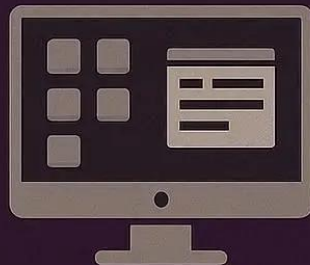


NIC **REBEL**
EDITION



THE TOP 5+ DO'S, DON'TS & HOW'S OF AZURE VIRTUAL DESKTOP



About me

Focus

Azure Virtual Desktop & Log
Analytics
WVDAdmin & Hydra for AVD

From
Germany

My Blog
blog.ITProCloud.de



The top screenshot shows the WVDAdmin interface for 'Azure' and 'WVD V2' configurations. It includes a table of virtual machines with columns for Name, Sessions, State, Allow new sessions, and Assigned user. Below the table are buttons for 'Refresh WVD' and 'Refresh Azure', and a 'Number of background processes' section showing 0.

The bottom screenshot shows the Project Hydra interface, specifically the 'Host Pool load - PROD' section. It features a line graph showing session counts over time. Below the graph is a table titled 'Session hosts for host pool PROD' with columns for Select, State, Session host name, Agent version, OS version, Allow, Sessions, Disconnected, and Load.

Select	State	Session host name	Agent version	OS version	Allow	Sessions	Disconnected	Load
<input type="checkbox"/>	Online	AVD-PROD-116	1.0.1102.290	10.0.19042	<input type="checkbox"/>	2	0	25%
<input type="checkbox"/>	Online	AVD-PROD-118	1.0.1102.290	10.0.19042	<input type="checkbox"/>	2	1	25%

Agenda

- Upgrading from Windows 10 -> 11
- Azure Boost: NVMe, Ephemeral, v6
- Orphan Resources
- Imaging Strategies
- My Top 5 Pitfalls and Reminders

Upgrading from Windows 10 -> 11

- Why
 - Windows 10 is EOL on October 14th, 2025
- Challenges
 - Older hosts / Golden Master on V1 disks (vTPM, Trusted Launch)
 - Windows update doesn't show an update path
 - How to run an in-place update
 - Site-node: Strange BitLocker behaviours on some updates (also Windows 11 23H2 -> 24H2)

V1 vs. V2 VM Sizes – Trusted Launch

- To upgrade from Windows 10 to Windows 11, we need a vTPM
- Usually, V1 VM sizes have no vTPM*

- Differences

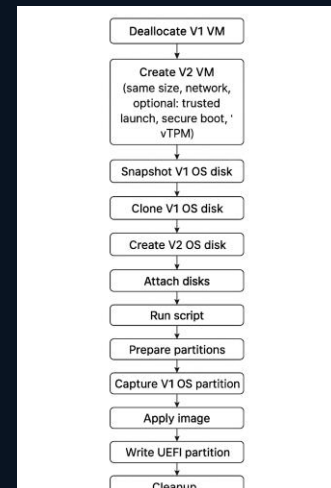
	V1	V2
Boot	PCAT / BIOS	UEFI
Disk Controller	IDE	SCSI (v6: NVME)
Advanced Security Feature	X	Yes, like vTPM, trusted launch*

- Action
 - Migrate the VM sizes (or at least the Golden Master)

