      "IsIPv6Teredo": false,  
      "IsIPv4MappedToIPv6": false  
    }  
  ],  
  "PingSucceeded": true,  
}
```

Ln 398, Col 2 100% Windows (CRLF) UTF-8

DEMO

Visualize objects

Import, Export, convert

- With import our data is translated to **Powershell objects**
 - It is not for example json or csv inside Powershell
 - *"Do you think that's JSON you are manipulating inside Powershell?"*
- ConvertTo-Json & ConvertFrom-Json
 - Note -**Depth** -parameter with ConvertTo-Json
- Export-CliXml & Import-CliXml
 - Good for secrets
- Out-File/Set-Content & Get-Content
- Export-csv & Import-csv

Graph API and JSON

- Graph API uses json format
- You will get json when you get information from Graph API
- Graph API expects to have payload in json format

Powershell object -> JSON

- We create custom Powershell object
- We convert custom Powershell object to JSON
- We send JSON payload to Graph API

Working with Graph API

- App Registration
- Permissions
- Conditional Access !
 - New Preview feature for Service Principals
- Secrets / Certificates
 - How to use your secrets in a safe way
 - Export-CliXml & Import-CliXml
 - Use certificates
 - Save credentials to Azure Automation account credentials variable
- Graph Explorer
- **Test, understand, visualize, convert data**
- Powershell script



DEMO

Working with Graph API

Conditional Access

```
PS 156 mins C:\NVS_2022> .\AppRegistrations_Secret_Expiry_Report_v1.ps1_
Authenticate to Graph API using Azure AD Application based authentication
Invoke-RestMethod : {"error":"invalid_grant","error_description":"AADSTS53003: Access has been blocked by Conditional A
ccess policies. The access policy does not allow token issuance.\r\nTrace ID: 9133e88e-c522-46ce-a70d-557caaf24000\r\nC
orrelation ID: 7472d7da-0f2f-4780-ac79-9136653ba7f3\r\nTimestamp: 2022-03-17 08:13:44Z","error_codes":[53003],"timestam
p":"2022-03-17 08:13:44Z","trace_id":"9133e88e-c522-46ce-a70d-557caaf24000","correlation_id":"7472d7da-0f2f-4780-ac79-9
136653ba7f3","error_uri":"https://login.microsoftonline.com/error?code=53003","suberror":"message_only","claims":{"ac
cess_token\":"{"capolids\":"{"essential\":"true,\"values\":"[\"dc7f1efa-efe2-4e5e-9d01-1c83e4d00fb5\"]}}}}"}
At C:\NVS_2022\AppRegistrations_Secret_Expiry_Report_v1.ps1:69 char:12
+ $Request = Invoke-RestMethod @PostSplat
+ ~~~~~
+ CategoryInfo          : InvalidOperation: (System.Net.HttpWebRequest:HttpWebRequest) [Invoke-RestMethod], WebExc
  eption
+ FullyQualifiedErrorId : WebCmdletWebResponseException,Microsoft.PowerShell.Commands.InvokeRestMethodCommand
Failed to authenticate using Azure AD Application secret
PS 156 mins C:\NVS_2022>
```

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