Microsoft 365

Microsoft Windows Virtual Desktop

The best virtual desktop experience, delivered on Azure

Adam Whitlatch– Global Black Belt WVD
April 2020

Agenda

Topic	Detail
Intros – Moderators	
WVD Overview & Architecture Q&A	Demo – User Experience Demo Application Publishing
Partner Ecosystem	
User Environment / User Data / Applications Q&A	Demo Azure Files / FSLogix
Networking, Host Pools	
Image Management Q&A	Demo – Simple Image Process
Monitoring Q&A	Demo – Azure Monitor – Sepago
Spring Release	Demo – Azure Portal ARM
Q&A – Wrap Up	

GRAND CANYON COUNCIL

Adam is a Technical Specialist for Windows Virtual Desktop Global Black Belt Team, based in Phoenix, AZ with 20+ years of experience inside the datacenter, and in Cloud engineering. His key areas of technical specialty are Virtual Desktop, Infrastructure Core Enablement, and Hybrid cloud strategy. Over his career, Adam has worked in Banking, Financial Services, Retail, Pharmaceuticals, and Healthcare industries. He provides strong technical depth & business architecture which results in impactful solutions for cloud implementations.

Adam Whitlatch

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Why does this matter to customers

Most desktop and app virtualization solutions are **running Windows Server and are currently on-premises**

Customers are running up against **End of Support for Windows 7 and Windows Server 2008/R2**

Broader **cloud migration of Windows Server and SQL Server** as well as **modernization to Windows 10**

Why virtualize Windows desktops and apps on Azure?

Mobility – users can access from any device, anywhere

Security – business data never leaves Azure

Scalability – adjust to fluctuations in workforce

Compatibility – older apps can run virtualized

Performance – apps remain close to the data

Management – single image for many users

Cost – utilize the elasticity of Azure

Customer challenges

Customer Challenges	Windows Virtual Desktop customer promises
End-user experience trade-off in multi-session environments	**Deliver the only multi-session Windows 10 experience** • Windows 10 multi-session and single-session • Free Windows 7 Extended Security Updates
Poor O365 experience in non-persistent multi-session	**Enable optimizations for Office 365 ProPlus** • FSLogix -> fast VHD load times • Per machine Install – OneDrive, Teams • Search, cache, indexing improvements
Remote Desktop deployments can be expensive	**Migrate existing RDS deployments to Azure** • CAPEX to OPEX • Tools to utilize Azure elasticity/scalability
Deployment/Management experience is sub-optimal	**Deploy and scale in minutes** • ARM templates for simplified deployment • Web GUIs for simplified management • Partner ecosystem extensibility

Business demands…

Innovation

More innovation at a faster pace

Costs

Take advantage of cloud scale and economics

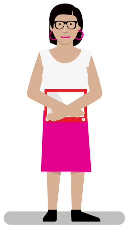
Agility

Business agility and flexibility

Repeatability, Predictability, Availability

Fast and predictable response to change and zero downtime

On-prem Desktop Virtualization Presents Challenges



Inconsistent User & IT Administrator Experience

Variable user experience across device types and clients

High effort to setup, configure, and monitor security

Complex remote desktops management

Unattractive Economics

Poor scalability and flexibility of on-prem infrastructure

High upfront Capex costs not aligned to business use

High cost of delivering true Windows 10 experience

High client and management licensing costs

High labor costs

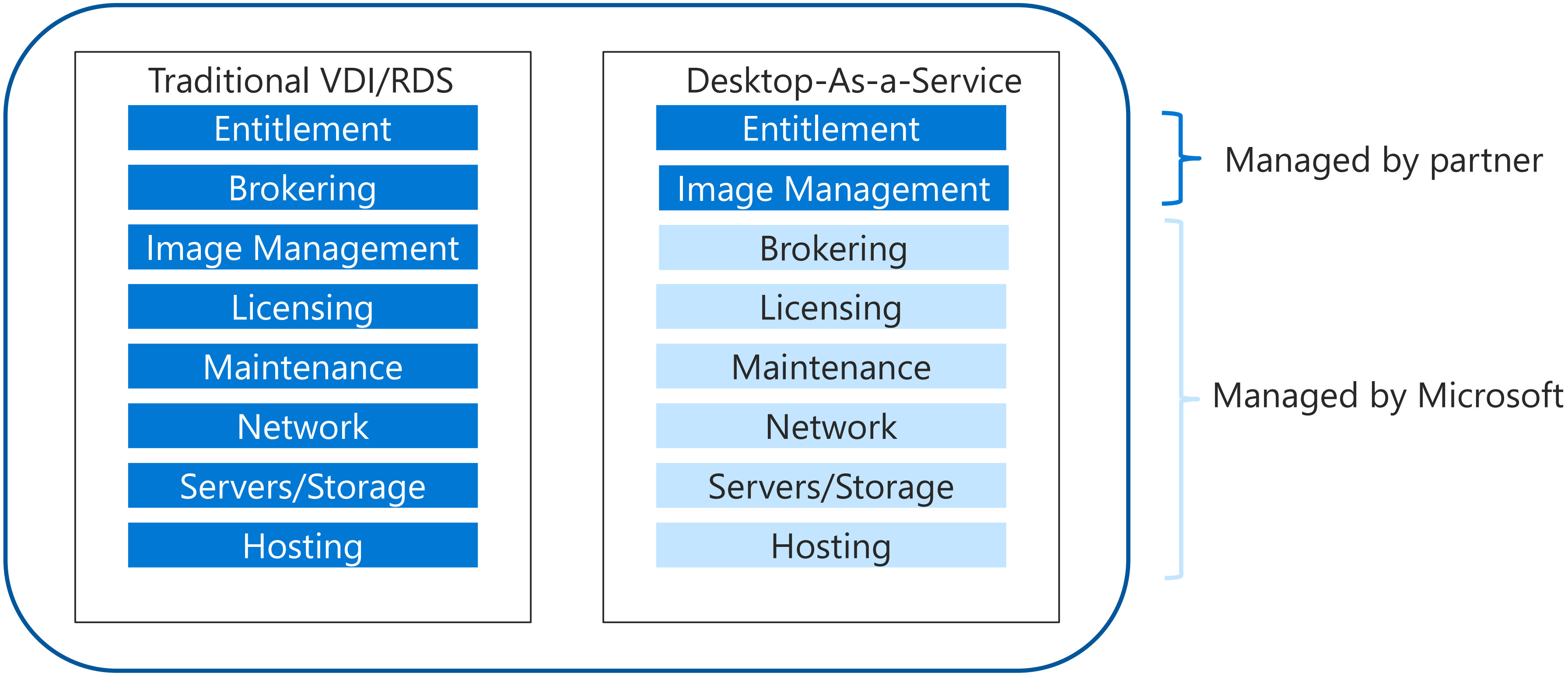
Non-standard Deployments & Environments

Variability across multi-site, global deployments

High investment in security

Non-standard deployments limit available talent to deploy/manage

Difference between traditional VDI/RDS and DaaS



Traditional VDI/RDS

- Entitlement
- Brokering
- Image Management
- Licensing
- Maintenance
- Network
- Servers/Storage
- Hosting

Desktop-As-a-Service

- Entitlement
- Image Management
- Brokering
- Licensing
- Maintenance
- Network
- Servers/Storage
- Hosting

Managed by partner

Managed by Microsoft

**Gartner, Inc., When Midsize Organizations Should Select Desktop as a Service, Nathan Hill, Refreshed: July 19, 2018

WVD Overview?

Windows Virtual Desktop

Windows Virtual Desktop is a comprehensive flexible service built on Azure that allows you to virtualize both desktop and applications then deliver those resources seamlessly to your end users.

Key Features

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

Supports Server 2012R2, 2016 & 2019

Global Service with Scale up and scale out capabilities

Personal and Pooled Desktops, Published Apps

Windows 7 virtual desktop with free Extended Security Updates (Single Session)

Integrates with the security and management of Microsoft 365, and security/compliance features in Azure

Native Windows Virtual Desktop

High Level Architecture

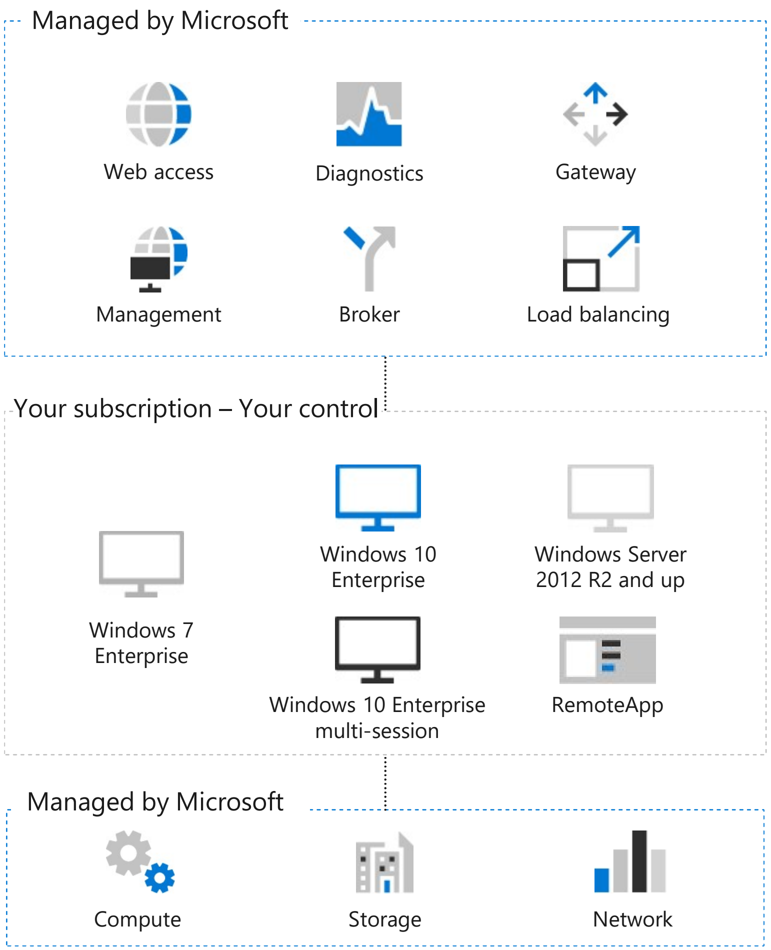
Use Azure Active Directory identity management service

Provide virtualization infrastructure as a managed service

Deploy and manage virtual machines in Azure subscription

Manage using existing tools like Configuration Manager or Microsoft Intune

Connect easily to on-premises resources



Security and Compliance

The Windows Virtual Desktop service is built upon the industry leading security and compliance capabilities of Azure

- Authentication is based Azure Active Directory. Azure AD has numerous services to protect user identities and access to the Windows Virtual Desktop service.
  - Conditional access
  - Multi-factor authentication
  - Identity governance
  - Identity protection
  - Privileged identity management
  - Advanced reports and monitoring

For the Windows Virtual Desktop service layer

- The Windows Virtual Desktop service retains minimal metadata which is encrypted.
- All traffic to/from the WVD service is encrypted.
- All traffic to/from clients uses port 443.
- WVD role-based access control enables delegation of admin rights at granular level.
- Reverse connect eliminates the need to open inbound ports, reducing the attack surface.

Compliance & Latency Considerations

General

- Users can be anywhere on the Internet
- VMs can be in any Azure Region

Data Sovereignty

- Customer/user data locale is controlled by administrator based on VMs, File Shares etc
- Service metadata (e.g. which user is connected to which VM) is stored in US region. WVD service not available in all regions

Connection Latency

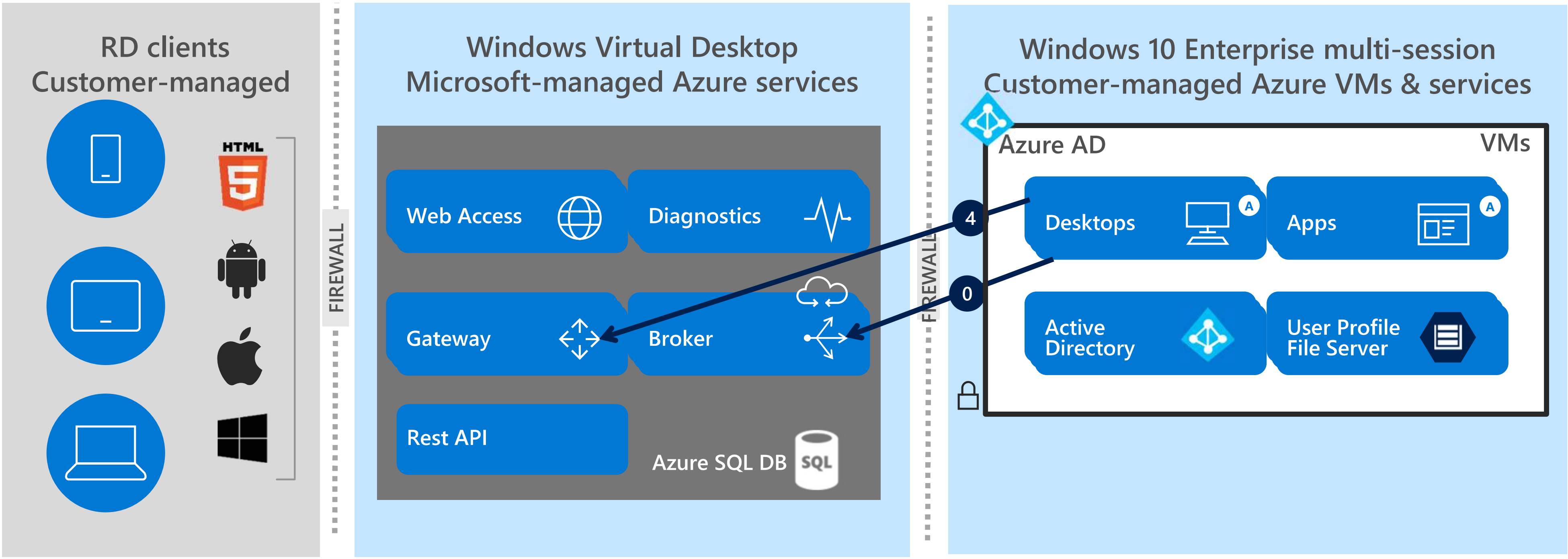
Latency will vary based on the location of user, VM, and Windows Virtual Desktop services
Latency will continuously improve as Windows Virtual Desktop services are deployed to new geographies
Web-based tool provided to estimate latency from user location to Azure region of VM

Improved Isolation: Reverse Connect

Outbound WebSocket connections from customer VMs to Broker and Gateway

Bidirectional communications between VMs and RD infra over https (443)

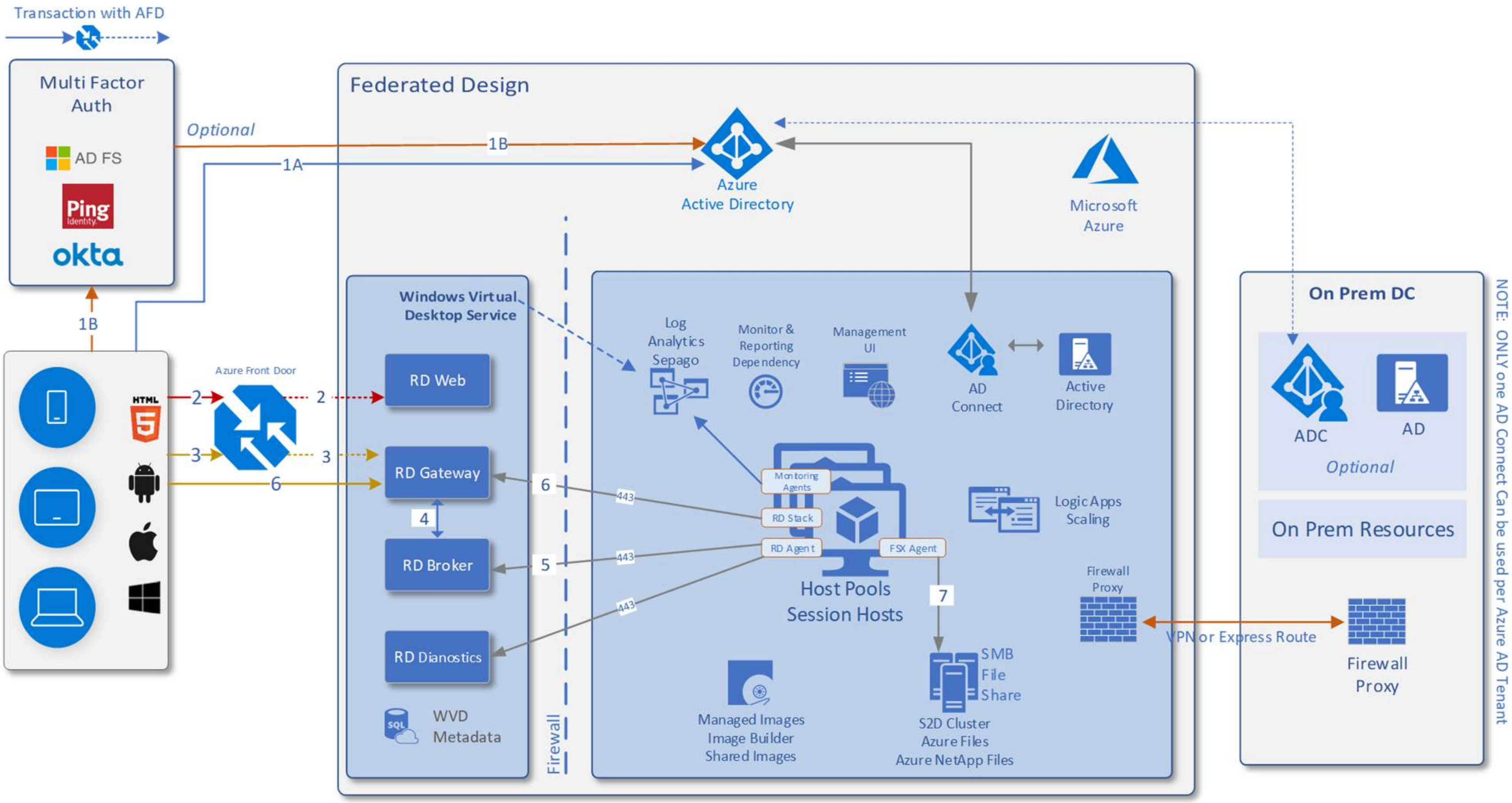
No inbound ports need be opened to the customer environment



Data Flow

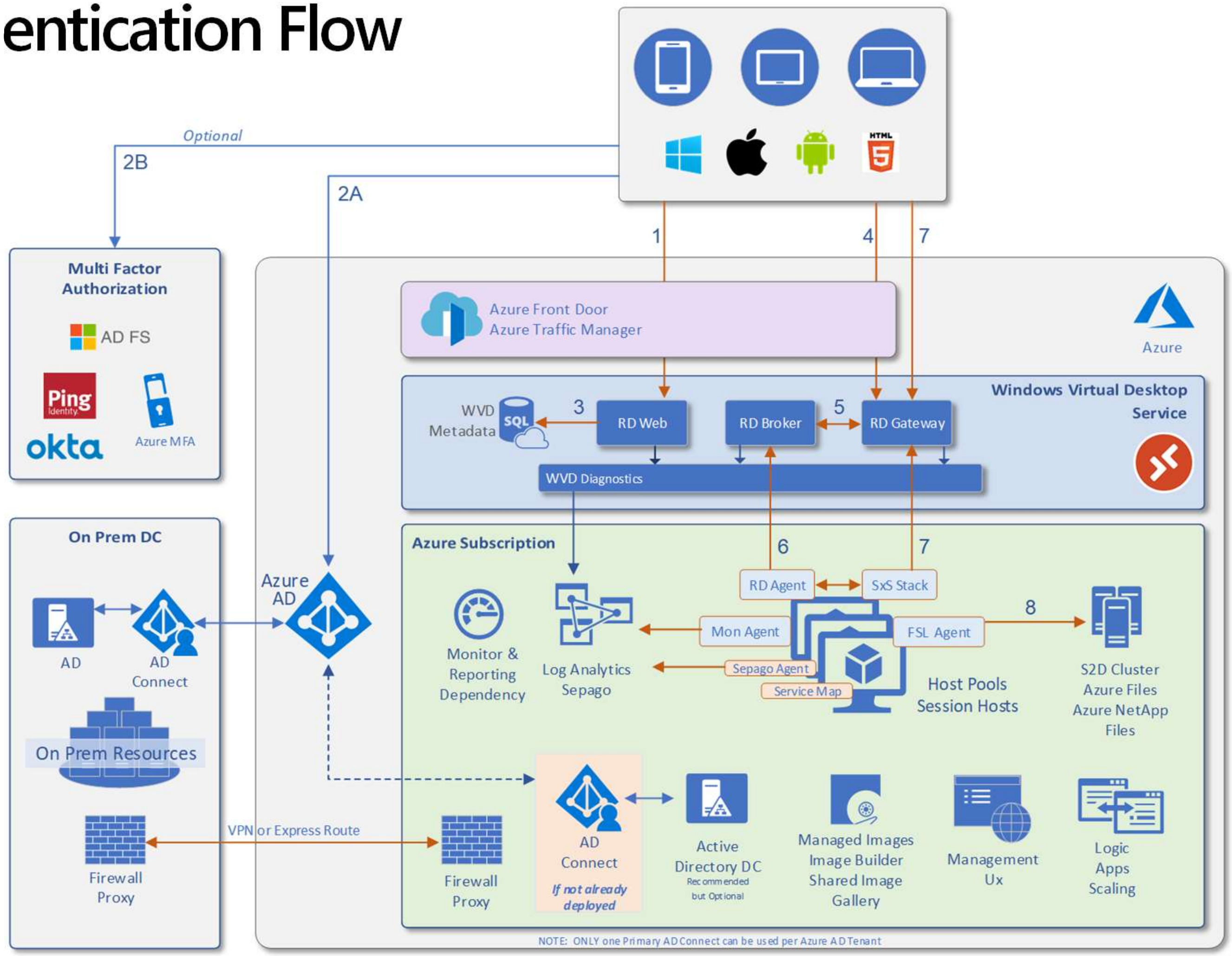
Flow index	Purpose	Protocol	Encryption	Port used	Transmitted information (Data/ Auth). If data, what?
1.1	User token between RD Client and AAD	HTTPS	TLS 1.2	443	AAD user UPN and auth token
1.2	User token between RD Client and Ping/Okta	HTTPS	TLS1.2	443	Ping user creds and auth token
2	XML Feed + user token	HTTPS	TLS 1.2	443	AAD Bearer token
3	RDP channel + user token	HTTPS	TLS 1.2	443	AAD Bearer token
4	REST Calls	HTTPS	TLS 1.2	443	AAD Bearer token
5	443:Persistent channel	HTTPS	TLS 1.2	443	RDBroker Bearer Token, Host health, session info
6	443:Persistent channel	HTTPS	TLS 1.2	443	RDBroker Bearer Token, Diagnostic info
7	RDP Channel	HTTPS	TLS 1.2	443	Reverse connect GUID
8	User Profile Access	SMB	Yes, if customer uses SMB 3.0	Standard SMB ports	VHD file content

