

*A Belgian and a Dutchman walk  
into a ~~bar~~ Community Meetup...*

# Quiz!



&





Freek Berson  
Wortell / RDSGurus  
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Microsoft MVP

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ASPEX / Cloud.Architect  
@michawets  
Microsoft MVP

**Application and Desktop delivery on Azure,  
from cool to awesome!**



My Computer

# Remoting 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

# The options

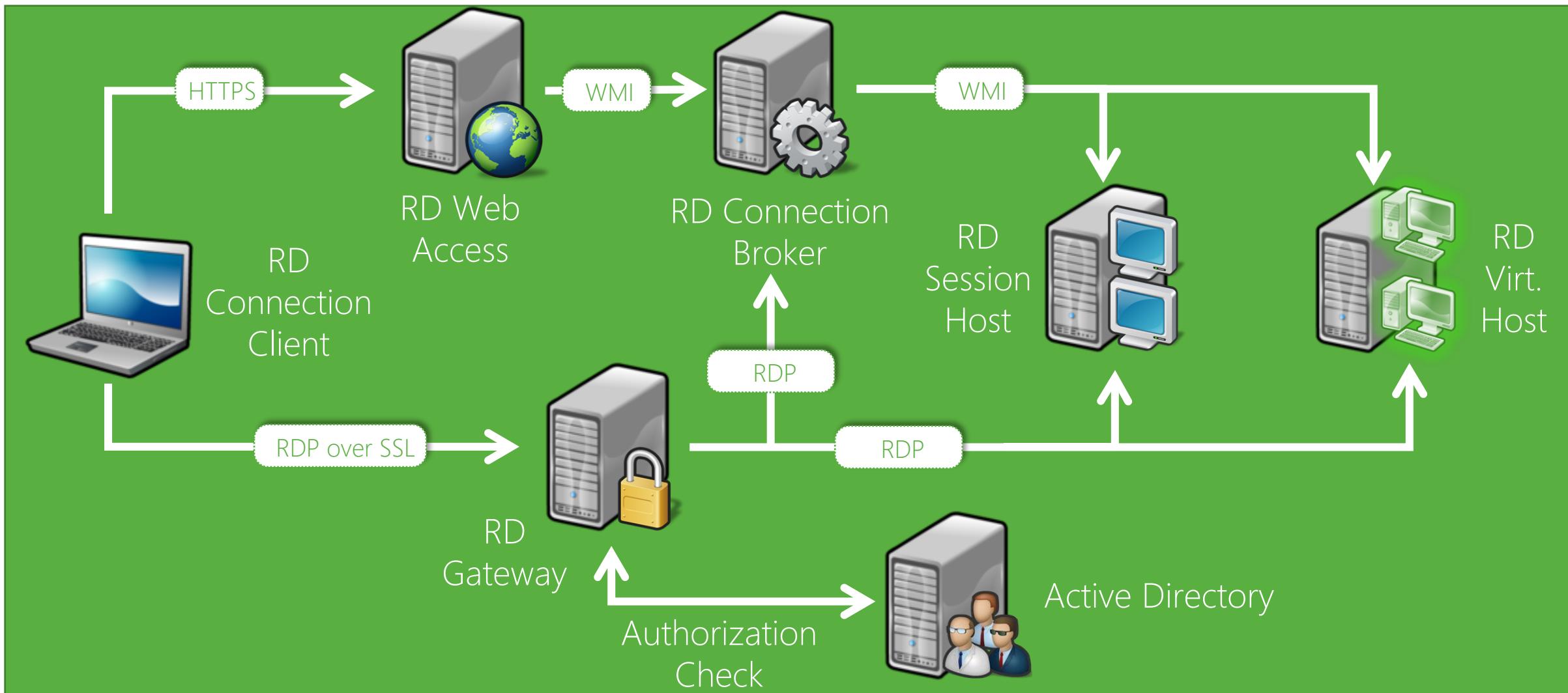
RDS on (Azure) IaaS ideal if you want...

- full end-to-end control of the desktop virtualization environment
- a private, isolated environment
- to extend current deployments

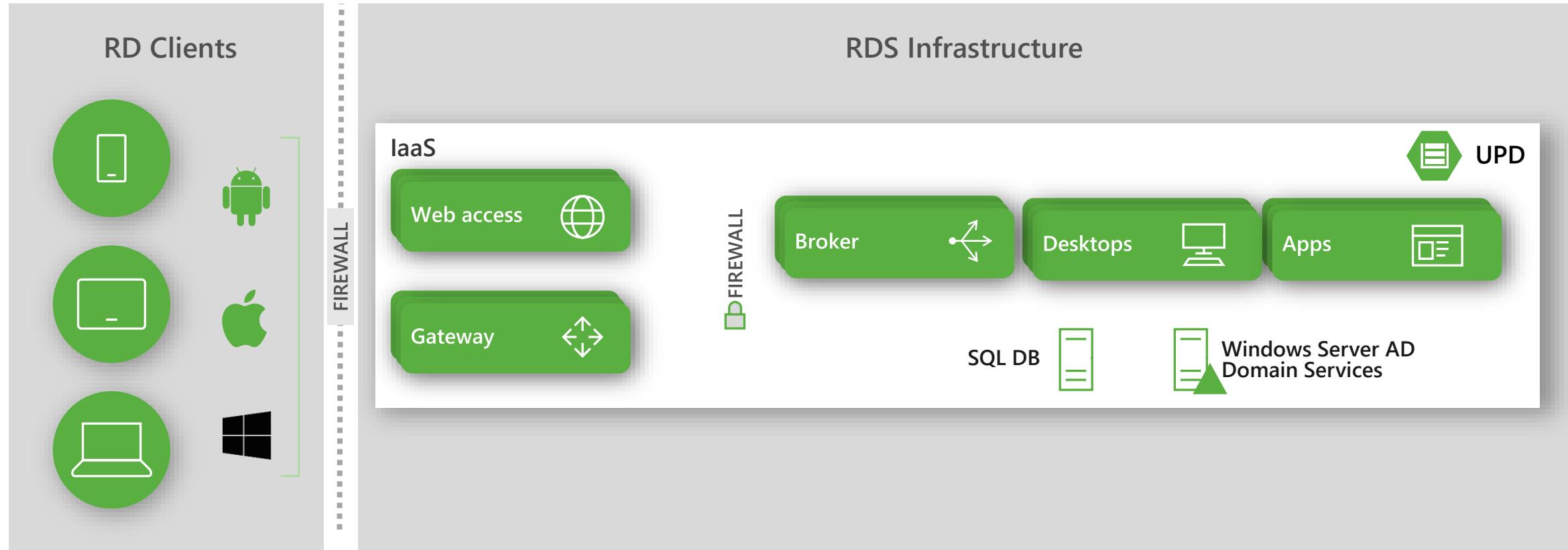
Windows Virtual Desktop ideal if you want...

- Microsoft to manage the brokering infrastructure as a service
- Windows 10 Enterprise multi-session capabilities
- Windows 7 Extended Security Updates

