
Microsoft 365
Microsoft Windows
Virtual Desktop
The best virtual desktop experience, delivered on Azure

Virtualization scenarios

Security and regulation

Financial Services

Healthcare

Government

Elastic workforce

Mergers and acquisition

Short term employees

Contractor and partner access

Specific employees

BYOD and mobile

Call centers

Branch workers

Specialized workloads

Design and engineering

Legacy apps

Software dev test

Virtualization hosts today

Windows Server Desktop Experience	Windows 10 Enterprise
Scalable multi – session **legacy** Windows environment	Native single – session **modern** Windows experience
Windows Server	Windows 10
Multiple sessions	Single session
Win32	Win32, UWP
Office Perpetual/Office ProPlus (Windows Server 2016, 2019)	Office 365 ProPlus
Long-Term Servicing Channel	Semi-Annual Channel

Virtualization hosts of the future

Windows Server RD Session Host

Scalable multi-session **legacy** Windows environment

- Windows Server
- Multiple sessions
- Win32
- Office Perpetual/Office ProPlus (Windows Server 2016, 2019)
- Long-Term Servicing Channel

Windows 10 Enterprise multi-session

Scalable multi-session **modern** Windows user experience with Windows 10 Enterprise security

- Windows 10
- Multiple sessions
- Win32, UWP
- Office 365 ProPlus
- Semi-Annual Channel

Windows 10 Enterprise

Native single-session **modern** Windows experience

- Windows 10
- Single session
- Win32, UWP
- Office 365 ProPlus
- Semi-Annual Channel

Windows Virtual Desktop Benefits

Enables a multi-session Windows 10 experience, optimized for Office 365 ProPlus

Supports Windows Server (2012R2+)

Most flexible service allowing you to virtualize both desktops and apps

Windows 7 virtual desktop with free Extended Security Updates

Integrated with the security and management of Microsoft 365

Supported OS

Windows 10 Enterprise Multi-session

Windows 10 Enterprise Single-Session

Windows 7 Single-Session

Windows Server 2019

Windows Server 2016

Windows Server 2012 R2

VMs in customer's Azure subscription

Deployment Overview

Prerequisites

Requirements

Azure subscription

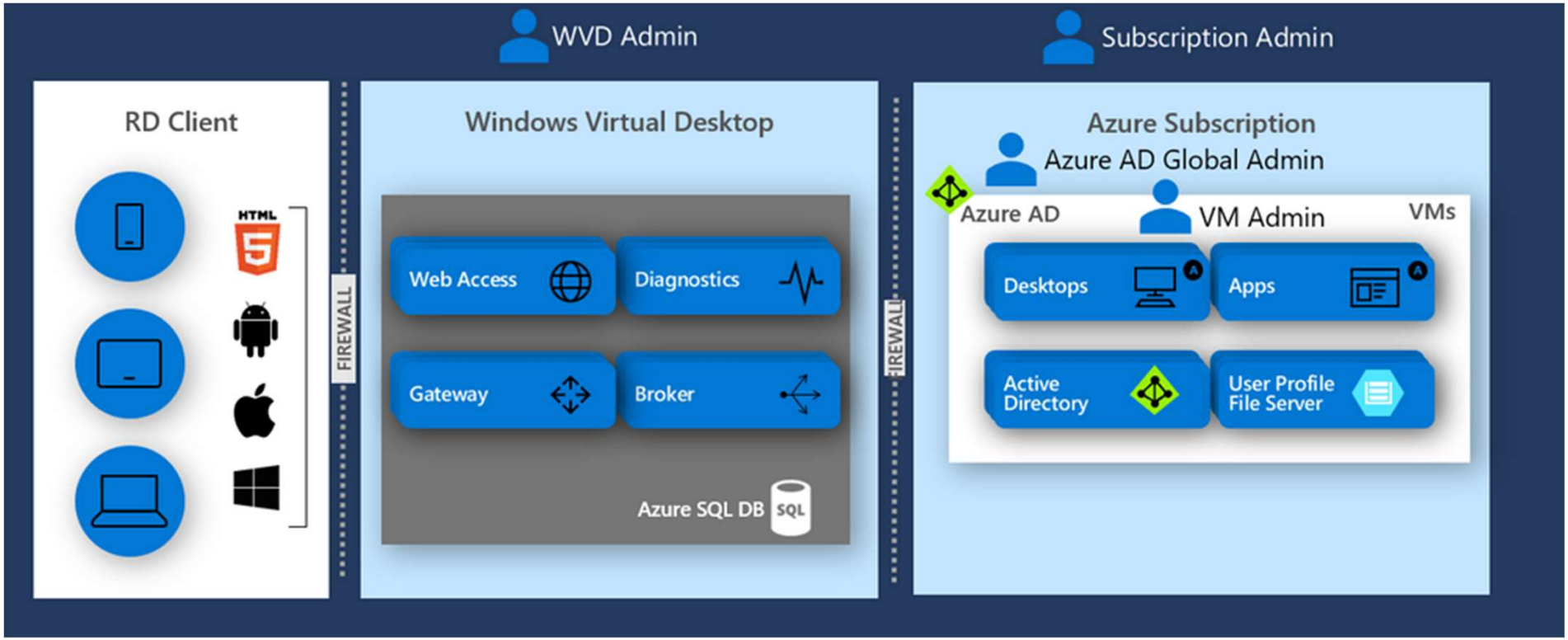
Azure Active Directory

Determine your identity strategy (AD, Azure AD DS)

All associated Azure resources (image, virtual network, storage) in one region

Required credentials (Azure AD, WVD tenant, Service principle, etc.)

Credentials required



Network requirements and considerations

Requirements

- Network must route to a Windows Server Active Directory (AD)
- This AD must be in sync with Azure AD so users can be associated between the two
- VMs must domain-join this AD

Considerations

	Connectivity Type	Special Considerations
ExpressRoute	Hybrid	Dedicated network through service provider
Site-to-Site VPN	Hybrid	Limited bandwidth compared to ExpressRoute
Azure AD Domain Services	Isolated	Must synchronize password hashes to Azure AD

Identity Strategies

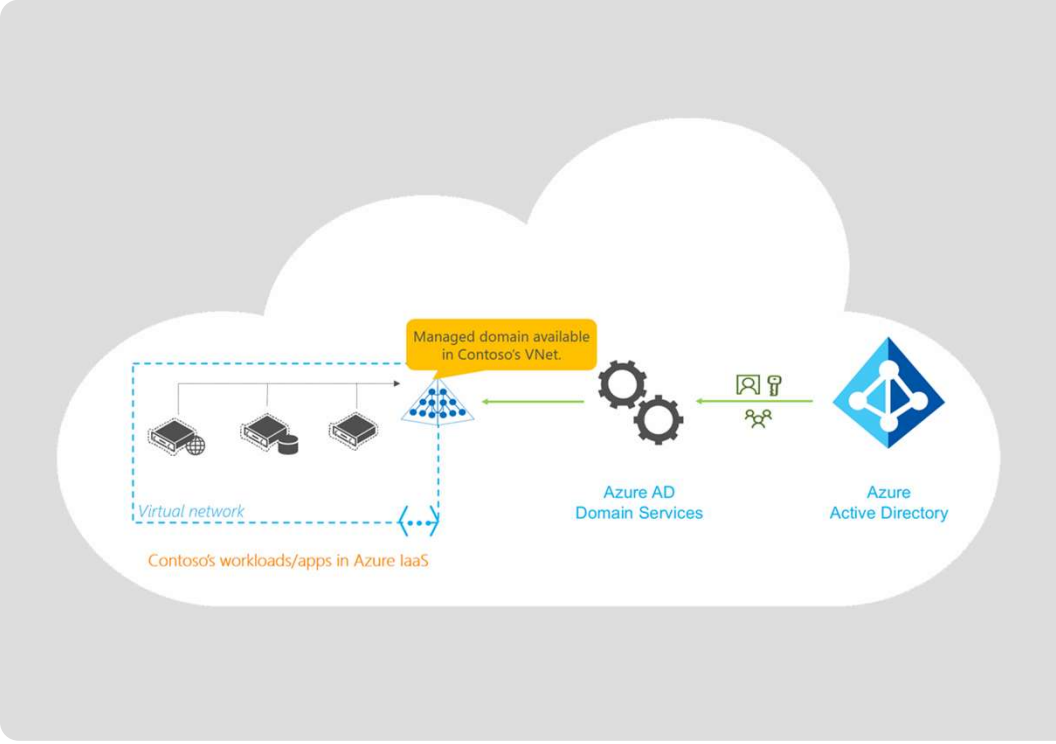
Option	Pros	Cons
Spin up a DC in your Azure subscription.	Can sync with on-premises DCs if VPN or ExpressRoute is configured. All familiar AD Group Policies can be used. Virtual machines can be paused or stopped when needed to reduce costs.	Overhead of running a full AD deployment on Azure.
For cloud-based organizations, use Azure AD DS.	Great for test or isolated environments that do not need connectivity to on-premises resources. Azure AD will be your leading source for identities.	AD DS will always be running resulting in a **fixed charge per month.**
For hybrid organizations, use VPN or ExpressRoute and make sure your on-premises DCs can be found in Azure.	Adds additional management of a VM and Active Directory in Azure. No AD DS or Domain Controller required in Azure.	Latency could be increased adding delays during user authentication to VMs. This assumes you have an on-premises environment, not suitable for cloud only tests. Overhead of running a full AD deployment on-premises

