

A cartoon ninja character in a black suit with a white mask, holding two black trident-like weapons. The character is standing on a green grassy hill with yellow and white daisies. In the background, there is a blue lake, a range of blue mountains, and a blue sky with white clouds. A small white bird is flying in the sky.

# **Exploring OSDCloud**

**Revolutionizing Modern Device Deployment**



# Thank you Sponsors

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# Ákos Bakos



SMARTCON

## Focus

Endpoint Management and Automation

## Certifications

A few...

## From

Long story...

## Hobbies

Adrenalin hunter

## My Blog

<https://akosbakos.ch>

## Contact

 [@AkosBakos](https://twitter.com/AkosBakos)

**LinkedIn** [in Ákos Bakos](https://www.linkedin.com/in/akosbakos)



# Agenda

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## Key takeaways:

- Understand what OSDCloud is
- Showing OSDCloud, OSDCloudGUI, OSDCloudAzure
- Different scenarios & use-cases

- OSDCloud background
- WinPE Configuration
- GUI vs Automation
- Zero Touch Deployment
- Notes from the field



# OSDCloud Definition

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**OSDCloud** is a solution for deploying Windows 10/11 x64 over the internet using the **OSD PowerShell Module**. This works by booting to WinPE where the OS Disk is wiped and partitioned. Once this is complete, the Windows Operating System is downloaded from Microsoft Update (using CuRL), before finally being staged (expanded) on the OS Disk. Driver Packs from Dell, Lenovo, and HP are downloaded directly from each of the manufacturers where they are installed in WinPE or in the Windows Specialize Phase. For computers that do not have a Driver Pack, hardware drivers are downloaded from Microsoft Update, so this should work on just about any computer model out there.

<https://www.osdcloud.com/>

<https://github.com/OSDeploy/OSD>



# OSD(Cloud) by who?

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## Contributors

- [Damien Van Robaeys](#)
- [Jérôme Bezet-Torres \[MVP - vExpert\]](#)
- [David Segura](#)
- [Gary Blok](#)
- [Michael Marable](#)
- [Ákos Bakos](#)



[OSDBuilder \(Offline Servicing\)](#)  
[OSDSUS \(Update Catalogs\)](#)  
[OSDUpdate \(MS Updates\)](#)  
[OSDDrivers \(Compact Drivers\)](#)



# Get-OSDCloud Metrics

```
PS C:\> Get-OSDMetrics
Current DateTime is 03/13/2024 20:28:49 UTC

OSD PowerShell Module
The latest version is 24.3.10.1
Published at 03/11/2024 05:12:58 UTC (63 hours ago)
This version has been installed or saved 16048 times

OSDCloud CLI (Start-OSDCloud)
Deployment Count started 12279 hours ago at 10/19/2022 05:15:05 UTC
196105 devices have been deployed using this method
Current usage rate is 15.97 devices per hour
383 per day / 2683 per week / 11658 per month / 139897 per year

OSDCloud GUI (Start-OSDCloudGUI)
Deployment Count started 12279 hours ago at 10/19/2022 05:15:11 UTC
167013 devices have been deployed using this method
Current usage rate is 13.6 devices per hour
326 per day / 2285 per week / 9928 per month / 119136 per year

OSDCloud Azure (Start-OSDCloudAzure)
Deployment Count started 12279 hours ago at 10/19/2022 05:15:00 UTC
1421 devices have been deployed using this method
Current usage rate is 0.12 devices per hour
3 per day / 20 per week / 88 per month / 1051 per year
```

# OSDCloud in the Real World

Examples for Cloud-based OSD







# OSD Challenges

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- Hardware hash import
- Naming convention for Autopilot
- Migrate existing devices: On-Prem management → Cloud-based device management
- TPM, firmware update
- OS, driver update
- Remove bloatware's
- Keyboard layout



# Configuration Phases

Heart of  
OSDCloud



2

Inject drivers +  
SetupComplete.cmd



Offline Servicing

3

Generalize

5

Audit System

4

Specialize

6

Audit User

7

Oobe System

oobe.cmd





# Build OSDCloud WinPE Requirements

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- Method #1
  - Windows 10 or Windows 11
  - Microsoft ADK
  - Uses the ADK WinPE (Boot.wim)
  - Wi-Fi requires WinRE (WinRE.wim)
- Method #2
  - Use an MDT Boot Image that contains PowerShell
- Method #3
  - Use a ConfigMgr Boot Image that contains PowerShell