WVD Authentication Flow

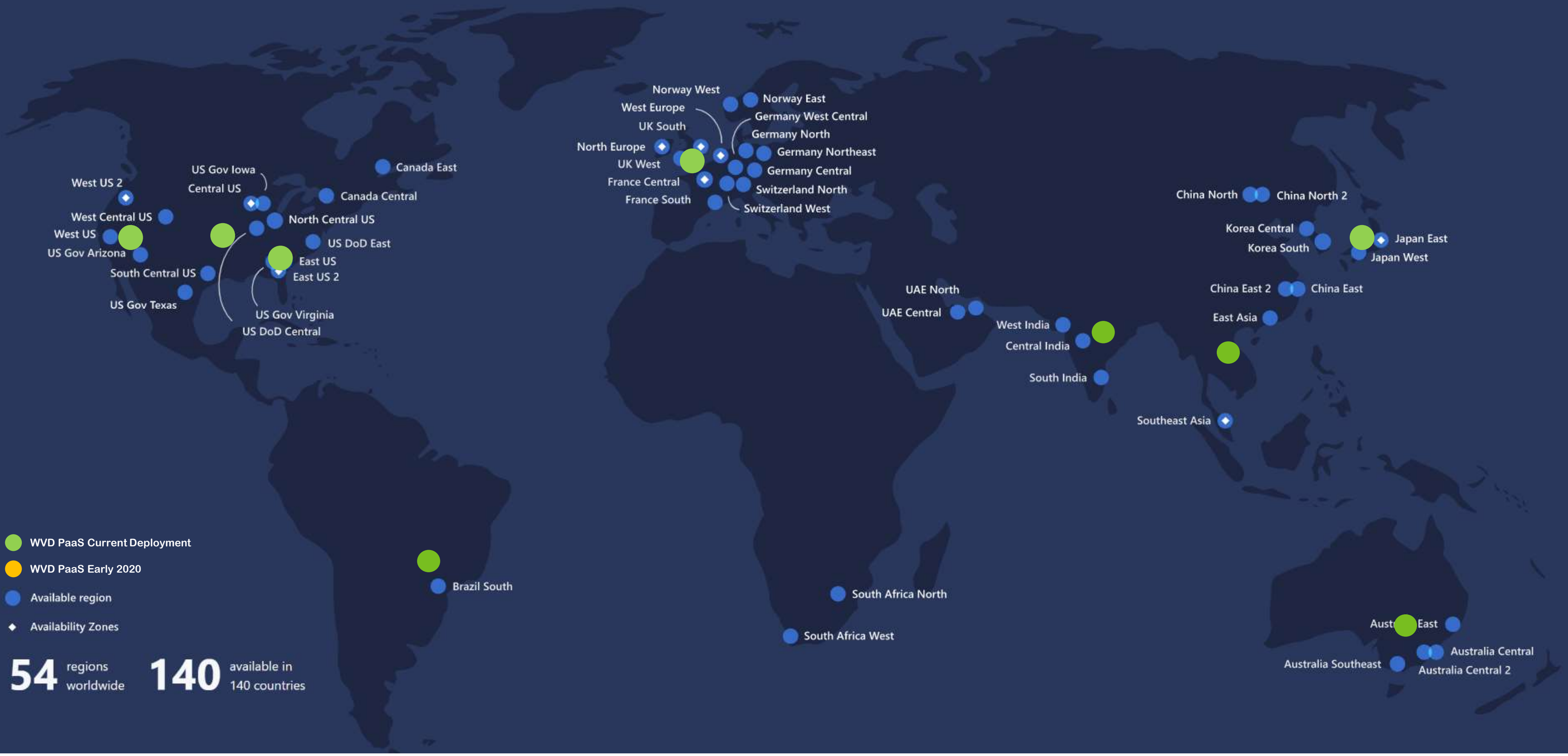


NOTE: ONLY one AD Connect Can be used per Azure AD Tenant

WVD Authentication Flow



Worldwide Azure Regions



🟢 WVD PaaS Current Deployment

🟡 WVD PaaS Early 2020

🔵 Available region

◆ Availability Zones

54 regions worldwide

140 available in 140 countries

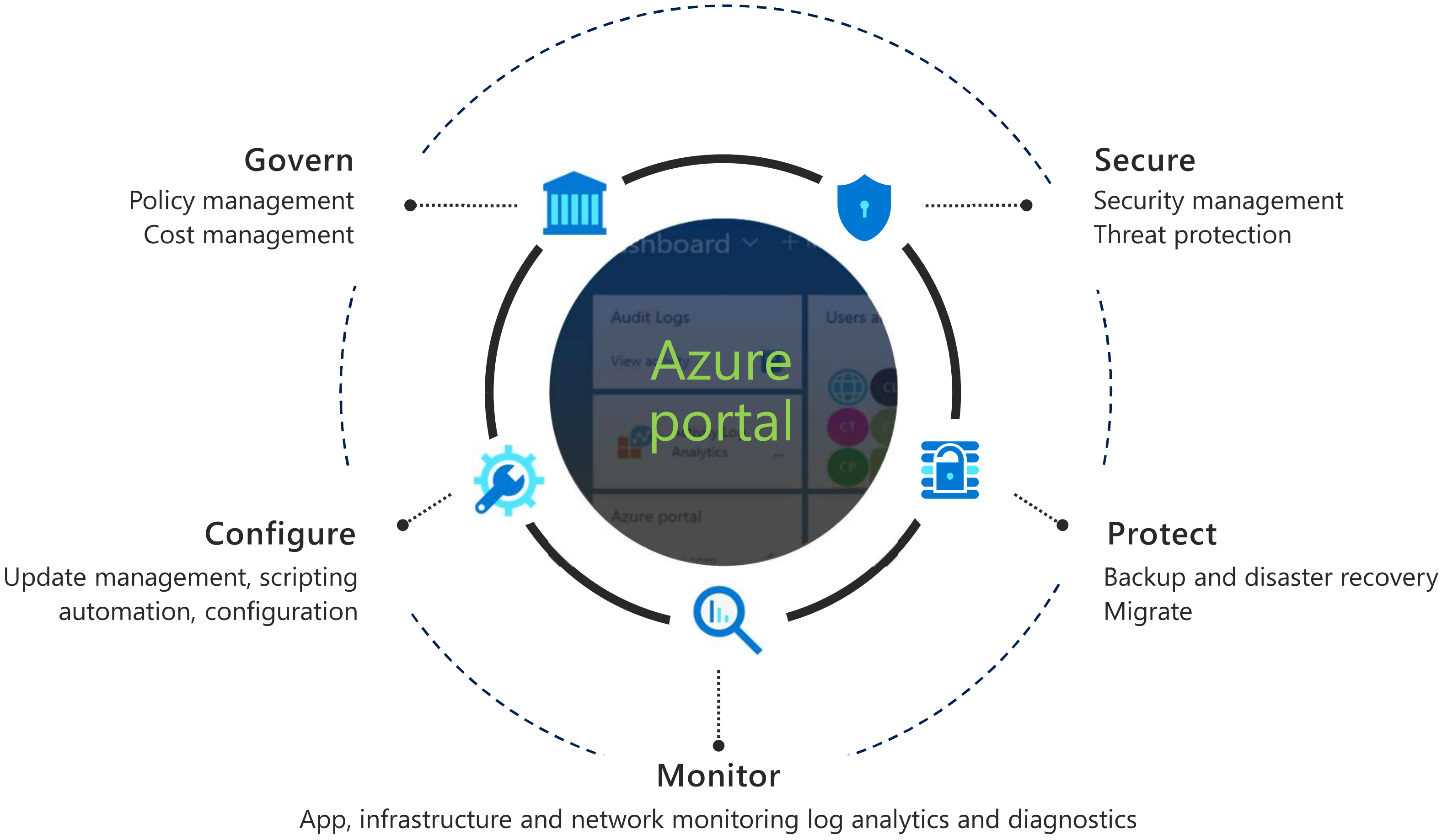
Productive

Hybrid

Intelligent

Trusted

Secure and well—managed for IT



Govern
Policy management
Cost management

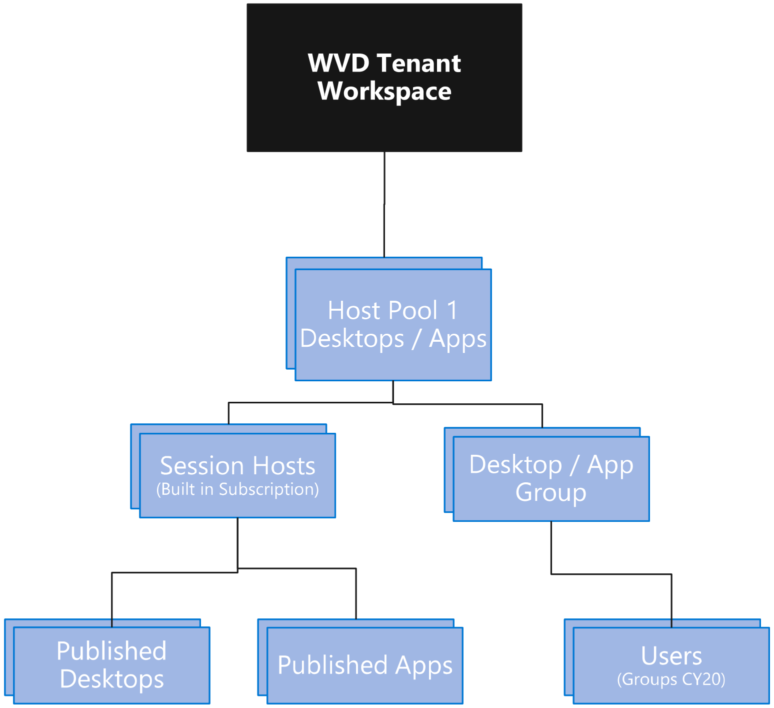
Secure
Security management
Threat protection

Configure
Update management, scripting automation, configuration

Protect
Backup and disaster recovery
Migrate

Monitor
App, infrastructure and network monitoring log analytics and diagnostics

WVD Object Model - Today



WVD Tenant Workspace

Host Pool 1 Desktops / Apps

Session Hosts (Built in Subscription)

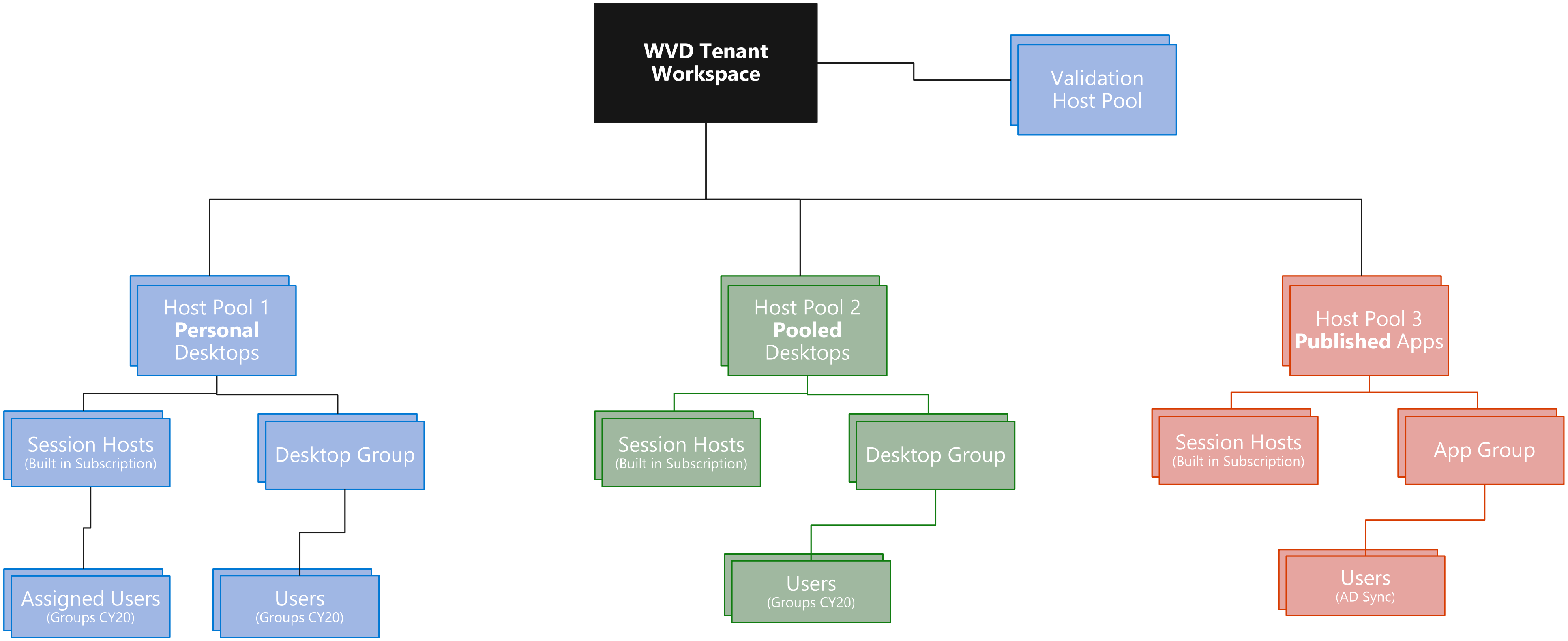
Desktop / App Group

Published Desktops

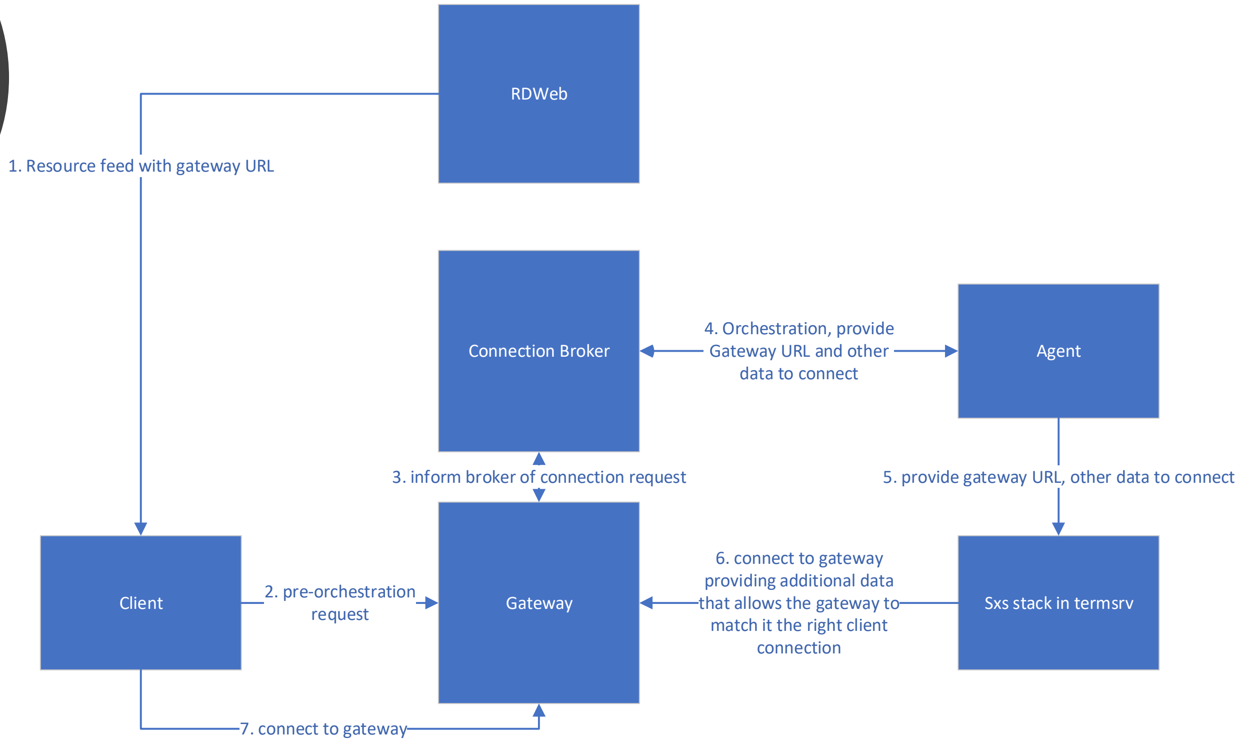
Published Apps

Users (Groups CY20)

WVD PaaS Architecture - Example


WVD Tenant Workspace
Validation Host Pool
Host Pool 1 **Personal** Desktops
Host Pool 2 **Pooled** Desktops
Host Pool 3 **Published** Apps
Session Hosts (Built in Subscription)
Desktop Group
Assigned Users (Groups CY20)
Users (Groups CY20)
Session Hosts (Built in Subscription)
Desktop Group
Users (Groups CY20)
Session Hosts (Built in Subscription)
App Group
Users (AD Sync)

CURRENT REVERSE CONNECT



RDWeb

1. Resource feed with gateway URL

Connection Broker

4. Orchestration, provide Gateway URL and other data to connect

Agent

3. inform broker of connection request

5. provide gateway URL, other data to connect

Client

2. pre-orchestration request

Gateway

6. connect to gateway providing additional data that allows the gateway to match it the right client connection

Sxs stack in termsrv

7. connect to gateway

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

Any Azure VM size in a customer’s subscription

Deploy and scale in minutes

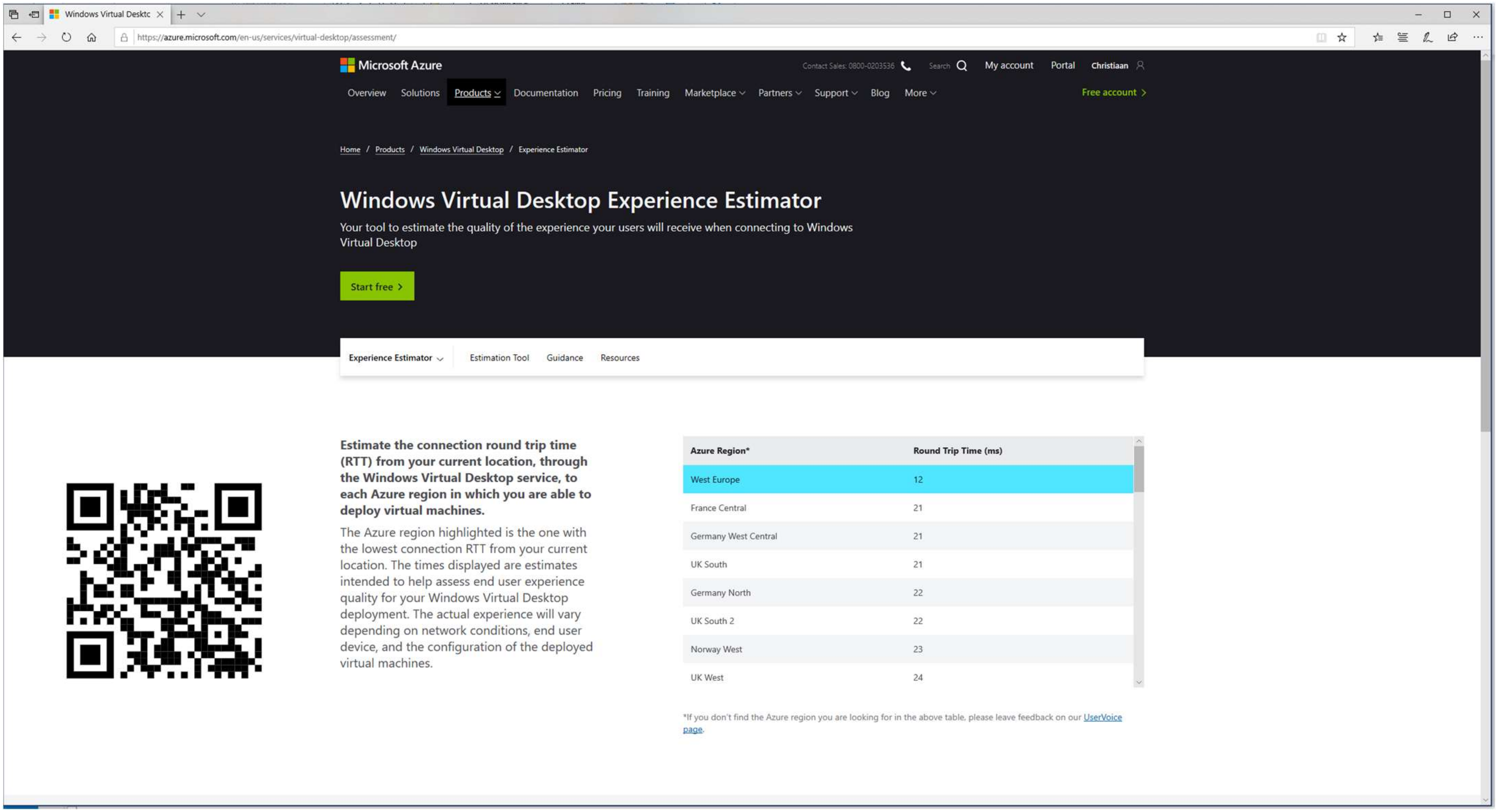
Quickly virtualize and deploy modern and legacy desktop app experiences in minutes with unified management in the Azure portal.

→ Azure has datacenters available in [54 regions, and 140 countries]

→ Azure management portal for Windows Virtual Desktop

→ Built in security and compliance (Windows and Azure)

→ Strong Partner ecosystem extensibility



Windows Virtual Desktop Experience Estimator

Your tool to estimate the quality of the experience your users will receive when connecting to Windows Virtual Desktop

Estimate the connection round trip time (RTT) from your current location, through the Windows Virtual Desktop service, to each Azure region in which you are able to deploy virtual machines.

The Azure region highlighted is the one with the lowest connection RTT from your current location. The times displayed are estimates intended to help assess end user experience quality for your Windows Virtual Desktop deployment. The actual experience will vary depending on network conditions, end user device, and the configuration of the deployed virtual machines.

Azure Region*	Round Trip Time (ms)
West Europe	12
France Central	21
Germany West Central	21
UK South	21
Germany North	22
UK South 2	22
Norway West	23
UK West	24

*If you don't find the Azure region you are looking for in the above table, please leave feedback on our UserVoice page.

Authentication workflow

- User opens RD Client and makes a feed request to RD Web.
- RD Web redirects the client Azure AD to receive a valid token for the service.
- If AAD is the authentication engine for the customer:
  - user is asked to enter their creds and that is passed to **AAD**.
  - If auth passes, then AAD issues a token to the RD Client.
- If AAD is not the final authentication engine (creds are not entered while interacting with AAD):
  - AAD responds with a redirect to **Ping/ Okta**.
  - RD Client communicates with Ping and user enters their creds.
- User opens a remote app or desktop on the client.
- RD Client establishes RDP connection with the RDGW
- RDGW passes info on the app/ desktop and user to the RD Broker.
- RD Broker identifies the host for the new user session to be established.
- RD Broker passes the UPN and the GW info (including port) to RD Agent on the host, which is handed over to the RD Stack on the host.
- RD Stack on the endpoint host, establishes reverse connect with RDGW.
- User is prompted for 2nd login—RDP login
- User enters creds and these are validated with **local AD** (can be a read-only instance synced from on-prem AD), that the host is joined to.
- If auth passes, the rest of the orchestration goes through and user can use the app/ desktop.

Data protection we will have at GA

- Network security and firewall settings – Customer has full freedom to implement their own network security and firewall and only open the outbound 443 port on their session hosts.
- User authentication and fine grained user controls – AAD used for user authentication and delegated access used for WVD resources.
- UserVHD – Mounting is via SMB V3
- Ability to replicate data globally for regional failures
- Ability to perform failovers from one region to another
- Protect and isolate sensitive data – All service meta-data are encrypted at rest.
- HTTPS by default/SSL encryption

Many customers are already eligible for WVD

WVD Licensing Requirements

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**

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)**

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

**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.*

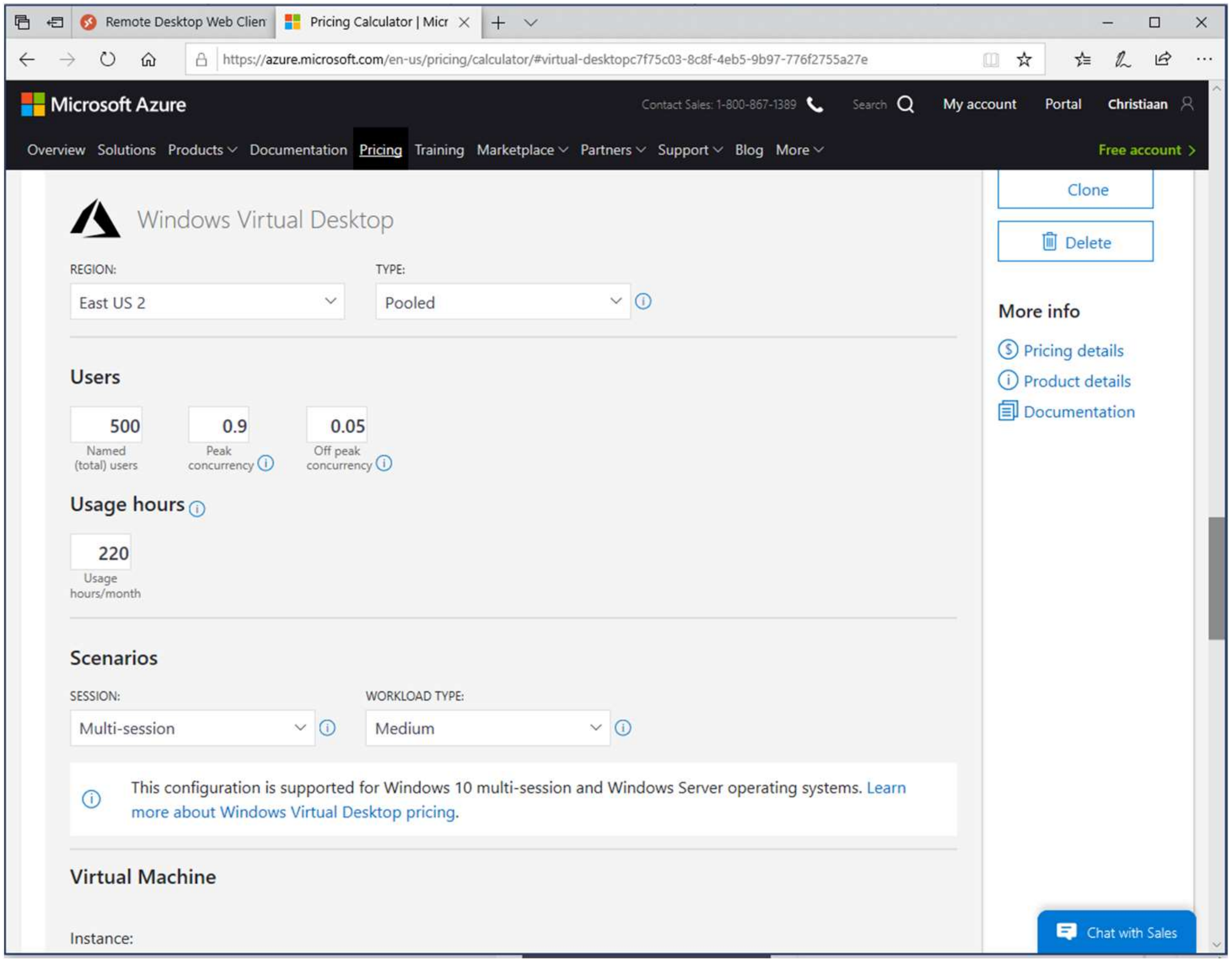
Pricing

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.

Azure Calculator



Windows Virtual Desktop

REGION: East US 2

TYPE: Pooled

Users

500 Named (total) users

0.9 Peak concurrency

0.05 Off peak concurrency

Usage hours

220 Usage hours/month

Scenarios

SESSION: Multi-session

WORKLOAD TYPE: Medium

This configuration is supported for Windows 10 multi-session and Windows Server operating systems. Learn more about Windows Virtual Desktop pricing.