Recommended identity setup for cloud-based organizations

Azure AD

Azure AD Domain Services

- Windows Server AD run as a service by Azure
- Allows VMs to be domain-joined
- Users recognized both in Azure AD and Windows Server AD

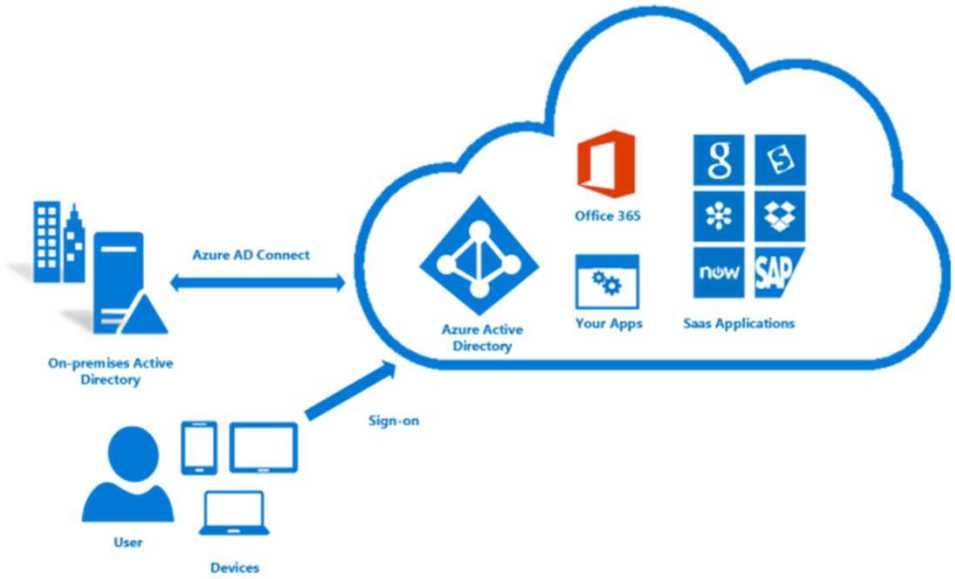


Recommended identity setup for hybrid organizations

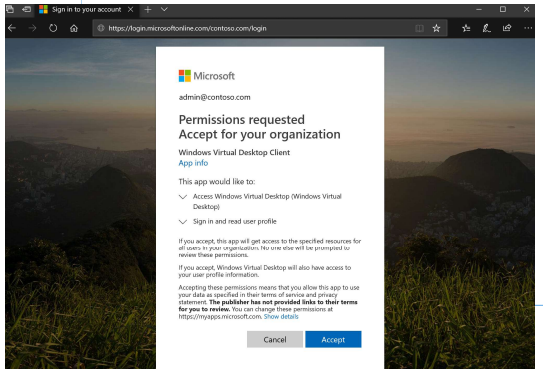
Azure AD

Windows Server AD on-prem connected to Azure

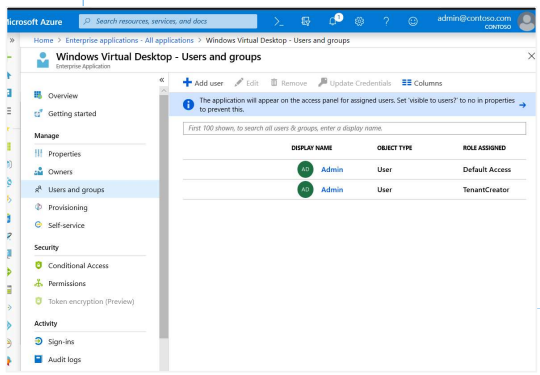
- ExpressRoute or site-to-site VPN to Azure
- Azure AD Connect to synchronize identities



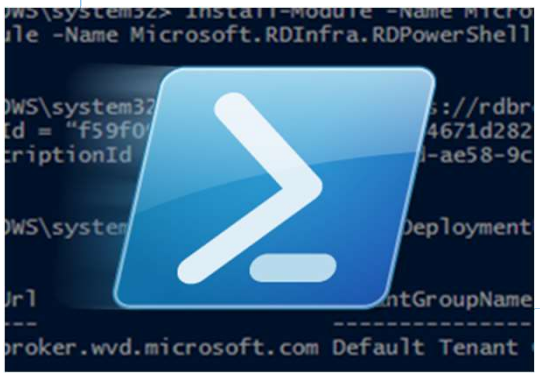
Create Windows Virtual Desktop tenant



Grant Azure AD consent



Assign a Tenant Creator



Create your tenant

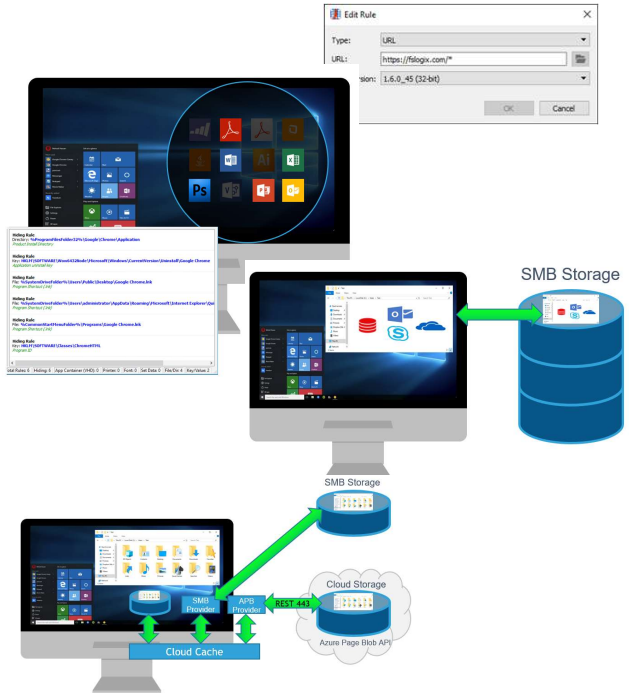
Documentation: aka.ms/wvdpreview

Getting Started Guide: aka.ms/startwvd

Automation

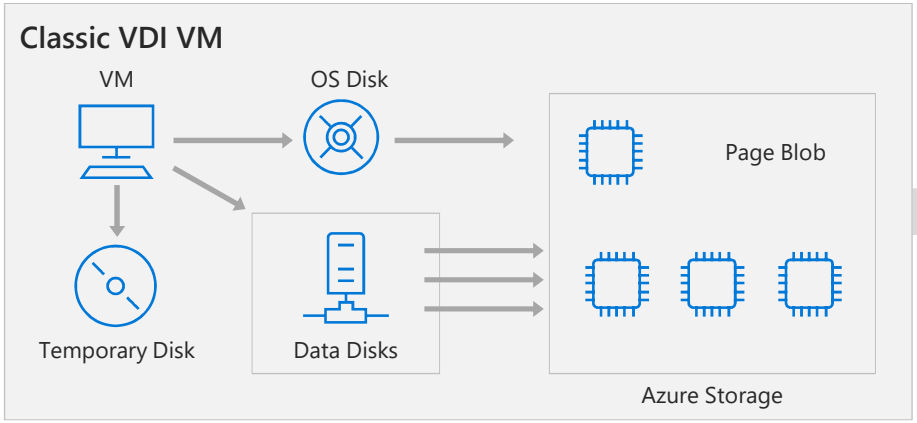
- Create or update VMs for a host pool
  - Create and provision host pool
  - Update VMs in existing host pool
- Scale your host pool
  - Scaling script