# OSDCloud Structure

Install OSDCloud module

OSD

New-OSDCloudTemplate

Boot.wim

New-OSDCloudWorkspace

Dev

Prod

Test

Edit-OSDCloudWinPE

Media

Boot USB - PXE - (2pint)iPXE - iPXE

Boot

Your choice



OSDCloud GUI

OSDCloud CLI

OSDCloudAzure

# Create an OSDCloud Template & Workspace

---

```
New-OSDCloudTemplate -Name WPNinjaS -SetInputLocale de-CH -Verbose
```

```
New-OSDCloudWorkspace -WorkspacePath E:\OSDCloud_WPNinjaS
```

```
Get-OSDCloudWorkspace
```

# Create an OSDCloud WinPE

```
Edit-OSDCloudWinPE -CloudDriver VMware -Wallpaper  
E:\OSDCloud_WPNinjaS\Wallpaper.jpg -StartOSDCloudGUI -Brand 'WPNinja CH'
```



# Using pre-created WinPE ISO Files

## Windows 11 22H2 ADK

[https://winpe.blob.core.windows.net/public/WinPE\\_Win11\\_22H2\\_ADK.iso](https://winpe.blob.core.windows.net/public/WinPE_Win11_22H2_ADK.iso)

- Windows 11 22H2 ADK winpe.wim

## Windows 11 22H2 ADK with KB5026372

[https://winpe.blob.core.windows.net/public/WinPE\\_Win11\\_22H2\\_ADK\\_KB5026372.iso](https://winpe.blob.core.windows.net/public/WinPE_Win11_22H2_ADK_KB5026372.iso)

- Windows 11 22H2 ADK winpe.wim
- [2023-05 Cumulative Update for Windows 11 Version 22H2 for x64-based Systems \(KB5026372\)](#)
- [CVE-2023-24932](#)

## Windows 11 22H2 WinRE

[https://winpe.blob.core.windows.net/public/WinPE\\_Win11\\_22H2\\_WinRE.iso](https://winpe.blob.core.windows.net/public/WinPE_Win11_22H2_WinRE.iso)

- Windows 11 22H2 WinRE
- Supports Wi-Fi
- Supports Recovery Environment

## Windows 11 22H2 WinRE with KB5026372

[https://winpe.blob.core.windows.net/public/WinPE\\_Win11\\_22H2\\_WinRE\\_KB5026372.iso](https://winpe.blob.core.windows.net/public/WinPE_Win11_22H2_WinRE_KB5026372.iso)

- Windows 11 22H2 WinRE
- Supports Wi-Fi
- Supports Recovery Environment
- [2023-05 Cumulative Update for Windows 11 Version 22H2 for x64-based Systems \(KB5026372\)](#)
- [CVE-2023-24932](#)

<https://www.osdcloud.com/sandbox/winpe-downloads>





# Demo

- Boot an OSDCloud Workspace into WinPE





# OSDCloud Automate

```
PS C:\> $OSDModuleResource.OSDCloud.Default
```

Name	Value
ImageIndex	6
Version	Windows 11
ReleaseID	23H2
Activation	Volume
Edition	Enterprise
Name	Windows 11 23H2 x64
Language	en-us

```
PS C:\> $OSDModuleResource.OSDCloud.Values
```

Name	Value
Version	{Windows 11, Windows 10}
ReleaseID	{23H2, 22H2, 21H2, 20H2...}
Activation	{Retail, Volume}
Edition	{Home, Home N, Home Single Language, Education...}
Name	{Windows 11 23H2 x64, Windows 11 22H2 x64, Windows 11 21H2 x64, Windows 10 22H2 x64...}
Language	{ar-sa, bg-bg, cs-cz, da-dk...}