Virtual Machine

Instance:

Virtualization helps address specific business needs

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

Demo User Experience

Partner Ecosystem

SI and GSIs

DXC.technology

wipro

Cognizant

IBM

HCL

Infosys®

ISVs and value-added partners

Cloud Jumper

Lakeside®

nerdio

liquidware

RDPSoft

LOGINVSI

PrinterLogic

numecent

PolicyPak
SECURING YOUR STANDARDS

deviceTRUST

ivanti

ThinPrint

Hardware partners

SAMSUNG

IGEL®

Comprehensive partner ecosystem

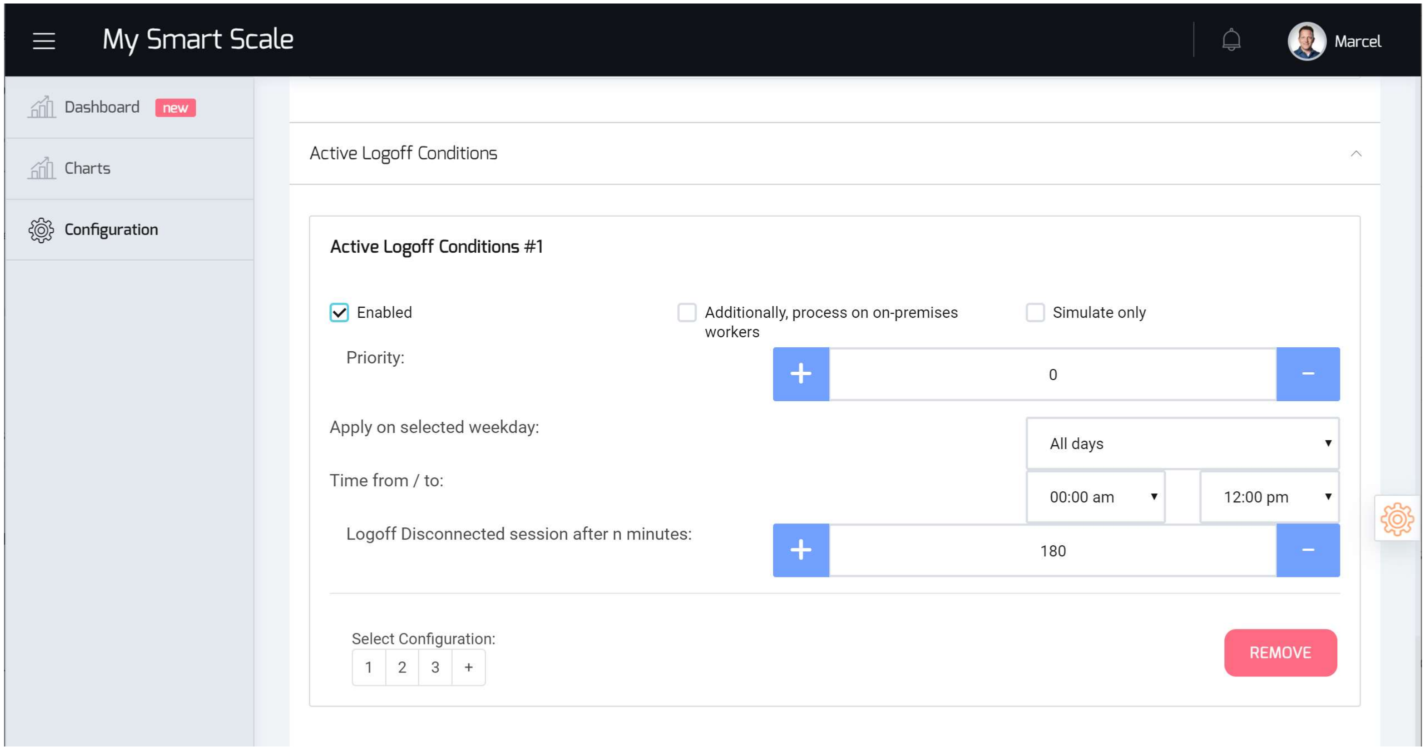
Global presence

Consistent standards and IT architectures

Aka.ms/wvdpartner

3^{rd} Party Tools? Sepago

WVD Monitor – Community Edition



Active Logoff Conditions #1

☑ Enabled

□ Additionally, process on on-premises workers

□ Simulate only

Priority: 0

Apply on selected weekday: All days

Time from / to: 00:00 am 12:00 pm

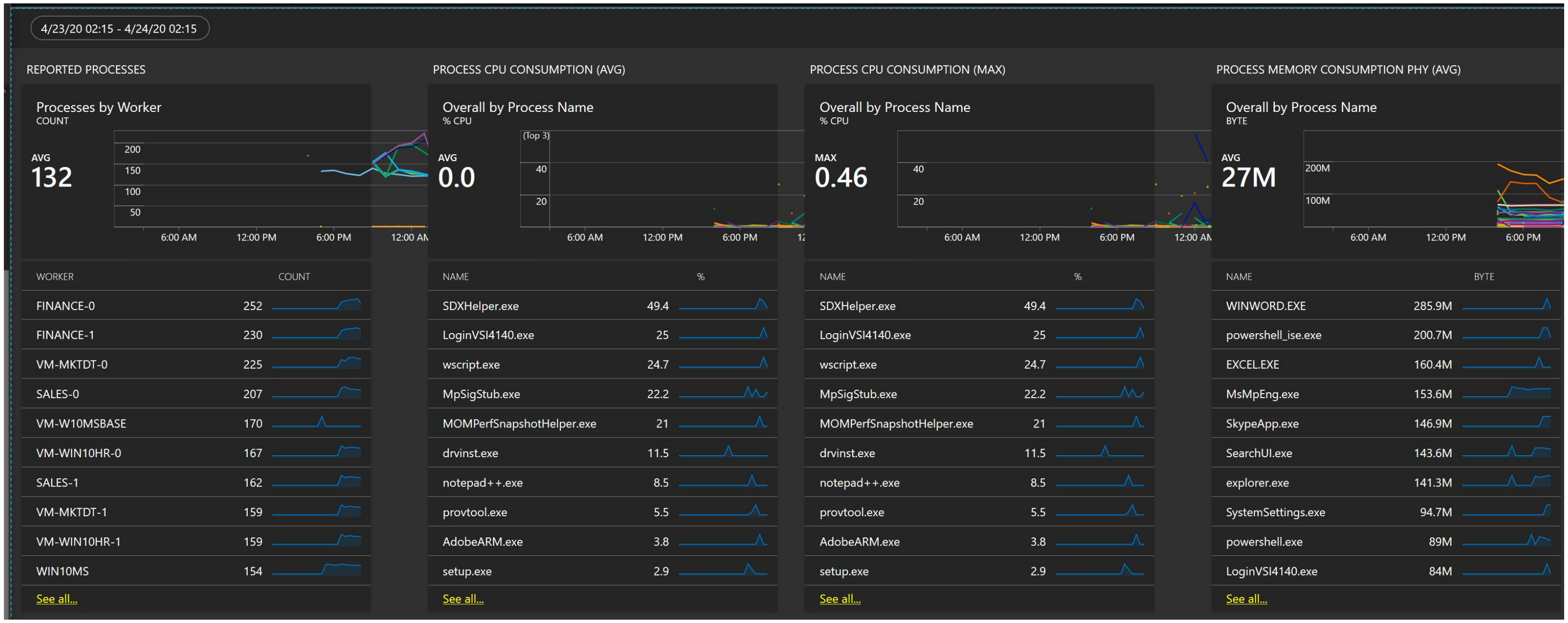
Logoff Disconnected session after n minutes: 180

Select Configuration: 1 2 3 +

https://www.sepago.de/en/wvd-value-add-tools/#scale

Community Edition https://github.com/MarcelMeurer/Project-MySmartScale

WVD Monitor – Community Edition



4/23/20 02:15 - 4/24/20 02:15

REPORTED PROCESSES

Processes by Worker
COUNT

AVG 132

WORKER	COUNT
FINANCE-0	252
FINANCE-1	230
VM-MKTDT-0	225
SALES-0	207
VM-W10MSBASE	170
VM-WIN10HR-0	167
SALES-1	162
VM-MKTDT-1	159
VM-WIN10HR-1	159
WIN10MS	154

See all...

PROCESS CPU CONSUMPTION (AVG)

Overall by Process Name
% CPU

AVG 0.0

NAME	%
SDXHelper.exe	49.4
LoginVSI4140.exe	25
wscript.exe	24.7
MpSigStub.exe	22.2
MOMPerfSnapshotHelper.exe	21
drvinst.exe	11.5
notepad++.exe	8.5
provtool.exe	5.5
AdobeARM.exe	3.8
setup.exe	2.9

See all...

PROCESS CPU CONSUMPTION (MAX)

Overall by Process Name
% CPU

MAX 0.46

NAME	%
SDXHelper.exe	49.4
LoginVSI4140.exe	25
wscript.exe	24.7
MpSigStub.exe	22.2
MOMPerfSnapshotHelper.exe	21
drvinst.exe	11.5
notepad++.exe	8.5
provtool.exe	5.5
AdobeARM.exe	3.8
setup.exe	2.9

See all...

PROCESS MEMORY CONSUMPTION PHY (AVG)

Overall by Process Name
BYTE

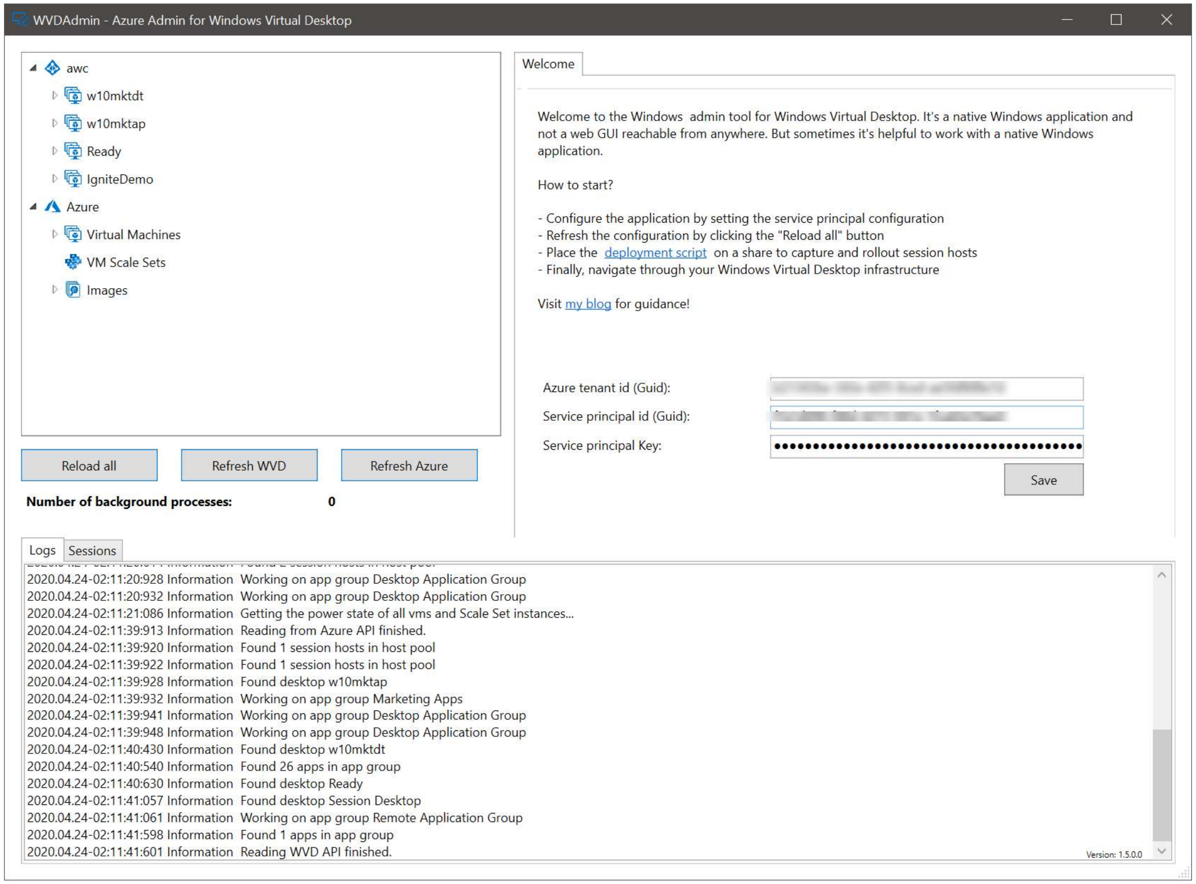
AVG 27M

NAME	BYTE
WINWORD.EXE	285.9M
powershell_ise.exe	200.7M
EXCEL.EXE	160.4M
MsMpEng.exe	153.6M
SkypeApp.exe	146.9M
SearchUI.exe	143.6M
explorer.exe	141.3M
SystemSettings.exe	94.7M
powershell.exe	89M
LoginVSI4140.exe	84M

See all...

https://www.sepago.de/en/wvd-value-add-tools/#azure

WVD Admin



Number of background processes: 0

Welcome to the Windows admin tool for Windows Virtual Desktop. It's a native Windows application and not a web GUI reachable from anywhere. But sometimes it's helpful to work with a native Windows application.

How to start?

- Configure the application by setting the service principal configuration
- Refresh the configuration by clicking the "Reload all" button
- Place the deployment script on a share to capture and rollout session hosts
- Finally, navigate through your Windows Virtual Desktop infrastructure

Visit my blog for guidance!

Azure tenant id (Guid): [redacted]

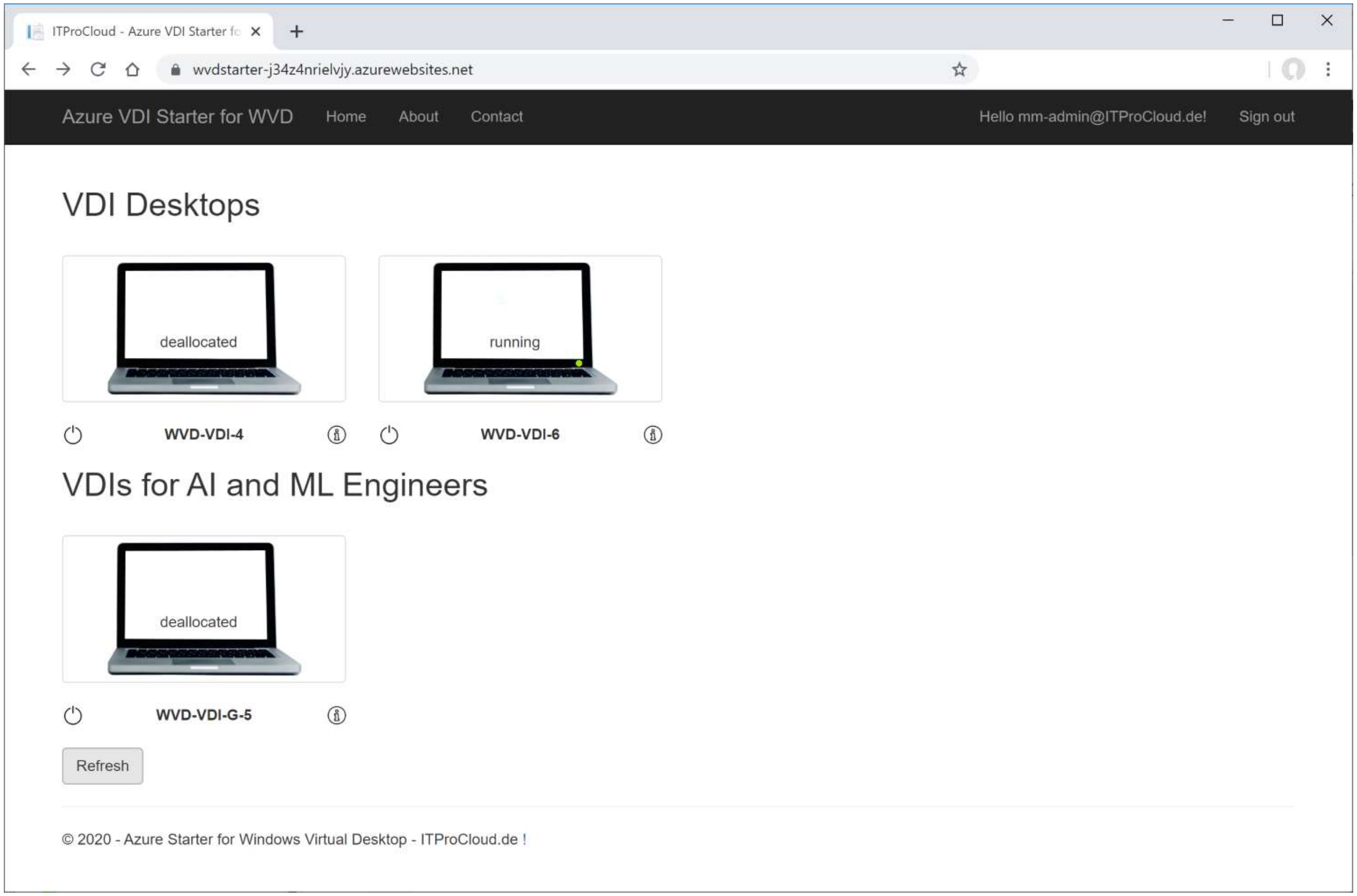
Service principal id (Guid): [redacted]

Service principal Key: ●●

```
2020.04.24-02:11:20:928 Information  Working on app group Desktop Application Group
2020.04.24-02:11:20:932 Information  Working on app group Desktop Application Group
2020.04.24-02:11:21:086 Information  Getting the power state of all vms and Scale Set instances...
2020.04.24-02:11:39:913 Information  Reading from Azure API finished.
2020.04.24-02:11:39:920 Information  Found 1 session hosts in host pool
2020.04.24-02:11:39:922 Information  Found 1 session hosts in host pool
2020.04.24-02:11:39:928 Information  Found desktop w10mktap
2020.04.24-02:11:39:932 Information  Working on app group Marketing Apps
2020.04.24-02:11:39:941 Information  Working on app group Desktop Application Group
2020.04.24-02:11:39:948 Information  Working on app group Desktop Application Group
2020.04.24-02:11:40:430 Information  Found desktop w10mktdt
2020.04.24-02:11:40:540 Information  Found 26 apps in app group
2020.04.24-02:11:40:630 Information  Found desktop Ready
2020.04.24-02:11:41:057 Information  Found desktop Session Desktop
2020.04.24-02:11:41:061 Information  Working on app group Remote Application Group
2020.04.24-02:11:41:598 Information  Found 1 apps in app group
2020.04.24-02:11:41:601 Information  Reading WVD API finished.
```

https://blog.itprocloud.de/Windows-Virtual-Desktop-Admin/

Azure Starter



ITProCloud - Azure VDI Starter fo
wvdstarter-j34z4nrielvjy.azurewebsites.net
Azure VDI Starter for WVD
Home
About
Contact
Hello mm-admin@ITProCloud.de!
Sign out

VDI Desktops

deallocated
WVD-VDI-4
running
WVD-VDI-6

VDIs for AI and ML Engineers

deallocated
WVD-VDI-G-5
Refresh

© 2020 - Azure Starter for Windows Virtual Desktop - ITProCloud.de !

https://github.com/MarcelMeurer/Azure-Starter-for-WVD

Partner ecosystem

Approved providers

CITRIX®

vmware®

Comprehensive partner ecosystem

Global presence

Consistent standards and IT architectures

Aka.ms/wvdpartner

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.

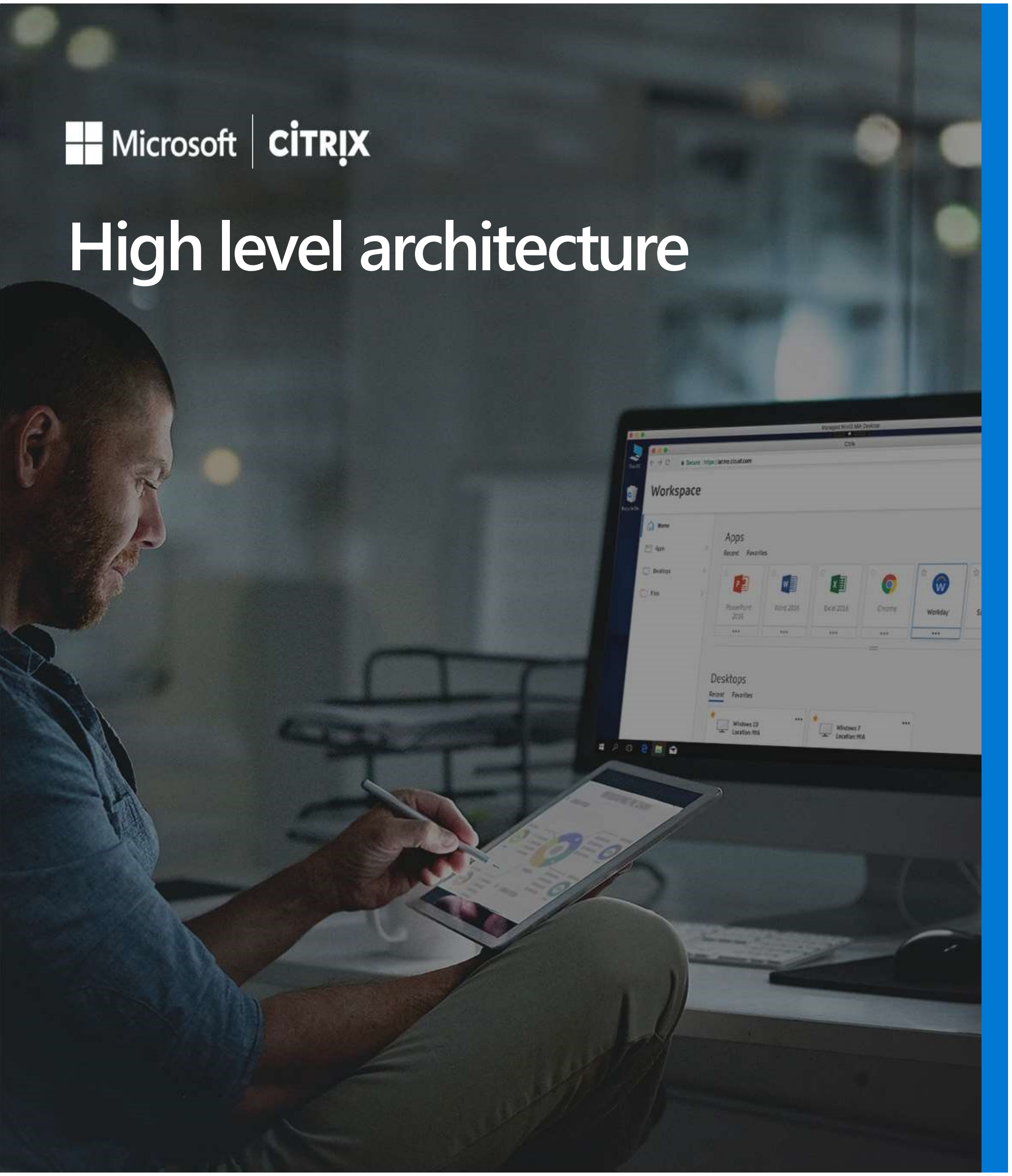
Why Windows Virtual Desktop and Citrix makes sense together

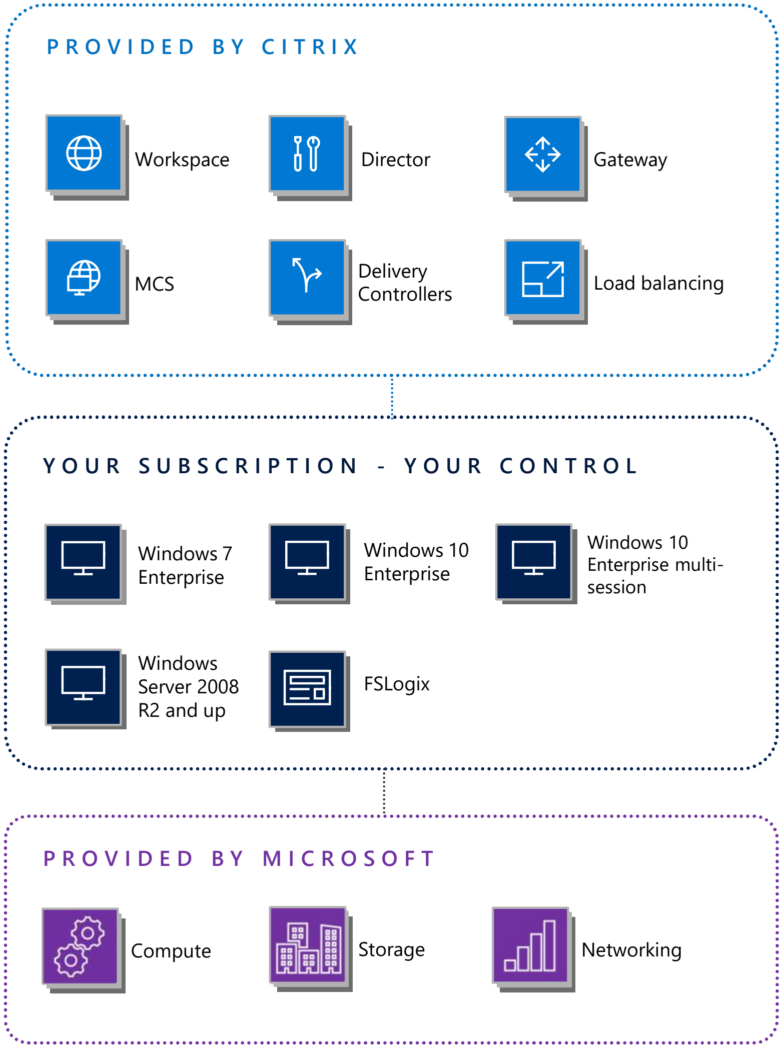
Microsoft Azure is Citrix's strategic and preferred public cloud