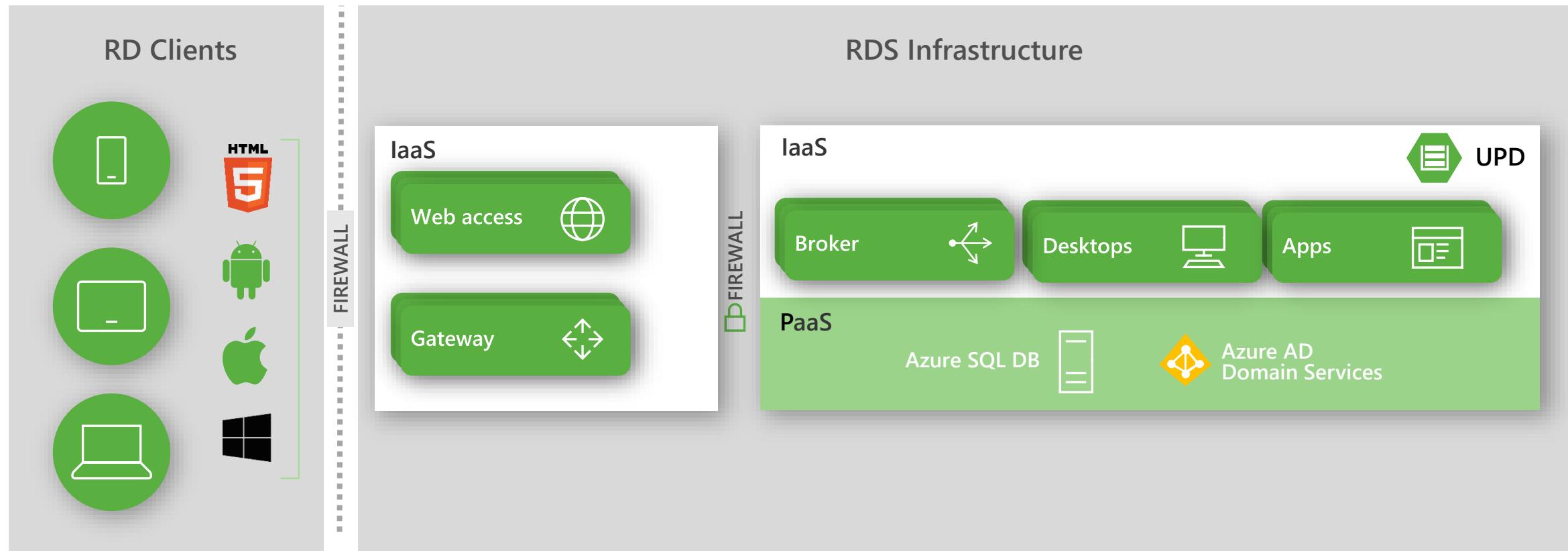
# RDS Roles explained



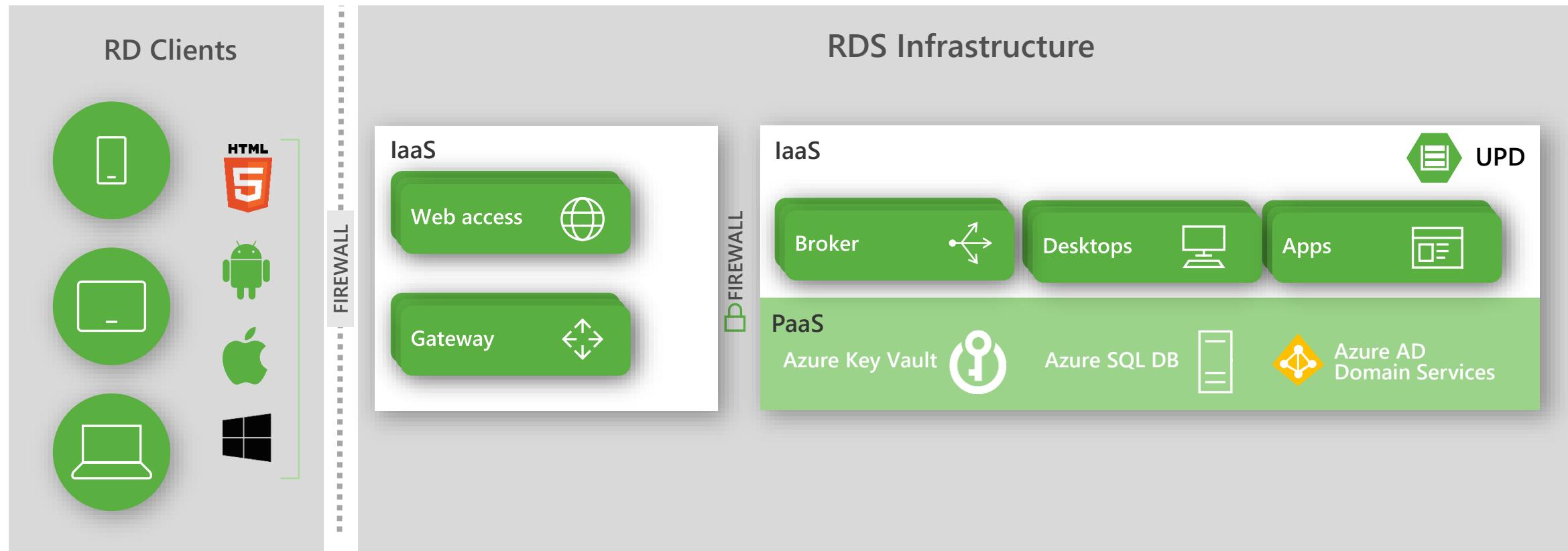
# RDS on Azure IaaS 2012 R2



# RDS on Azure IaaS 2016

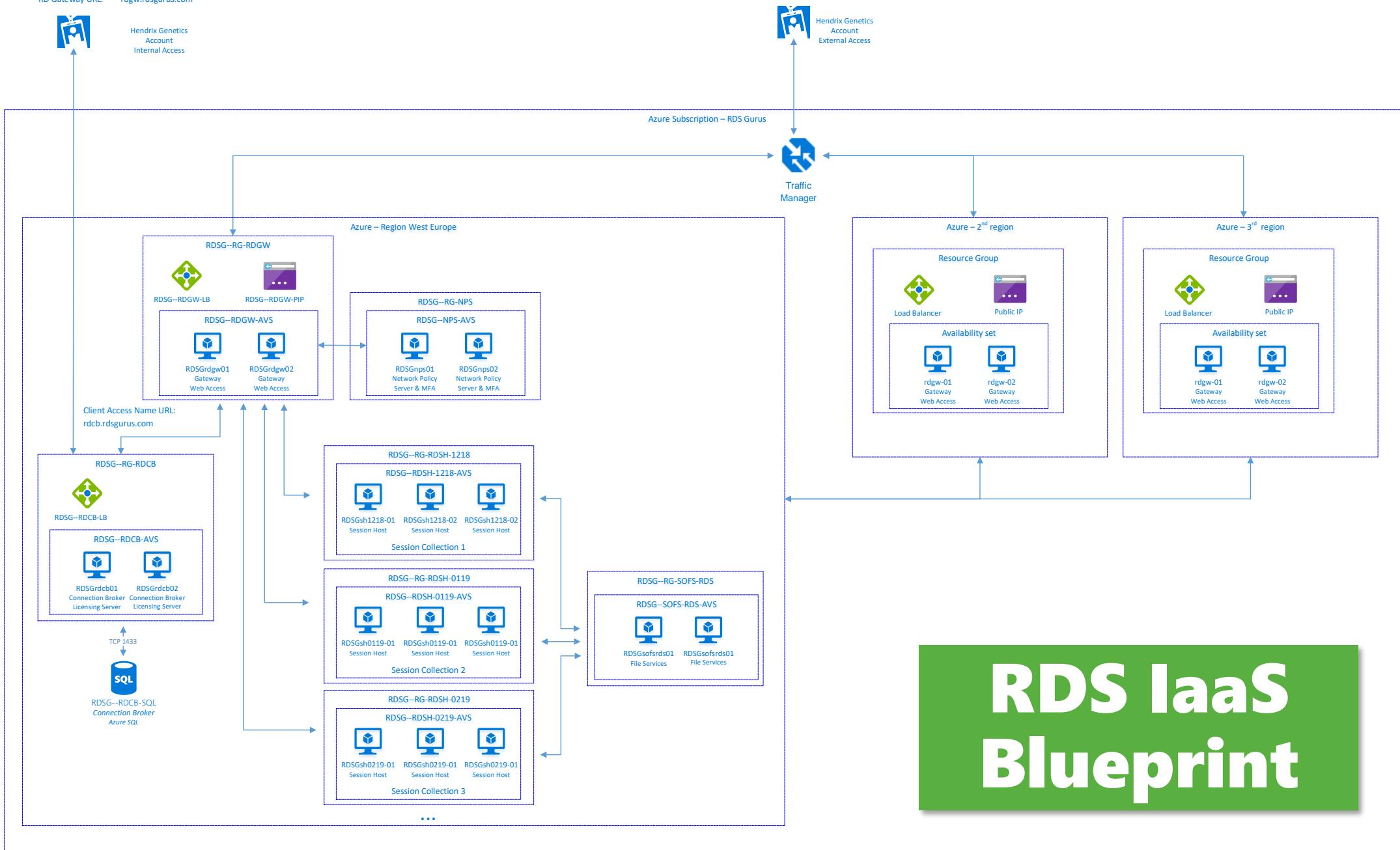


# RDS on Azure IaaS 2019



RD Web Access URL: [apps.rdsgurus.com](http://apps.rdsgurus.com)  
RD Gateway URL: [rdgw.rdsgurus.com](http://rdgw.rdsgurus.com)

RD Web Access URL: [apps.rdsgurus.com](http://apps.rdsgurus.com)  
RD Gateway URL: [rdgw.rdsgurus.com](http://rdgw.rdsgurus.com)