# OSDCloudGUI Values

```
PS C:\> #Customize the OSDCloud Values
```

```
PS C:\> $OSDModuleResource.OSDCloud.Values.Activation = 'Retail'
```

```
PS C:\> $OSDModuleResource.OSDCloud.Values.ReleaseID = '22H2','23H2'
```

```
PS C:\> $OSDModuleResource.OSDCloud.Values.Edition = 'Enterprise'
```

```
PS C:\> $OSDModuleResource.OSDCloud.Values.Name = 'Windows 11 22H2 x64','Windows 11 23H2 x64'
```

```
PS C:\> $OSDModuleResource.OSDCloud.Values.Language = 'de-de'
```

```
PS C:\> #Start OSDCloud GUI
```

```
PS C:\> start-OSDCloudGUI  
2024-03-10-192605 Exporting
```

=====

**OSDCloudGUI Configuration**

Name

----

Function

LaunchMethod

AutomateConfiguration

AutomateJsonFile

BrandName

BrandColor

ComputerManufacturer

ComputerModel

ComputerProduct

DriverPack

DriverPacks

OSDCloudGUI 24.1.11.1 on VMware, Inc. VMware7,1 product VMware7,1

Deployment Options Microsoft Update Catalog

**OSDCloud**

**Operating System** Windows 11 23H2 x64

Enterprise

**Index** 6

**Driver Pack** Microsoft Update Catalog

de-de

Start





# OSDCloudGUI Settings

```
PS C:\> #Customize the OSDCloudGUI Preferences  
PS C:\> $OSDModuleResource.StartOSDCloudGUI.updateDiskDrivers = $false  
PS C:\> $OSDModuleResource.StartOSDCloudGUI.updateFirmware = $true  
PS C:\> $OSDModuleResource.StartOSDCloudGUI.updateSCSIDrivers = $true  
PS C:\> #Start OSDCloud GUI
```

```
PS C:\> Start-OSDCloudGUI  
2024-03-10-192957 Exporting
```

## OSDCloudGUI Configuration

```
Name  
----  
Function  
LaunchMethod  
AutomateConfiguration  
AutomateJsonFile  
BrandName  
BrandColor  
ComputerManufacturer  
ComputerModel  
ComputerProduct  
DriverPack  
DriverPacks  
DriverPackName
```

OSDCloudGUI 24.1.11.1 on VMware, Inc. VMware7,1 product VMware7,1

Deployment Options

Microsoft Update Catalog

- ☒ update Disk Drivers
- ☒ update System Firmware
- ☒ update Network Drivers
- ☒ update SCSIAdapter Drivers

Enterprise    Index 6

Driver Pack Microsoft Update Catalog

Start



# Start-OSDCloud

- Start-OSDCloud
  - OSVersion 'Windows 11'
  - OSBuild 23H2
  - OSEdition Pro
  - OSLanguage de-de
  - OSActivation Retail
  - ZTI







# 'AutopilotOOBE' PS Module

Basics

21.8.18.2 AutopilotOOBE

## Autopilot Manual Registration

Windows 10 Enterprise 21H1 (19043.1110)

GroupTag:

AddToGroup:

AssignedUser:

AssignedComputerName:

PostAction:

☐ Assign: Wait for Intune to assign an Autopilot profile for this device

[Register](#)

PowerShell [Run](#)

Windows Autopilot Documentation [Docs](#)

Microsoft Corporation  
Virtual Machine  
810-8001-1784-6788-2691-0614-93  
BIOS Hyper-V UEFI Release v4.0  
TPM: 2.0  
INTERNET

# OSDCloud Automate

GUI → ZTI





# OSDCloud Automate

---

- OSDCloudGUI Configuration File
  - <driveletter:>\OSDCloud\Automate\Default\Start-OSDCloudGUI.json
- Autopilot Configuration File
  - <driveletter:>\OSDCloud\ Automate\Default\AutopilotConfigurationFile.json
- PowerShell Scripts
  - <driveletter:>\OSDCloud\Automate\Default\Startup\\*.ps1
  - <driveletter:>\OSDCloud\Automate\Default\Shutdown\\*.ps1
- Provisioning Packages
  - <driveletter:>\OSDCloud\Automate\Default\Provisioning\\*.ppkg



# Edit-OSDCloudWinPE (startnet.cmd)

## EXAMPLE 1

```
Edit-OSDCloudWinPE -StartOSDCloudGUI
```

## EXAMPLE 2

```
Edit-OSDCloudWinPE -StartOSDCloud '-OSBuild 22H2 -OSEdition Pro -OSLanguage en-us -OSActivation Retail'
```