- 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

Microsoft | CITRIX

High level architecture





PROVIDED BY CITRIX

Workspace

Director

Gateway

MCS

Delivery Controllers

Load balancing

YOUR SUBSCRIPTION - YOUR CONTROL

Windows 7 Enterprise

Windows 10 Enterprise

Windows 10 Enterprise multi-session

Windows Server 2008 R2 and up

FSLogix

PROVIDED BY MICROSOFT

Compute

Storage

Networking

CITRIX + Microsoft

Hybrid Cloud

Time to Value

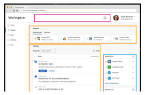
Image Management

Auto Scaling

User Experience

HDX

High-Def Experience



Workspace Intelligence

Broad Client Support

Monitoring & Control

Granular Policy Engine

Monitoring

Analytics

Office Optimizations

Teams

OneDrive

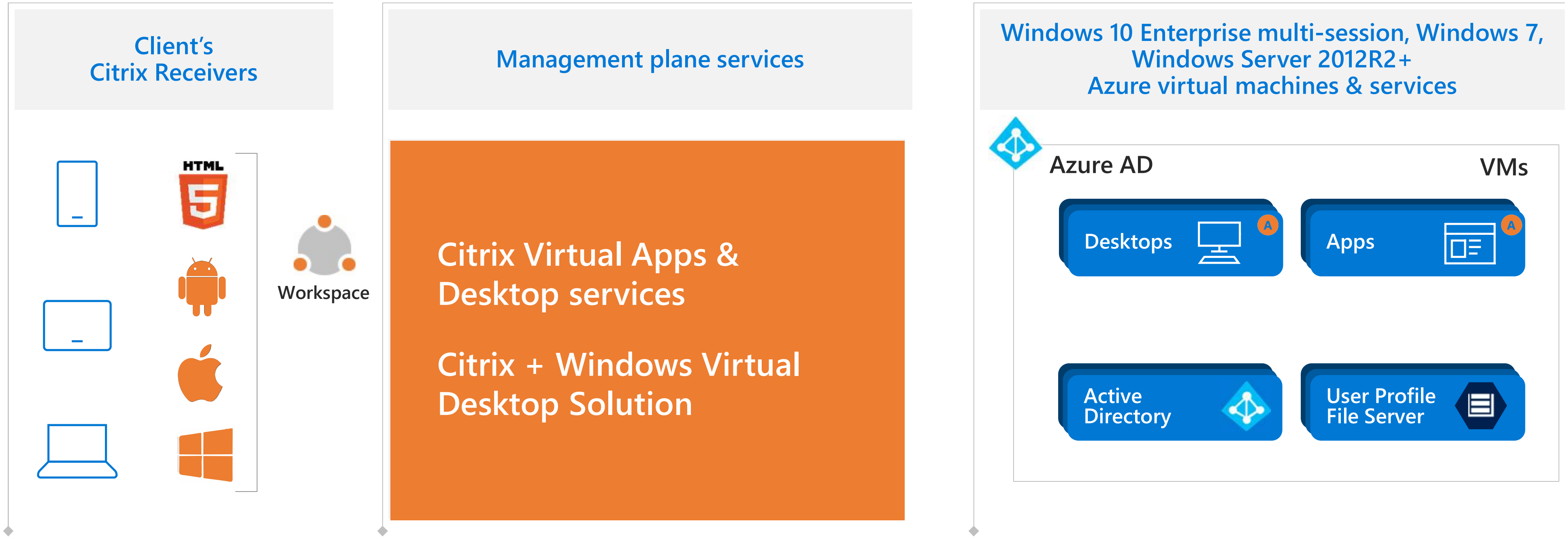
OneDrive & Outlook

Office 365

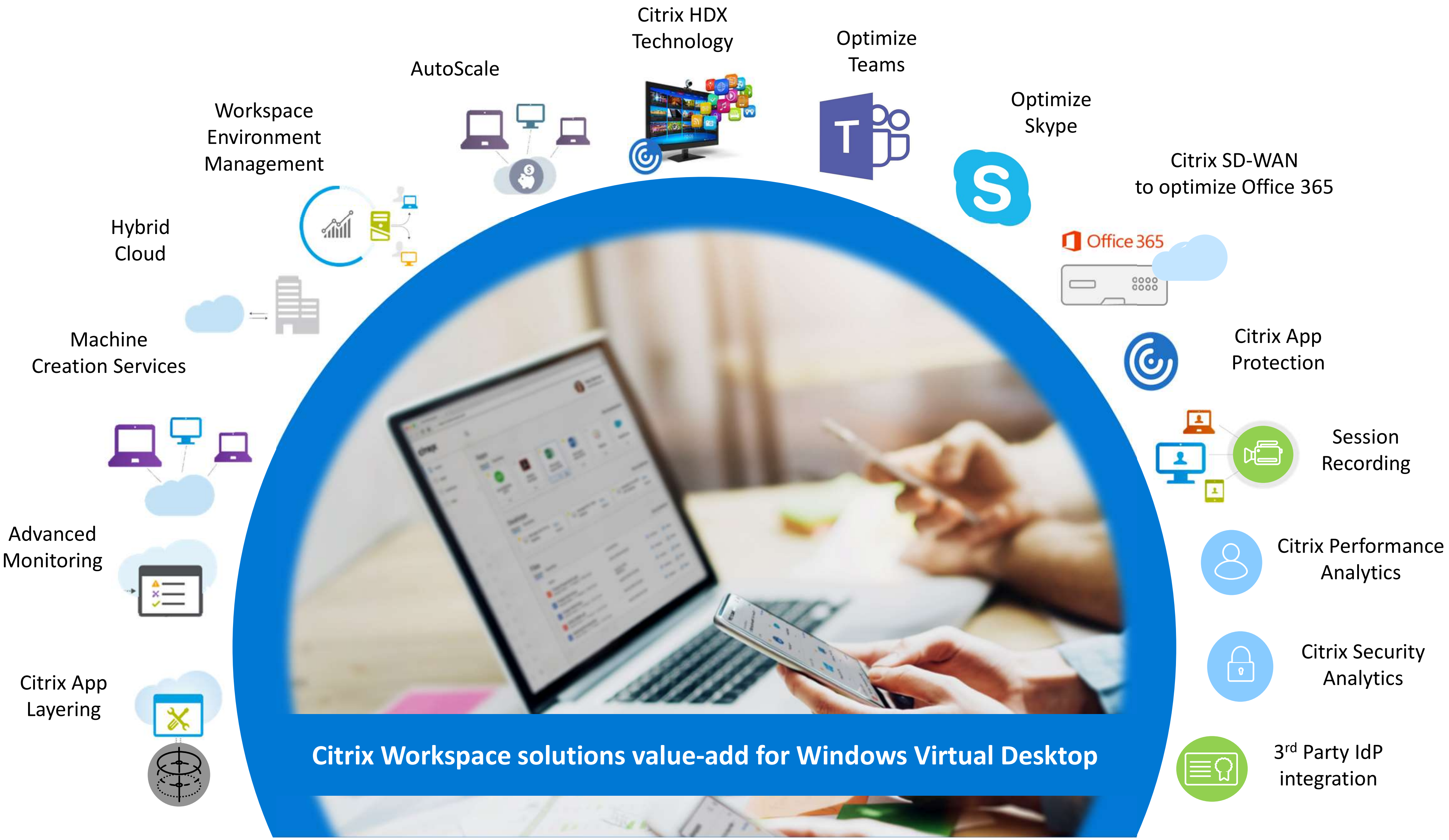
Office 365 & SD-WAN

Windows Virtual Desktop and Citrix: Architectural Guidance

- **Option 1:** Use full Windows Virtual Desktop with Citrix Workspace to aggregate resource feeds from Windows Virtual Desktop and Citrix on-premises and cloud deployments
- **Option 2:** Use Windows Virtual Desktop with Windows 10 multi-session capabilities, Profile Container, and Office 365 Container with Citrix clients, agents, and management plane services



Client's Citrix Receivers
HTML
Workspace
Management plane services
Citrix Virtual Apps & Desktop services
Citrix + Windows Virtual Desktop Solution
Windows 10 Enterprise multi-session, Windows 7, Windows Server 2012R2+
Azure virtual machines & services
Azure AD
VMs
Desktops
A
Apps
A
Active Directory
User Profile File Server



Citrix Workspace solutions value-add for Windows Virtual Desktop

Citrix App Layering

Advanced Monitoring

Machine Creation Services

Hybrid Cloud

Workspace Environment Management

AutoScale

Citrix HDX Technology

Optimize Teams

Optimize Skype

Citrix SD-WAN to optimize Office 365

Office 365

Citrix App Protection

Session Recording

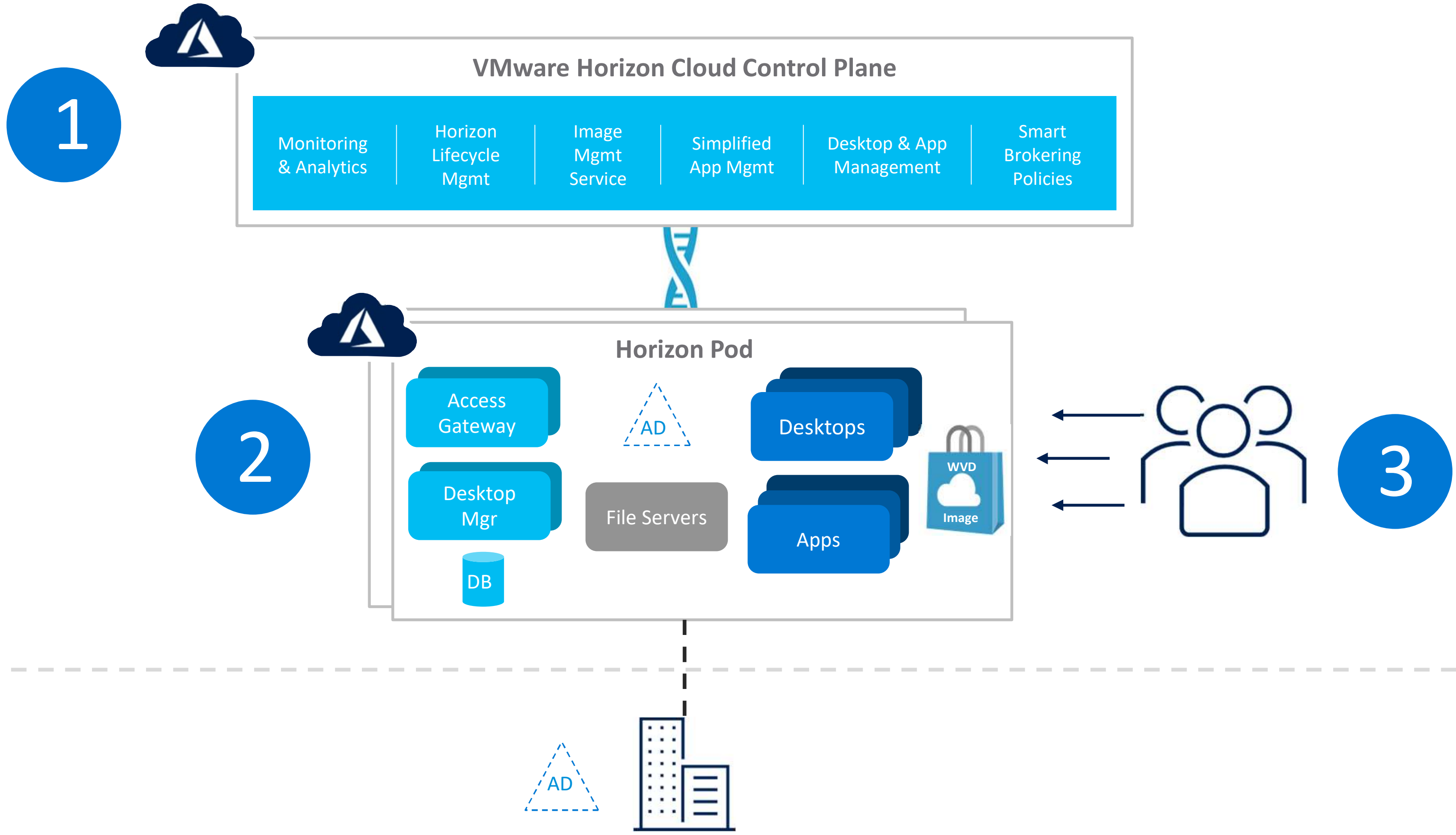
Citrix Performance Analytics

Citrix Security Analytics

3rd Party IdP integration

Vmware?

High-level Components



Recent improvements Windows Virtual Desktop

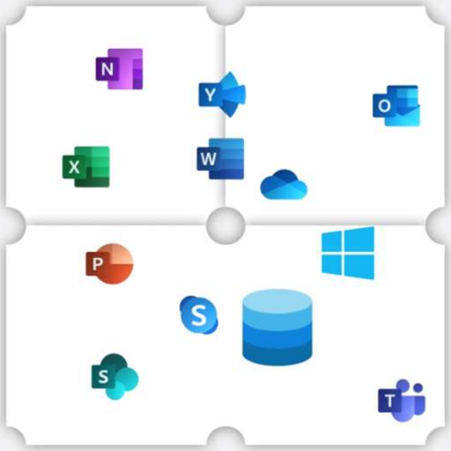
1. IGEL thin client support for WVD native
2. MSIX app attach in public preview
3. WVD control-plane available in India, Australia, Indonesia, Brazil – and Japan (next to WE and USA)
4. Azure Files support for traditional Active Directory
5. WVD On-Premises support for Azure Stack Hub
6. Teams AV support for WVD
7. OneDrive Per-Machine is Generally Available (GA)
8. Desktop App Assure support for Windows 10 Multi-Session
9. Endpoint Manager (SCCM) support for Windows 10 Multi-Session
10. Azure Migrate integration for Virtual Desktop workloads

User Environment and User Data?

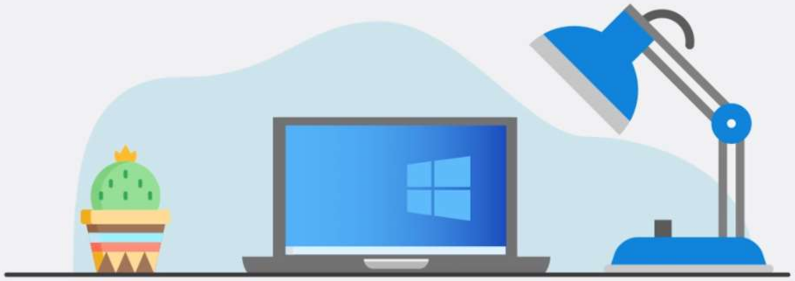
End-user compute environment

3 main components

Operating system
Applications
User defined data



Data, applications, and OS

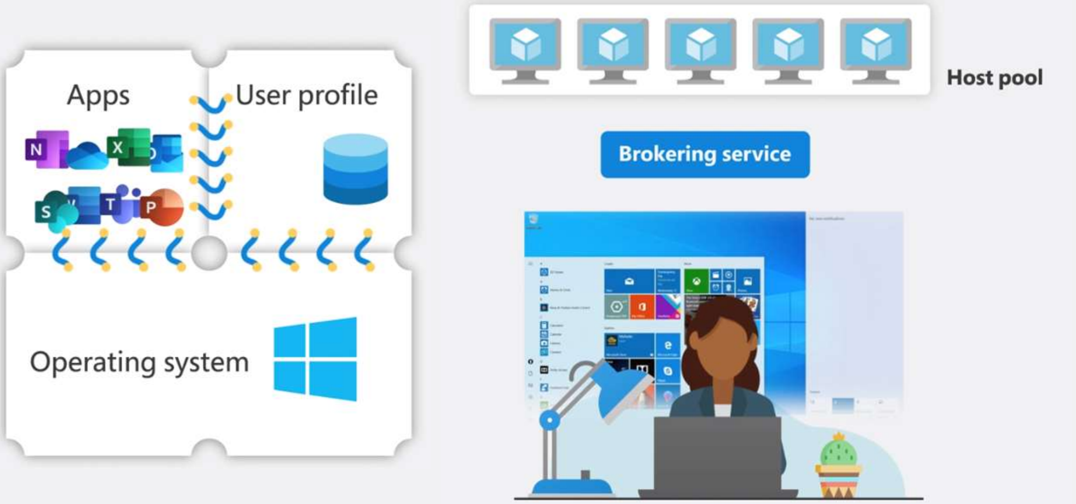


Physical workstation: all components closely coupled

Apps
User profile
Operating system

Virtualized compute environments

In an optimized virtualization environment, a brokering service routes a user to a virtual machine from a host pool to a VM with the resources available to host the user's app or desktop workloads

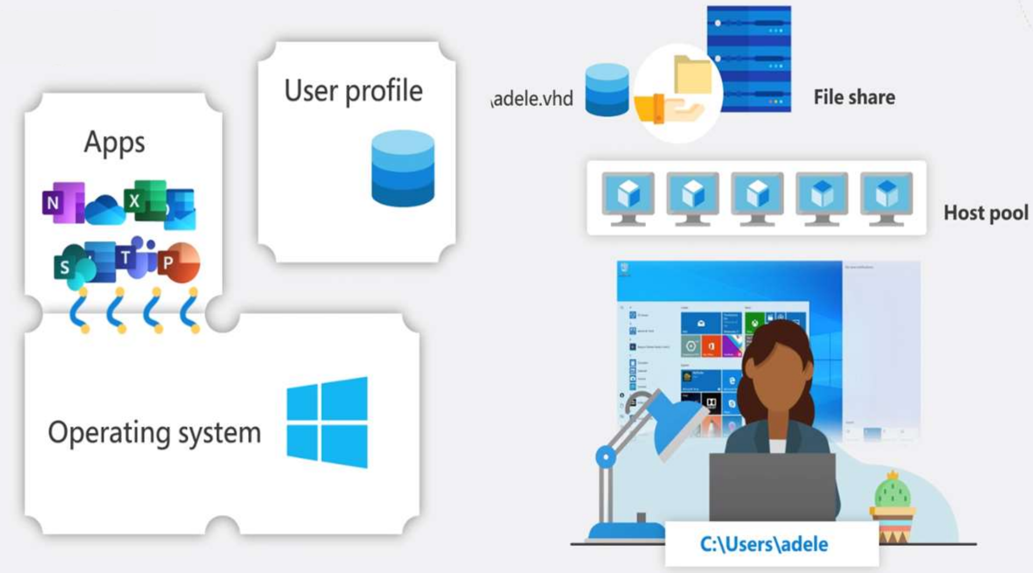


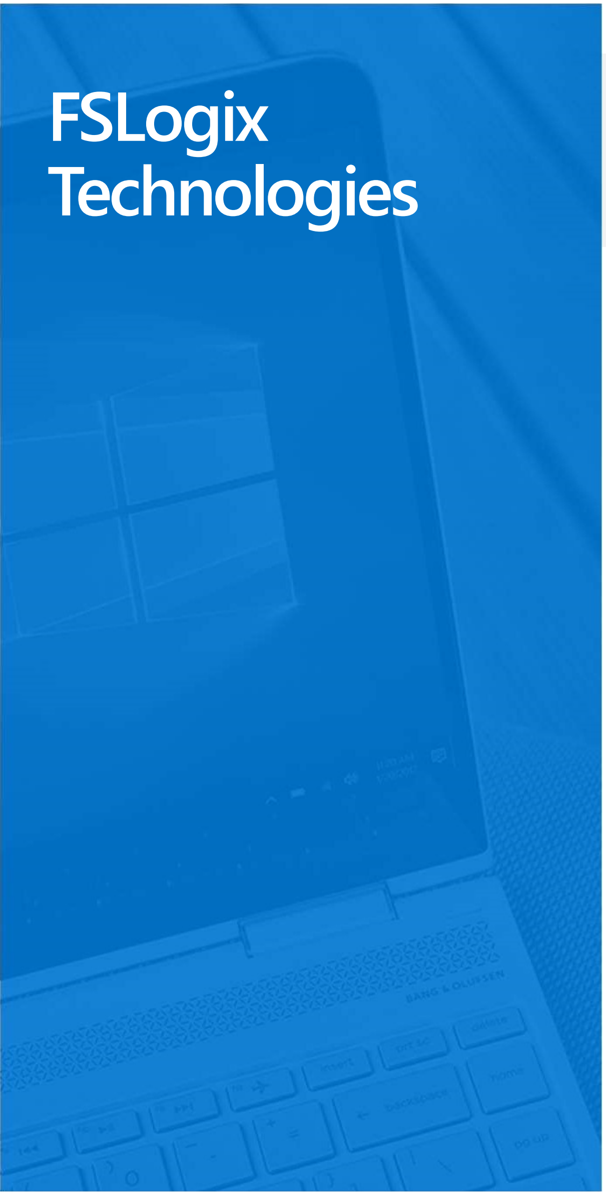
The promise: completely dynamic environments

FSLogix - Profiles

With FSLogix we’ve separated the user profile layer from the virtual machine

To the user it feels like you’re saving and accessing files from a local disk





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.

Storage Considerations in WVD

Option	Considerations
Azure Files	Managed PaaS Service. Azure AD/.AAD DS Integration only* Up to 100K IOPS/Share. Higher Latency (~3ms) Easy to Manage, cost effective Service available broadly across regions
Scale Out File Server	Customer Managed IaaS Service ADDS Integration Only Up to 160K IOPS/disk with a latency of ~1ms using Ultra Disks Minimum of 2 VMs (with Cloud Witness) or 3 Without CW + Cost of disks
Azure NetApp Files	Managed PaaS Service ADDS Integration Only Up to 320K IOPS with a latency of ~1ms Region dependent

Azure Files with AD DS Steps to Configure

1. Enable Azure Files AD DS authentication on your storage account.
2. Assign access permissions for a share to the Azure AD identity (a user, group, or service principal) that is in sync with the target AD identity.
3. Configure ACLs over SMB for directories and files.
4. Mount an Azure file share to a VM joined to your AD DS.
5. Update the password of your storage account identity in AD DS.

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

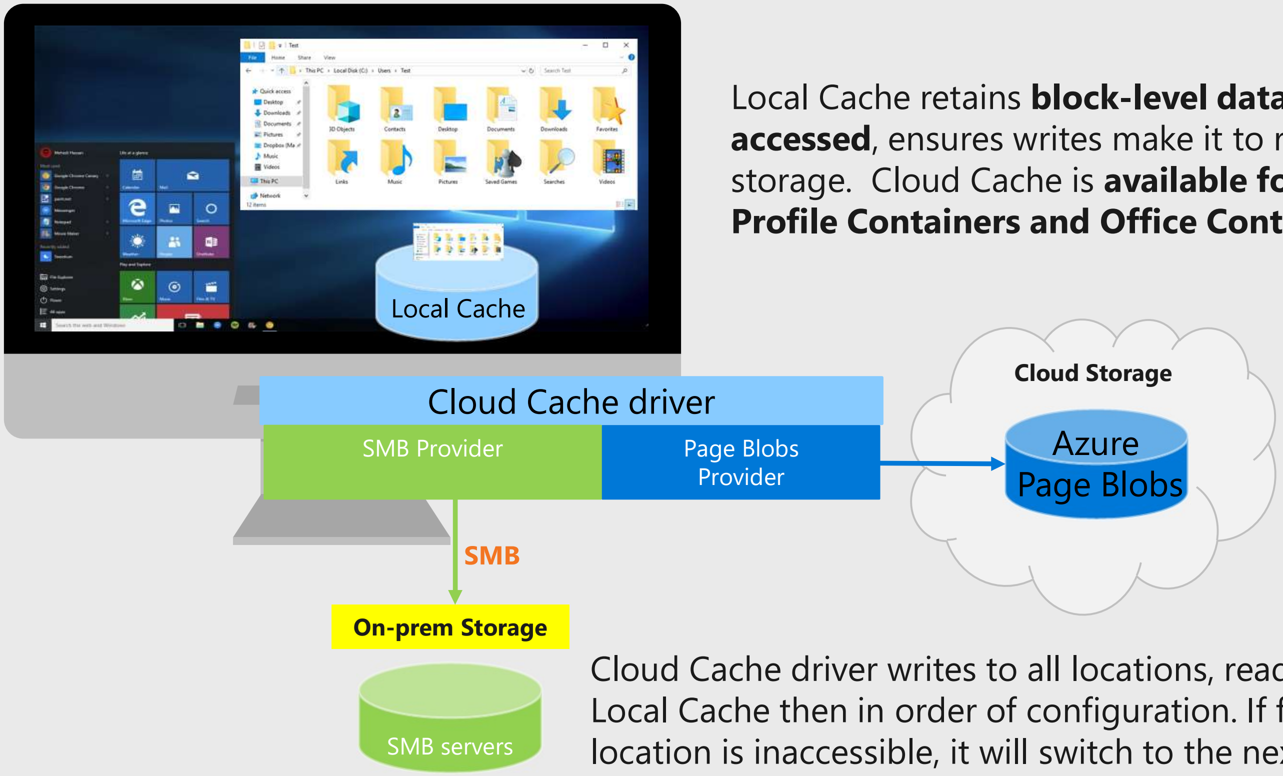
Windows 10 VDA per user

Remote Desktop Services (RDS) CAL

Remote Desktop Services (RDS) SAL

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

FSLogix cloud cache



Local Cache retains **block-level data as it's accessed**, ensures writes make it to remote storage. Cloud Cache is **available for both Profile Containers and Office Containers**.

Remote storage **locations can be SMB** or via **native cloud API for Azure PageBlobs**.

Cloud Cache driver writes to all locations, reads from Local Cache then in order of configuration. If first location is inaccessible, it will switch to the next location, then re-sync when original comes back.

Roaming user profiles get us half-way there

But—what about the apps?

- In a shared or pooled virtual machine,
  this is a challenge
- Each user might need a different set of apps
- They can be assigned to a different VM with each logon

Apps
User profile
Operating system
PowerPoint
Excel
CAD
Marketing
Finance
Engineer

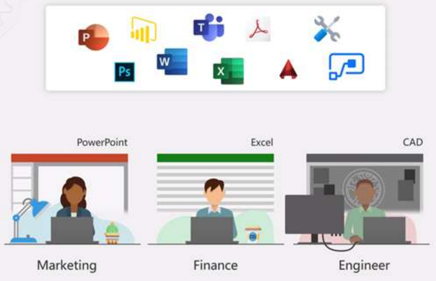
Current options

Image 1: Marketing
Image 2: Finance
Image 3: Engineering
PowerPoint
Excel
CAD
Marketing
Finance
Engineer

Current option 1: Multiple images by role

OPTION 1
Multiple images by role

- Manage numerous VM pools customized for different users' roles
- These images would all need to be individually maintained and patched
- High overhead



Current option 2: Mega single image with hidden apps

OPTION 2
Traditional App layering

- Image can get bloated
- Additional policies
- App licensing could be challenging

Current option 3: Streaming apps

OPTION 3
App streaming

- Requires apps to get cached into OS during user session
- Need to manage app streaming infra
- Possible need to repackage/ sequence the app

MSIX app attach

Public Preview

What is it?

Rapidly attach applications just-in-time as users log on

Leverages FSLogix concepts, but for applications

Per user visibility – Only authorized users have access to applications

No repackaging required for applications in MSIX format

Join the preview at http://aka.ms/msixandwvd

How it works

MSIX packages are expanded into VHD or other containers

Containers are attached to the computer

Applications are made available on a per-user basis

Applications delivered via app attach are indistinguishable from natively installed applications

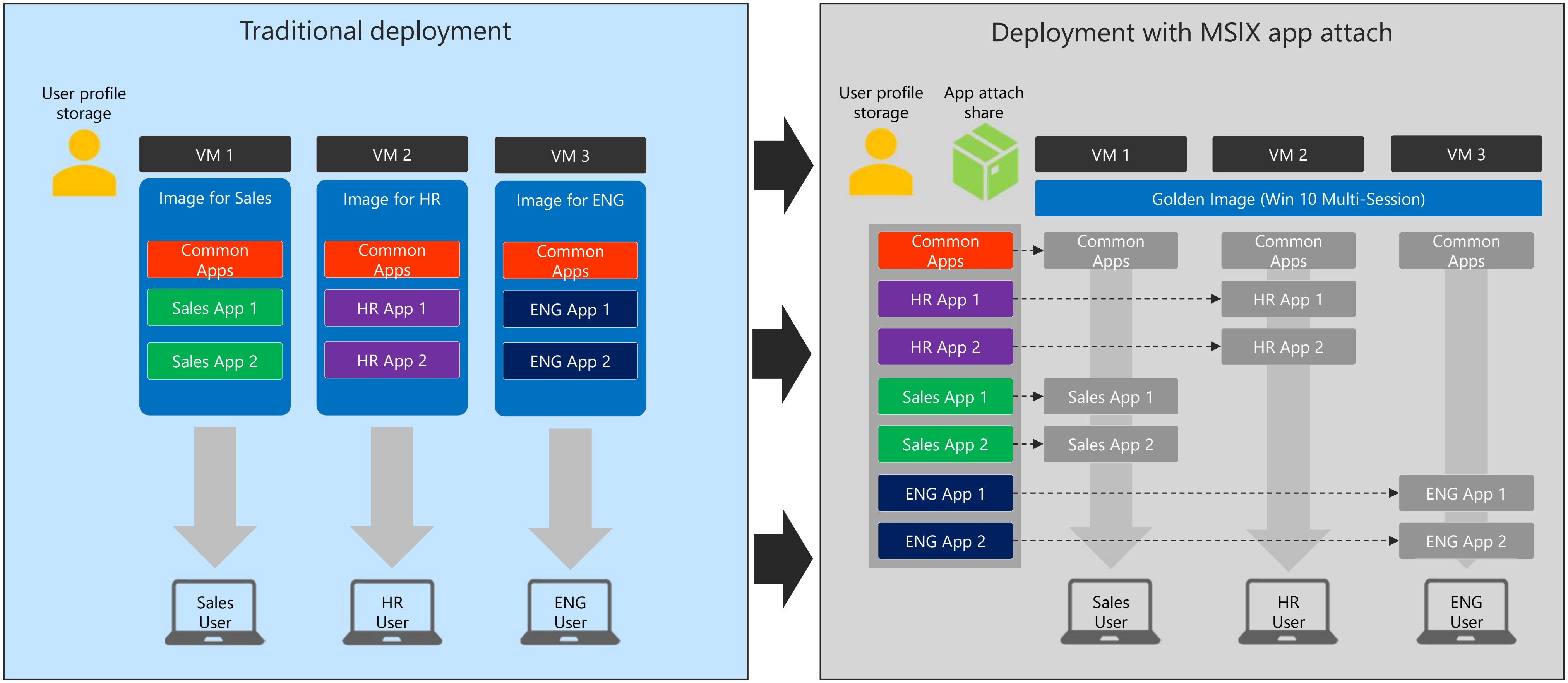
What is MSIX?

