

Invoke-ManagementUpgrade

PowerShell and WAC, a better way to manage Windows Server

Eric Claus

<https://github.com/ericclaus14/>



Outline

- Intro
- PowerShell
 - Intro to PowerShell
 - Cmdlet and function naming syntax
 - Loops and Conditionals
 - Documentation
 - Functions and Parameters
 - Transcripts
 - Profiles
 - Modules
 - Error Handling
 - Example Scripts
- WAC
 - What is WAC?
 - Installing WAC from command line
 - Managing Extensions
 - Adding server connections
 - Basic AD management

PowerShell

Why Use PowerShell?

- Automate and consolidate processes
 - Windows admin processes
 - Just about anything else
- High level scripting language (easy to read and write)
- PowerShell can do everything in Windows
- Replaces and greatly expands upon CMD

Ways to Work with PowerShell

- PowerShell (console)
 - Great for quick one-liners and for running existing scripts/functions
- PowerShell ISE
 - Great for creating and editing small scripts, functions, and other blocks of code
- Visual Studio Code
 - Great for working with large scripts and solutions comprised of multiple scripts/modules.

Verb-Noun (Cmdlet/function naming syntax)

- Get-Command
- Move-Item
- Write-Host
- Test-NetConnection
- New-ADUser
- Import-Module
- Invoke-WebRequest
- Set-Acl
- Send-MailMessage
- Backup-GPO

Loops and Conditionals

- `Foreach () {}` # Loads all objects into memory and then processes them one by one
- `ForEach-Object {}` # One object at a time pipes into it, then pipes out (less RAM!)
- `For () {}`
- `While () {}`
- `If () {}`
- `Elseif () {}`
- `Else {}`
- `Switch () {}` # Think case statements

Inline and Block Comments

Inline comments begin with the '#' symbol

- # At the beginning of a line (preferred)
- On an existing line # everything after the '#' is treated as a comment

Block comments begin with '<#' and end with '#>'

```
<# This is a comment
```

```
Everything within this is also a comment
```

```
#>
```

Get-Help

- Get-Help is the PowerShell command to see documentation regarding cmdlets, functions, and scripts.
- The PowerShell version of Linux's "man" command.

```
Get-Help <cmdlet name> [-Full | -Examples | etc.]
```

```
Get-Help about_<term>
```

```
Get-Help <search term (part of cmdlet name)>
```

Creating Your Own Get-Help Content

- In a block comment (`<# ... #>`) at the top of your script or function.

.SYNOPSIS

.DESCRIPTION

.INPUTS

.OUTPUTS

.NOTES

.LINK

.EXAMPLE

.COMPONENT

<#

.SYNOPSIS

Creates a secure password file which can be used to retrieve the password at a later time.

.DESCRIPTION

This is a function to create a secure password file. It can be run one time to create a secure password that will be used in scripts that require automation.

.OUTPUTS

[string] path to the secure password file.

.EXAMPLE

```
New-SecurePassFile "C:\myPwds\"
```

Prompts for a password, then converts it to a secure string and saves the file to the "C:\myPwds\" directory.

.NOTES

Author: Eric Claus, Sys Admin, North American Division of SDA, ericclaus@nadadventist.org

Last Modified: 4/17/2019

Based on code from Shawn Melton (@wsmelton), <http://blog.wsmelton.com>

#>

Functions and Parameters

```
function Backup-Directory{
    [CmdletBinding()]
    Param(
        # Folder the backup file will reside in
        [Parameter(Mandatory=$true)]
        [string]$BackupDestinationDir,

        # Secure password file containing the encryption key for the backup
        [ValidateScript({Test-Path $_ -PathType 'leaf'})]
        [string]$EncryptionKey,

        # What compression level to use
        [ValidateSet("Ultra", "High", "Fast", "Low", "None", "Normal")]
        [string]$compressionLevel = "Fast",
    )
    # Code to do stuff...
}
```

Transcripts

- A log of everything outputted to console during a PowerShell session.

```
Start-Transcript -Path C:\path\to\transcript.log  
Stop-Transcript
```

- Very useful, especially when automating scripts, as you can go back and see a transcript of what happened while the script was running.