## EXAMPLE 3

```
Edit-OSDCloudWinPE -StartURL 'https://sandbox.osdcloud.com'
```



# OSDCloud Automate 1/4

```
Write-Host -ForegroundColor Green "Importing OSD PowerShell Module"
Import-Module OSD -Force

#=====
Write-SectionHeader "[PreOS] Updating Driver Catalogs"
#=====
if ((Get-MyComputerManufacturer -Brief) -eq "Acer") {
    Write-DarkGrayHost "Updating Acer Driver Catalog"
    $OSDModuleBase = (Get-Module -Name OSD -ListAvailable | Sort-Object -Property Version -Descending | Select-Object -First 1).ModuleBase

    Save-WebFile `
        -SourceUrl 'http://acercatalog.osdcloud.ch/' `
        -DestinationName 'CloudDriverPacks.json' `
        -DestinationDirectory (Join-Path $OSDModuleBase 'Catalogs') -Overwrite
}

if ((Get-MyComputerManufacturer -Brief) -eq "Microsoft") {
    Write-DarkGrayHost "Updating Microsoft Driver Catalog"
    Invoke-RestMethod "http://surfacecatalog.osdcloud.ch/" | Invoke-Expression
    Update-OSDCloudSurfaceDriverCatalogJustInTime -UpdateDriverPacksJson -Verbose
}

#=====
Write-SectionHeader "[OS] Params and Start-OSDCloud"
#=====
$Params = @{
    OSVersion    = "Windows 11"
    OSBuild      = "23H2"
    OSEdition     = "Pro"
    OSLanguage    = "de-de"
    OSLicense     = "Retail"
    ZTI           = $true
    Firmware     = $true
}
Start-OSDCloud @Params
```



# OSDCloud Automate 2/4

```
Write-DarkGrayHost "Create C:\ProgramData\OSDeploy\OSDeploy.AutopilotOOBE.json file"
```

```
$AutopilotOOBEJson = @"
```

```
{
```

```
    "AssignedComputerName" : "$AssignedComputerName", ←
```

```
    "AddToGroup": "$AddToGroup", ←
```

```
    "Assign": {
```

```
        "IsPresent": true
```

```
    },
```

```
    "GroupTag": "$GroupTag", ←
```

```
    "Hidden": [
```

```
        "AddToGroup",
```

```
        "AssignedUser",
```

```
        "PostAction",
```

```
        "GroupTag",
```

```
        "Assign"
```

```
    ],
```

```
    "PostAction": "Quit",
```

```
    "Run": "NetworkingWireless",
```

```
    "Docs": "https://google.com/",
```

```
    "Title": "Autopilot Manual Register"
```

```
}
```

```
"@
```

```
If (!(Test-Path "C:\ProgramData\OSDeploy")) {
```

```
    New-Item "C:\ProgramData\OSDeploy" -ItemType Directory -Force | Out-Null
```

```
}
```

```
$AutopilotOOBEJson | Out-File -FilePath "C:\ProgramData\OSDeploy\OSDeploy.AutopilotOOBE.json" -Encoding ascii -Force
```





# OSDCloud Automate 3/4

```
#=====
Write-SectionHeader "[PostOS] SetupComplete CMD Command Line"
#=====
Write-DarkGrayHost "Create C:\Windows\Setup\Scripts\SetupComplete.cmd"
$SetupCompleteCMD = '@'
'@
$SetupCompleteCMD | Out-File -FilePath 'C:\Windows\Setup\Scripts\setupcomplete.cmd' -Encoding ascii -Force

#=====
Write-SectionHeader "[PostOS] OOBE CMD Command Line"
#=====
Invoke-RestMethod https://autopilot.osdcloud.ch | Out-File -FilePath 'C:\Windows\Setup\scripts\autopilot.ps1' -Encoding ascii -Force
Invoke-RestMethod https://oobedeploy.osdcloud.ch | Out-File -FilePath 'C:\Windows\Setup\scripts\oobe.ps1' -Encoding ascii -Force
Invoke-RestMethod https://cleanup.osdcloud.ch | Out-File -FilePath 'C:\Windows\Setup\scripts\cleanup.ps1' -Encoding ascii -Force
Invoke-RestMethod https://osdgather.osdcloud.ch | Out-File -FilePath 'C:\Windows\Setup\scripts\osdgather.ps1' -Encoding ascii -Force

$OOBECmdTasks = '@'
@echo off
# Execute OOBE Tasks
start /wait powershell.exe -NoL -ExecutionPolicy Bypass -F C:\Windows\Setup\Scripts\oobe.ps1

# Execute OSD Gather Script
start /wait powershell.exe -NoL -ExecutionPolicy Bypass -F C:\Windows\Setup\Scripts\osdgather.ps1

# Below a PS session for debug and testing in system context, # when not needed
# start /wait powershell.exe -NoL -ExecutionPolicy Bypass

# Execute Cleanup Script
start /wait powershell.exe -NoL -ExecutionPolicy Bypass -F C:\Windows\Setup\Scripts\cleanup.ps1

exit
'@
$OOBECmdTasks | Out-File -FilePath 'C:\Windows\Setup\scripts\oobe.cmd' -Encoding ascii -Force
```