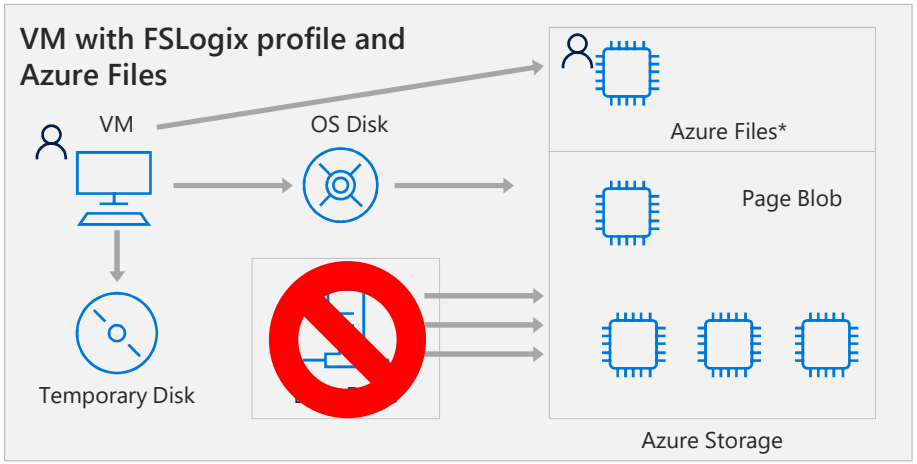
FSLogix

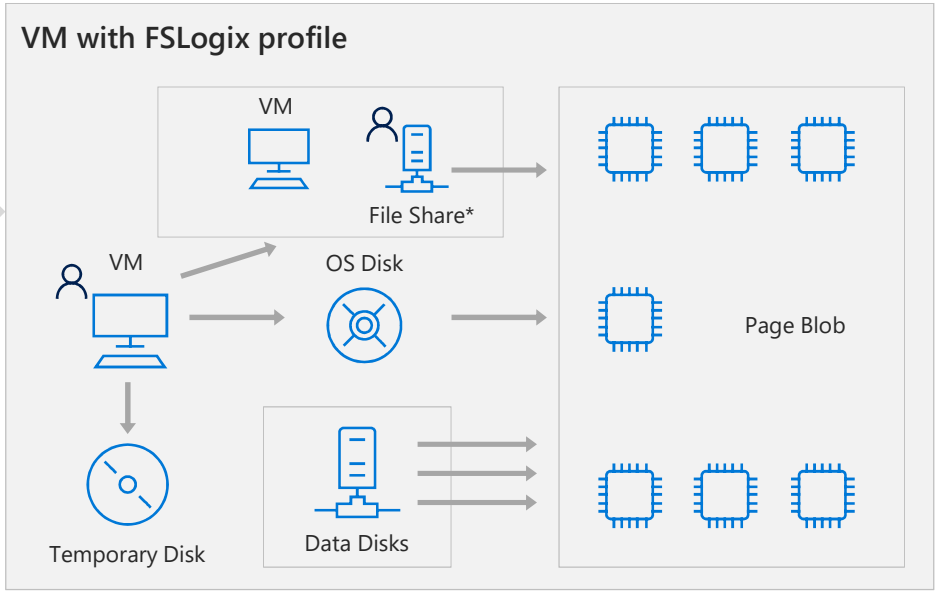


- Profile is stored in VHD/VHD(X)
- Same approach used by UPD
- Mounted at Login – faster login and no target storage requirement
- Size of Profile doesn't impact logon time
- VHD(X) = Block Transfer decreases network utilization
- Caching from Windows Cache Manager
- Profile Container redirects everything from the user profile.
- Filter driver causes profile to appear local – broader application support