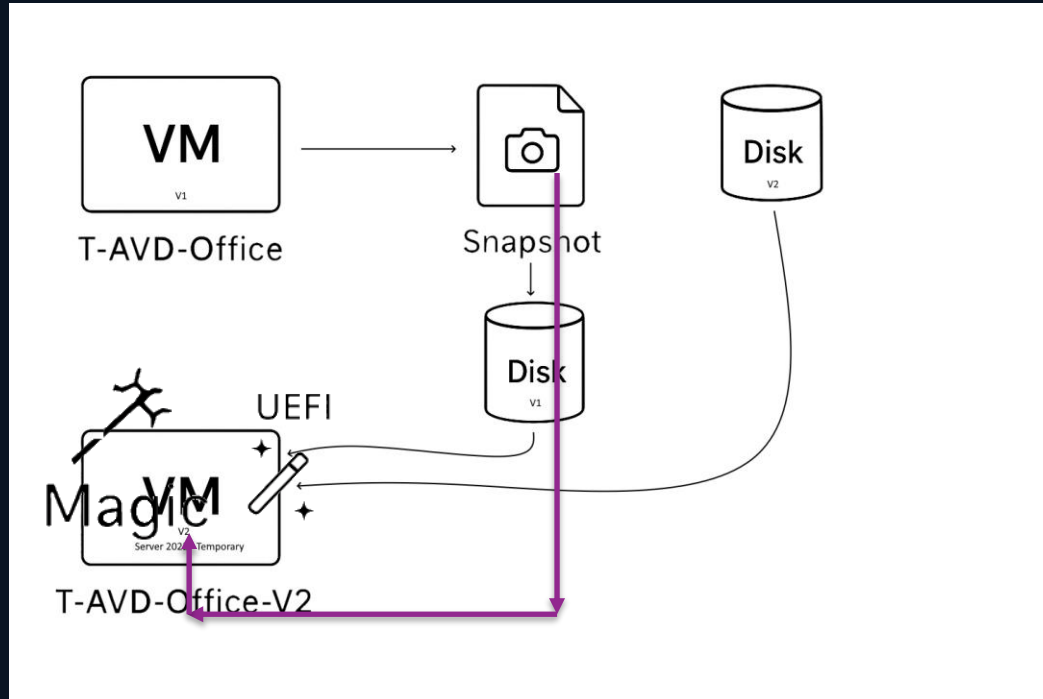
* <https://learn.microsoft.com/en-us/azure/virtual-machines/trusted-launch-existing-vm-gen-1>

V1 vs. V2 VM Sizes – Trusted Launch

- Challenge
 - That is not directly possible!
- Solution
 - Create a V2 VM with Windows Server 2022 and a larger OS disk (256 GB+)
 - Create a copy of the V1 OS Disk (V1-disk)
 - Create a new V2 managed disk (V2-disk)
 - Attach both to the server VM
 - Capture content of the V1-disk with Dism.exe
 - Write image to the V2-disk
 - Modify partitions, write UEFI BIOS
 - We have a V2-disk with the content of the V1-disk and can create a VM



V1 vs. V2 VM Sizes – Trusted Launch



Windows – Updating

- Challenge:
 - Windows Update is not showing an update
- Two options
 - Forcing the new V2 Windows 10 client to search for a specific Windows update
 - Inplace upgrade

Windows – Updating 1

- Configuring a local policy

The screenshot shows the 'Select the target Feature Update version' window in Windows Group Policy. The 'Enabled' radio button is selected. The 'Supported on' field is set to 'At least Windows Server 2016 or Windows 10'. In the 'Options' section, the 'Which Windows product version would you like to receive feature updates for?' dropdown is set to 'Windows 11' and the 'Target Version for Feature Updates' dropdown is set to '24h2'. The 'Help' section provides instructions on how to enter the product and version as listed on the Windows Update target version page, with the URL aka.ms/WindowsTargetVersioninfo and a warning about accepting the Microsoft Software License Terms.

Select the target Feature Update version

Select the target Feature Update version

Previous Setting Next Setting

☐ Not Configured Comment:

☒ Enabled

☐ Disabled

Supported on: At least Windows Server 2016 or Windows 10

Options:

Which Windows product version would you like to receive feature updates for? e.g., Windows 10

Windows 11

Target Version for Feature Updates

24h2

Help:

Enter the product and version as listed on the Windows Update target version page:

aka.ms/WindowsTargetVersioninfo

The device will request that Windows Update product and version in subsequent scans.

Entering a target product and clicking OK or Apply means I accept the Microsoft Software License Terms for it found at aka.ms/WindowsTargetVersioninfo. If an organization is licensing the software, I am authorized to bind the organization.

If you enter an invalid value, you will remain on your current version until you correct the values to a supported product and version.

