

PowerShell Advanced Fundamentals

Introduction

Emanuel Palm
Simon Wählin
Björn Sundling
bjorn.sundling@advania.com
@bjompen
John Roos
Emil Gullbrandsson

Agenda

- git Started
- VS Code
- Filters, Functions and Advanced Functions
- PowerShell Classes
- Regex Intro
- API
- Error Handling
- Debugging
- Building Modules
- Testing with Pester
- Bring Your Own Lab

Lab 0

git Started

Why version control?
Script-Folder problem
v1
v2
v2.final
Central location for master data
Where's latest?
Snapshot based - Go back and forth in time
History of What, When and Whom
Collaboration

git vs GitHub

- Protocol
- Service

GitHub

- Fork
- Pull request / PR
- GitHub CLI

Only six commands!

- git status
- git init / git clone
HTML vs. SSH?
- git add
- git pull
--rebase
- git commit
-m
- git push

Working with branches

- GitHub Flow
- Git Flow
- Trunk based development / single branch
- Git checkout -b
- Git branch

Visual tools

- Start with CLI
- GitHub for Windows
- VS Code
- posh-git

Lab 1

Try Along!

VS Code

Why?

- Free
- Cross-platform
- Open source
- Microsoft standard

Basic Features

- Open Folder
- Zen mode
- Snippets
- git integration
- Extensions

- From PowerShell...
- ...via HTML previews...
- ..to live share!

Editor Features

- Move row
- Comment
- Rename
- Multi Cursor
- Bracket pair colorization

PowerShell Integration

- Terminal
- IntelliSense
- Code-format
- Debugger

Filters, Functions and Advanced Functions

Goal: Re-Use Code!

- Multiple copies are hard to maintain
- Never Copy & Paste code!
- Hiding details makes a script easier to read

Example

- Just code
- Function and code

Verb-Noun

Three Types of "functions"

- Filters
 - Extremely uncommon
 - Your own "Select" commands

Function

- Not for pipelines
- Easy to understand
- Good for "helpers"

Advanced Function

- Rich Parameter support
 - Metadata
 - Mandatory
 - Position
 - Pipeline Input
 - ParameterSetName
 - Alias

- HelpMessage
- DontShow
- Type
 - Implicit Casting
- Validation
 - AllowNull()
 - AllowEmptyString()
 - ValidateCount(1,5)
 - ValidateLength(1,5)
 - ValidatePattern('+')
 - ValidateScript({ Test-Path \$_ })
 - ValidateSet('Apelsin', 'Banan', 'Clementin')
 - ErrorMessage
- Switch-Parameters
 - On / Off
- CmdletBinding
 - ConfirmImpact
 - DefaultParameterSetName
 - HelpUri
 - SupportsShouldProcess

Lab 2

PowerShell Classes

- [ClassName]::New()
- New-Object -TypeName
- More Dev-Oriented
 - Only output from return

Class

- Property
- Method
- Constructor
- Hidden Property
- Static

Enum

- Bitflag-like

Inheritance

Interfaces

Lab 3

Regex

- Pattern matching
 - Validating input
 - Searching for part of text
 - Log searching w. Select-String
 - Phone number
 - Birth date
- Replacing text

Use web tools

- Flavors

Regular Expression Language - Quick Reference (link)

- Online regex tester and debugger: PHP, PCRE, Python, Golang and JavaScript (link)

Special characters

- []\$.|?*(+)

Character classes

- Word
- Space
- Digit
- Character group
- Unicode

Quantifiers

?

*

+

{2}

{2,}

{2,5}

Groups

Subexpression My name is (+)

Named Subexpression My name is (<?name>+)

Lab 4

API

What is an API?

Invoke-WebRequest

Invoke-RestMethod

Authentication

Basic

Username / password

PAT - Personal Access Tokens

OAUTH

-UseDefaultCredentials

TLS

Encoding

Lab 5

Error Handling

Terminating vs Non-terminating

ErrorAction / ErrorActionPreference

ErrorView

Get-Error

Try/Catch/Finally

Lab 6

Debugging

Hard see what happens inside your code

VSCode Breakpoints

Line

Condition

HitCount

Log

Watch window

Set-PSBreakpoint

Line

Script

Action

Column

Command

Script

Action

Variable

Script

Action

Mode

Can debug other processes

Lab 7

Building Modules

Basic

psm1

Folder name

- Manifest
- Splitting code
 - Private
 - Public
 - Class
- Combining code
 - Faster load time
 - Looking good
- Help
 - External Help
 - Comment Based
- Module helper tools
 - Plaster - Scaffold and set up your projects
 - ModuleBuilder - Combine and build your modules
 - PlatyPS - Write help in Markdown
 - Invoke-Build - Build automation tool
- Can be done in C# or F#
- PSGallery
 - Possible to create your own
- Lab 8

Testing Code with Pester

- Testing Code
 - Unit
 - Integration
- Commands
 - Describe
 - Context
 - It
 - Should
 - Mock
- TDD
- Infrastructure Testing
- Lab 9