# ARM Template Goal

6 Managed Disks

6 NIC's

6 VM's

3 Availability Sets

Azure SQL Database

Static public IP Addresses

2 load balancers

All VM's joined to AD Domain

Anti-virus & Anti Malware configured

Bginfo configured

Full HA RDS Deployment

2 RD Connection Broker / Licensing

2 RD Gateway / Web Access

2 RD Session Host

SSL Certificates configured for all roles

Session Collection created

Sample RemoteApp published

RD Web Access branding

RD CAP / RAP Policies

Session Time Out settings configured

UPD Configuration

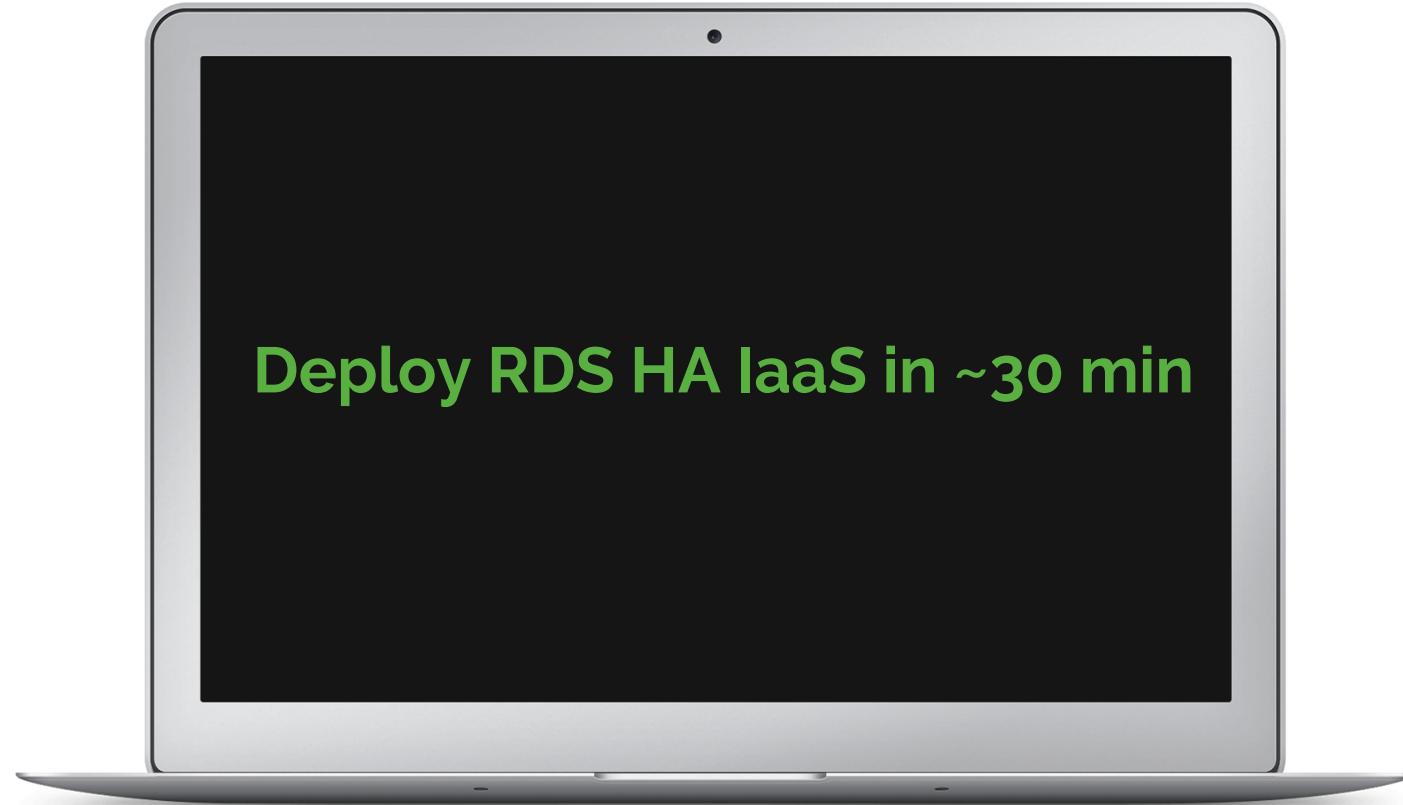
HTML5 configuration

PUBLISHER

freekberson@hotmail.com

```
6      "type": "string",
7      "metadata": {
8          "description": "The name existing of the AD domain
9      }
10     },
11     "adminPassword": {
12         "type": "securestring",
13         "metadata": {
14             "description": "The password of the administrator
15         }
16     },
17     "adminUsername": {
18         "type": "string",
19         "metadata": {
20             "description": "The username of the administrator
21         }
22     },
23     "assetLocation": {
24         "type": "string",
25         "defaultValue": "https://rdsonazureiaas9114.blob.core.windows.net/assets",
26         "metadata": {
27             "description": "Asset location (Azure Blob Storage)
28         }
29     },
30     "authenticationMethodRDGateway": {
31         "type": "int",
32         "defaultValue": 1,
33         "metadata": {
34             "description": "RD gateway authentication method used
35         }
36     }
37 }
```

# Demo



# “Limitations” RDS on Azure IaaS

- It's IaaS 😊
- Based on Active Directory
  - No Conditional Access, MFA, ....
- No real Multi Tenancy, no RBAC
- Traditional Server Manager admin console
- No autoscaling of infrastructure roles
- Limited Windows Server versions support
- No modern Apps

SEPTEMBER 30, 2019

# Windows Virtual Desktop is now generally available worldwide

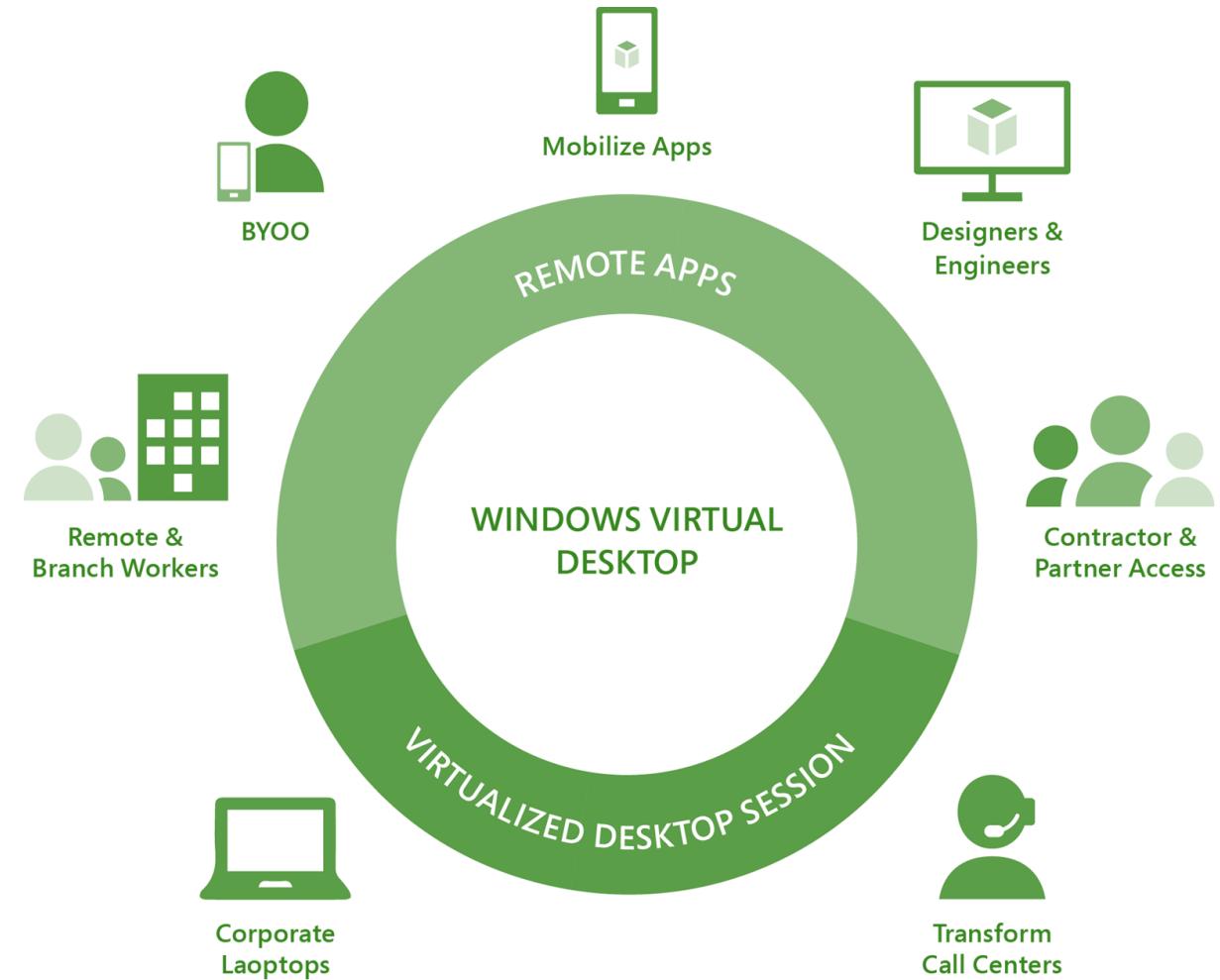
By Brad Anderson, Corporate Vice President for Microsoft 365, and Takeshi Numoto, Corporate Vice President for Microsoft Azure

Today, we're excited to announce that Windows Virtual Desktop is now generally available worldwide. 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 Services (RDS) desktops and apps. With Windows Virtual Desktop, you can deploy and scale your Windows desktops and apps on Azure in minutes.