OK Cancel Apply

Windows – Updating 2

- Download multi-ISO to do an in-place upgrade
<https://www.microsoft.com/en-us/software-download/windows11>

Download Windows 11 Disk Image (ISO) for x64 devices

This option is for users that want to create a bootable installation media (USB flash drive, DVD) or create a virtual machine (ISO file) to install Windows 11. This download is a multi-edition ISO which uses your product key to unlock the correct edition.

Windows 11 ISOs for Arm64 devices are available [here](#).

Windows 11 (multi-edition ISO for x64 devices) ▾

> Before you begin downloading an ISO

Confirm

- Note: “Rumors” say that in-place upgrade is not supported in Azure and Hyper-V should be used

Windows – Ready

- We hopefully migrated our Golden Master to Windows 11
- Does this work always?
- Automate the process with PowerShell:
 - <https://blog.itprocloud.de/Migrate-Azure-V1-VM-to-Azure-V2-VM-In-A-Safe-Way/>
 - <https://blog.itprocloud.de/Update-Windows-10-Multi-user-to-Windows-11-Multi-user/>

Azure Boost: NVMe, Ephemeral on v6

The new start in town “boost VMs”

- Advantages of boost with NVMe:
 - Higher input/output operations per second (IOPS)
 - Higher throughput (MBps)
 - Faster network connection
 - Modern CPU
 - Offloading of virtualisation tasks

Azure Boost: NVMe, Ephemeral on v6

The new start in town “boost VMs”

OS disk		Premium Disk			
		↔ Swap OS disk			
Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
AVD-Design-001_disk1_def52e63fb	Premium SSD LRS	128	500	100	SSE with PT
OS disk		Ephemeral Disk			
		↔ Swap OS disk			
Disk name	Storage type	Size (GiB)	Max IOPS	Max throughput (...)	Encryption
AVD-Design-003_OsDisk_1_c2dc69f	Standard HDD LRS	128	36000	477	SSE with PT

Azure Boost: NVMe, Ephemeral on v6



Azure Boost: NVMe, Ephemeral on v6

Challenges

- No migration path for Windows
- Images are not compatible (custom, gallery)
- Pagefile on C:\ instead of D: \, if present

Azure Boost: Migration

“There is no support way to migrate to a V6 directly.”
(as I know)

Azure Boost: Images

- Microsoft Marketplace images are working (scsi, nvme)
- Custom images are not working
- If we have no way to migrate a Golden Master, we have to create a new v6 Golden Master – with all the effort
- But ...

Azure Boost: Images

We can use a specific Azure Compute Gallery Definition

- Create a new definition
- Enable NVME
- Security type “trusted launch” (recommend)
- Capture the image from your old Golden Master into the definition (WVDAdmin, Hydra, PowerShell, ...)

Microsoft Azure

Home > ITProCloud_images >

Create a VM image definition

your resources.

Subscription: Microsoft MVP Subscription 12k

Resource group: WVD_Templates

Instance details

Region: (Europe) West Europe

VM image definition details

Target Azure compute gallery: ITProCloud_images

VM image definition name: Test

OS type: Windows

Security type: Trusted launch

VM generation: Gen 2

Higher storage performance with NVMe: ☒ (indicated by a red arrow)

Accelerated networking: ☐

VM architecture: x64

Hibernation supported: ☐

OS state: Generalized

VM generation has been automatically switched to Gen 2 because Gen 1 virtual machines are not supported with Trusted and Confidential security type.

Azure Boost: Images

You can now deploy session hosts with that image from the Gallery Definition

Hints:

- The operating system must support NVMe



Add virtual machines to a host pool ...

Basics Virtual Machines Tags Review + create

Add virtual machines ☐ No ☒ Yes

Host pools are a collection of one or more identical virtual machines within Azure Virtual Desktop environments. Here you provide a common set of properties to update the Session hosts within your host pool.

Resource group WVD.Design2

Name prefix * AVD-Test ☒ Session host name must be unique within the Resource Group.