Profiles

- Scripts that are run whenever a PowerShell session is started
- Some things that can be included in profiles:
 - Functions
 - Modules
 - Variables
 - Dot sources functions
- PowerShell has six profiles, each affecting different scopes
- See the path to the profiles via the `$profile` variable

Profiles

Description	Path	Variable
Current User, Current Host - console	\$Home\[My Documents\WindowsPowerShell\Profile.ps1	\$PROFILE.CurrentUserCurrentHost
Current User, Current Host - ISE	\$Home\[My Documents\WindowsPowerShell\Microsoft.PowerShellISE_profile.ps1	\$profile.CurrentUserCurrentHost
Current User, All Hosts	\$Home\[My Documents\Profile.ps1	\$PROFILE.CurrentUserAllHosts
All Users, Current Host - console	\$PROFILE.CurrentUserAllHosts	\$PROFILE.AllUsersCurrentHost
All Users, Current Host - ISE	\$PsHome\Microsoft.PowerShellISE_profile.ps1	\$profile.AllUsersCurrentHost
All Users, All Hosts	\$PsHome\Profile.ps1	\$PROFILE.AllUsersAllHosts

Modules

- A collection/package of cmdlets, functions, variables, etc.
- .psm1 file extension

Install-Module

Import-Module

Error Handling Methods

- Write-Error
 - Non-terminating error
- Throw statements
 - Terminating error
- -ErrorAction
 - Define the error action preference for a single cmdlet
- \$ErrorActionPreference
 - Define the error action preference for the PowerShell session
- Trap statements
 - Block of code to execute upon terminating error
- Try/Catch blocks
 - If a terminating error occurs in the Try block, the code in the Catch block will run (can also be used to catch specific errors)

Example PowerShell Scripts

<https://github.com/ericclaus14/Invoke-ManagementUpgrade>

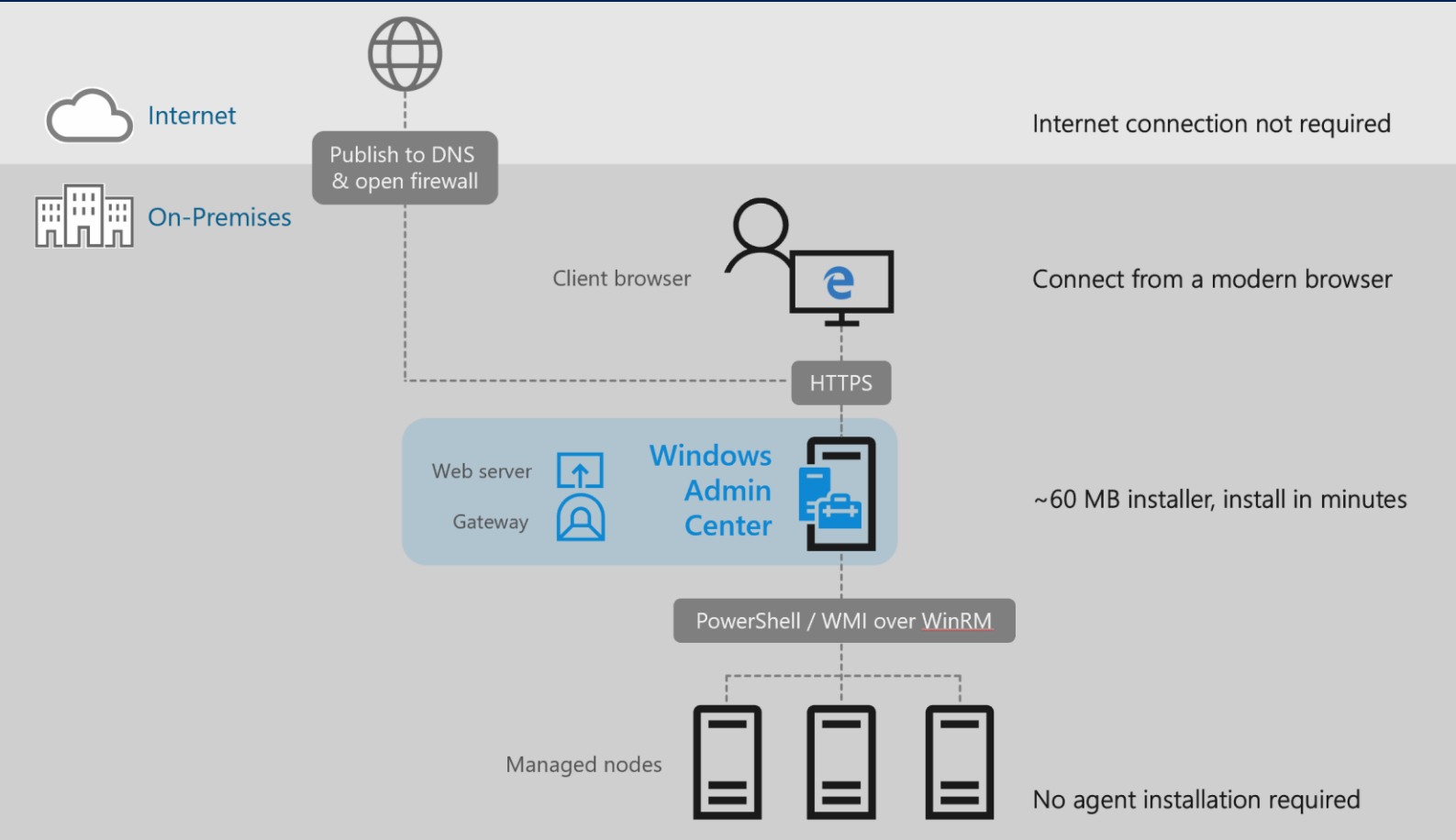
Windows Admin Center (WAC)