Storage in WVD



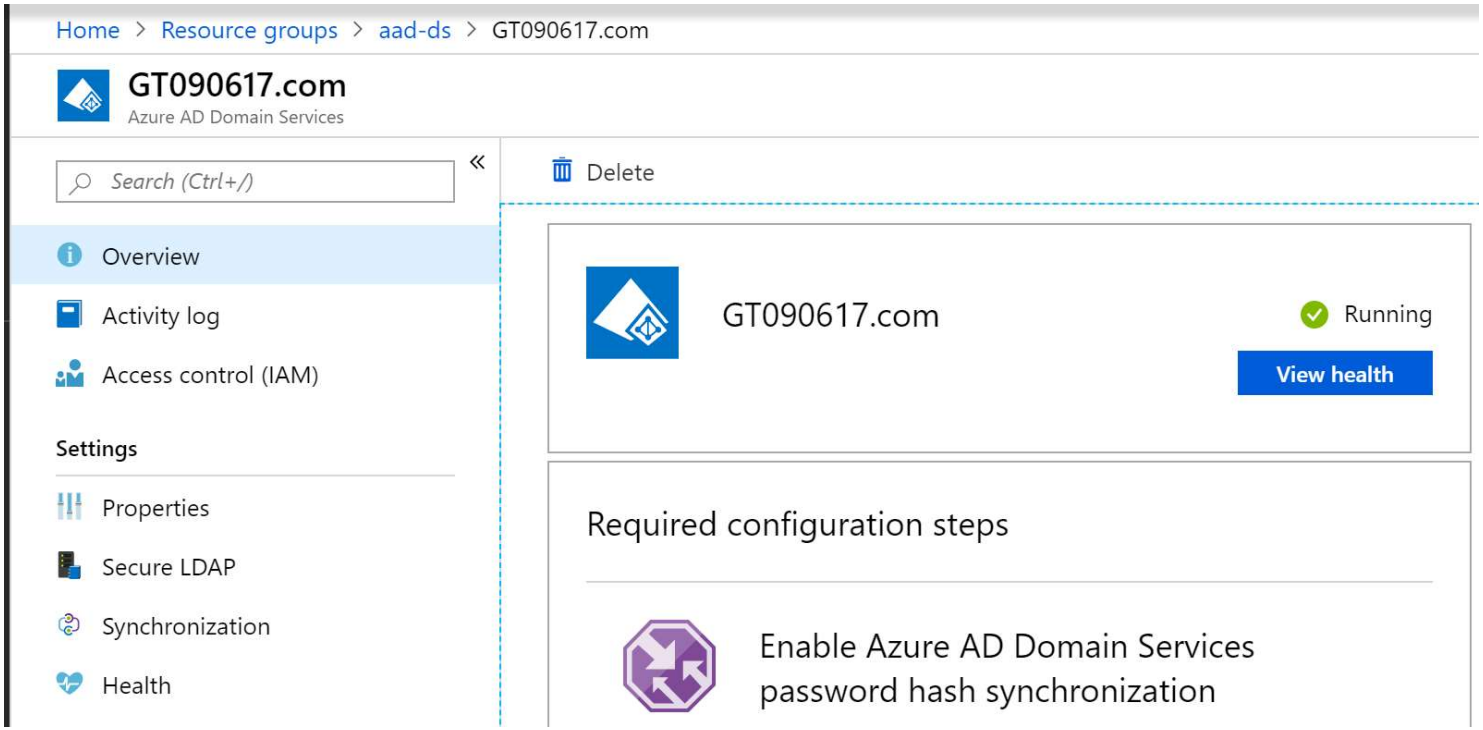




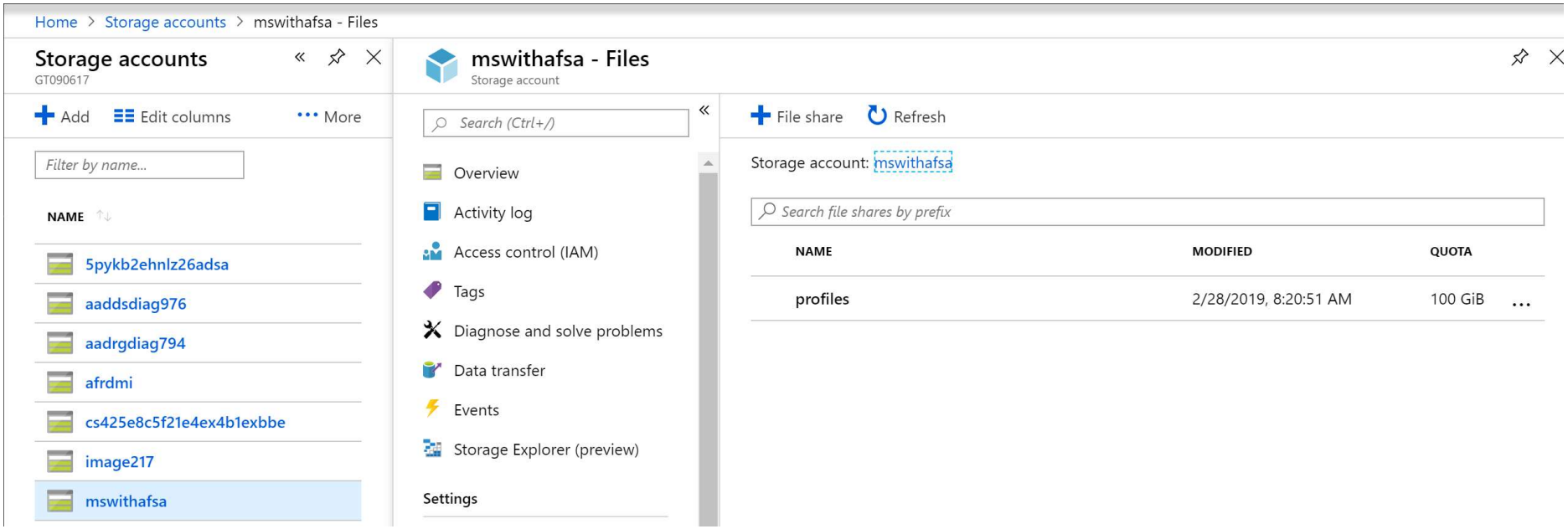
Dependencies

- On prem AD integration (Coming soon)
- ✓ Premium Files rollout (overlap in hero regions)
- ✓ AADS integration

Azure AD Domain Services



Create storage account



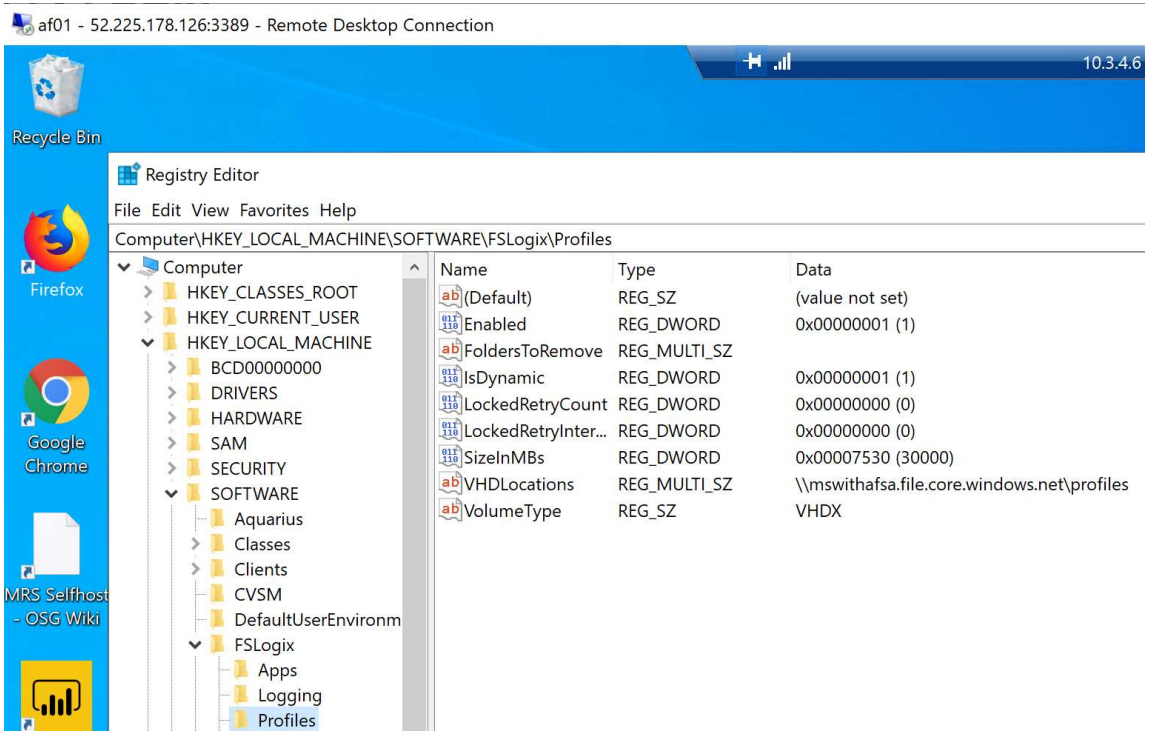
Create custom Azure role


```
#List the custom roles
az role definition list --custom-role-only true --output json | jq
'.[] | {"roleName":.AzureFilesRWDRole, "description":.description,
"roleType":.roleType}'

#Assign the custom role to the target identity
az role assignment create --role "AzureFilesRWDRole" --assignee
"stefan@wvdcontoso.com" --scope "/subscriptions/25e8c5f2-1e4e-4b1e-
bbef-
00d911724630/resourceGroups/MSwithAF/providers/Microsoft.Storage/st
orageAccounts/mswithafsa/fileServices/default/fileshare/profiles"
```

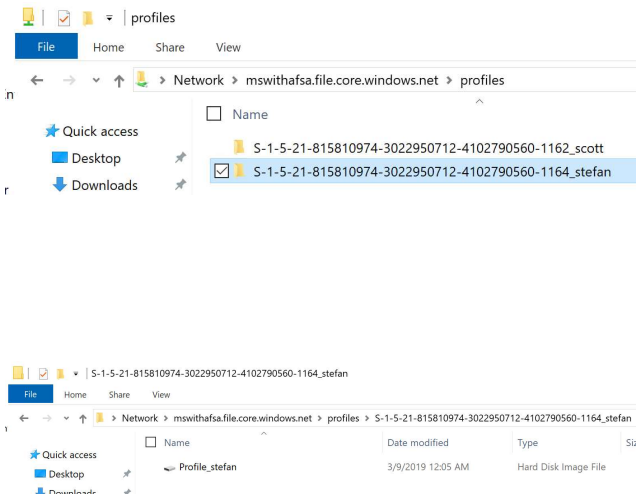
Create custom Azure role - continued


```
#Onetime operation
net use g: \\mswithafsa.file.core.windows.net\profiles
9IJ78n+SFuAlmHO6Ix93mQ4q9z0S3rAjTo9vKP5yoVTbfkqmmq8az8yG
X3rpAEEqzR6bBZCZ4ivyzb9SMZYO4Q== /user:Azure\mswithafsa

#Grant users permissions
icacls g: /grant stefan@wvdcontoso.com:(f)
icacls g: /grant pieter@wvdcontoso.com:(f)
```