Virtual machine type ☒ Azure virtual machine ☐ Azure Local virtual machine

Security type * ☐ Trusted launch virtual machines

Enable secure boot ☒

Enable vTPM ☒

Integrity monitoring ☐

Image * ☐ ITProCloud_Images/Secure-Boot-NVMe/0.0.29 [See all images](#)

Virtual machine size * ☐ Standard D8as v6 8 vCPUs, 32 GiB memory [Change size](#)

Demo Time

Azure Boost: Migration

One step back

If the OS supports NVMe, we can migrate existing VMs:

- Capture a specialized image into a prepared Gallery Definition
- Create a new v6 VM based on that image
- Done

Azure Boost: Pagefile

Do you know the “Don’t store data on D: drive” drive?

- E.g.: D8ads_v6
 - d stands for a local drive on the hypervisor
 - Perfect for the pagefile, because no network in between

And?

Hint: Check out <https://cloudprice.net/>

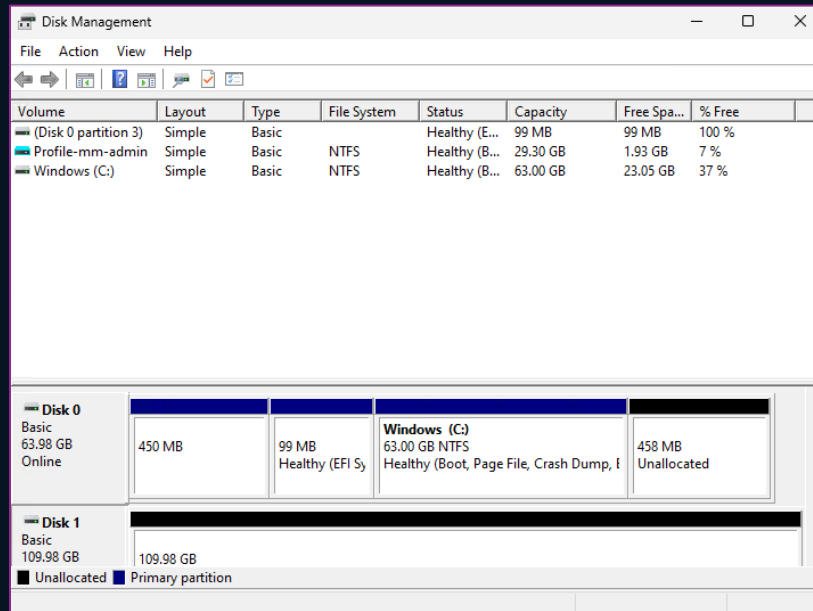
Azure Boost: Pagefile

Do you know the “Don’t store data on D: drive” drive?

The D: drive is not automatically mounted

Challenge:

- Mount D:
- Format D:
- Reconfigure the pagefile
- Reboot



Azure Boost: Pagefile

But:

```
C:\Windows\system32\diskpart.exe

DISKPART> select disk 1

Disk 1 is now the selected disk.

DISKPART> detail disk

Microsoft NVMe Direct Disk v2
Disk ID: {99F71161-C07A-48E2-A6AD-3B07C20AD2EB}
Type : NVMe
Status : Online
Path : 0
Target : 0
LUN ID : 0
Location Path : ACPI(_SB_)#ACPI(VMOD)#ACPI(VMBS)#VMBUS({44c4f61d-4444-4400-9d52-802e27ede19f}#{6f26848a-48d5-4f1e-8ca0-a2c31d72ae4e})#VPCI(0000)#NVME(P00T00L00)
Current Read-only State : No
Read-only : No
Boot Disk : No
Pagefile Disk : No
Hibernation File Disk : No
Crashdump Disk : No
Clustered Disk : No

There are no volumes.

DISKPART>
```

Azure Boost: Pagefile

- How to handle the pagefile:
 - Each time the host is allocated, the ID is changed
 - Therefore:
 - Detect if the NVMe disk exists but is not mounted/formatted
 - Mount and format the disk
 - Reconfigure pagefile
 - Do a reboot (a reboot will not change the device ID)
 - Do that very early before the AVD agent starts
- The upcoming Hydra version will do that automatically if you want.

Azure Boost: Finally

Microsoft Azure

Home > AVD-Design-003

AVD-Design-003 | Boot diagnostics ☆ ...