What is WAC?

- Web-based remote management system for Windows Servers
- "The modern evolution of 'in-box' management tools, like Server Manager and MMC."¹

1. <https://docs.microsoft.com/en-us/windows-server/manage/windows-admin-center/understand/what-is>

WAC Architecture

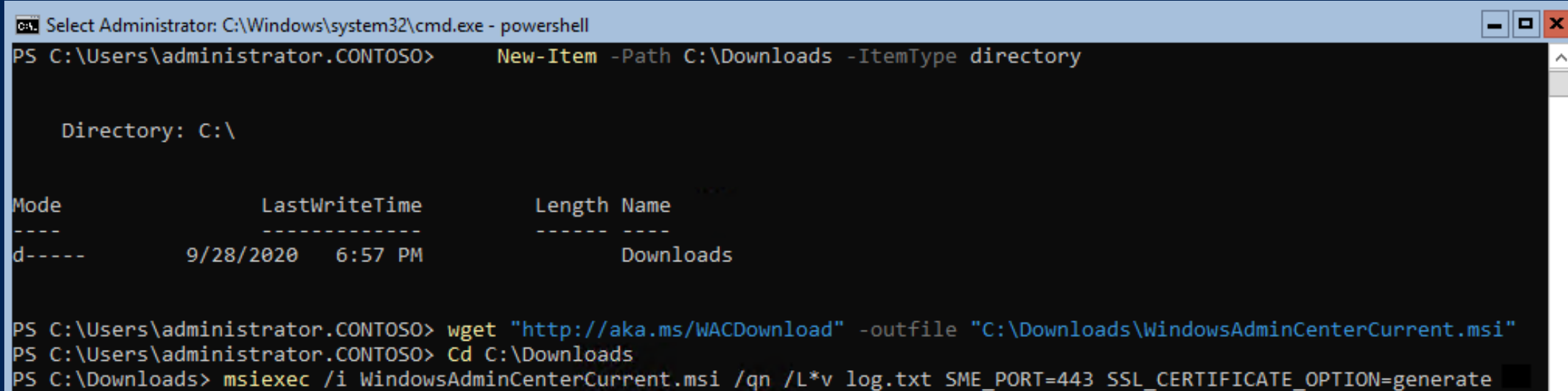


<https://docs.microsoft.com/en-us/windows-server/manage/windows-admin-center/understand/what-is>

Installing WAC

1. `New-Item -Path C:\Downloads -ItemType directory`
2. `wget "http://aka.ms/WACDownload" -outfile
"C:\Downloads\WindowsAdminCenterCurrent.msi"`
3. `Cd C:\Downloads`
4. `msiexec /i WindowsAdminCenterCurrent.msi /qn /L*v log.txt
SME_PORT=443 SSL_CERTIFICATE_OPTION=generate`
5. #Wait for it to finish installing and then run the following to verify it has installed successfully

Installing WAC



```
PS C:\Users\administrator.CONTOSO> New-Item -Path C:\Downloads -ItemType directory

Directory: C:\

Mode                LastWriteTime         Length Name
----                -
d-----          9/28/2020   6:57 PM             Downloads

PS C:\Users\administrator.CONTOSO> wget "http://aka.ms/WACDownload" -outfile "C:\Downloads\WindowsAdminCenterCurrent.msi"
PS C:\Users\administrator.CONTOSO> Cd C:\Downloads
PS C:\Downloads> msixexec /i WindowsAdminCenterCurrent.msi /qn /L*v log.txt SME_PORT=443 SSL_CERTIFICATE_OPTION=generate
```