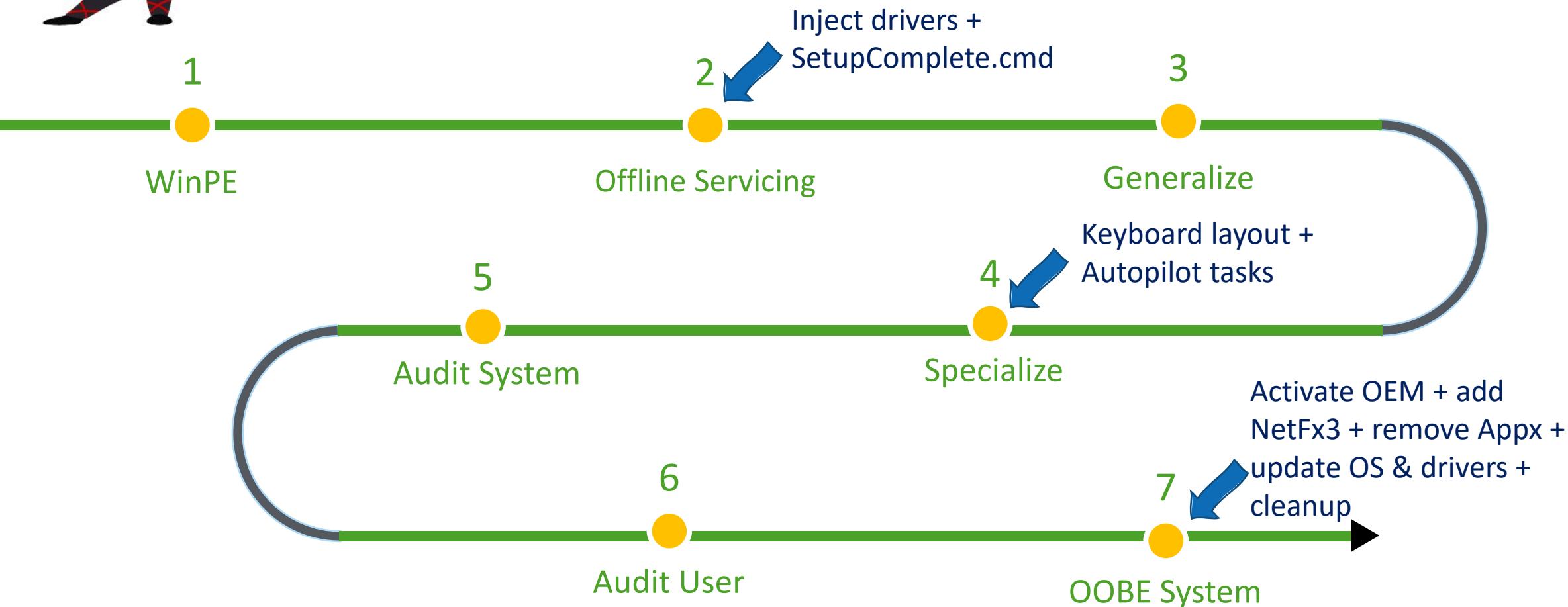
# OSDCloud Automate 4/4

```
#=====
Write-SectionHeader "[PostOS] Define Specialize Phase"
#=====
$UnattendXml = @'
<?xml version="1.0" encoding="utf-8"?>
<unattend xmlns="urn:schemas-microsoft-com:unattend">
  <settings pass="specialize">
    <component name="Microsoft-Windows-Deployment" processorArchitecture="amd64" publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS"
      xmlns:wcm="http://schemas.microsoft.com/WMIConfig/2002/State" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
      <RunSynchronous>
        <RunSynchronousCommand wcm:action="add">
          <Order>1</Order>
          <Description>Start Autopilot Import & Assignment Process</Description>
          <Path>PowerShell -ExecutionPolicy Bypass C:\Windows\Setup\scripts\autopilot.ps1</Path>
        </RunSynchronousCommand>
      </RunSynchronous>
    </component>
  </settings>
  <settings pass="oobeSystem">
    <component name="Microsoft-Windows-International-Core" processorArchitecture="amd64" publicKeyToken="31bf3856ad364e35" language="neutral" versionScope="nonSxS">
      <InputLocale>de-CH</InputLocale>
      <SystemLocale>de-DE</SystemLocale>
      <UILanguage>de-DE</UILanguage>
      <UserLocale>de-CH</UserLocale>
    </component>
  </settings>
</unattend>
'@

$Panther = 'C:\Windows\Panther'
$UnattendPath = "$Panther\Unattend.xml"
$UnattendXml | Out-File -FilePath $UnattendPath -Encoding utf8 -Width 2000 -Force
Use-WindowsUnattend -Path 'C:\' -UnattendPath $UnattendPath | Out-Null
```