Virtual machine

Search

Refresh Settings Troubleshoot

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Resource visualizer

Connect

Connect

Bastion

Networking

Network settings

Load balancing

Application security groups

Network manager

Settings

Disks

Extensions + applications

Operating system

Screenshot Serial log

Updated: Friday, August 29, 2025 at 8:11:00 AM UTC [Download screenshot](#)

: (

Your device ran into a problem and needs to restart. We'll restart for you.

For more information about this issue and possible fixes, visit <https://www.windows.com/stopcode>

If you call a support person, give them this info:

Stop code: DRIVER_HVCI_NOT_LESS_OR_EQUAL

What failed: stopcode.sys

Orphan resources

```
"Name": "Design/AVD-Design-002.ITProCloud.test",  
"Id": "/subscriptions/dcdce2ee-c9c0-4765-acd5-197126d21978/resourcegroups/WVD.Design2/providers/Microsoft.DesktopVirtualization/hostpools/Design/sessionhosts/AVD-Design-002",  
"Type": "Microsoft.DesktopVirtualization/hostpools/sessionhosts",  
"Properties": {  
  "LastHeartBeat": "2025-09-03T06:47:28.62Z",  
  "Sessions": 0,  
  "AgentVersion": "1.0.11802.2200",  
  "AllowNewSession": true,  
  "AssignedUser": null,  
  "FriendlyName": null,  
  "Status": 2,  
  "StatusTimestamp": null,  
  "OsVersion": "10.0.22621.5768",  
  "SxSStackVersion": "rdp-sxs250508650",  
  "UpdateState": 3,  
  "LastUpdateTime": "2025-09-01T08:18:35.25Z",  
  "UpdateErrorMessage": "",  
  "SessionHostHealthCheckResultObject": [],  
  "ResourceId": "/subscriptions/dcdce2ee-c9c0-4765-acd5-197126d21978/resourceGroups/WVD.Design2/providers/Microsoft.Compute/virtualMachines/AVD-Design-002",  
  "VirtualMachineId": "e2330658-aaaa-46d6-8906-24cb9e14fb63"
```

Orphan resources

While a host is only linked to a VM, the following can happen:

- Orphan Host: The VM is deleted, but not the host -> Issues in autoscaling
- Orphan VM: The session host is deleted (in the Azure Portal), but the VM still exists:
 - If the VM is running, you pay for the full VM – Autoscale will not shut down the VM
 - You may run out of IP addresses
 - Storage costs
- Different and similar: If a host/VM is offline for 90+ days, the AVD Agent cannot connect to the backend the next time
 - The hosts show up as unavailable/shutdown -> See orphan host

Orphan resources - Investigate

Azure Virtual Desktop - Deep-Insights

This workbook gives you an insight into the logs coming from the Azure Virtual Backplane. These data can be used to resolve issues while user connecting or running sessions.

[Check for an update of this Workbook](#) - Current version: v3.5

Connections Errors Session Bandwidths & Latencies Graphic Performance Logon Timing VMs Runtime FSLogix Water Markings Resources

Azure Virtual Desktop Resources and Relationships

Check-out the ITProCloud Blog

- blog.itprocloud.de
- [WVDAdmin](#)
- [Hydra](#)

Hydra

Message

Orphan session hosts detected (Demo Tenant): We detected some session hosts without a linked virtual machine (or offline for longer than 90 days). That is expected during a rollout or deletion. Please validate the listed Session Hosts / VMs to avoid issues with auto scaling: AVD-AAD-GPU-002, AVD-Crazy2-0.ITProCloud.test, AVD-Crazy2-1.ITProCloud.test, AVD-Crazy2-2.ITProCloud.test, AVD-Crazy2-3.ITProCloud.test, AVD-SPLIT-S01.ITProCloud.test, AVD-SPLIT-S02.ITProCloud.test, AVD-SPLIT-S03.ITProCloud.test, VDI-11-MXE-001.ITProCloud.test