# Windows Virtual Desktop

The best virtual desktop experience, delivered on Azure

- 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



# Windows Virtual Desktop

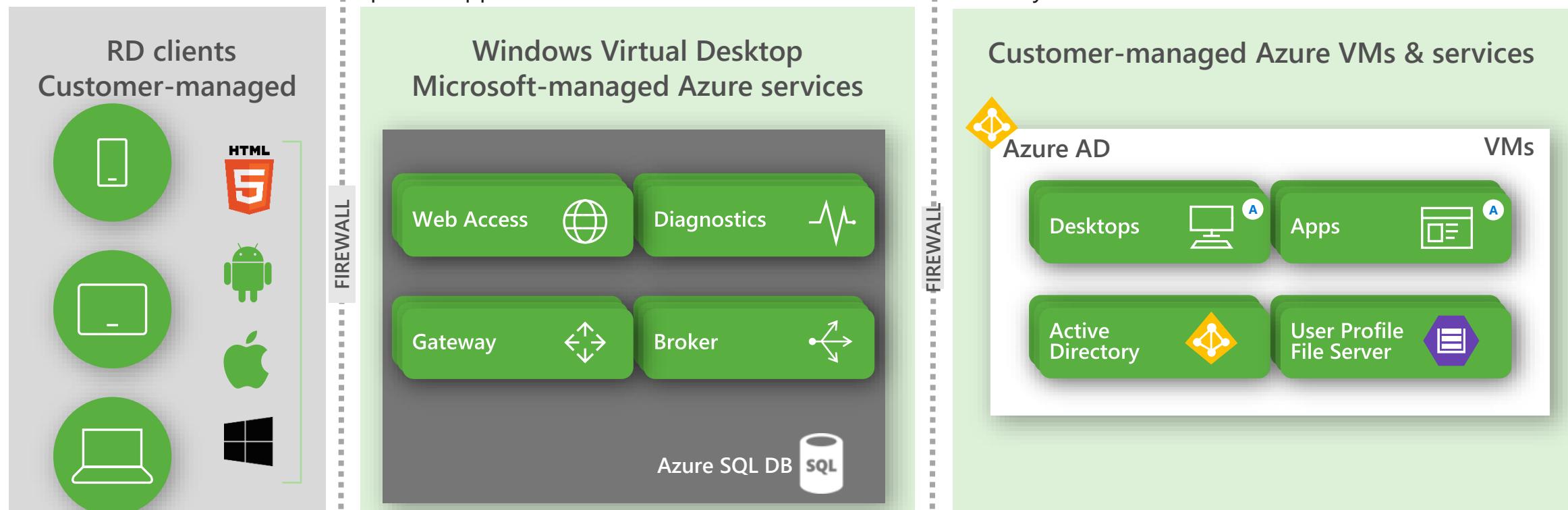
Consists of: **Azure service** to manage connections between **RD clients** and **Customer Managed Azure VMs**

IT admins can:

- Publish remote desktops and apps to end users from pools of single or multi-session VMs in Azure
- Manage and troubleshoot connections between RD Clients and Windows virtual machines

End users can:

- Connect to Windows desktops and applications from their favorite client device from anywhere on the internet

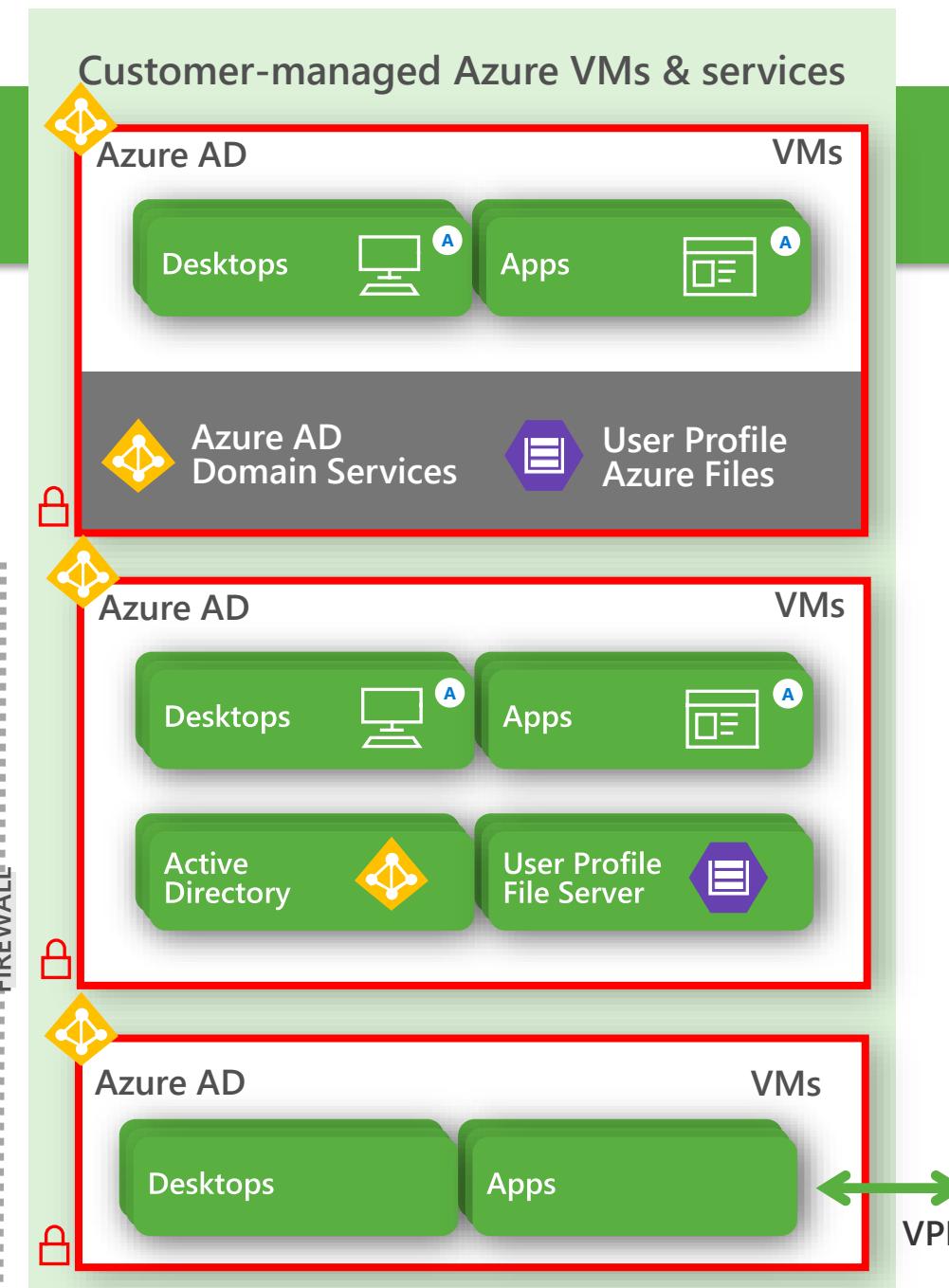
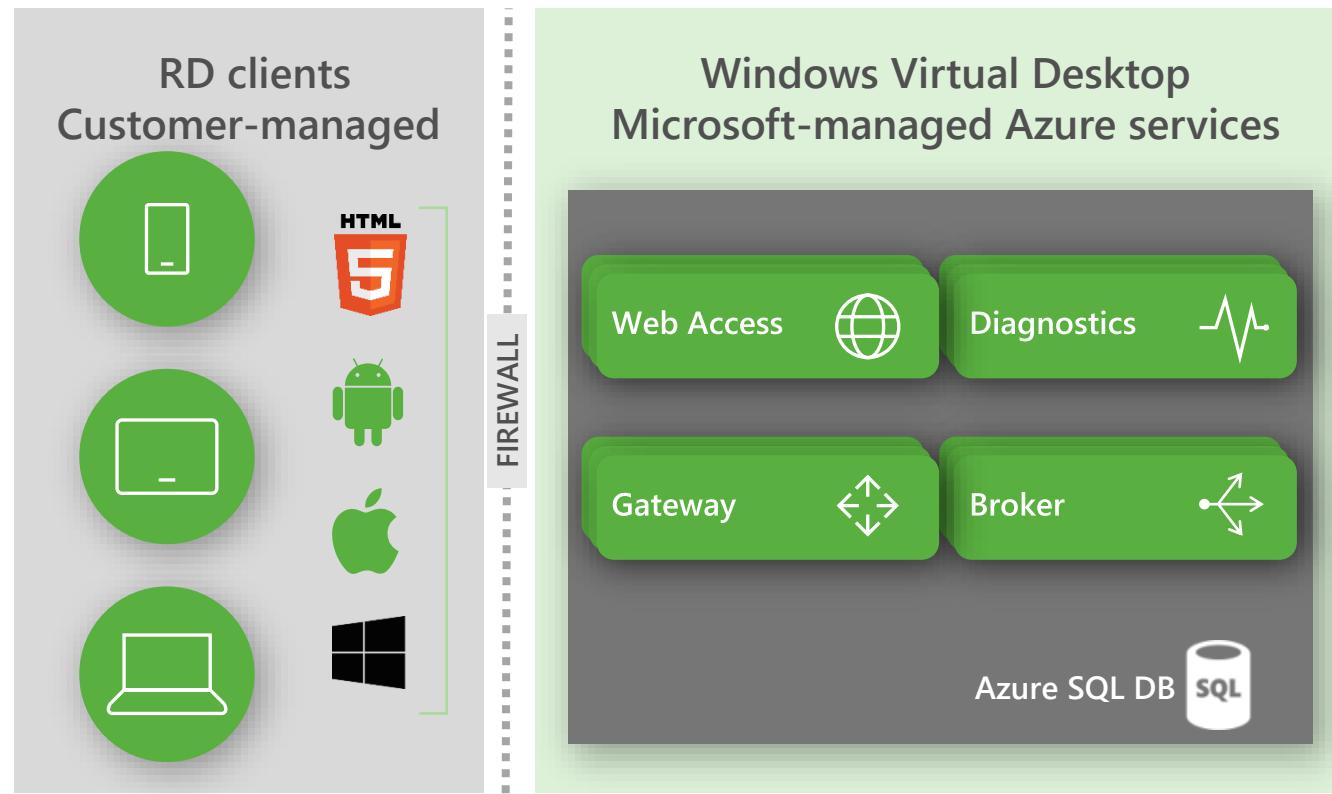