# Extended (Configuration) Phases





# Notes from the field

---

- Restaging clients, new client concept (Intune to Intune)
- Client migration from netCIM with *wipe & load* via USB bootable stick to Intune
- Client migration from Matrix42 with *wipe & load* via PXE to Intune
- Client migration from AD with *wipe & load* via USB to Intune
- Client migration from ConfigMgr via task sequence (*executing at home*) via WiFi



# Oobe Tasks

```
#region Oobe
if ($WindowsPhase -eq 'OOBE') {
    #Load everything needed to setup a new computer and register to AutoPilot
    Step-installCiscoRootCert
    step-InstallWinGet
    step-WinGetUpdate
    osdcloud-StartOOBE
    Step-InstallM365Apps
    Step-oobeHotFix #fix for Autopilot failing
    Step-installSTCACert
    Step-oobeDellDCU
    Start-WindowsUpdate
    Start-WindowsUpdateDriver
    Step-RestartConfirmation
    Set-TimeZoneFromIP
    Step-oobeSetDateTime
    Step-oobeRegisterAutopilot
    Step-oobeRemoveAppxPackageAllUsers
    Step-oobeSetUserRegSettings
    Step-oobeSetDeviceRegSettings
    Step-desktopWallpaper
    Step-oobeCreateLocalUser
    Step-oobeRestartComputer
}
```



## 'OSDCloudAzure' Module

What if I don't have access to the USB anymore? I sent it to the engineer in the field?!







# OSDCloud vs OSDCloudAzure

## Operating Systems

Windows 10/11

## Driver Packs

Downloaded from Vendor

## Security

USB GUID & some basic PS protections

## Cost

Internet Usage

## Operating Systems

ESD/WIM/ISO Windows 10/11/Server

## Driver Packs

Downloaded from Vendor and Azure

## Security

Device Auth (Login) & RBAC (Storage)

## Cost

Internet Usage + Azure Storage



# Demo

Invoke Start-OSDCloudAzure  
(in WinPE)





# OSDCloud Blog Posts

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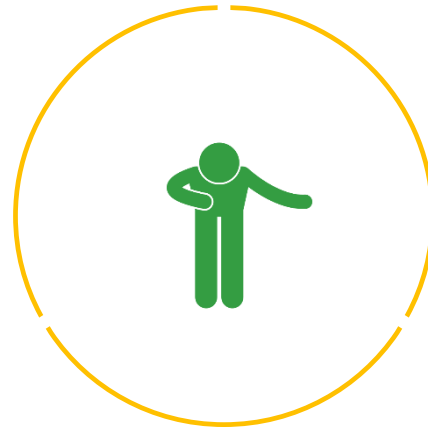


<https://akosbakos.ch/tag/osdcloud/>



# Q&A





**Thank you**