Configure FSLogix



Windows Virtual Desktop with FSLogix

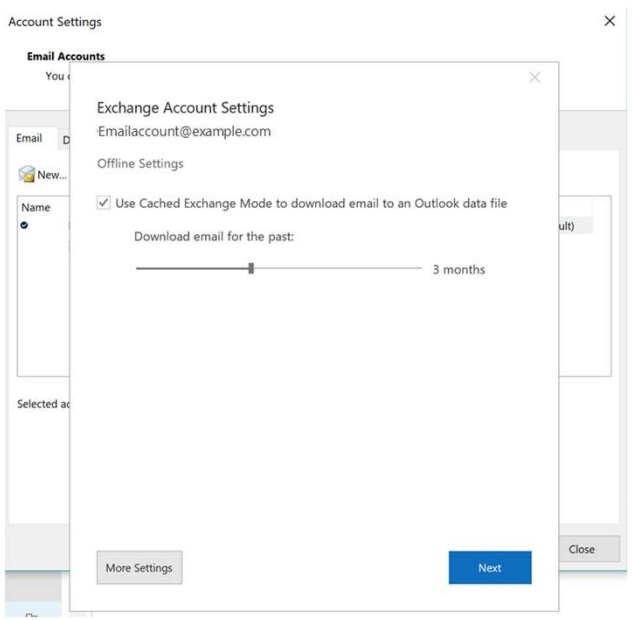


Admin assign users to session hosts

End user's login

Gets profile assigned

Outlook

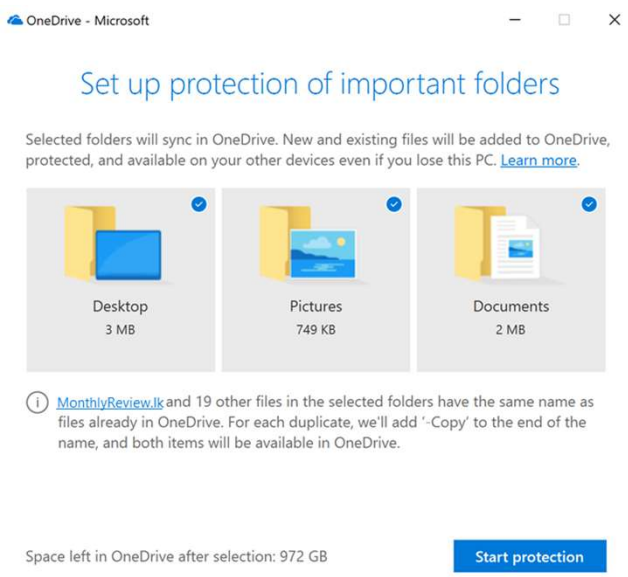


- Virtual environment friendly defaults settings
- Syncing of Inbox prior to Calendar for faster startup experience
- Admin option to reduce calendar sync window
- Reduce the number of folders that are synced by default
- Windows Desktop Search is now per-user

Requirements:

- FSLogix
- SCA activated for Office

OneDrive



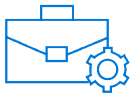
- Co-auth and collab capabilities in WXP, powered by OneDrive
- OneDrive sync will run in non-persistent environments
- Files on Demand capabilities
- Auto populate user profile folders

Per-machine install steps:

- Download OneDriveSetup.exe
- Run "OneDriveSetup.exe /allusers" or by using SCCM
- Once setup is complete, OneDrive will start. Any accounts added on the computer will be migrated automatically

Implementation Guidance – infrastructure management

Master Image Management



Master image can be managed by any already existing process and technologies including

- Azure Update Management
- System Center Configuration Manager
- 3rd party

Best practices document will be provided to assist in configuration of a golden image for WVD

Application masking technology to minimize the number of golden images and simplify app image management

Patch Management

Use one host pool as a pilot group before updating all host pools

Update VMs with existing Azure management solutions and all VMs in
a host pool

Updates can be staged in a maintenance window to keep systems available after logon

All VMs in a host pool must be at the same update-level after maintenance window is completed

Use SCCM to manage
your images

Profile Management

Profile Container

- User profile is placed into a VHD container that is stored in a central location on the network or in the cloud
- This VHD is dynamically attached at user logon
- Content appear to be in its native location

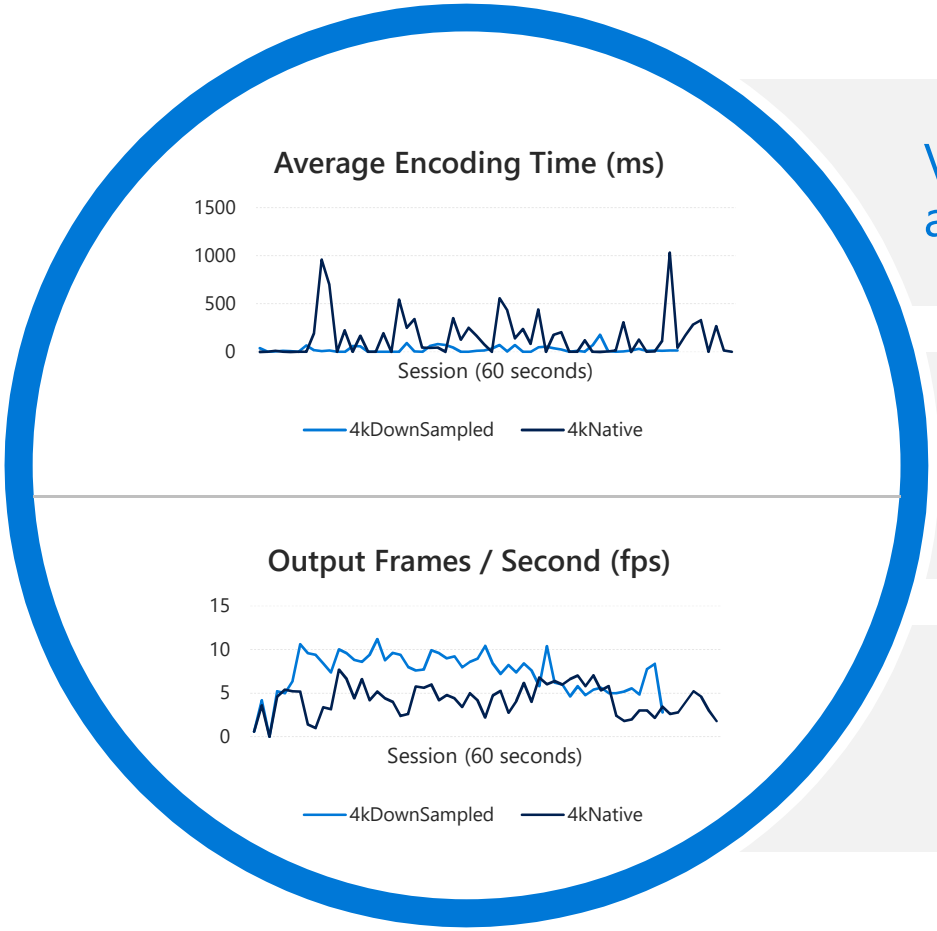
Benefits

- Extremely fast logon times
- Virtually eliminates profile corruption
- Uses native Windows VHD capabilities–no hypervisor
- Very easy to deploy and manage
- Completely seamless end user experience

Cloud Cache

- Cloud Cache will absorb reads and optimize writes into cost effective payloads
- Adding a local cache component
- Applications talk to the local cache, and the cache talks to the remote container
- If the connection to the remote container is interrupted, the apps still work because they're talking to the cache
- If the interruption is short, or no data that isn't in the cache is requested during the outage, everything behaves normally
- When connection comes back online, we reconnect and re-sync if necessary

Video and graphics improvements



Video playback always uses hardware acceleration

Smooth playback when moving the video window

4K downsampling

Device redirection

High-level redirection of built-in or attached video camera

Less network bandwidth compared to USB camera redirection

Increased video framerate, up to 30 fps

Redirect multiple cameras

Improved printing messages

Built-in Windows client first to adopt

Virtualizing Windows Server

- Supports 2012 R2, 2016, and 2019
  - If an older version, suggest upgrade to newer version or refactor app for Windows 10 multi-session
- Office 365 ProPlus support only in Windows Server 2016 and 2019
  - 2012 R2 only supports Office perpetual
  - Use Windows 10 Enterprise multi-session for best experience
- Requires the use of Windows Server VMs on Azure but can leverage Azure Hybrid Benefit for cost savings

Windows Server RD Session Host

Scalable multi-user legacy Windows environment. Windows Server

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Multiple users

Win32

Office Perpetual or Office 365 ProPlus (Windows Server 2016/2019)

Long-Term Servicing Channel

Virtualizing Windows 7

- 3 years ESU
- Requires full Windows 7 desktop
- Use App Assure or something else first
- Last Resort

Windows 7

Scalable multi-user legacy Windows environment.