# Multitenancy

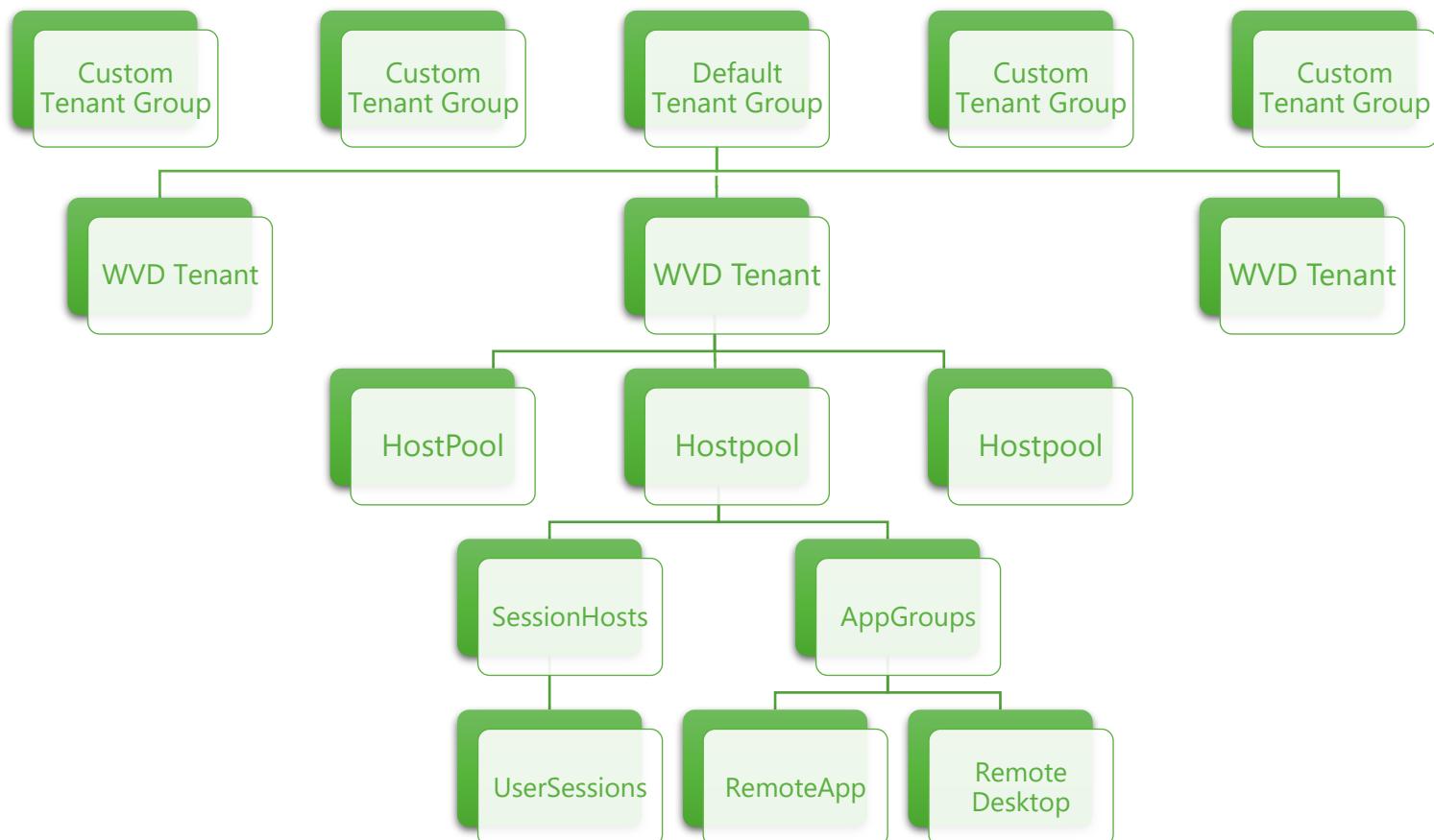
Customer environments are highly isolated