What is MSIX?

1. New app packaging format (.exe, MSI, click once, AppV, etc.)
2. Declarative install = clean uninstall means no registry rot or leftover artifacts
3. Simpler packaging and deployment
4. OS-managed
5. Apps are installed per user
6. Tamper protection
7. Native MSIX applications no longer require repackaging
8. Base app and customization can be updated within MSIX container without repackaging

Traditional Application Delivery vs. MSIX app attach

Traditional Application Delivery vs. MSIX app attach



MSIX app attach

Native format is MSIX (no re-packaging)

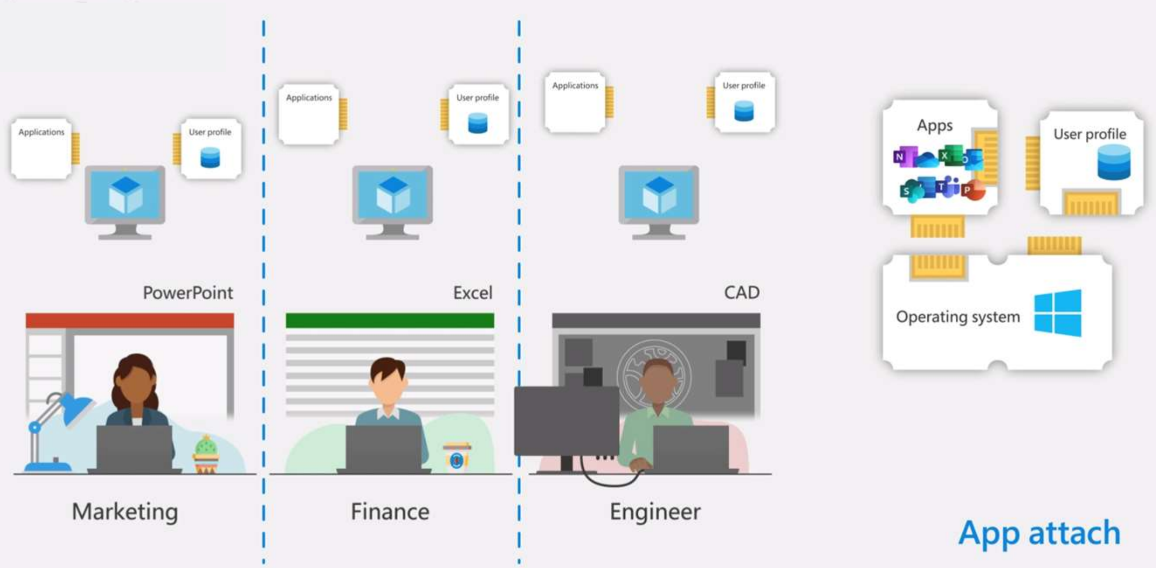
Minimal performance impact

MSIX Apps can be stored off the windows disk

Remotely mount the apps to the VM on-demand

Apps groups are assigned to users, and they're available instantly on login

Looks and feels local to the user and to windows



https://docs.microsoft.com/en-us/azure/virtual-desktop/app-attach

App Assure

Microsoft’s application compatibility promise

Microsoft is committed to ensuring your apps work on the latest versions of our software. If you encounter any issues, we will help you remediate them at no additional cost!

<table>
<tr><th colspan="2">Windows Virtual Desktop</th></tr>
<tr><th>WINDOWS 10 ENTERPRISE MULTI-SESSION</th><th>WINDOWS 1O ENTERPRISE</th></tr>
<tr><td>Virtualized apps that run on Windows Server RDSH will run on Windows 10 Enterprise multi-session as part of WVD</td><td>Apps running in any Win7 /Win10 VDI environment will run on Win7/Win10 Enterprise as part of WVD*
<b><i>and</i></b>
Apps running on Win7 /Win10 client devices will run on Win7/Win10 Enterprise as part of WVD*</td></tr>
</table>

*See our service description at https://aka.ms/DesktopAppAssure/

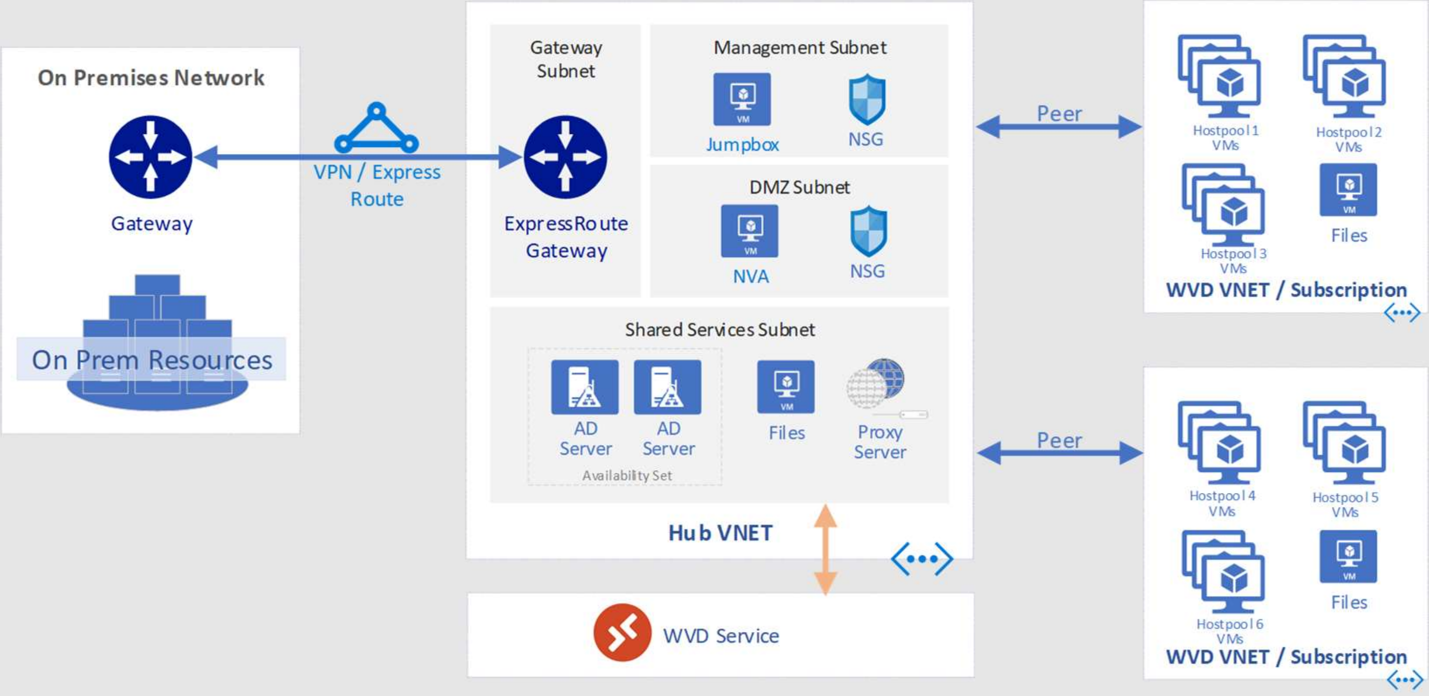
Demo Azure Files & FSLogix

Links to FSLogix, Azure Files & MSIX

- FSLogix
  - Agent
  - Profile Container Configuration
  - Office Container Configuration
  - Cloud Cache Configuration
  - App Masking
- Azure Files with AD DS
- NetApp Files
- MSIX App Attach

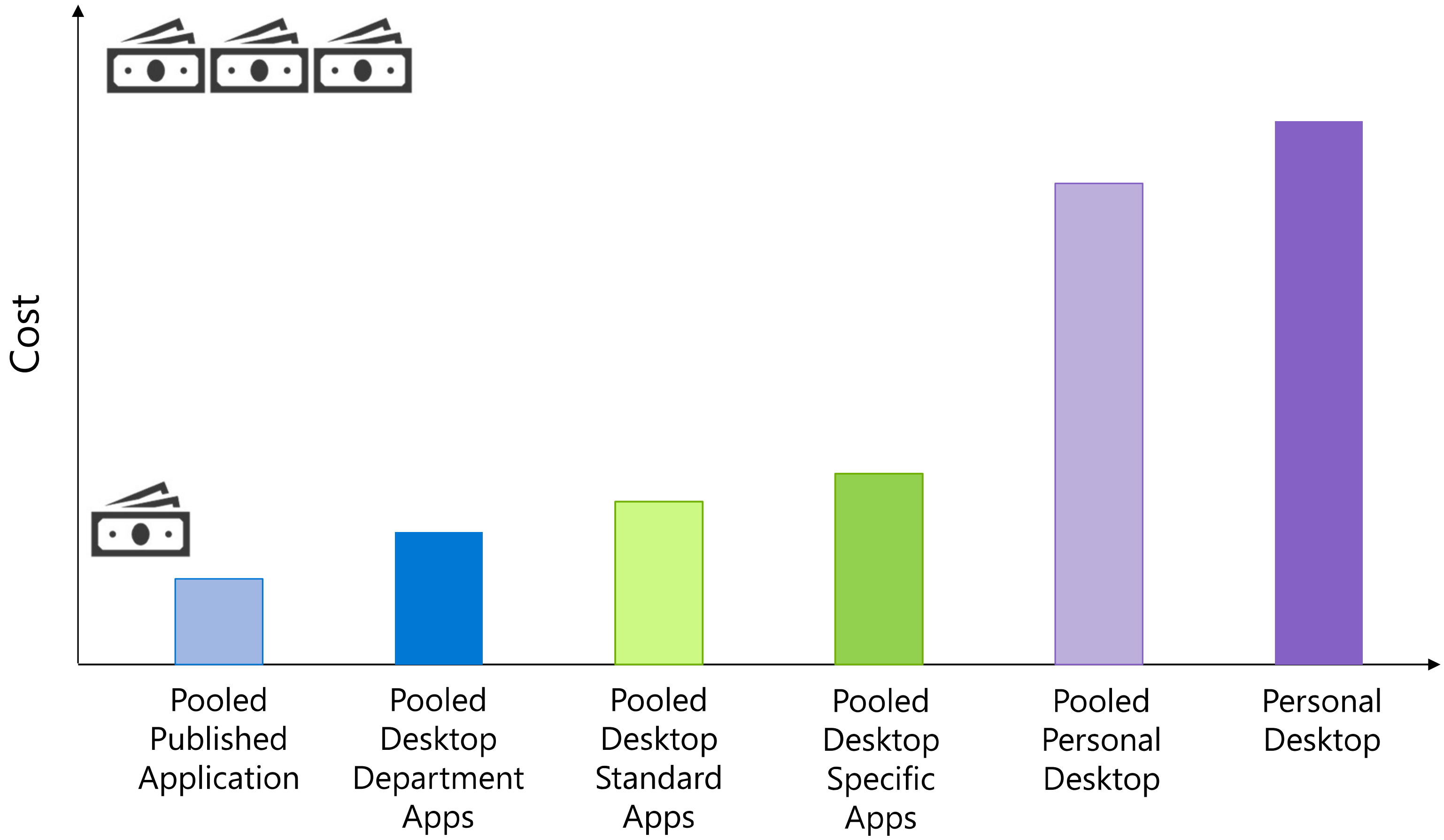
Networking

Example Network Design



Host Pool Design

Deployment Models



Host Pool Design Principals

- Create Host Pools based on similarities in user type or applications
    - Group Users types
    - Group Application or Department types
    - Group locations
    - Security Boundaries
    - Performance Characteristics

Image Management

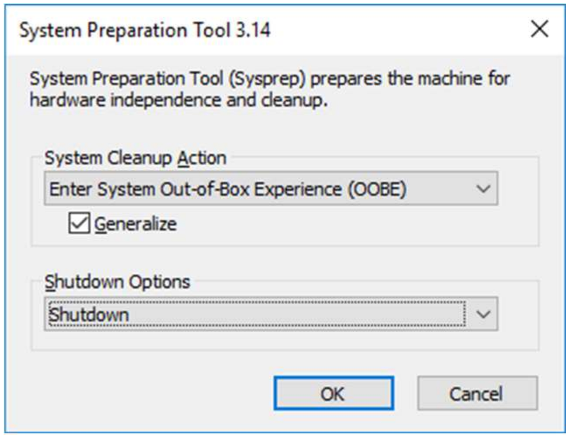
Azure Managed Images with WVD

What are Azure Managed Images?

- Customized Windows image that are captured and stored in Azure that can be used to create VMs / WVD Session hosts.
- Quickly create WVD hostpools with consistent user experiences

How are WVD managed images created?

- Create a Windows VM with customized applications and settings.
- Generalize a Windows VM Using Sysprep
- Create an Image in the Portal or
- Create an Image using PowerShell



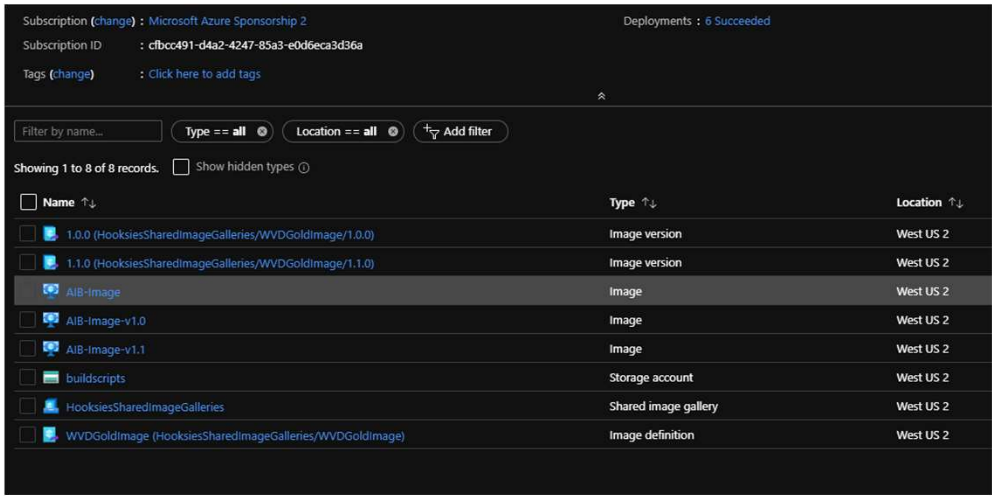
System Preparation Tool 3.14

System Preparation Tool (Sysprep) prepares the machine for hardware independence and cleanup.

System Cleanup Action: Enter System Out-of-Box Experience (OOBE)

☑ Generalize

Shutdown Options: Shutdown



Subscription (change) : Microsoft Azure Sponsorship 2

Subscription ID : cfbcc491-d4a2-4247-85a3-e0d6eca3d36a

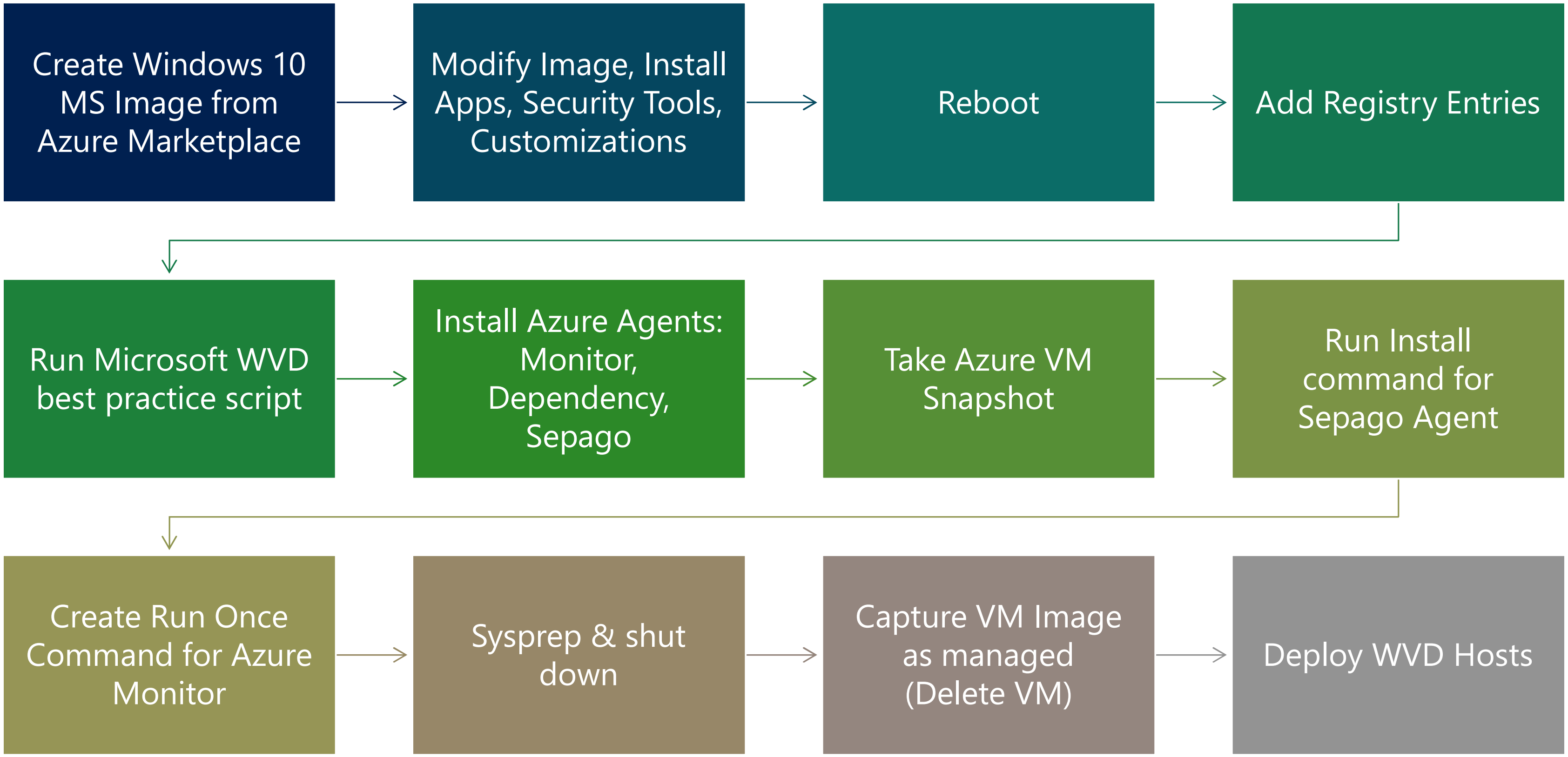
Tags (change) : Click here to add tags

Deployments : 6 Succeeded

Showing 1 to 8 of 8 records. □ Show hidden types

Name	Type	Location
1.0.0 (HooksiesSharedImageGalleries/WVDGoldImage/1.0.0)	Image version	West US 2
1.1.0 (HooksiesSharedImageGalleries/WVDGoldImage/1.1.0)	Image version	West US 2
AIB-Image	Image	West US 2
AIB-Image-v1.0	Image	West US 2
AIB-Image-v1.1	Image	West US 2
buildscripts	Storage account	West US 2
HooksiesSharedImageGalleries	Shared image gallery	West US 2
WVDGoldImage (HooksiesSharedImageGalleries/WVDGoldImage)	Image definition	West US 2

Managed Images flow chart



Create Windows 10 MS Image from Azure Marketplace

Modify Image, Install Apps, Security Tools, Customizations

Reboot

Add Registry Entries

Run Microsoft WVD best practice script

Install Azure Agents: Monitor, Dependency, Sepago

Take Azure VM Snapshot

Run Install command for Sepago Agent

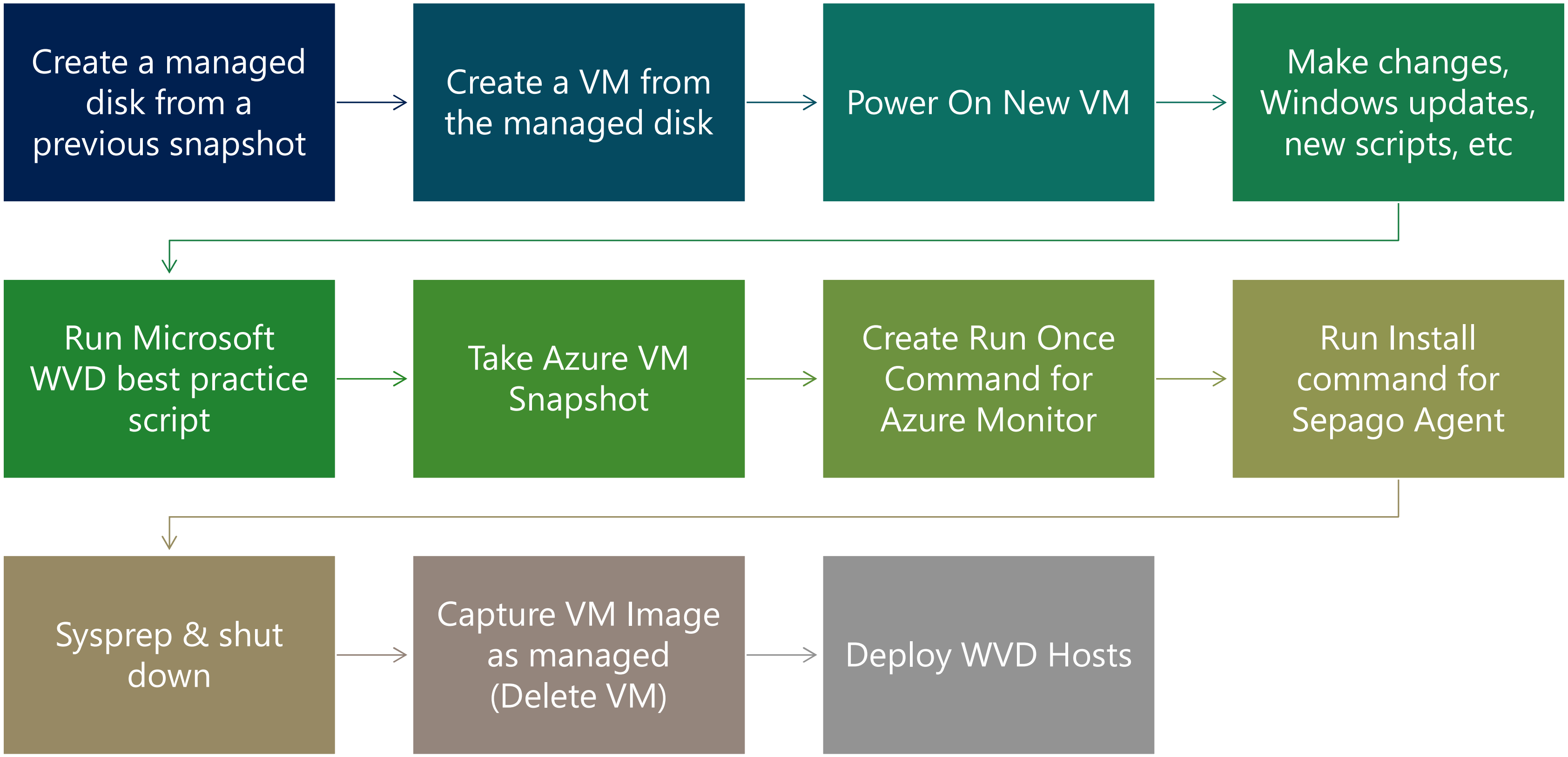
Create Run Once Command for Azure Monitor

Sysprep & shut down

Capture VM Image as managed (Delete VM)

Deploy WVD Hosts

Managed Images flow chart



Create a managed disk from a previous snapshot

Create a VM from the managed disk

Power On New VM

Make changes, Windows updates, new scripts, etc

Run Microsoft WVD best practice script

Take Azure VM Snapshot

Create Run Once Command for Azure Monitor

Run Install command for Sepago Agent

Sysprep & shut down

Capture VM Image as managed (Delete VM)

Deploy WVD Hosts

Optimizing WVD Master Images

Recommended Settings for WVD Master Image:

- Setup User Profiles Containers (FSLogix)
- Configure Windows Defender
- Disable Automatic Updates
- Start Layout
- Time Zone Redirection
- Disable Storage Sense
- Add language support

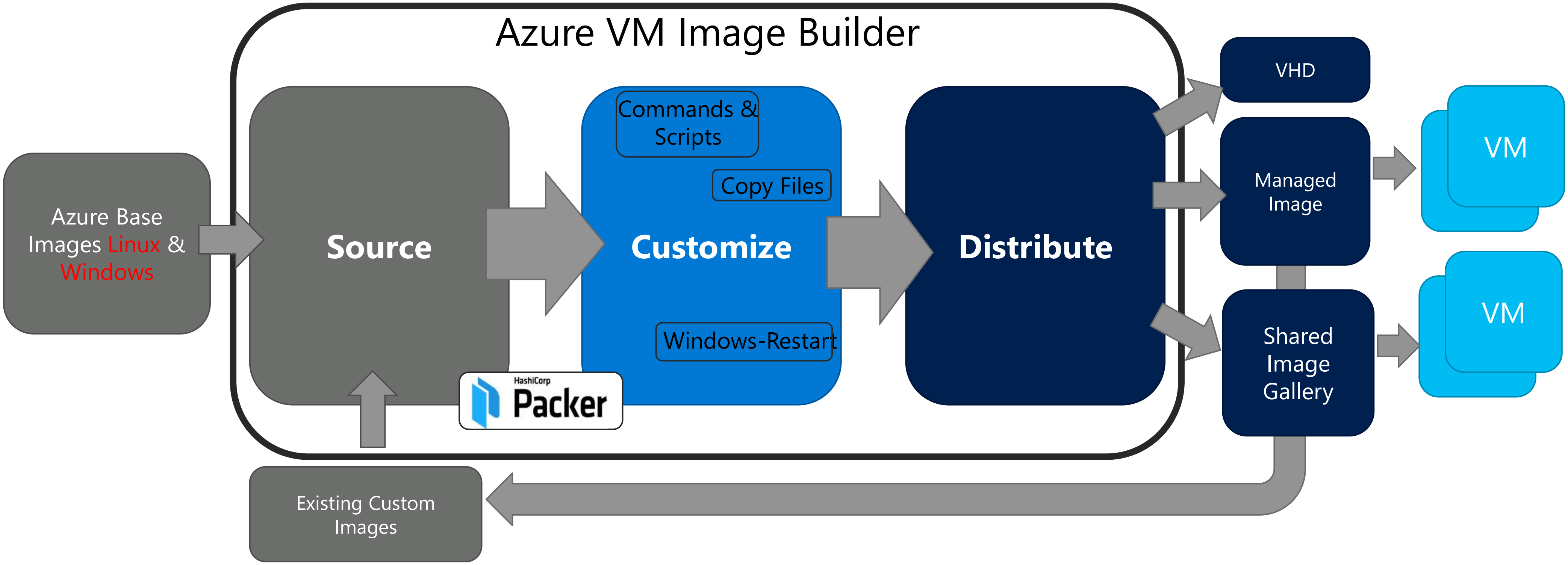
Optional Configurations:

- Configure OneDrive
- Install Office
- Install additional software

https://docs.microsoft.com/en-us/azure/virtual-desktop/set-up-customize-master-image
https://docs.microsoft.com/en-us/azure/virtual-desktop/install-office-on-wvd-master-image
PowerShell Script available to automate these tasks:

- https://github.com/markhooks81/Winter-Ready-2020/blob/master/SysPrepScript.ps1

Azure VM Image Builder

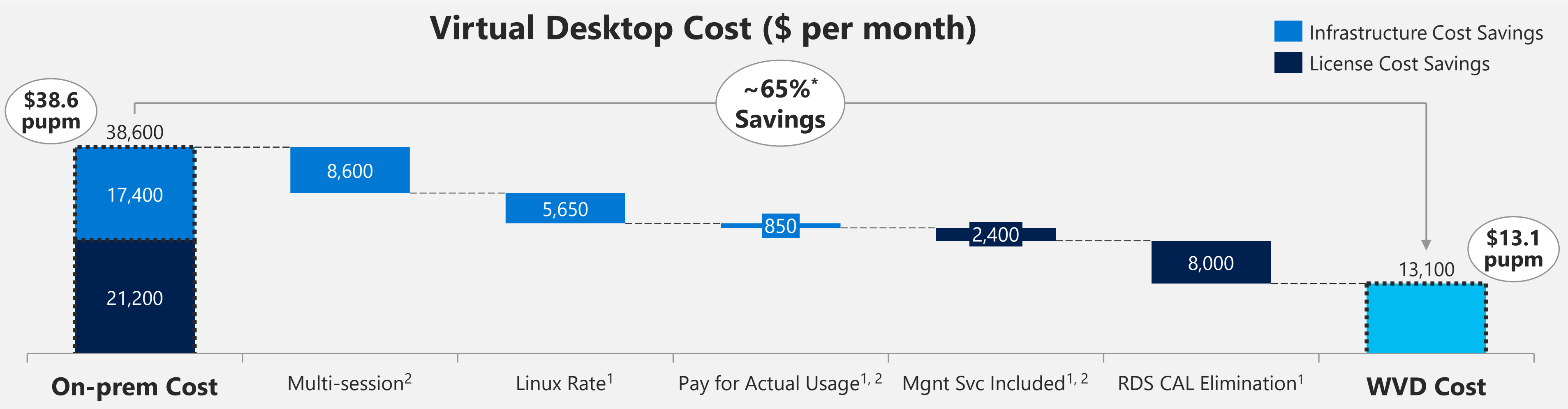


https://aka.ms/azvmimagebuilder

Example Customer Scenario: WVD Economic Benefits

Example Migration Scenario

- User Group 1: 800 medium workload users (session running 170 hrs/month): From Windows Server on-prem to Windows 10 multi-session in WVD
- User Group 2: 200 medium workload users (session running 110 hrs/month): From Windows 10 single-session on-prem to Windows 10 multi-session in WVD



Virtual Desktop Cost ($ per month)

Drivers for Saving	Windows 10 multi-session reduces number of VMs required (vs. single-session)	Session host VMs charged at Linux compute rate (vs. Windows Server compute rate)	Most actual usage charged at PAYG rate (vs. fixed on-prem investment)	Free** WVD management service incl. associated infra (vs. mgnt services and infra on-prem)	RDS CAL not required by W10 MS in WVD**

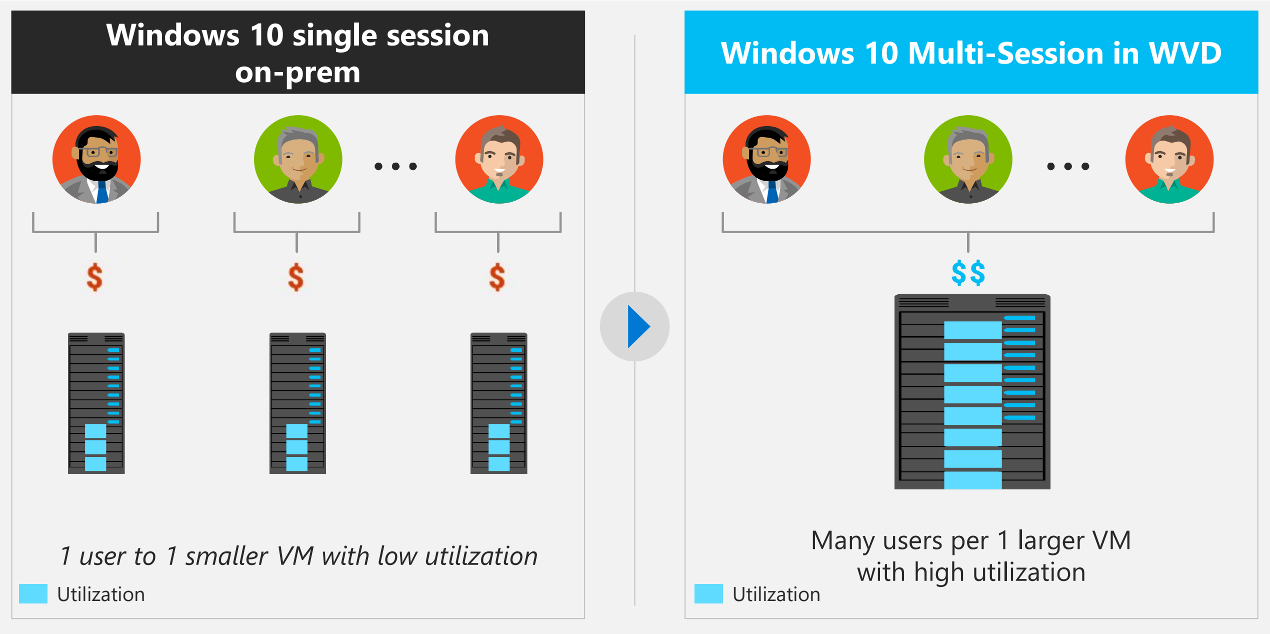
Note: Chart shows the overall on-prem and WVD cost and associated cost savings for User Group 1 and 2 combined
Note: Given on-prem costs are highly variable, Azure reserved instance cost is used as the proxy for average on-prem cost; on-prem cost is likely underestimated
Note: Results generated by WVD Solution Configurator, an excel-based tool for sizing WVD opportunities; figures are rounded for simplicity
1 – Savings for User Group 1; 2 – Savings for User Group 2
*~70% Savings on infrastructure cost and ~60% on license cost, respectively; labor cost excluded
**Many customers already own licenses that qualify them for WVD (e.g. Win10 E3/E5, M365 E3/E5, VDA) and incur no additional cost for WVD

Cost-optimized infrastructure

Windows 10 Experience at Multi-session Cost

Customer Scenario – From Windows 10 single session on-prem to Windows 10 Multi-Session in WVD

- Trade many small dedicated VMs for few large shared VMs with higher utilization



Windows 10 single session on-prem

1 user to 1 smaller VM with low utilization

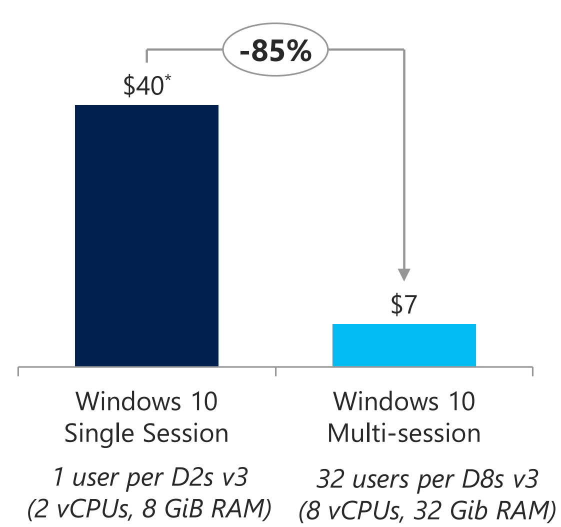
🟦 Utilization

Windows 10 Multi-Session in WVD

Many users per 1 larger VM with high utilization

🟦 Utilization

Example Economic Benefit
$ per user per month



Note: WVD is the only way to run Windows 10 Multi-Session

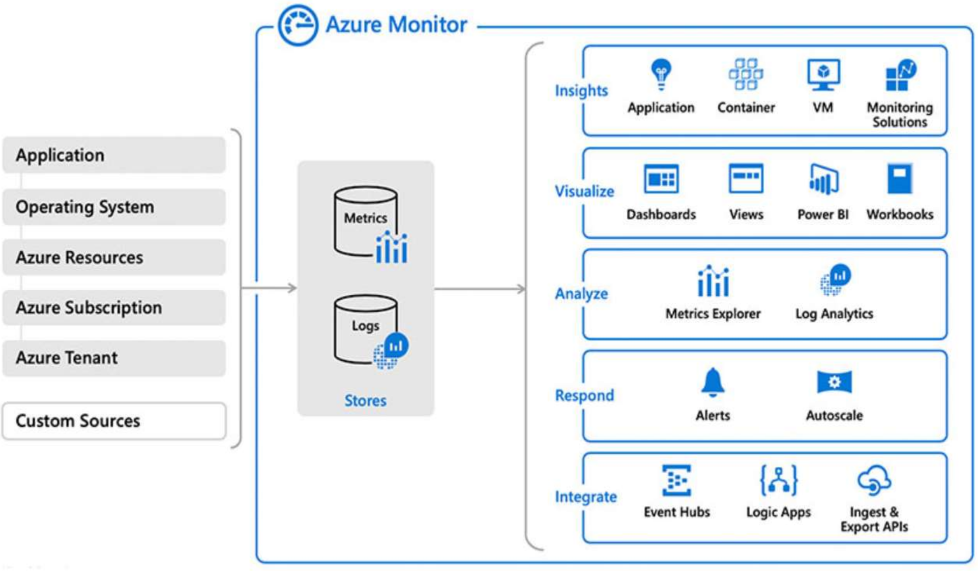
Note: Figures are illustrative and based on pre-configured assumptions; actual savings vary by user requirements and infrastructure configuration

*The $40 PUPM for single session cost is modeled for a common configuration: Windows 10 single-session in WVD starts at ~$15 per user per month for 1 vCPU, 2 GiB RAM configuration

Demo Azure Image Process

Monitoring

WVD and Azure Monitor



https://azure.microsoft.com/en-us/services/monitor/

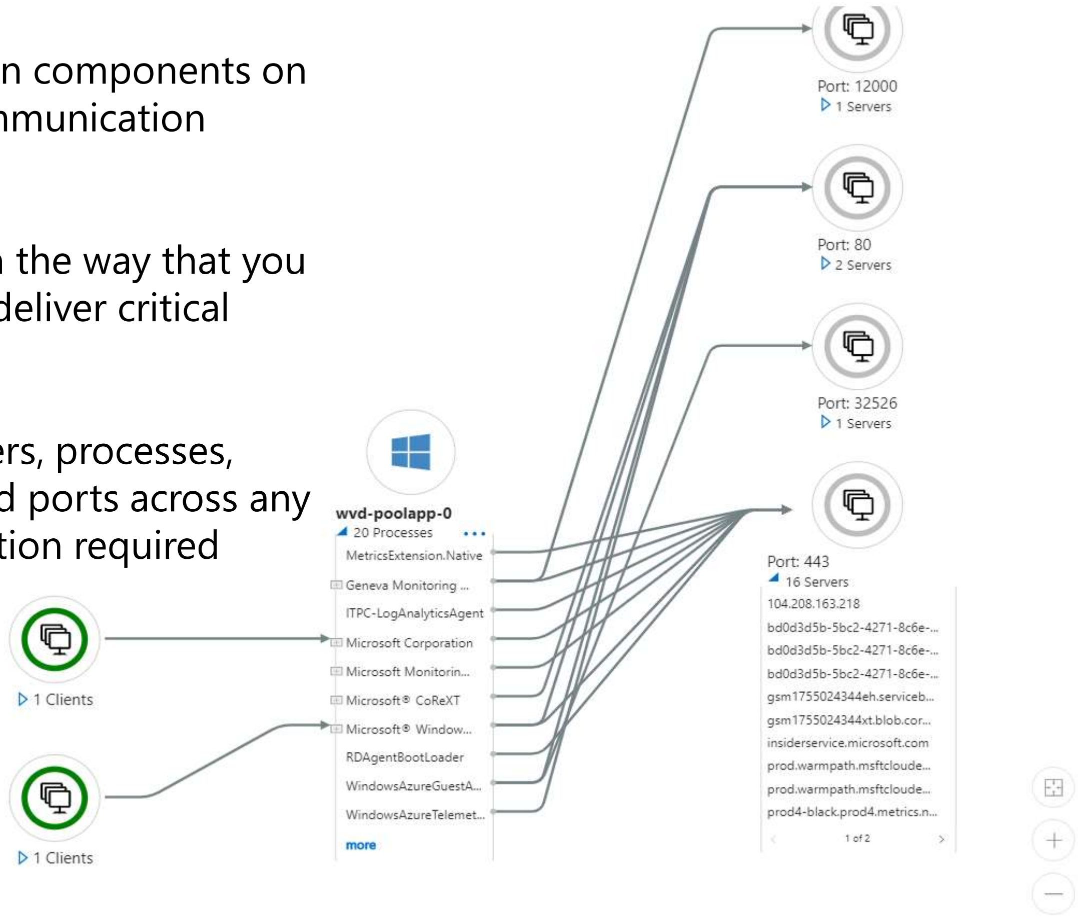
Do	What you can do with Azure Monitor include:
Detect and diagnose	Detect and diagnose issues across applications and dependencies with Application Insights.
Correlate	Correlate infrastructure issues with Azure Monitor for VMs and Azure Monitor for Containers.
Drill	Drill into your monitoring data with Log Analytics for troubleshooting and deep diagnostics.
Support	Support operations at scale with smart alerts and automated actions.
Create	Create visualizations with Azure dashboards and workbooks.

WVD with Service Map Extension

Service Map automatically discovers application components on Windows and Linux systems and maps the communication between services.

With Service Map, you can view your servers in the way that you think of them: as interconnected systems that deliver critical services.

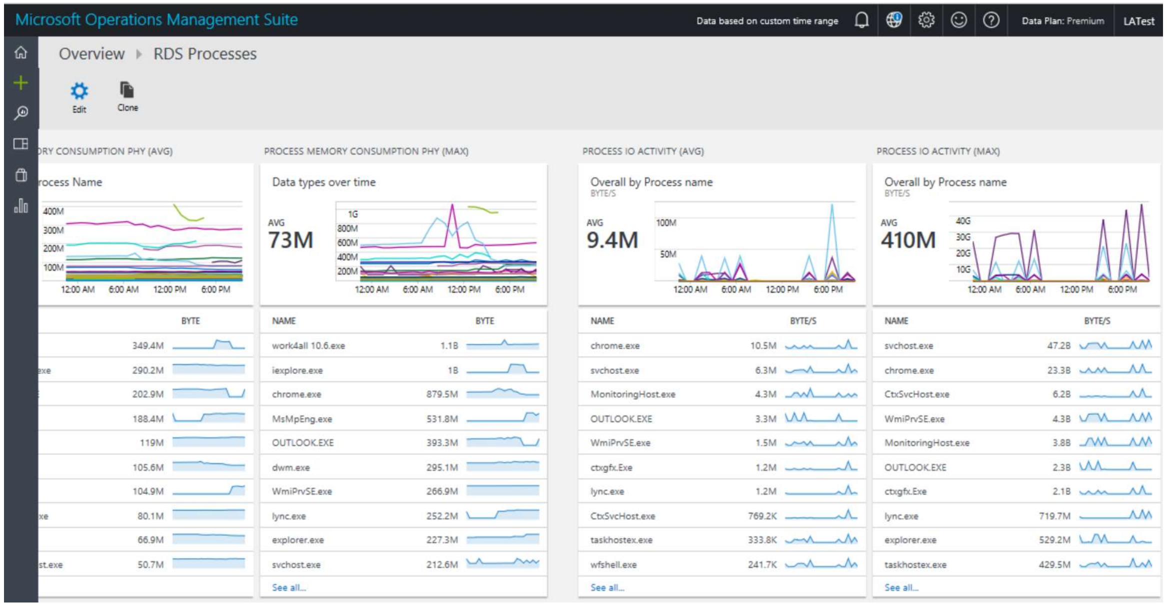
Service Map shows connections between servers, processes, inbound and outbound connection latency, and ports across any TCP-connected architecture, with no configuration required other than the installation of an agent.



WVD with Log Analytics

Leveraging our partner Sepago, each worker in your WVD environment can be monitored. The agent is focused on events, performance consumption, network activities and more regarding each user's experiences.

Workers in this context are Windows Remote Desktop Server or Windows 10EVD\MSEVD. The agent combines data from different sources and sends them to your Log Analytics workspace in Azure.



	BYTE
	349.4M
exe	290.2M
	202.9M
	188.4M
	119M
	105.6M
	104.9M
xe	80.1M
	66.9M
st.exe	50.7M

NAME	BYTE
work4all 10.6.exe	1.1B
iexplore.exe	1B
chrome.exe	879.5M
MsMpEng.exe	531.8M
OUTLOOK.EXE	393.3M
dwm.exe	295.1M
WmiPrvSE.exe	266.9M
lync.exe	252.2M
explorer.exe	227.3M
svchost.exe	212.6M

See all...

NAME	BYTE/S
chrome.exe	10.5M
svchost.exe	6.3M
MonitoringHost.exe	4.3M
OUTLOOK.EXE	3.3M
WmiPrvSE.exe	1.5M
ctxgfx.Exe	1.2M
lync.exe	1.2M
CtxSvcHost.exe	769.2K
taskhostex.exe	333.8K
wfshell.exe	241.7K

See all...

NAME	BYTE/S
svchost.exe	47.2B
chrome.exe	23.3B
CtxSvcHost.exe	6.2B
WmiPrvSE.exe	4.3B
MonitoringHost.exe	3.8B
OUTLOOK.EXE	2.3B
ctxgfx.Exe	2.1B
lync.exe	719.7M
explorer.exe	529.2M
taskhostex.exe	429.5M

See all...

```
$LogAnalyticsWorkspaceId = ""
$LogAnalyticsPrimaryKey = ""
Set-RdsTenant -Name $tenant -LogAnalyticsWorkspaceId $LogAnalyticsWorkspaceId -LogAnalyticsPrimaryKey $LogAnalyticsPrimaryKey
```

Demo Azure Sepago & Monitor

Migration

Azure Migrate – hub for all your migration needs

NEW! Deeper application discovery **(incl. application roles, features, and versions)**

NEW! Physical server discovery

NEW! Agentless dependency visualization & migration for VMware environments

NEW! .NET app migration to Azure App Service

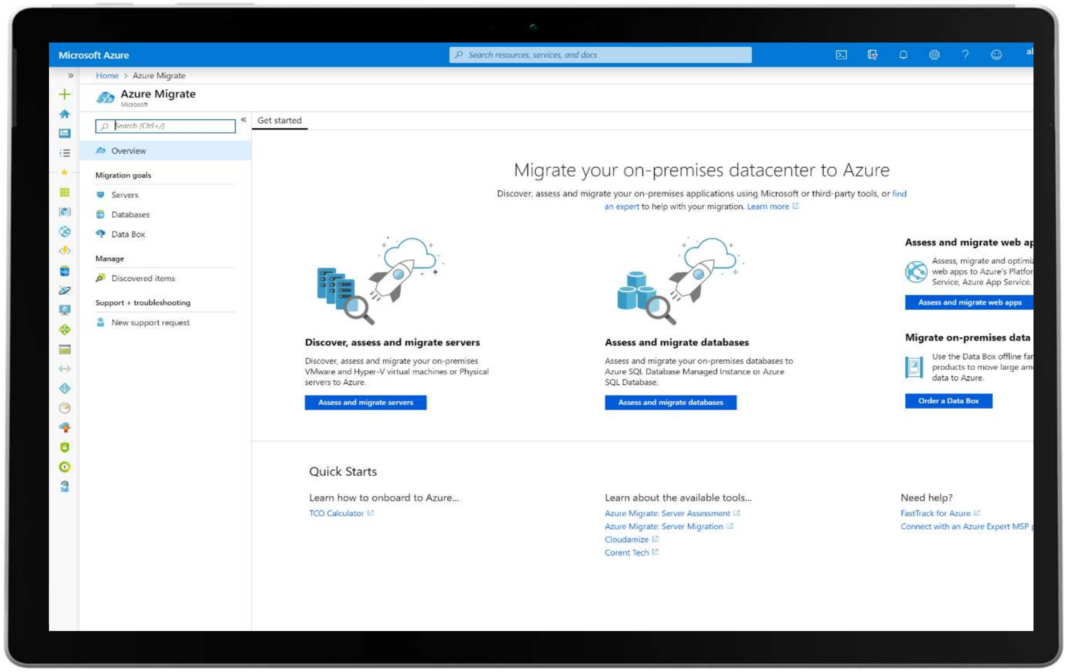
NEW! VDI migration to Windows Virtual Desktop

Integrated with Carbonite, Cloudamize, Corent Tech, Device42, Turbonomic, and UnifyCloud

VMware, Hyper-V, Physical server migration

SQL / Non-SQL data migration

Migration from on-premises, AWS, & GCP



Migrate your on-premises datacenter to Azure

Discover, assess and migrate your on-premises applications using Microsoft or third-party tools, or find an expert to help with your migration. Learn more

Discover, assess and migrate servers

Discover, assess and migrate your on-premises VMware and Hyper-V virtual machines or Physical servers to Azure.

Assess and migrate databases

Assess and migrate your on-premises databases to Azure SQL Database Managed Instance or Azure SQL Database.

Assess and migrate web ap

Assess, migrate and optimi web apps to Azure's Platfor Service, Azure App Service.

Migrate on-premises data

Use the Data Box offline fa products to move large am data to Azure.

Quick Starts

Learn how to onboard to Azure...
TCO Calculator

Learn about the available tools...
Azure Migrate: Server Assessment
Azure Migrate: Server Migration
Cloudamize
Corent Tech

Need help?
FastTrack for Azure
Connect with an Azure Expert MSP

https://docs.microsoft.com/en-us/azure/migrate/migrate-services-overview

Continuously optimize resources during and after migration

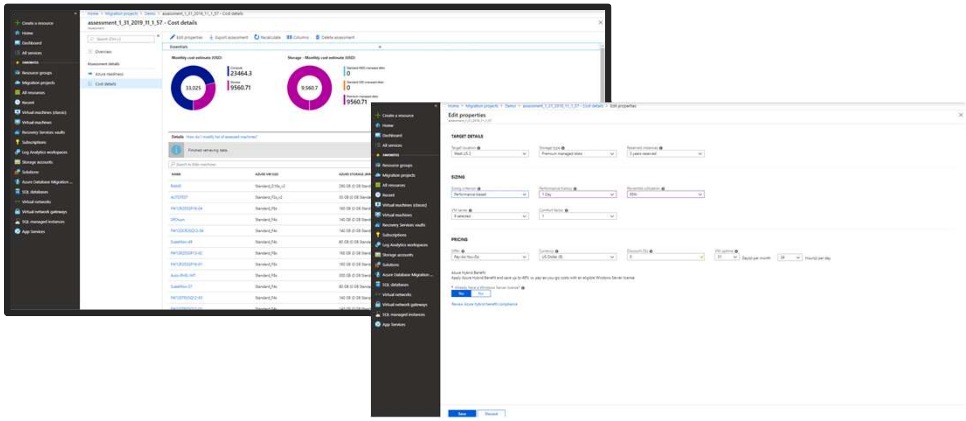
As you move

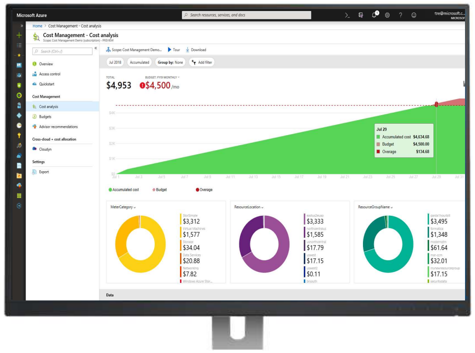
- Right-size Azure resources based on assessment guidance
- Use Azure Hybrid Benefit and Azure Reserved Instances to save money

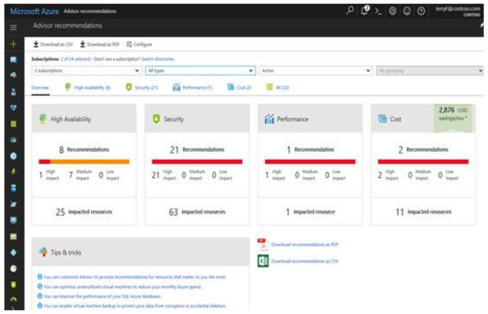
After you move

- Unified experience to optimize cloud spends: Azure Cost Management
- Azure Advisor: Built-in best practice recommendations (e.g., turn off idle VMs)

Modernize for longer term value

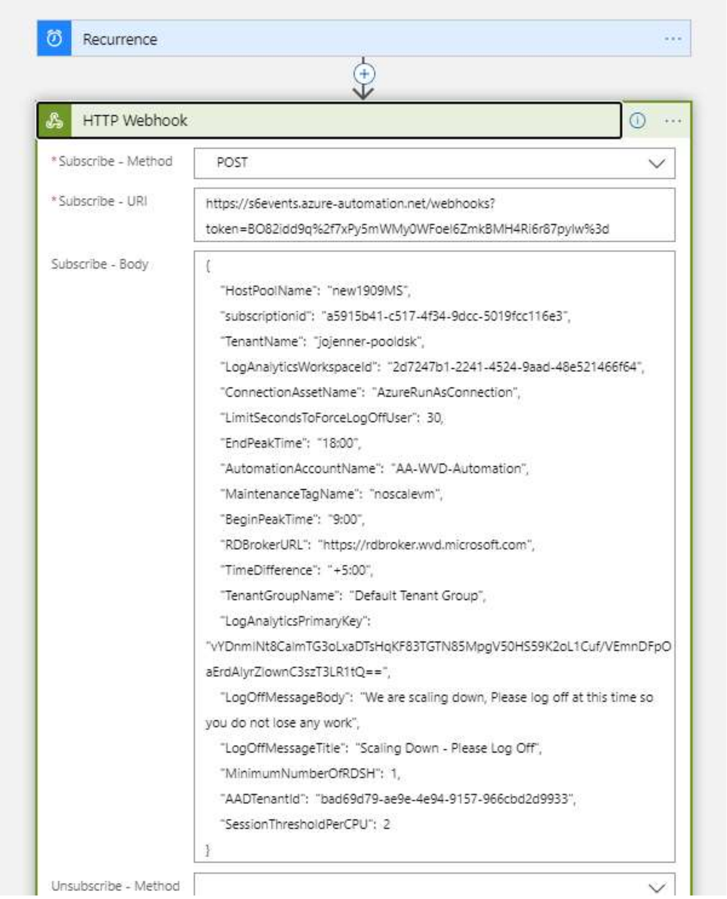






Scaling

WVD VM Scaling Logic App Designer view



*Subscribe - Method: POST

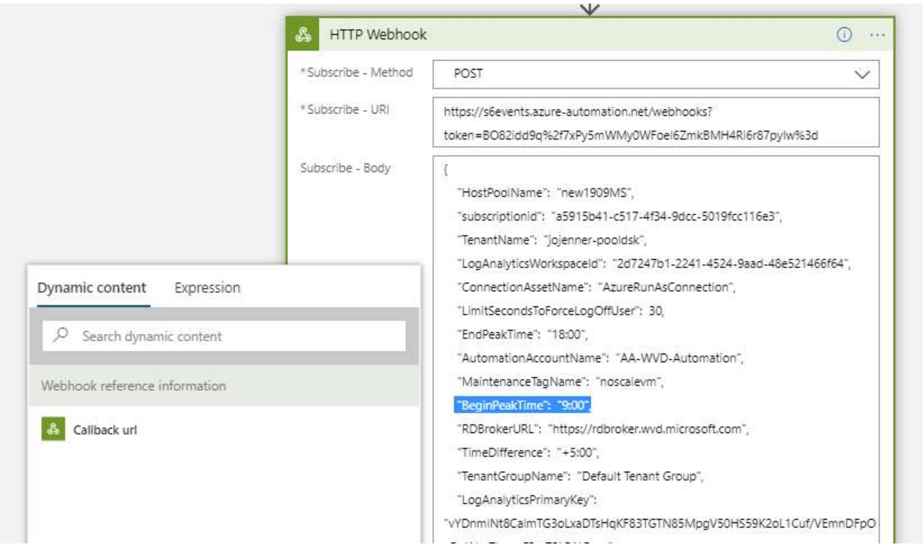
*Subscribe - URI: https://s6events.azure-automation.net/webhooks?token=BO82idd9q%2f7xPy5mWMy0WFoel6ZmkBMH4Ri6r87pylw%3d

Subscribe - Body:

```
{
   "HostPoolName": "new1909MS",
   "subscriptionid": "a5915b41-c517-4f34-9dcc-5019fcc116e3",
   "TenantName": "jojenner-pooldsk",
   "LogAnalyticsWorkspaceId": "2d7247b1-2241-4524-9aad-48e521466f64",
   "ConnectionAssetName": "AzureRunAsConnection",
   "LimitSecondsToForceLogOffUser": 30,
   "EndPeakTime": "18:00",
   "AutomationAccountName": "AA-WVD-Automation",
   "MaintenanceTagName": "noscalevm",
   "BeginPeakTime": "9:00",
   "RDBrokerURL": "https://rdbroker.wvd.microsoft.com",
   "TimeDifference": "+5:00",
   "TenantGroupName": "Default Tenant Group",
   "LogAnalyticsPrimaryKey":
"vYDnmINt8CaImTG3oLxaDTsHqKF83TGTN85MpgV50HS59K2oL1Cuf/VEmnDFpO
aErdAlyrZiownC3szT3LR1tQ==",
   "LogOffMessageBody": "We are scaling down, Please log off at this time so
you do not lose any work",
   "LogOffMessageTitle": "Scaling Down - Please Log Off",
   "MinimumNumberOfRDSH": 1,
   "AADTenantId": "bad69d79-ae9e-4e94-9157-966cbd2d9933",
   "SessionThresholdPerCPU": 2
}
```

Unsubscribe - Method:

Select the component you want to change below using the code designer option from the middle blade.