Windows 7

Single user

Legacy Win32

Office 2019 Perpetual

Full Desktop only

Full desktop vs. RemoteApp

Based on what your users need to do.

Full desktop	Use RemoteApp
Power Users / Developers that need to install their own apps or admin privileges	Clients vary widely and application consistency is impacted
Clients lack computing power / outdated	Different version of the same app from different OS

WVD Deployment and management options

Deployment

Onboarding will be through Azure Marketplace or through Github using ARM templates to deploy new or update existing host pool

Management

Azure Portal will enable native integration post GA for deployment and management alongside other Azure services

Use REST API's to set and manage WVD directly, build complex workflows – sample UI and outlines for customers will be provided

PowerShell is the best option for repeatable deployment, Azure integration, and DSC

Other options include Terraform or partner management solutions

Hosting partners

Leverage multitenancy support to scale the number of customers

Performance guidance

VM should be deployed to Azure regions with WVD clusters

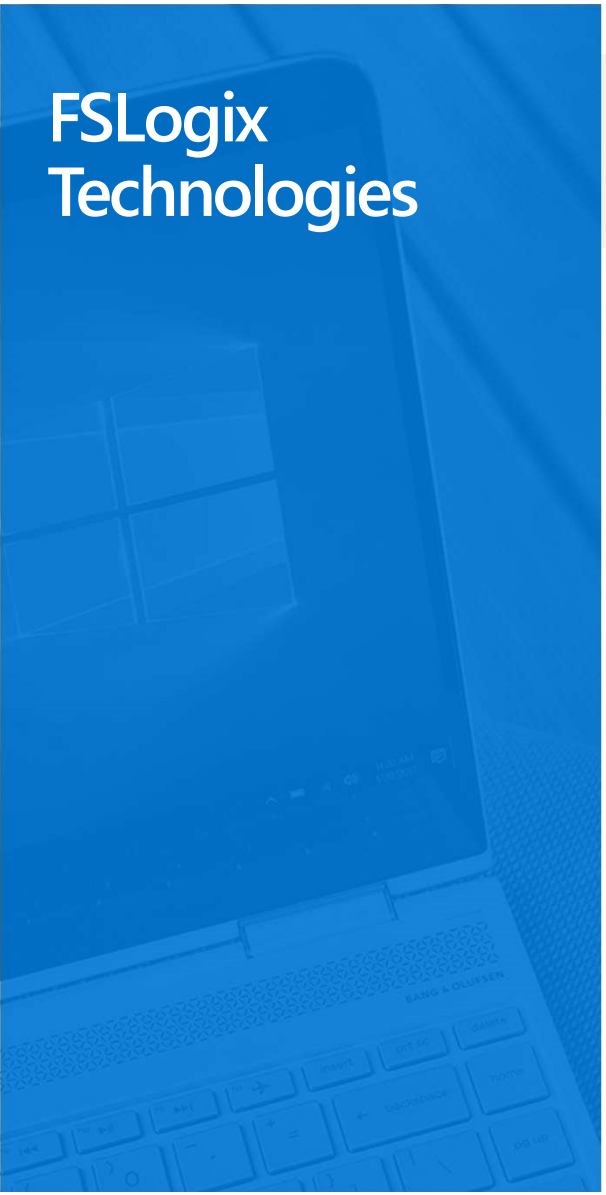
Active Directory datacenters should be in each region where session host pools are located

Recommend a mix of breadth and depth scaling to accommodate peak and nonpeak timing

Leverage multisession user density for the most cost-effective option

VM configurations should match use case and host pool needs

FSLogix Technologies



With the acquisition of FSLogix, eligible customers will get access to three core pieces of technology

Profile Container

Replacement for roaming profiles and folder redirection. Dramatically speeds up logon and application launch times.

- Includes Office 365 Container, which roams Office cache data (Outlook OST, OneDrive cache, Skype for Business GAL, etc.) and Windows Search DB with user in virtual desktop environments.

App Masking

Minimize number of gold images by creating a single image with all applications. Excellent app compatibility with no packaging, sequencing, backend infrastructure, or virtualization.

Java Redirection

Helps protect the enterprise from vulnerabilities of multiple installed versions of Java by mapping specific versions to individual apps or websites.

Benefits

- Container
- Profile Container
- Office 365 Container
- App Masking
- Java Redirection

SMB Storage

Uses native Windows VHD capabilities–no hypervisor.

Very easy to deploy and manage.

Completely seamless end-user experience.

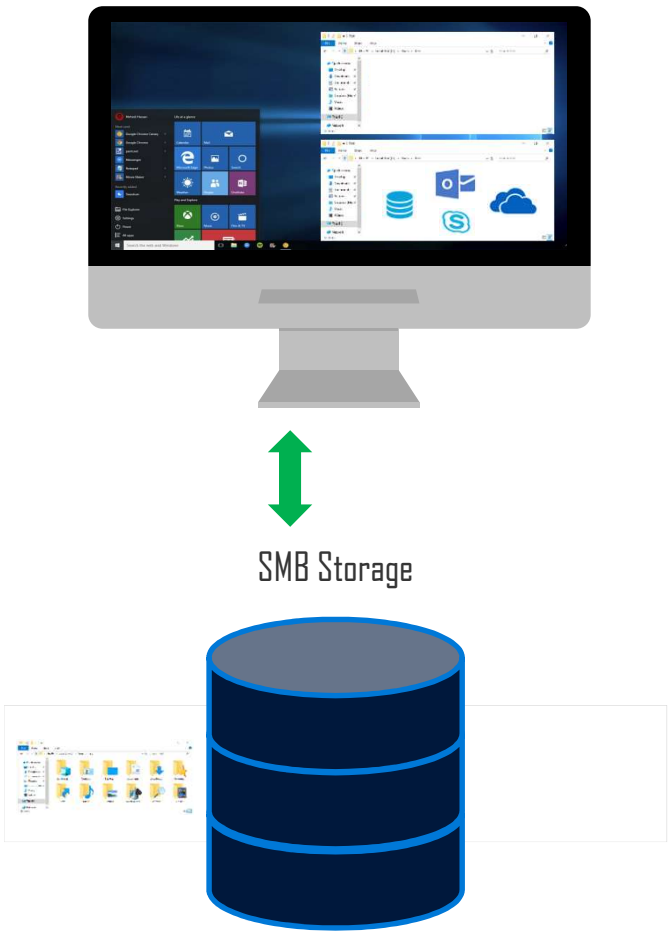
Works with other application management platforms.

Easy to test, implement, and manage.

Reduces network and filesystem load.

Benefits

- Container
- Profile Container
- Office 365 Container
- App Masking
- Java Redirection



Places entire user profile in network-based container.