Different AD configurations in each customer environment

VPN from tenant environments to on-prem

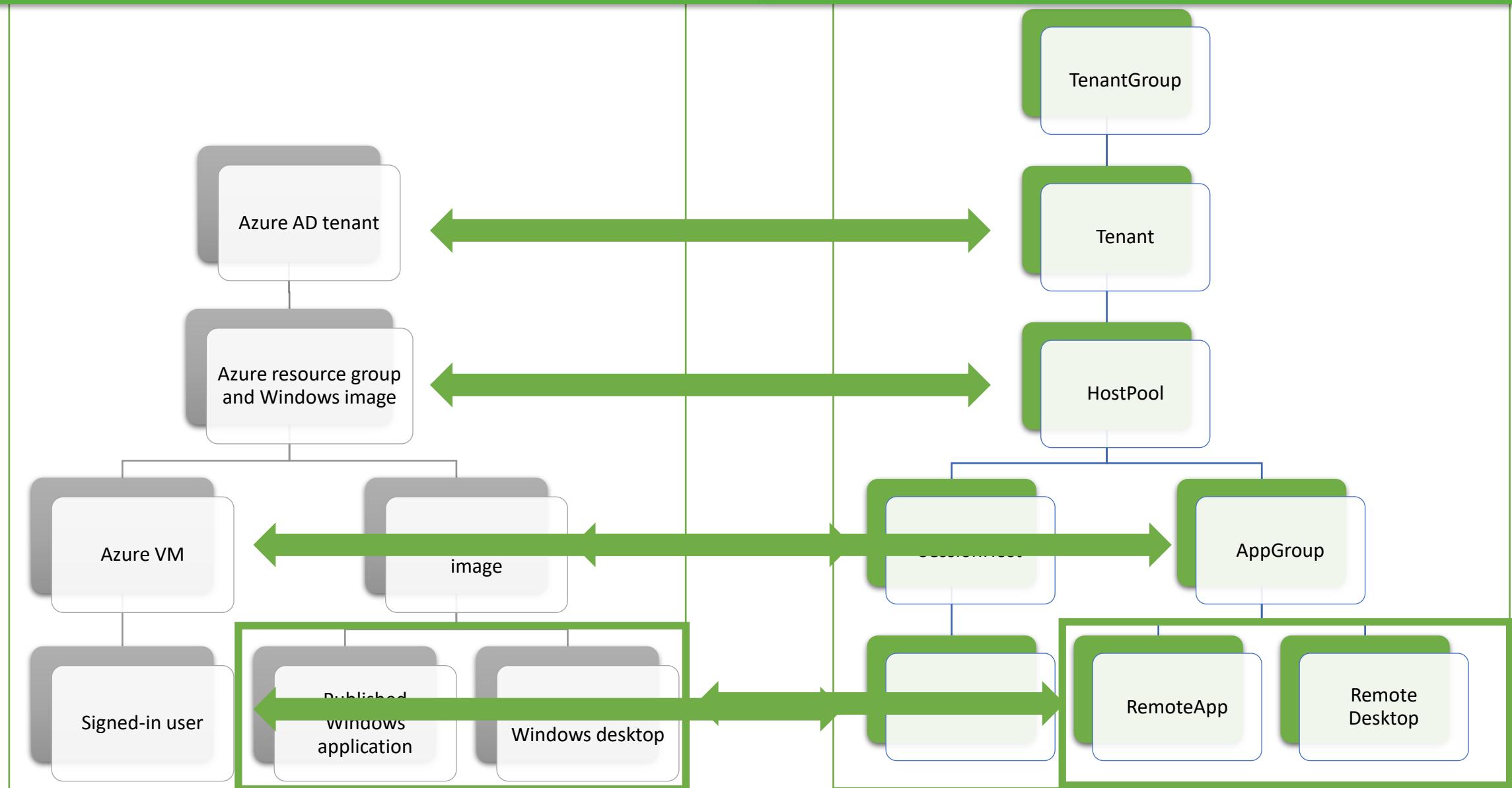


# WVD Object Model



# Azure

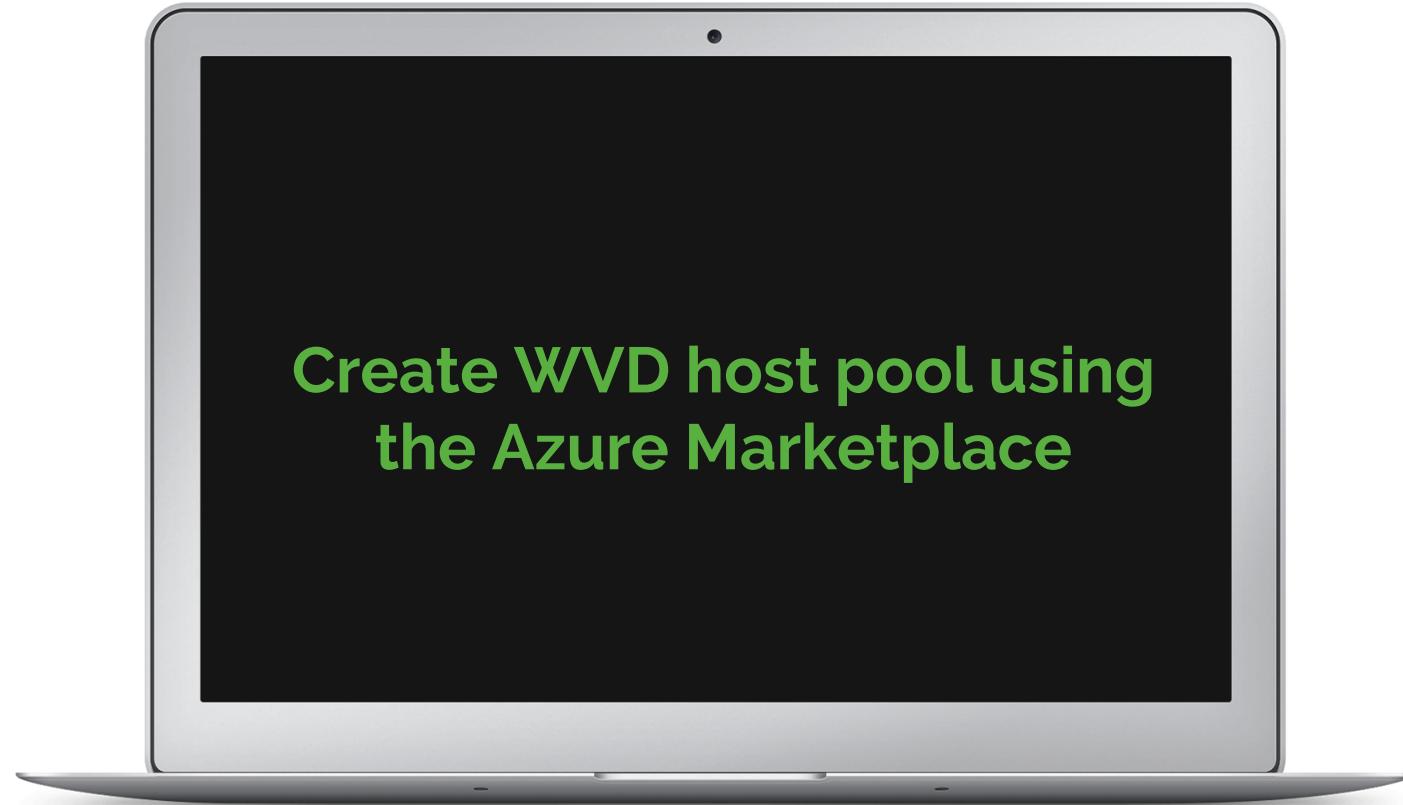
# WVD



# 5 main prerequisites

1. Azure subscription
2. Azure Active Directory
3. Determine your identity strategy (AD, ADDS)
4. All associated Azure resources (image, virtual network, storage)
5. Required credentials (Azure AD, WVD tenant, Service principle)

# Demo



# Expectations vs. Reality



sculpt

# Identity Strategies

Domain Controller inside your Azure subscription.

PRO:

- Reuse existing GPO's
- Optionally sync with on-prem

CON:

- Additional VM to manage

Cloud based organizations can use AADDS

PRO:

- Isolated environments that do not need connectivity to on-prem
- Azure AD leading source of identities

CON:

- AADDS costs per month
- No (full) reuse of existing GPO's

Hybrid based organizations can Use VPN or ER to connect DC's

PRO:

- Reuse existing GPO's
- No AADDS or DC in Azure is required

CON:

- Latency could be increased during authentication
- Not suitable for Cloud Only

# Windows 10 multi-user



## Windows Server 2019 RD Session Host

Scalable multi-user **legacy**  
Windows environment.

Windows Server 2019

Multiple users

Win32

Office 2019 Perpetual

Long-Term Servicing Channel

## Windows 10 Enterprise multi-user

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

Windows 10

Multiple users

Win32, UWP

Office 365 ProPlus

Semi-Annual Channel

## Windows 10 Enterprise

Native single-session **modern**  
Windows experience.