Orphan session hosts detected (Azure Local Tenant): We detected some session hosts without a linked virtual machine (or offline for longer than 90 days). That is expected during a rollout or deletion. Please validate the listed Session Hosts / VMs to avoid issues with auto scaling: AVD-PROD-M-302.FRA0204-AVD-LAB.local

Orphan AVD Agents detected (Demo Tenant): We detected some running Virtual Machines that are not listed as available on Azure Virtual Desktop. That is expected during a rollout or a longer operation, like Windows Update. Please validate the listed VMs/Session Hosts to avoid additional costs and issues: AVD-LAB-001 (VM running)

Warning	Crazy-II	AVD-Crazy2-2.ITProCloud.test	0	283	avd-crazy2-2
Warning	Crazy-II	AVD-Crazy2-1.ITProCloud.test	0	283	avd-crazy2-1
Warning	Crazy-II	AVD-Crazy2-0.ITProCloud.test	0	283	avd-crazy2-0

- Link: <https://blog.itprocloud.de/AVD-Azure-Virtual-Desktop-Error-Drill-Down-Workbook/>

Orphan resources

We will see it in my don't does....

Demo Time

Imaging Strategies

“Isn't using templates so 90s?”

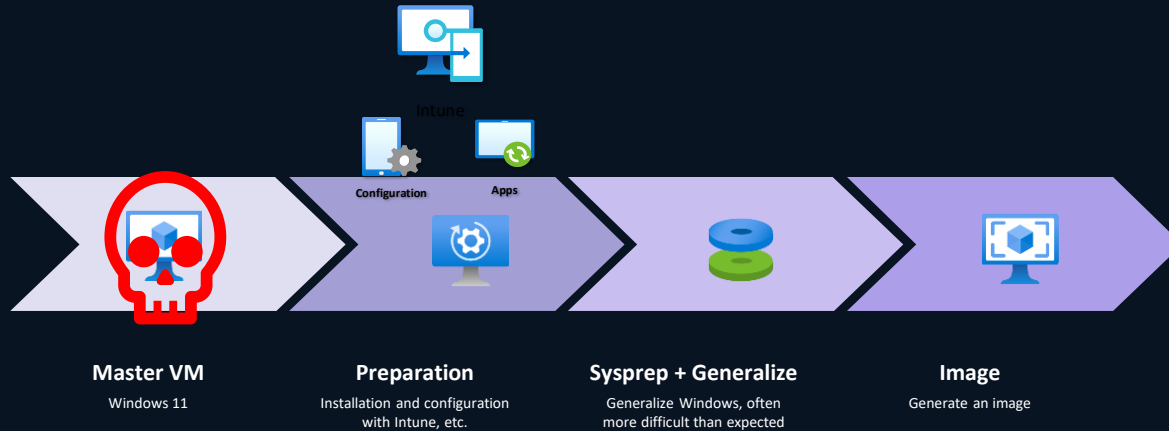
I don't think so...

Imaging Strategies

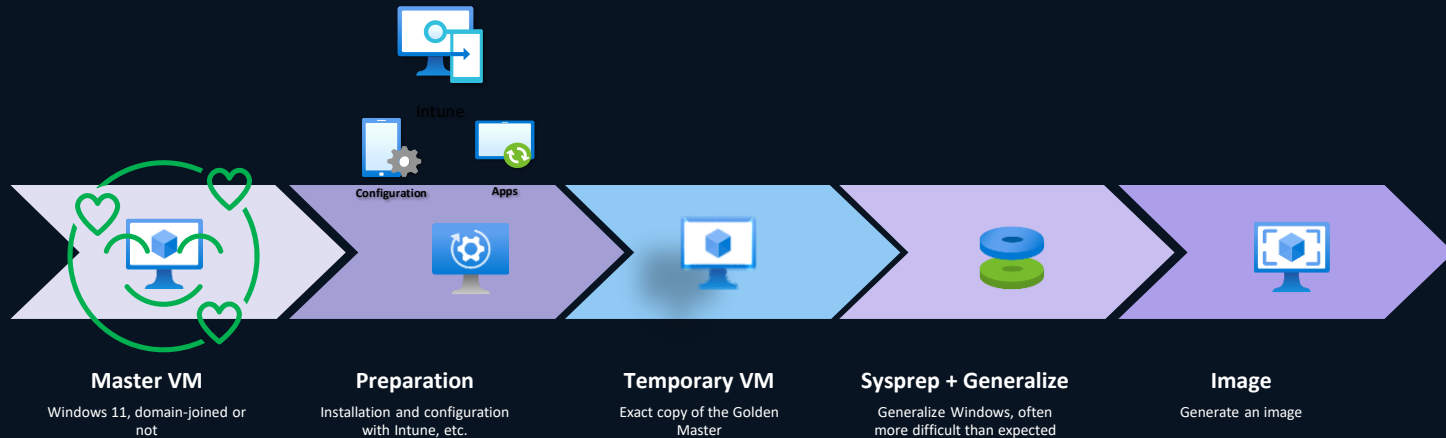
Why imaging still matters for most cases:

- Fast deployment
Deployment of session hosts with all apps and configuration in minutes
- Ready-to-use
Users can connect directly and work with the apps
- Simple
No complex installation process with all challenges regarding autoscaling, processes are in use, ...
- Repeatable
All hosts in a shared pool are equal
- Management
So easy – with the right tools
- ...

Imaging Strategies - Native



Imaging Strategies – With tools



- Makes a copy from the Golden Master
- Works with the copy (temporary VM)
 - Sysprep
 - Generalization & grab the image
- Remove temporary VM
- The Golden Master can be reused

Imaging Strategies - Challenges

What do we have to care about:

- Image types:
 - Custom/compute images
 - Gallery Images
 - Azure local images
- VM types:
 - Security type standard
 - Security type trusted launch
 - Confidential
- Specific settings:
 - Accelerated NIC
 - NVMe vs. SCSI
 - Plan-based (not plant-based)
 - Hibernation
 - ...
- Sysprep ☹️

Imaging Strategies – Gallery Definition

Example:

A correct gallery definition is needed for a deployment of:

- Hibernation enabled
- Trusted Launch
- Accelerated NIC

Create a VM image definition ...

Instance details

Region * ⓘ (US) West US

VM image definition details

Target Azure compute gallery ⓘ ITProCloud_images

VM image definition name * ⓘ Windows-11-Office-TrustedLaunch.Hib.AccNic ✓

OS type * ⓘ ☒ Windows
☐ Linux

Security type ⓘ Trusted launch

VM generation ⓘ ☐ Gen 1
☒ Gen 2
i VM generation has been automatically switched to Gen 2 because Gen 1 virtual machines are not supported with Trusted and Confidential security type.

Higher storage performance with NVMe ⓘ ☐

Accelerated networking ⓘ ☒

VM architecture ⓘ ☒ x64
☐ Arm64

Hibernation supported ⓘ ☒

Demo Time

My top 5

Does and don't do:

“Never delete a host in the Azure Portal without reading the small letters”

Don't forget to delete the VM – or use fancy tools to do that. Don't forget the disk and nic

My top 5

Does and don't do:

“Separate FSLogix profiles and don't mix them up (usually)”

Keep a folder for each host pool to store the profiles. Use the same name as the pool and configure NTFS permissions correctly

My top 5

Does and don't do:

“Choose the right storage for FSLogix”

Huge differences between performance, provisioned and used capacity, pay-as-you-go, and the
“Provisioned price model”

E.g., Pay-as-you-go, standard storage: Tier and transactions matters

My top 5

Does and don't do:

“Always configure diagnostic settings on the pools”

This gives you so many insights into what happens on the backend.

<https://blog.itprocloud.de/AVD-Azure-Virtual-Desktop-Error-Drill-Down-Workbook/>

My top 5

Does and don't do:

“Check for orphan resources”

Stop paying for VM of “unavailable” session hosts.

<https://blog.itprocloud.de/AVD-Azure-Virtual-Desktop-Error-Drill-Down-Workbook/>

My top 5

Does and don't do:

“Don't put a half-installed Windows Update in an Image”

Stop slow deployments.

Thanks a lot