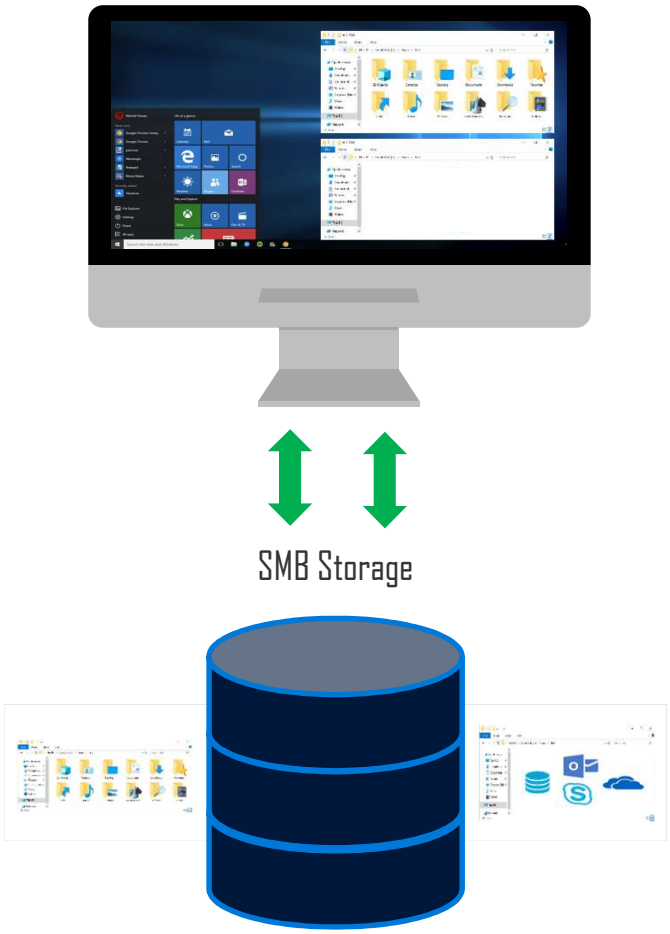
Extremely fast logon times.

Virtually eliminates profile corruption.

Works alongside existing User Environment Management platforms.

Benefits

- Container
- Profile Container
- **Office 365 Container**
- App Masking
- Java Redirection



Places Office 365 cache data in network-based container.

Enables roaming of Outlook OST, OneDrive cache, Windows Search, and more…

Office apps have native performance and behavior.

Works alongside other profile management platforms.

Benefits

- Container
- Profile Container
- Office 365 Container
- App Masking
- Java Redirection

Application Management without sequencing, snapshotting, packaging, or virtualization.

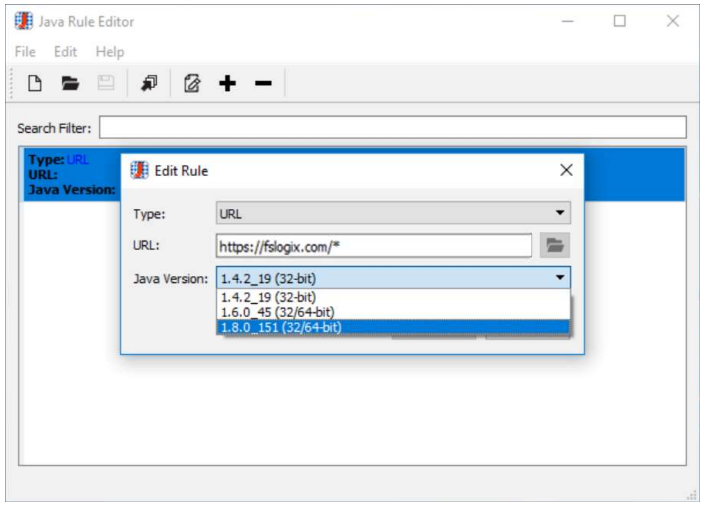
All apps installed in base image.

- Only apps a user is entitled to are revealed.
- App entitlements can be changed in real time.
- Works with fonts, plugins, and more…
- Excellent app compatibility

Massively reduce the number of gold images that must be maintained

Benefits

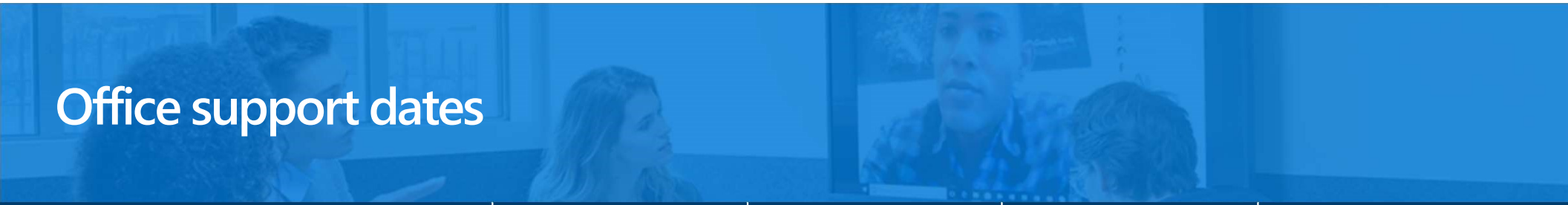
- Container
- Profile Container
- Office 365 Container
- App Masking
- Java Redirection



Securely collocate multiple version of Java on same base image

Run each app or website with specific version of Java required for full functionality

Uses FSLogix App Masking to hide unused versions of Java when not needed



Office support dates

	Office 365 ProPlus always supported		Office 2019 Oct 2025		Office 2016 Oct 2025		Office 2013 April 2023		Office 2010 Oct 2020	
	Client Supported Until	**Service Use Supported Until**	**Client Supported Until**	**Service Use Supported Until**	**Client Supported Until**	**Service Use Supported Until**	**Client Supported Until**	**Service Use Supported Until**	**Client Supported Until**	**Service Use Supported Until**
Win10 SAC always supported	No end date	No end date	Oct 2025	Oct 2023	Oct 2025	Oct 2023	Apr 2023	Oct 2020	Oct 2020	Oct 2020
Win8/8.1 Jan 2023	Jan 2023	Jan 2023	n/a		Jan 2023	Jan 2023	Jan 2023	Oct 2020	Oct 2020	Oct 2020
Win7 w/ ESU Jan 2023	Jan 2023	Jan 2023	n/a		Jan 2023	Jan 2023	Jan 2023	Oct 2020	Oct 2020	Oct 2020
Windows Virtual Desktop Oct 2028	Oct 2028	Oct 2028	n/a		n/a		n/a		n/a	
WS 2019 Oct 2028	Oct 2025	Oct 2025	Oct 2025	Oct 2023	n/a		n/a		n/a	
WS 2016 Jan 2027	Oct 2025	Oct 2025	n/a		Oct 2025	Oct 2023	Apr 2023	Oct 2020	Oct 2020	Oct 2020
WS 2012 R2 Oct 2023	Jan 2020	Jan 2020	n/a		Oct 2023	Oct 2023	Apr 2023	Oct 2020	Oct 2020	Oct 2020
Win10 LTSC 2018 Oct 2028	n/a		Oct 2025	Oct 2023	n/a		n/a		n/a	
Win10 LTSB 2016 Oct 2026	Jan 2020	Jan 2020	n/a		Oct 2025	Oct 2023	Apr 2023	Oct 2020	Oct 2020	Oct 2020
Win10 LTSB 2015 Oct 2025	Jan 2020	Jan 2020	n/a		Oct 2025	Oct 2023	Apr 2023	Oct 2020	Oct 2020	Oct 2020

Blog

Most customers are already eligible for WVD

Client

Customers are eligible to access Windows 10 single and multi session and Windows 7 with Windows Virtual Desktop (WVD) if they have one of the following licenses*:

- **Microsoft 365 E3/E5**
- **Microsoft 365 A3/A5/Student Use Benefits**
- **Microsoft 365 F1**
- **Microsoft 365 Business**
- **Windows 10 Enterprise E3/E5**
- **Windows 10 Education A3/A5**
- **Windows 10 VDA per user**

**Customers can access Windows Virtual Desktop from their non-Windows Pro endpoints if they have a Microsoft 365 E3/E5/F1, Microsoft 365 A3/A5 or Windows 10 VDA per user license.*

Server

Customers are eligible to access Server workloads with Windows Virtual Desktop (WVD) if they have one of the following licenses:

- **RDS CAL license with active Software Assurance (SA)**

Pay only for the virtual machines (VMs), storage, and networking consumed when the users are using the service

Take advantage of options such as one-year or three-year Azure Reserved Virtual Machine Instances, which can save up to 72 percent versus pay-as-you-go pricing. Now with monthly payment options!