Windows 10

Single user

Win32, UWP

Office 365 ProPlus

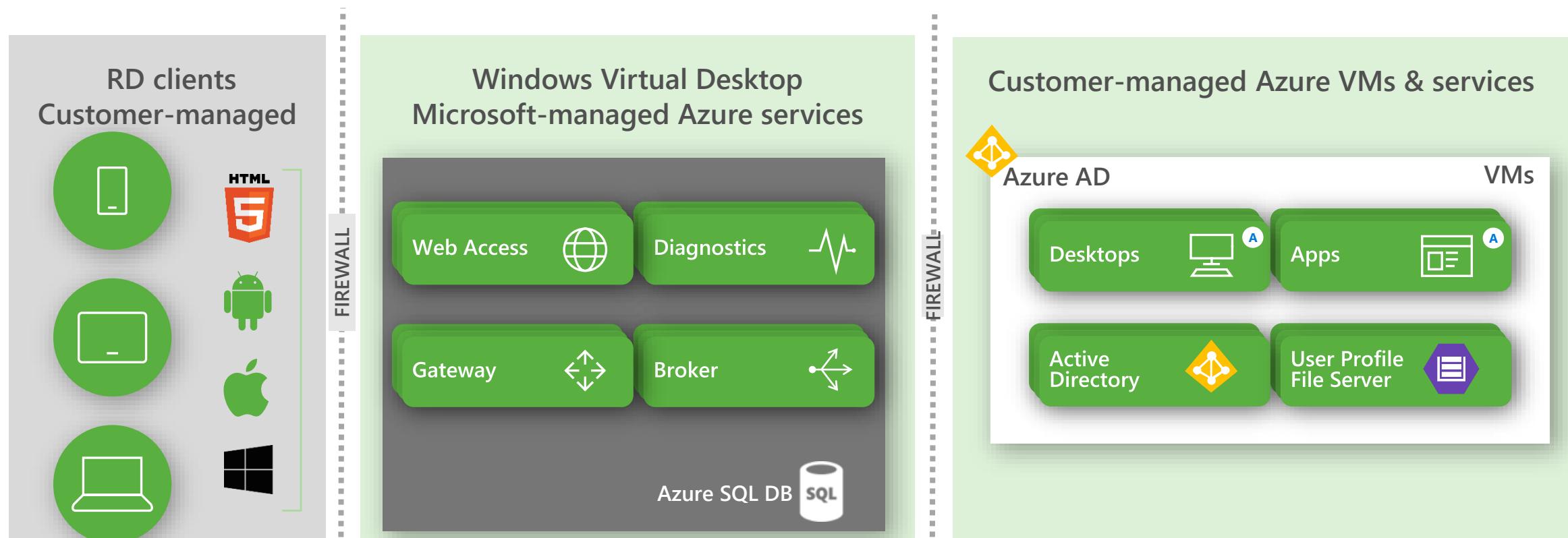
Semi-Annual Channel

# Azure AD Authentication

RD clients authenticate with Azure Active Directory (AD)

Enables Azure AD security features, such as Conditional Access, Multi-factor Authentication, and Intelligent Security Graph

Maintains app compatibility in the customer's environment where Windows VMs are AD domain-joined

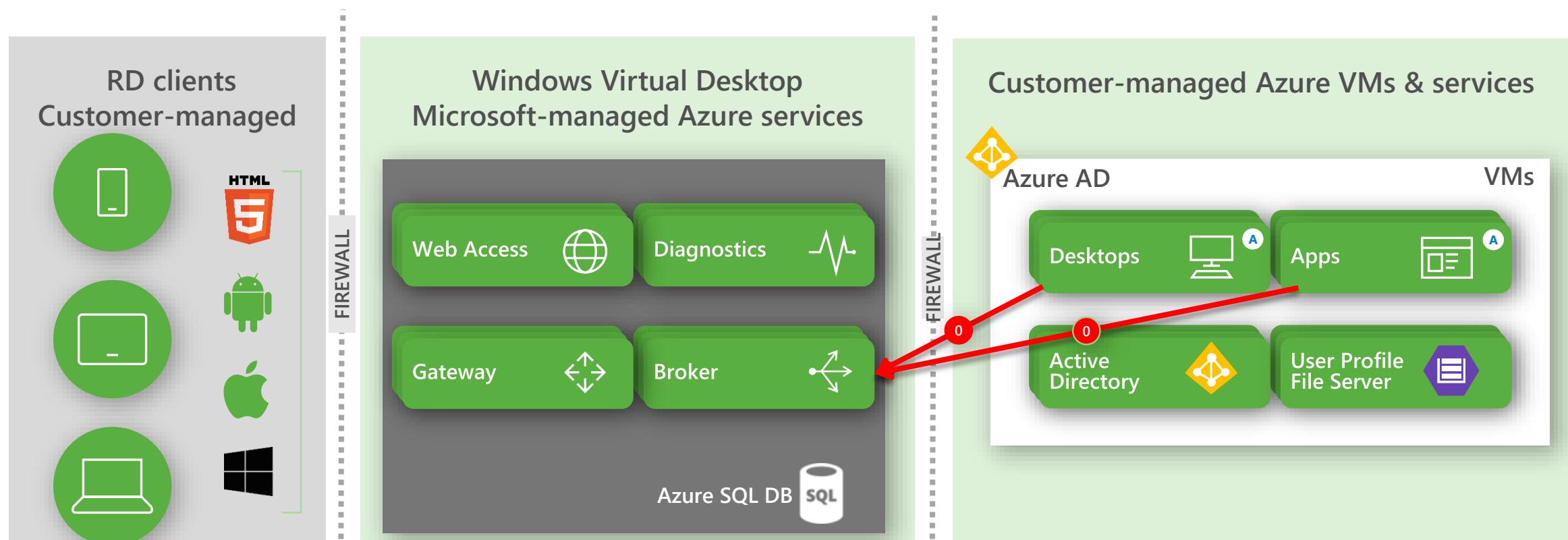


# Improved Isolation: Reverse Connect

Outbound WebSocket connections from customer VMs to Broker and Gateway

Bidirectional communications between VMs and WVD services over https (443)

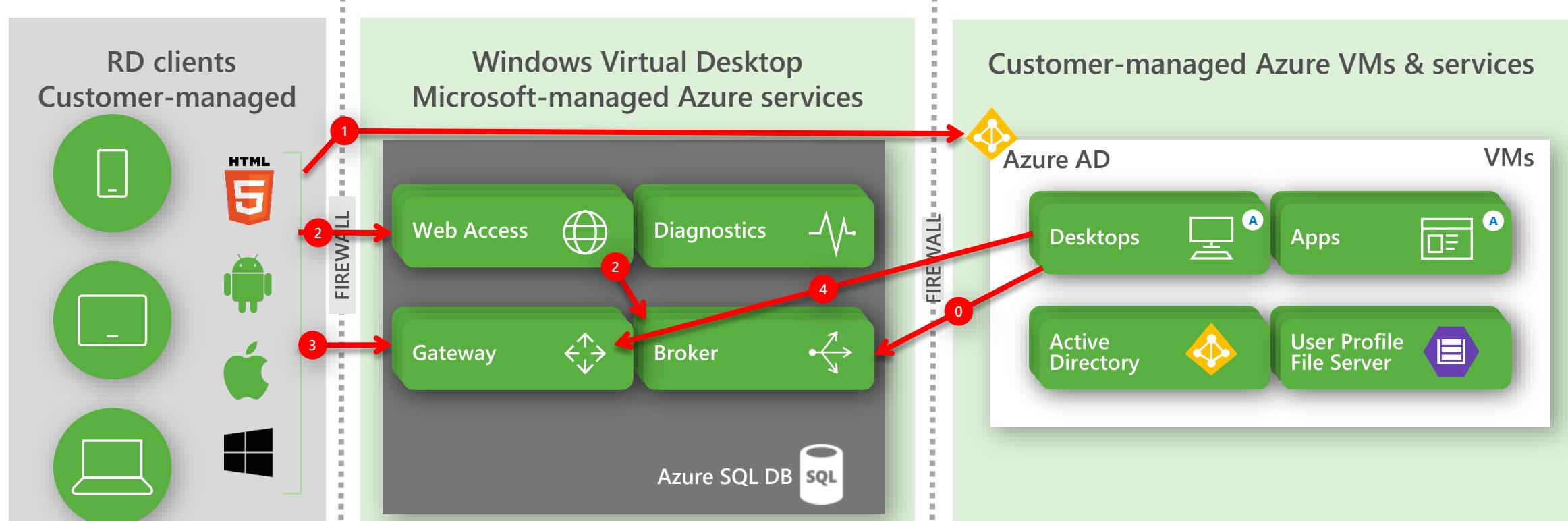
No inbound ports need be opened to the customer environment



# User Connection Flow

1. User launches RD client which connects to Azure AD, user signs in, and Azure AD returns token
2. RD client presents token to Web Access, Broker queries DB to determine resources authorized for user
3. User selects resource, RD client connects to Gateway
4. Broker orchestrates connection from host agent to Gateway

>>> RDP traffic now flowing between RD client and session host VM over connections 3 and 4



# Supported Hosts

Windows 7\*

Windows 10

Windows 10 Enterprise Multisession

Windows Server 2012

Windows Server 2012 R2

Windows Server 2016

Windows Server 2019

\* 64 bit only, azure limitation



# Supported VM Types

Hosts can be based on any VM type that is available in the Azure region.