*Subscribe - Method: POST

*Subscribe - URI: https://s6events.azure-automation.net/webhooks?token=BO82idd9q%2f7xPy5mWMy0WFoel6ZmkBMH4Ri6r87pylw%3d

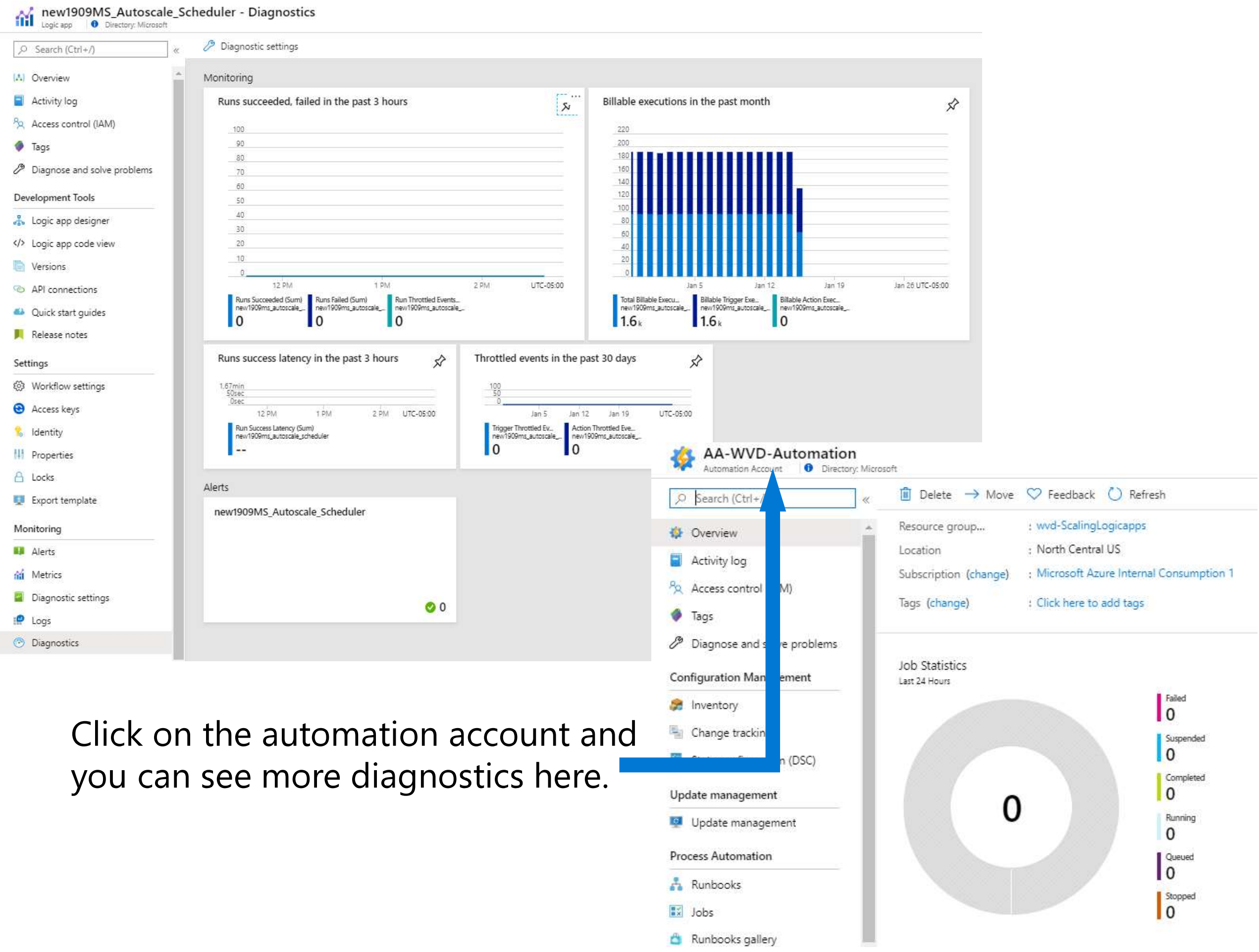
Subscribe - Body:

```
{
   "HostPoolName": "new1909MS",
   "subscriptionid": "a5915b41-c517-4f34-9dcc-5019fcc116e3",
   "TenantName": "jojenner-pooldsk",
   "LogAnalyticsWorkspaceId": "2d7247b1-2241-4524-9aad-48e521466f64",
   "ConnectionAssetName": "AzureRunAsConnection",
   "LimitSecondsToForceLogOffUser": 30,
   "EndPeakTime": "18:00",
   "AutomationAccountName": "AA-WVD-Automation",
   "MaintenanceTagName": "noscalevm",
   "BeginPeakTime": "9:00",
   "RDBrokerURL": "https://rdbroker.wvd.microsoft.com",
   "TimeDifference": "+5:00",
   "TenantGroupName": "Default Tenant Group",
   "LogAnalyticsPrimaryKey":
"vYDnmINt8CaImTG3oLxaDTsHqKF83TGTN85MpgV50HS59K2oL1Cuf/VEmnDFpO
```

WVD VM Scale Logic App Diagnostics

With Log Analytics\Monitor being leveraged you get graphical data like this.

If you use Azure Monitor and Log Analytics you can export this data and have a single pane of glass to look at. https://docs.microsoft.com/en-us/azure/automation/automation-manage-send-joblogs-log-analytics



Click on the automation account and you can see more diagnostics here.

Pre-requisites to using Windows Virtual Desktop

Prerequisites

Requirements

- Azure subscription
- Azure Active Directory
- Determine your identity strategy (AD, ADDS)
- All associated Azure resources (image, virtual network, storage) in one region
- Required credentials (Azure AD, WVD tenant, Service principle, etc.)

Link to prepare Demo bench (coming soon)

Prerequisites

Pre-Req	Description	Owner / Stakeholders
1-2 use cases	Choose 1-2 standard or typical target use case(s) for POC. Include standard apps installed and any security or internal management tools you use.	Customer Virtual Desktop Team or Business Owners
Azure AD Tenant	Most customers already have this set up through their O365 Tenant. A separate free account can also be used but nor recommended for POC or Prod Trial. GA account to the AAD Tenant. At least one admin account with MFA turned off or ability to create service principal	Admin or Security Team
Azure Subscription	Deployed subscription connected to the Azure AD Tenant Above Owner or Contributor Rights to the Subscription Quota and/or policy rights to create network, security, VMs, etc	Cloud Team, Billing Owner

Prerequisites

Pre-Req	Description	Owner / Stakeholders
Security Controls	Info about FW and/or Proxy required by Internal Security or access to security team during deployment If FW or Proxy is used, the whitelist URLs should be submitted 1-2 weeks ahead of deployment Info about MFA or SSO tools used internally – Admin accounts if this must be configured	Network / Security Team
Networking	Access to VNET or ability to create a VNET, if necessary Networking/on-premises connectivity via express route, VPN, etc. – *Access to domain controller either in Azure or on prem and access to on prem apps. If the domain controller is isolated in Azure, and no on-prem access is needed this can be skipped.*	Network / Security Team
Licensing	Entitlement check (licensing) - M365 E3/E5, etc. See slide below	Microsoft Team / Cloud Team, Billing Owner
Domain Controller	Needed for traditional AD join of VM hosts Can be in Azure or On-prem – *see Networking requirements above for On-prem* Domain Admin Rights or GPO policy to allow a user to add VMs to domain – Non MFA account Windows Domain Users sync'd to Azure AD through AD Connect OR Azure AD Domain Services deployed	Admin, Cloud Team

Many customers are already eligible for WVD

WVD Licensing Requirements

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**

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)**

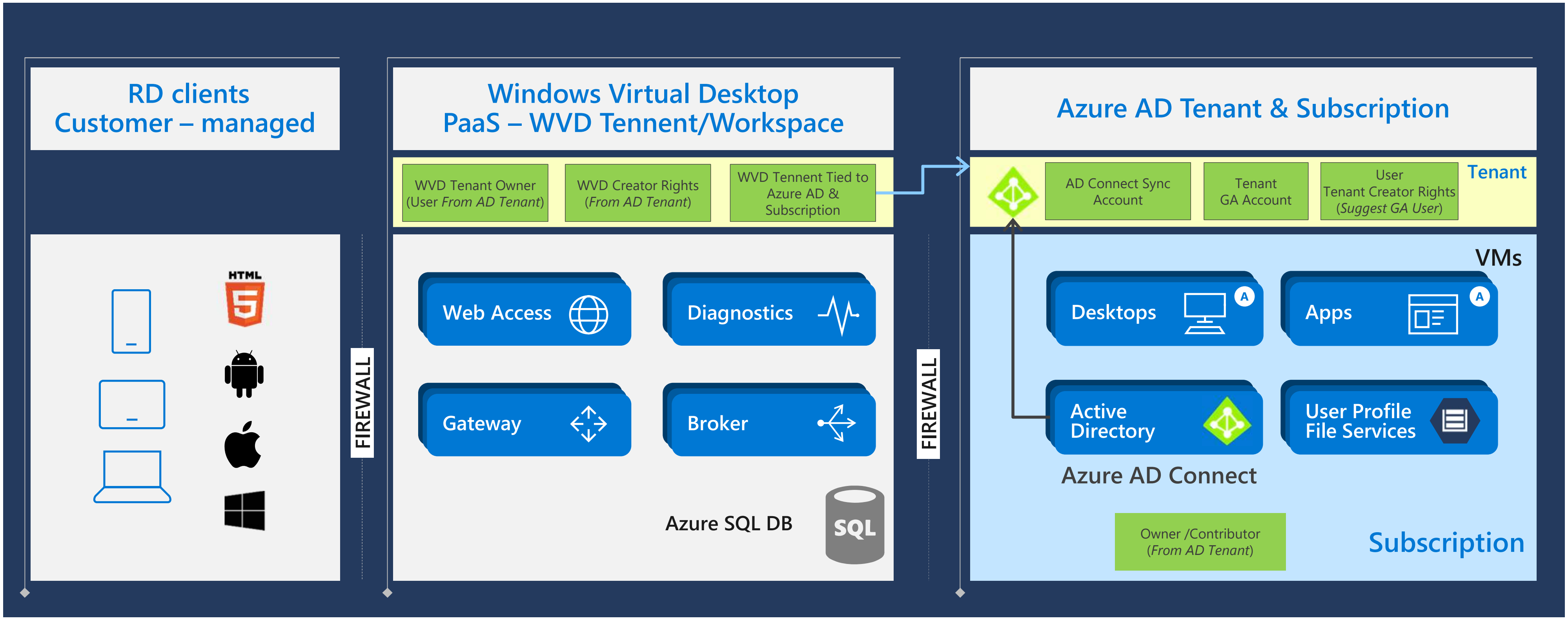
Customers pay for the virtual machines (VMs), storage, and networking consumed when the users are using the service

**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.*

Credentials Required – Customer Environment

Many Subscriptions to One Azure AD Tenant can be used as long as each subscription has an accessible domain controller that is sync'd to the Azure AD Tenant

Many WVD Tenants to one Azure AD Tenant is also acceptable



Whitelist URLs

Mandatory

Address	Outbound TCP port	Purpose	Service Tag
*.wvd.microsoft.com	443	Service traffic	WindowsVirtualDesktop
mrsglobalsteus2prod.blob.core.windows.net	443	Agent, SXS stack updates, and Agent traffic	AzureCloud
*.core.windows.net	443	Agent traffic	AzureCloud
*.servicebus.windows.net	443	Agent traffic	AzureCloud
prod.warmpath.msftcloudes.com	443	Agent traffic	AzureCloud
catalogartifact.azureedge.net	443	Azure Marketplace	AzureCloud
kms.core.windows.net	1688	Windows activation	
*.microsoftonline.com	443	Authentication to MS Online Services	
*.events.data.microsoft.com	443	Telemetry Service	

Optional

Address	Outbound TCP port	Purpose	Service Tag
licensing.mp.microsoft.com			
*.sls.microsoft.com			
activation-v2.sls.microsoft.com			
*.microsoftonline.com	443	Authentication to MS Online Services	
*.events.data.microsoft.com	443	Telemetry Service	
www.msftconnecttest.com	443	Detects if the OS is connected to the internet	
*.prod.do.dsp.mp.microsoft.com	443	Delivery Optimization Service, used for Windows Update in Windows 10	
login.windows.net	443	Login to MS Online Services, Office 365	
*.sfx.ms	443	--> Updates for OneDrive client software	
*.digicert.com	443	Certificate revocation check	

For Office related URL's , visit https://docs.microsoft.com/en-us/office365/enterprise/urls-and-ip-address-ranges . This documentation also covers required AAD related URL's.

Secure user access: Administrators

1. Integrating with Azure portal means Azure role-based access control (RBAC)

2. Extend the same policies and restrictions you have today

3. View and give permissions to individual Virtual Desktop objects

4. Create your own custom RBAC roles for designated access

Secure user access: End-users

- Azure RBAC also applies to end-users

- Assign access based on Azure AD groups

- Combine resource access with Azure AD Conditional Access for more control

End User Clients

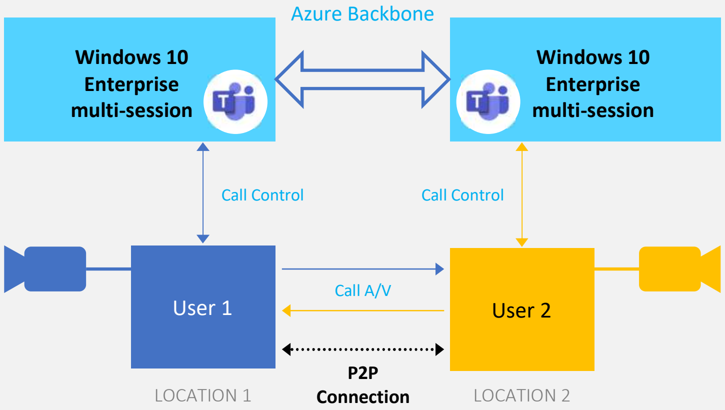
Spring Release

Best Virtualized End-user Experience

Teams Enhancements (Coming soon)

Teams provides end users with better conferencing and media experience

Teams on WVD – With Enhancement



Azure Backbone

Windows 10 Enterprise multi-session

Windows 10 Enterprise multi-session

Call Control

Call Control

User 1

Call A/V

User 2

P2P Connection

LOCATION 1

LOCATION 2

Multimedia redirection

Multimedia redirection

Per machine installation

Per machine installation

User Experience Benefits

Less network bandwidth compared to USB camera redirection

Increased video framerates, up to 30 fps

Enhanced UI for ease of use in virtualized environments

Ability to redirect multiple cameras

High-performance, low latency audio & video calling

Coming soon

What is it?

New Azure Portal Deployment and Management Experience

First-party service functionality

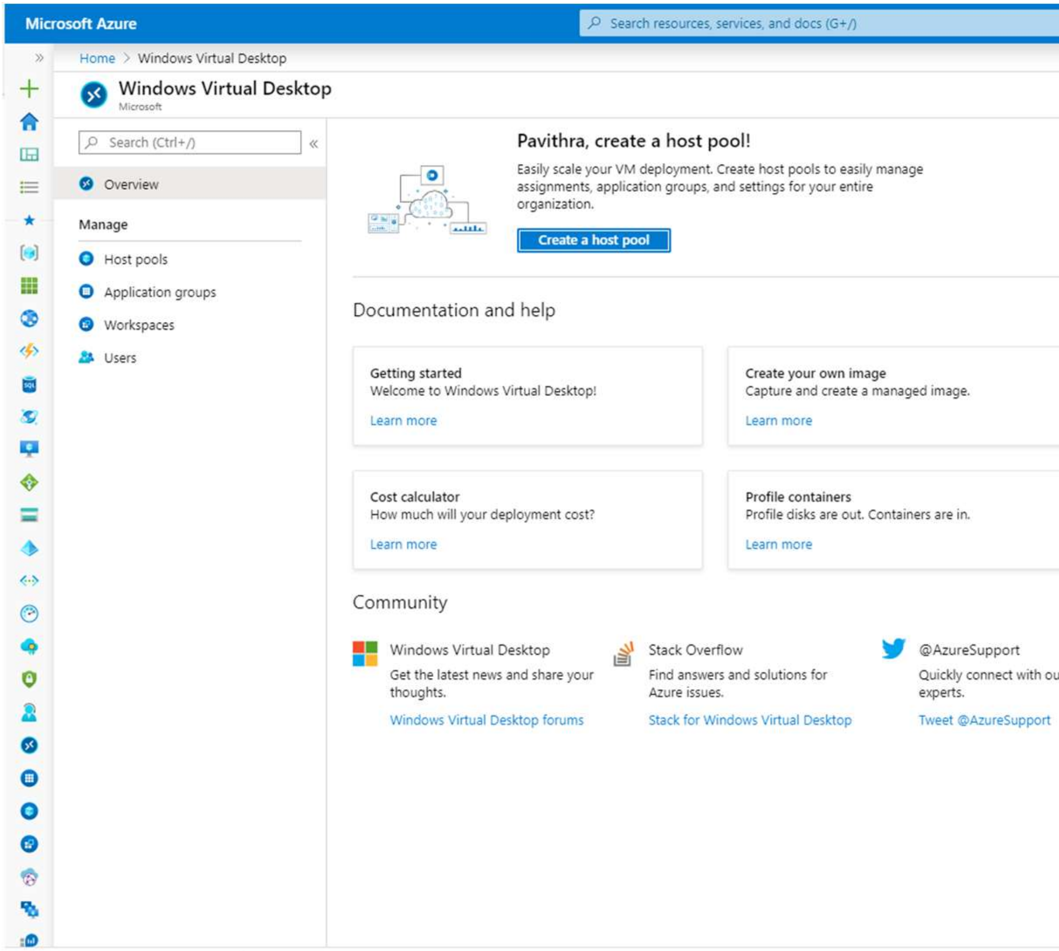
Support for AD Groups

Integrated PowerShell with Azure Module

Integration into Azure Monitor and Log Analytics

Uses Azure RBAC and Lighthouse

Azure portal support for creation, management and diagnostics



Pavithra, create a host pool!

Easily scale your VM deployment. Create host pools to easily manage assignments, application groups, and settings for your entire organization.

Documentation and help

Getting started
Welcome to Windows Virtual Desktop!
Learn more

Create your own image
Capture and create a managed image.
Learn more

Cost calculator
How much will your deployment cost?
Learn more

Profile containers
Profile disks are out. Containers are in.
Learn more

Community

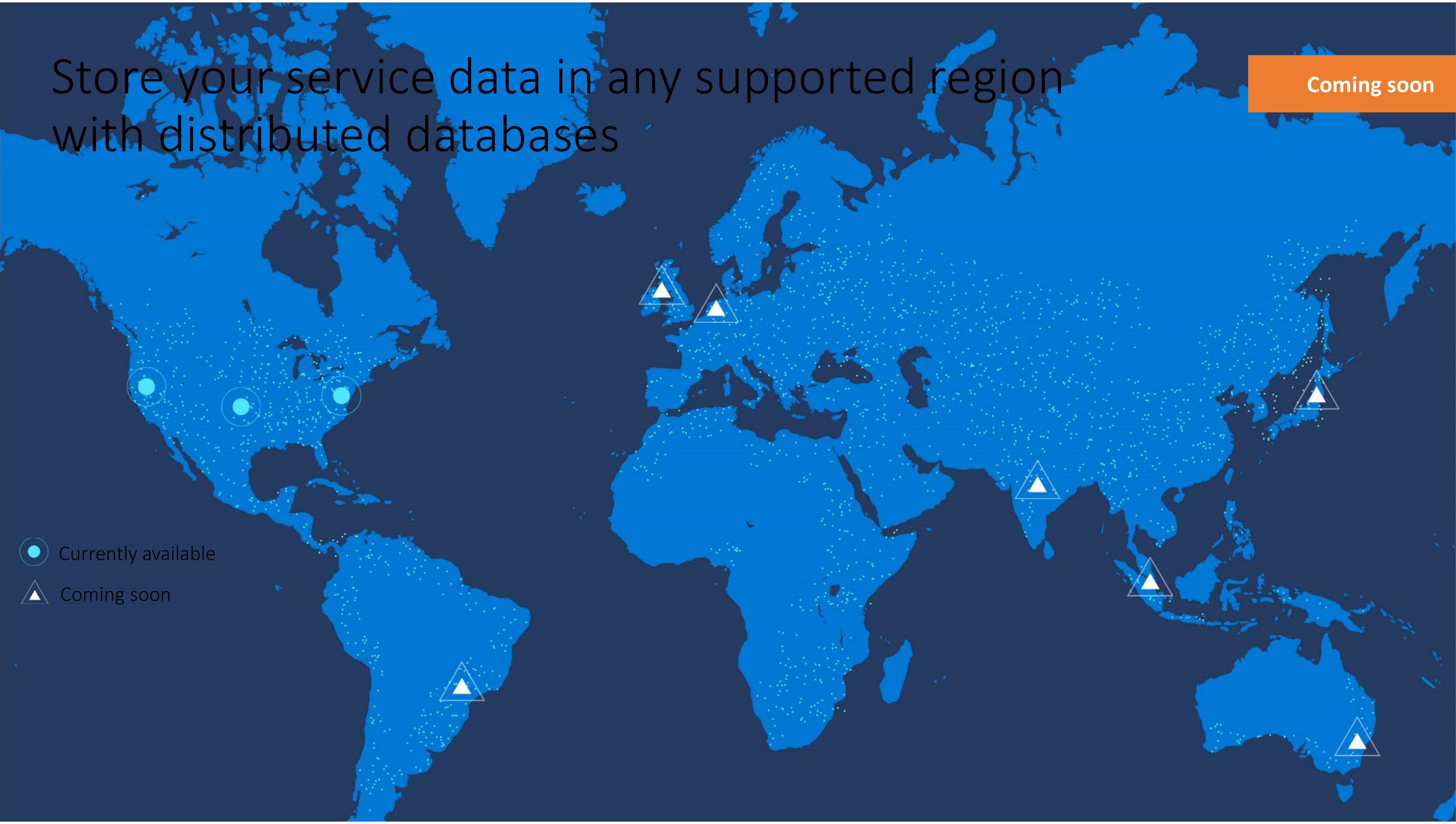
Windows Virtual Desktop
Get the latest news and share your thoughts.
Windows Virtual Desktop forums

Stack Overflow
Find answers and solutions for Azure issues.
Stack for Windows Virtual Desktop

@AzureSupport
Quickly connect with ou
experts.
Tweet @AzureSupport

Store your service data in any supported region with distributed databases

Coming soon



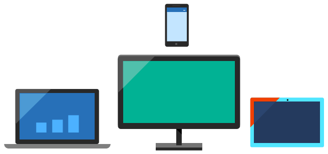
Best Virtualized End-user Experience

Platform of your choice

- Connect from any device of your choice (Windows, MacOS / iOS, HTML5, Android, Linux*)

* Coming soon

Windows differentiation

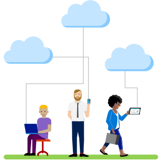


- Like-local Windows experience
- Extensive support for devices

Enhanced protocol

- Support for Windows Hello for Business
- Dynamically adapting bandwidth utilization

Containerized User Profiles



- Containerized User Profiles (FSLogix) with fast VHD load times, Azure NetApp Files