Verifying WAC has Installed Successfully

```
PS C:\Downloads> Get-Content C:\Downloads\log.txt -Tail 20

MSI (s) (20:F0) [19:06:43:861]: Windows Installer installed the product. Product Name: Windows Admin Center. Product Version: 1.2.26274.0. Product Language: 1033. Manufacturer: Microsoft Corporation. Installation success or error status: 0.

MSI (s) (20:F0) [19:06:43:877]: Deferring clean up of packages/files, if any exist
MSI (s) (20:F0) [19:06:43:877]: MainEngineThread is returning 0
MSI (s) (20:7C) [19:06:43:877]: No System Restore sequence number for this installation.
=== Logging stopped: 9/28/2020 19:06:43 ===
MSI (s) (20:7C) [19:06:43:892]: User policy value 'DisableRollback' is 0
MSI (s) (20:7C) [19:06:43:892]: Machine policy value 'DisableRollback' is 0
MSI (s) (20:7C) [19:06:43:892]: Incrementing counter to disable shutdown. Counter after increment: 0
MSI (s) (20:7C) [19:06:43:892]: Note: 1: 1402 2: HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Installer\Rollback\Scripts 3: 2
MSI (s) (20:7C) [19:06:43:892]: Note: 1: 2265 2: 3: -2147287035
MSI (s) (20:7C) [19:06:43:892]: Note: 1: 1402 2: HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Installer\Rollback\Scripts 3: 2
MSI (s) (20:7C) [19:06:43:892]: Decrementing counter to disable shutdown. If counter >= 0, shutdown will be denied. Counter after decrement: -1
MSI (s) (20:7C) [19:06:43:924]: Destroying RemoteAPI object.
MSI (s) (20:6C) [19:06:43:924]: Custom Action Manager thread ending.
MSI (c) (F4:E0) [19:06:43:924]: Decrementing counter to disable shutdown. If counter >= 0, shutdown will be denied. Counter after decrement: -1
MSI (c) (F4:E0) [19:06:43:924]: MainEngineThread is returning 0
=== Verbose logging stopped: 9/28/2020 19:06:43 ===

PS C:\Downloads>
```

Managing Extensions

Settings - Windows Admin Center

Not secure | https://wac.contoso.cool/settings/extension/installed

Windows Admin Center | Settings

Microsoft

Settings

User

Account

Personalization

Language / Region

Suggestions

Development

Advanced

Performance Profile

Gateway

Extensions

Azure

Access

Shared Connections

Internet Access

Extensions

We might have to restart the Windows Admin Center gateway after installing an extension, temporarily affecting availability for anyone else currently using this gateway.

Available extensions

Installed extensions

Feeds

Uninstall

Update

40 items

Search

Name	Version	Created by	Status
Active Directory	0.86.0	Microsoft	Installed
Apps & features	1.76.0	Microsoft	Installed
Azure hybrid services	1.134.0	Microsoft	Installed
Azure Security Center	2.0.16	Microsoft	Installed
Certificates	1.67.0	Microsoft	Installed
Cluster Creation (Preview)	1.373.0	Microsoft	Installed
Cluster Manager	1.435.0	Microsoft	Installed
Dell EMC OpenManage Integration	1.1.1	Dell EMC	Installed
Developer Guide	1.1096.0	Microsoft	Installed
Devices	1.76.0	Microsoft	Installed
DHCP (Preview)	0.9.3	Microsoft	Installed
DNS (Preview)	0.9.5	Microsoft	Installed

Details - Active Directory

Description

Manage Active Directory objects, including users, computers, organizational units and attributes

ID

msft.sme.active-directory

Version

Adding a New Server Connection

Windows Admin Center

All connections

Modernize your virtualization hosts with an Azure Stack HCI hybrid solution, for industry-leading price-performance. [Learn more](#)

+ Add

Connect

Manage as

Remove

Edit Tags

2 items

Search

<input type="checkbox"/> Name ↑	Type	Last connected	Managing as	Tags
Shared				
MGMT01.contoso.cool	Servers	Never	CONTOSO\administrator	
Personal				
wac01.contoso.cool (Gateway)	Servers	Never	CONTOSO\administrator	

Creating an AD OU and User

✓ Successfully added connections...
dc01.contoso.cool was added to your connection list.
Server connections 10:15:32 AM

2 items  

Settings

User

- Account
- Personalization
- Language / Region
- Suggestions
- Development
- Advanced
- Performance Profile
- Gateway
- Extensions
- Azure
- Access
- Shared Connections**
- Internet Access

Shared Connections

+ Add  Remove  Edit Tags

☐ Name ↑

Type

Tags

 DC01.contoso.cool

Servers

 MGMT01.contoso.cool

Servers