FSLogix entitlements

FSLogix technology, which improves the performance of Office 365 ProPlus in multi-user virtual environments, is now available at no additional cost for Microsoft 365 and Remote Desktop Services customers

- Microsoft 365 E3/E5/F1/Business
- Microsoft 365 A3/A5/Student Use Benefits
- Windows 10 Enterprise E3/E5
- Windows 10 Education A3/A5
- Windows 10 VDA per user
- Remote Desktop Services (RDS) CAL
- Remote Desktop Services (RDS) SAL

*Including Office 365 Container, Profile Container, App Masking and Java Redirection

Pricing

Pay only for the virtual machines (VMs), storage, and networking consumed when your users are using the service

You have the flexibility to pick any VM and storage options to match your use cases

Take advantage of options such as one-year or three-year Azure Reserved Virtual Machine Instances, which can save you up to 72 percent versus pay-as-you-go pricing. Reserved Virtual Machine Instances are flexible and can easily be exchanged or returned

WVD Pricing page on Azure.com

Migration

Migration will be allowed for Azure VMs that are part of other virtualization environments (including RDS on Azure)

Full migration guidance will be published closer to General Availability

Migration recommendations from AWS to WVD will also be published as part of the guidance

We will have CSP partners that will also work with their customers in automating migration from other clouds and technologies to WVD

Windows Virtual Desktop partnership with Citrix

With the partnership, Citrix is authorized by Microsoft to provide the benefits of Windows Virtual Desktop in their value-added cloud services hosted on Azure.

Why Windows Virtual Desktop and Citrix makes sense together

Microsoft Azure is Citrix's strategic and preferred public cloud

- Drive incremental M365 E3/5 : Land the value and innovation of the M365 suite with WVD in Citrix offerings
- Drive incremental Azure Consumed Revenue: Help accelerate customers' cloud initiatives and enable enterprise IT to effectively streamline the migration from on-premises infrastructure
  to Azure

Windows Virtual Desktop partnership with Citrix continued

Windows Virtual Desktop in Citrix Offerings

Windows Virtual Desktop seamlessly integrate* into Citrix Workspace and Citrix Virtual Apps on Desktops service offerings

- Provide users with the benefits of Windows Virtual Desktop such as multi-session Windows 10 experience on Azure, Office optimization with Office 365 Containers, Profile Containers, App masking and free Extended Security Updates, with Windows 7
- Centrally manage Hybrid deployments with WVD on Azure and manage existing Citrix Virtual App and Desktop service on-premises
- Rapidly provision Windows Virtual Desktop resources at scale

*Citrix Workspace and the Citrix Virtual Apps and Desktop service will include Windows Virtual Desktop on the first day of Windows Virtual Desktop General Availability.

Partner Value-Added Services

Partners will integrate with Rest APIs and PS cmdlets offered by WVD service.

Solutions developed by partners will be made available through Azure Marketplace.

Keyword (tentative) – Windows Virtual Desktop will be part of their marketplace title and will be displayed when using the keyword

Other partners can offer their services independently as part of their cloud offering.

See if Windows Virtual Desktop is right for your customers

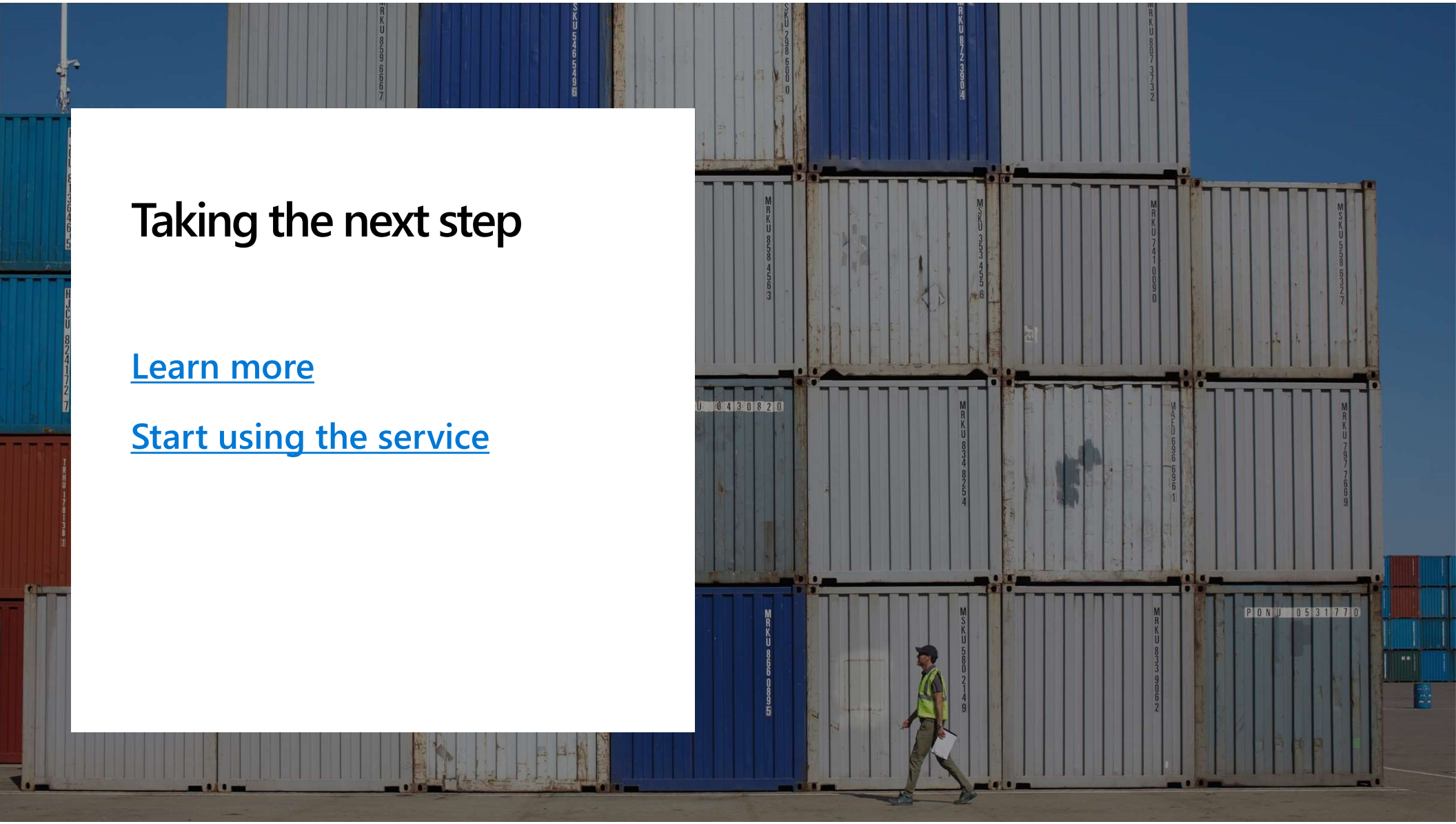
Take the self-assessment:

- ❑ You need the ability to add users quickly and easily
- ❑ You need to scale efficiently on demand
- ❑ Your end-users need a seamless rich client experience with Outlook, Search, Cortana, OneDrive, and Skype
- ❑ You need to manage different deployment types across different deployment planes
- ❑ You need to bring Remote Desktop Services (RDS) to your users
- ❑ You need to support both persistent and non-persistent environments
- ❑ You need integrated security and management e.g. Microsoft 365, AAD
- ❑ You need to run Windows 7 legacy applications post upcoming Win 7 EOL
- ❑ You are in a regulated industry and need to meet strict compliance requirements
- ❑ Your virtual desktop journey requires reuse of existing investments (e.g. Citrix)
- ❑ You want to reduce management and deployment costs for Windows Server

Taking the next step

Learn more

Start using the service



Microsoft 365

Thank you