Outlook, OneDrive & Desktop Search Improvements

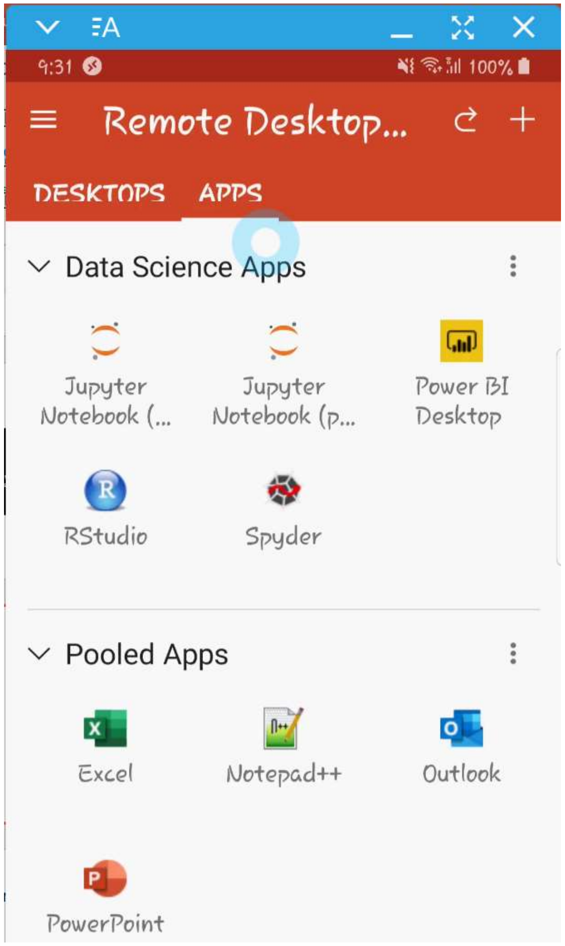
- Faster startup experience, improved syncing optimized for virtual environment, and per-user Desktop Search

Teams Enhancements

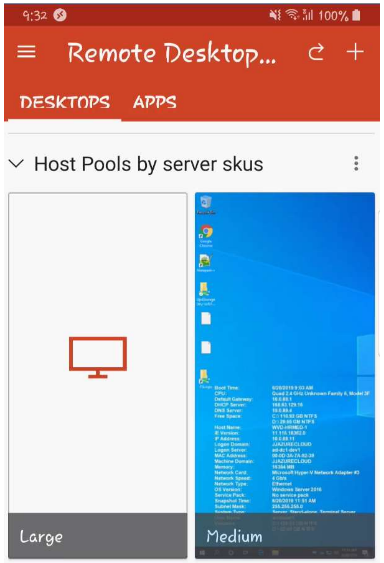
- Multimedia redirection capability, high-performance, low latency audio & video calling

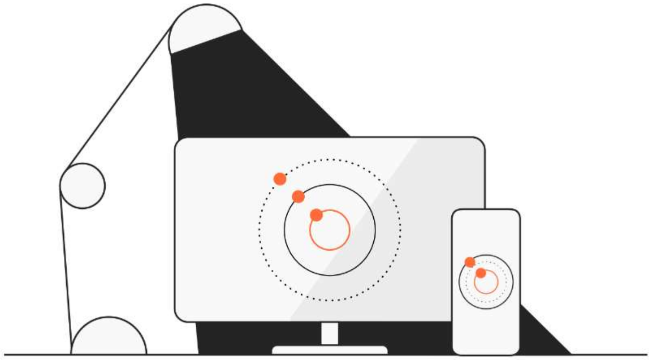
Office 365 ProPlus also supported on Windows Server 2019 (with OneDrive Files-on-Demand capabilities)

Windows Virtual Desktop Mobile Android



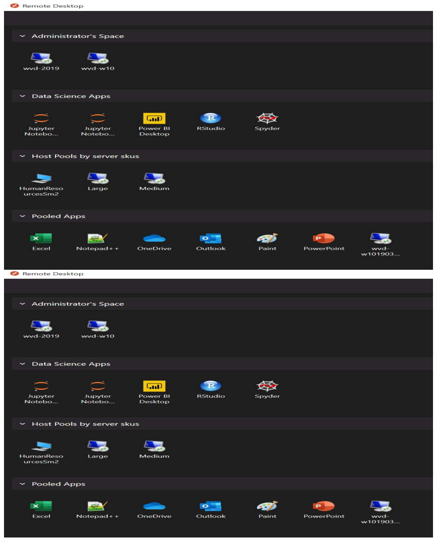
https://www.samsung.com/global/galaxy/apps/samsung-dex/



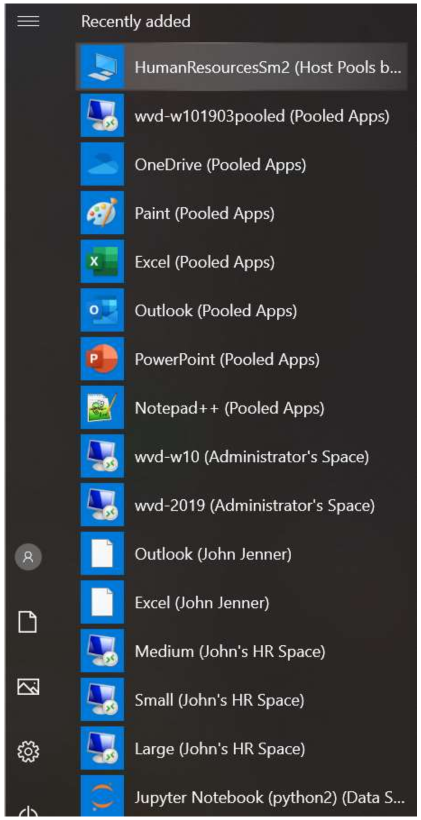


Samsung DeX is getting ready to start.

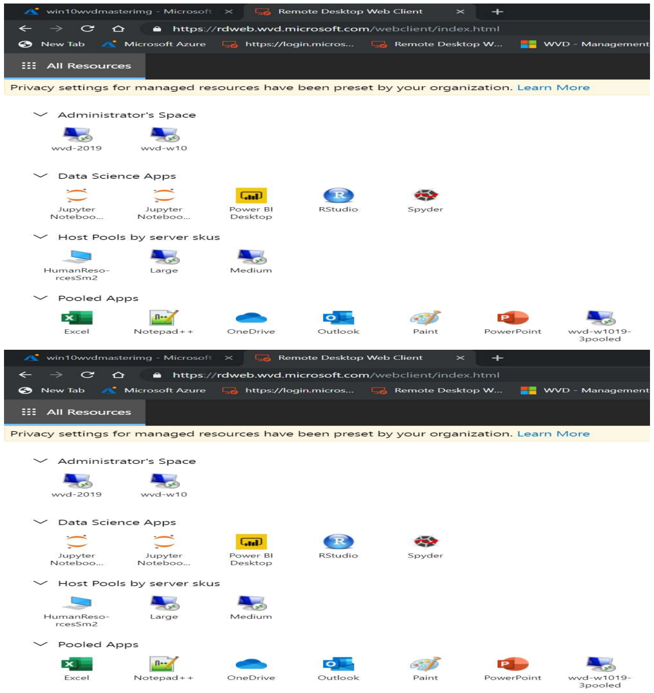
Windows Virtual Desktop 3 ways



RDClient



Windows 10 Start Menu Integration



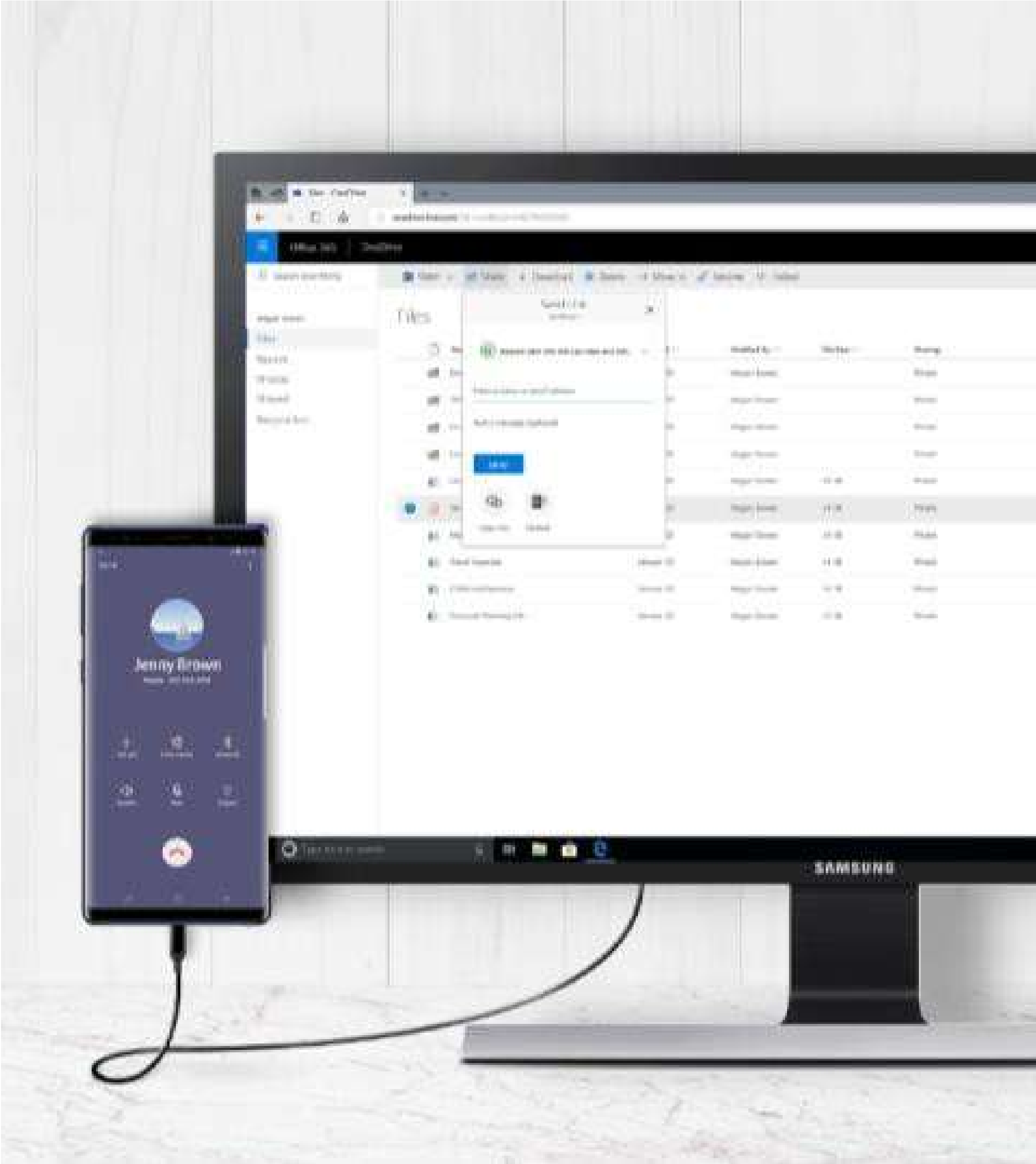
HTML 5 Browser

Windows Virtual Desktop with Samsung DeX

Full screen Windows 10 and Office 365 ProPlus experience from Samsung DeX-enabled mobile devices, providing the **Windows Virtual Desktop experience on an Android endpoint**

Enhanced mobility and productivity with **small and big screen experience**, allowing customers to seamlessly switch from one application to another

Faster speeds and reduced latency with the new Samsung Galaxy S10 support for 5G and Wi-Fi 6



Samsung DeX

PC-like experience entirely powered by Galaxy device

- Software that’s built-into Galaxy device that provides PC-like experience (optimized UI)

- Connects Galaxy device to a bigger screen, keyboard and mouse

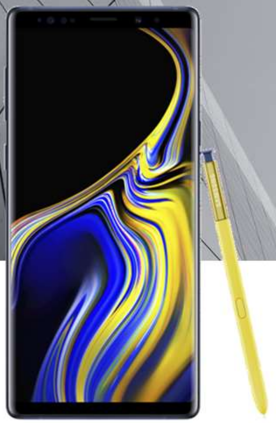
- Unifies the mobile and desktop with optimized user experience

- Knox security built-in, granular management controls and customizable for your business via Intune

More information on Samsung DeX can be found here

DeX Ready Devices

Galaxy S Series



Galaxy Note Series

Galaxy Tab S Series

Galaxy S10

Most Advanced Network Capability (5G, Wi-Fi 6)

Ultimate Performance (Improved CPU and GPU, reduced power consumption)

Galaxy Note 9

Optimized for Productivity (Connected S Pen, 12MP+8MP Cameras)

Firstline Worker ready (Water & Dust Resistance (IP68), All Day Battery)

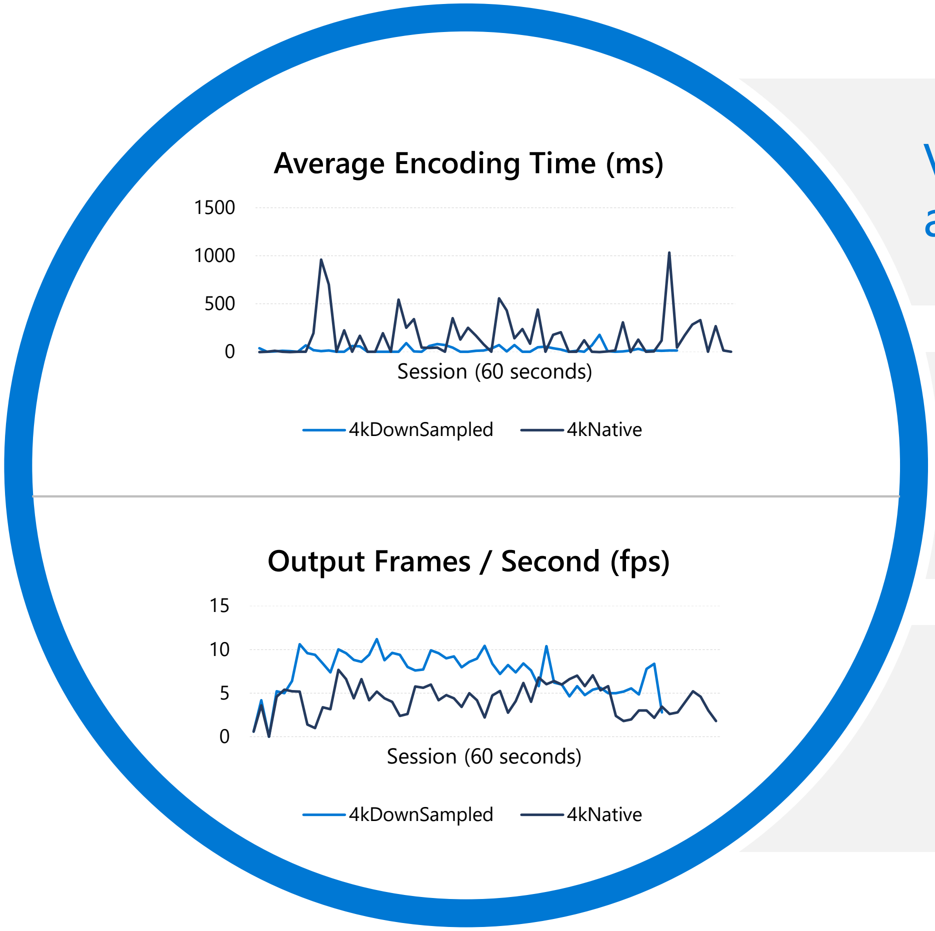
Galaxy Tab S4

Optimized for Customer engagement (Immersive display, 16hr battery)

Productivity on the go (S-Pen, Pogo Keyboard)

Connection
thru USB-C

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

Enabling Teams on WVD

Full-featured, high-performance M365 integration is critical to WVD.

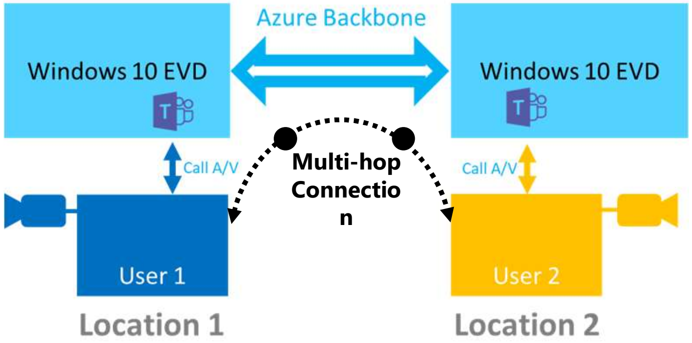
However, UC apps like Teams aren't well-supported in VDI environments:

- Latency, glitching, and A/V sync challenges when streams redirect through VM
- Difficulties associated with traditional in-app Acoustic Echo Cancellation implementations result in unacceptable audio quality
- Increased vCPU usage during peak reduces user/core density

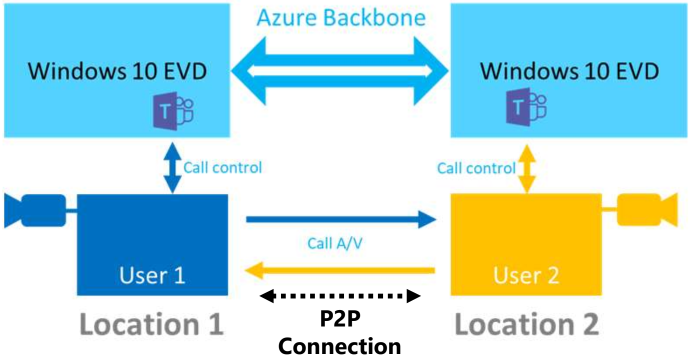
We are delivering WebRTC-based P2P conferencing for Teams:

- Modular design can support new remote protocols and OS environments with less rework while retaining a common core.
  - **Design decision**: We have scoped out support for Win7 clients. Support for Win7 clients will be based on customer feedback.
- High-performance peer-to-peer streaming facilitated by WebRTC
- On Win10 clients, all the benefits of the modern media stack including HW video decoding

Current: Teams Calling with device redirection



WebRTC Enabled: Peer-to-peer Teams on WVD



Top ten Citrix value adds to Windows Virtual Desktop

Hybrid cloud management

- Have a single interface for workloads on-premises or in Azure.*
- Migrate, capacity burst, or load balance.

*Windows 10 Enterprise support available only in Azure.

Citrix HDX technology

- Access any device, any connection.
- Optimize for Microsoft Teams, Skype, and more.

Performance and security analytics

- Gain visibility into user behavior and session responsiveness.
- Catch small issues before they become big ones.

Workspace environment management

- Optimize user density and logon performance.
- Improve user experience.
- Maximize IT spend value.

Session recording

- Record and play back sessions for issue diagnosis, compliance, and security audits.

Citrix app protection and watermarking

- Protect against accidental and malicious data leaks.

Advanced monitoring

- Use tools built for enterprise scale.
- Monitor health, user sessions, and more.

AutoScale

- Scale environments and cloud workloads.
- Leverage existing investments and ramp sessions into the cloud.

Citrix provisioning

- Simplify administration.
- Enhance reliability.
- Rapidly deploy at any scale.

Citrix app layering

- Access flexible technology.
- Enhance user experience.
- Leverage nonpersistent environments.

Appendix

Futures

Feature	Target Availability	Environment
MSIX – App Attach	Q1’20	Private Preview
AAD Join (No DC)	Q4’19	Public Preview
Azure Files with Domain	Q1’20	Public Preview
Personal Desktop Assignments	Q4’19	GA
Portal Management ARM Integration	Q2’20	Preview
AD Group Add	Q1’20	GA
Intune Support for Win 10 Multi Session	H1’20	Preview
Security Center/ Sentinal Integration	H1’20	Preview

Additional Resources – How to Videos

1. WVD Deployment
2. WVD Management
3. WVD User Profiles
4. WVD High Availability of User Profiles
5. WVD User Experiences
6. WVD Web Management UX
7. WVD Scaling Out (Building new session hosts in existing host pools manually)
8. WVD with Azure AD Domain Services
9. WVD Web Diagnostics tool
10. WVD Automation (Build new session hosts in existing host pools with a custom PowerShell script extension)
11. WVD Monitoring (Sepago)
12. WVD Updates (Build new, throw away the old with my custom ARM Template to build new Session hosts in existing host pools, joining to domain and adding to WVD automatically)
13. WVD Bandwidth Recommendations
14. WVD Latency & Experience Estimator
15. WVD Partners
16. WVD Windows 7 / 10 Client
17. WVD Android Client
18. WVD MacOS Client
19. WVD ios Client

https://aka.ms/rdposter

Windows Virtual Desktop

Windows Virtual Desktop is the only service that delivers simplified management, a multi-session Windows 10 experience, optimizations for Office 365 ProPlus, and support for Windows Server Remote Desktop Session Host (RDSH) desktops and apps. With Windows Virtual Desktop, you can deploy and scale your Windows desktops and apps on Azure in minutes.

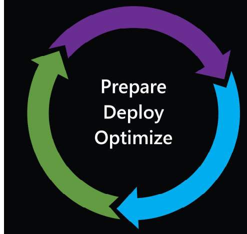
Reasons to choose Windows Virtual Desktop:

Deliver the only multi-session Windows 10 experience

Enable optimizations for Office 365 ProPlus

Migrate Windows Server (RDS) desktops and apps

Deploy and scale in minutes



Microsoft

PREPARE

A highly scalable Windows Virtual Desktop deployment requires the use of specific patterns and practices. Designing for optimal performance and scale-out is key. Use the scenarios below to help you envision, architect, and continually refine your deployment.

VDI VS. SESSION-BASED

Deploy session hosts for a more lightweight and cost effective model when requirements for user resources are lower. Take advantage of increased application compatibility and a familiar Windows Client OS experience with a VDI deployment.

PERSONAL OR POOLED DESKTOPS

Personal desktops give end users increased flexibility of administrative access, while pooled desktops lower maintenance requirements and costs. Provision personal and pooled desktops in both VDI and session-based deployments.

DEPLOY ANYWHERE

Deploy User VMs anywhere in the world and connect to management services at the location most suited to your needs. Connect to on-premises data/resources as needed using Azure site-to-site VPN or Express Route.

CATER TO DIFFERENT KINDS OF USERS

Scale your deployment depending on the expected need of each type of user.

For example, users may perform data entry tasks on lightweight apps, manipulate large datasets with productivity apps like Office, or work with heavy duty engineering or graphics apps.

ACCESS FROM ANYWHERE

End users can connect to internal network resources securely from outside the corporate firewall through Windows Virtual Desktop.

HIGH AVAILABILITY

The Windows Virtual Desktop services provide high availability to support large-scale deployments and allow end users to connect seamlessly, every time.

SECURE AUTHENTICATION

Leveraging the power of Azure Active Directory and ADFS to provide secure seamless, single sign on functionality. Further enhance security through features like MFA and conditional access [CA].

SECURE DATA STORAGE

Store business resources, user personalization data, and settings securely on-premises or in Azure. Remoteapp and Desktop Hosts use AD authentication and empower users with the resources they need in a personalized environment, securely.

SECURE ENVIRONMENT

New architecture uses reverse connect functionality from the Remoteapp and Desktop Hosts to the infrastructure roles. This eliminates the need for opening any inbound IP ports to the Remoteapp and Desktop Hosts environments, thereby increasing the isolation and security for your virtual workspace environment.

ENABLE HIGH-END GRAPHICS REMOTING

Improve users' graphics performance in a remote session by attaching GPUs to your Remoteapp and Desktop Hosts servers. Directly map a GPU to a VM using Discrete Device Assignment.

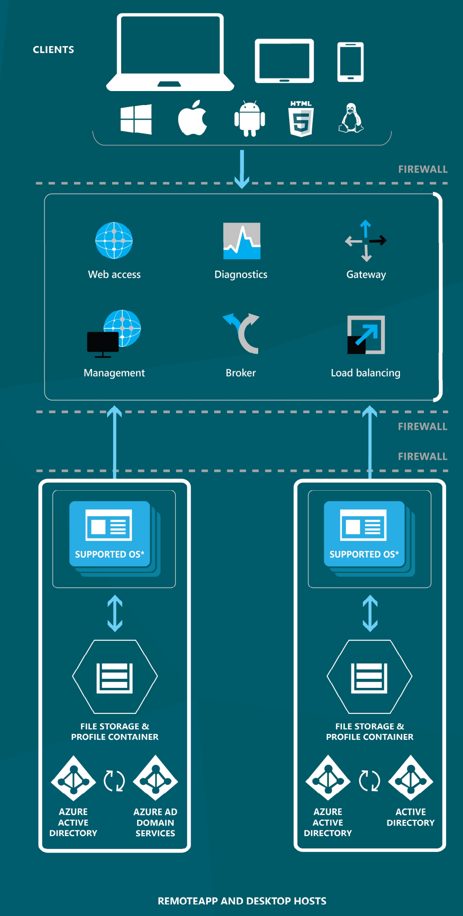
CONNECT FROM ANY DEVICE

Access corporate resources from any Windows, Apple, Android, or Linux computer, tablet, or phone. Enable users to easily see their available desktops and applications from any device through WVD Web Feed.

DEPLOY

Windows Virtual Desktop services are managed by Microsoft and available to the administrator. The services automatically manage connections between the customers users and virtual machines.

Azure Active Directory provides highly secure authentication for your users to connect from any Windows, Apple, Android, or Linux computer, tablet, or phone.



OPTIMIZE

Tuning your deployment requires instrumentation and monitoring. Use the processes below to refine your Windows Virtual Desktop deployment, keep it running, and enable scaling out (and in) as needed.

It's a good practice to continually assess the metrics and balance against running costs.

MANAGEMENT & MONITORING

Use the Windows Virtual Desktop (WVD) Diagnostics role to monitor deployments for potential bottlenecks and troubleshoot issues with user connections and administrative activities.

POWERSHELL & REST API: *Use the WVD* PowerShell module or the REST API to perform and automate administrative tasks such as deploying resources, configuring deployments, and troubleshooting problems. Delegate administrative capabilities using the WVD Role-based Access Control system and built-in roles.

GRAPHICAL USER INTERFACES: Use the WVD Management and Diagnostics web interfaces for manual deployment configuration, diagnostics, and troubleshooting.

SCALE: BIGGER, BETTER, FASTER

With visibility into the deployment, you can control scale with more precision. Easily add or remove resources, such as Remoteapp or desktop session host VMs, based on scale needs.

WVD deployments built on Azure can make use of Azure services, like Azure Files and Azure compute, to easily scale as needed.

AUTOMATION: SCRIPT FOR SUCCESS

Maintaining a large deployment involves repeating administrative tasks on a regular basis. Use WVD PowerShell cmdlets to develop scripts that can be run on multiple deployments with consistent results.

LOAD TEST YOUR DEPLOYMENT

Load test the deployment with both stress tests and simulation of real-life usage. Vary the load size to avoid surprises! Ensure that responsiveness meets user requirements, and that the entire system is resilient. Create load tests with simulation tools that check your deployment's ability to meet the users' needs.

Desktop virtualization using Windows Virtual Desktop—service architecture

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