Configure number of VMs... □ ×

Usage Profile ⓘ  
Light   Medium   Heavy   Custom

\* Total users  
100

\* Virtual machine size  
**4x Standard D8s v3**  
8 vcpus, 32 GiB memory  
**Change size**

\* Virtual machine name prefix ⓘ

Select a VM size  
Browse available virtual machine sizes and their features

nv  Restore default filters  
Add filter

Showing 3 of 83 VM sizes. | Subscription: Microsoft Azure Enterprise | Region: East US 2 | Curre

VM SIZE ↑↓	OFFERING ↑↓	FAMILY	↑↓	VCPUS ↑↓	RAM (GiB) ↑↓	DATA DISKS ↑↓	MAX IOPS ↑↓
NV12	Standard	GPU		12	112	48	40000
NV24	Standard	GPU		24	224	64	80000
NV6	Standard	GPU		6	56	24	20000

# Windows Virtual Desktop with Samsung DeX

## Benefits



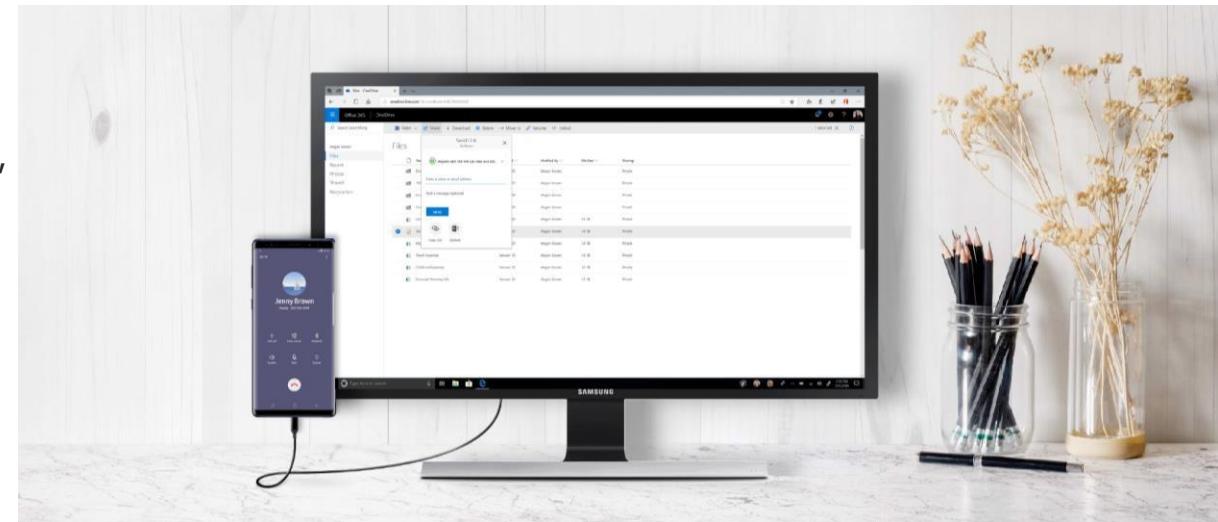
Full screen Windows 10 and Office 365 ProPlus experience from Samsung DeX-enabled mobile devices, providing the **Windows Virtual Desktop experience on an Android endpoint**



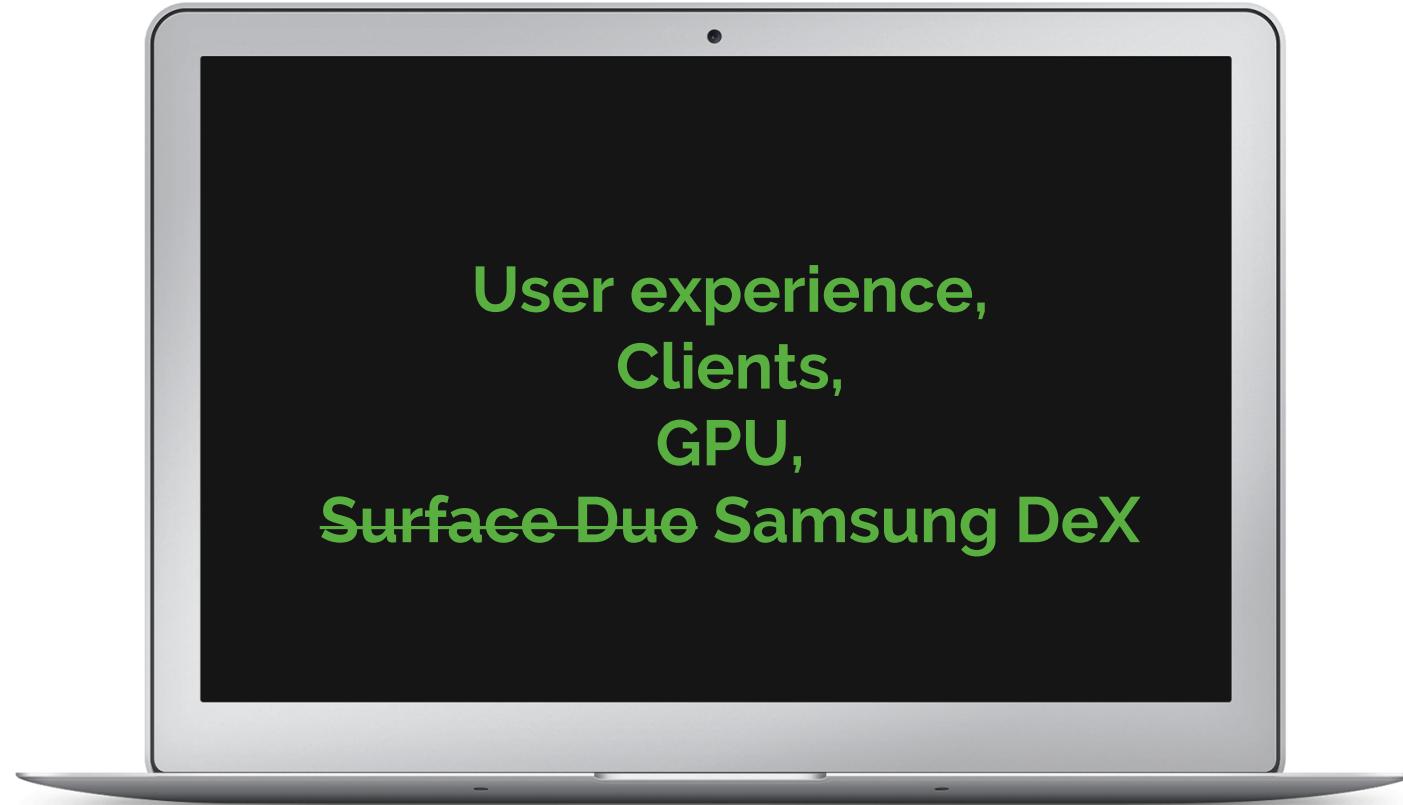
Enhanced mobility and productivity with **small and big screen experience**, allowing customers to seamlessly switch from one application to another



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



# Demo



# Quiz!



# Management options



## Deployment

- Azure Marketplace
- ARM templates



## Management

- Powershell cmdlets
- REST API
- Simple Management UI
- Azure Portal (post GA)
- Diagnostics UI



## Hosting partners

Leverage multitenancy support to scale the number of customers

# Built-in RDS roles

	Create (New-Rds*)	Read (Get-Rds*)	Update (Set-Rds*)	Delete (Remove-Rds*)	Authorize (*-RdsRoleAssignment)
RDS Owner					
RDS Contributor					
RDS Reader					
RDS Operator (diagnostics)					

# PowerShell CmdLets

PowerShell cmdlet	Description
Add-RdsAccount	User or service principle signs in to WVD service
Set, Get-RdsContext	Sets the TenantGroup context
New, Get, Set, Remove-Rds<objectName>	Manage explicitly created WVD objects, where ObjectName = TenantGroup, Tenant, HostPool, AppGroup, or RemoteApp
New, Export, Remove-RdsRegistrationInfo	Manage host pool's registration token
Get, Set-RdsRemoteDesktop	Manage RemoteDesktop
Get, Set, Remove-RdsSessionHost	Manage session hosts that are registered with a host pool
Get-RdsStartMenuApp	Return start menu apps available for publishing
Add, Get, Remove-RdsAppGroupUser	Manage user access an app group
Get, Disconnect-RdsUserSession	Disconnect user session
Send-RdsUserSessionMessage	Send message to user session
Invoke-RdsUserSessionLogoff	Sign user out of session
Get-RdsDiagnosticActivity	Return diagnostic information for user and admin activities

# Public Preview

The screenshot shows the Microsoft WVD Management interface. The URL in the browser is <https://wvduirsg.azurewebsites.net/admin/hostpoolDashboard/RdsgWvdAppHostpool03>. The user is logged in as Freek Berson (fb).

**WVD Tenants** sidebar:

- Tenants
  - RdsgWvdTenant03 (selected)
  - RdsgWvdTenant04
  - RdsgWvdTenant05
  - RdsgWvdTenantGPU01
  - RdsgWvdTenantGPU02

**Host pool "RdsgWvdAppHostpool03"** details:

General    Hosts    App Groups (selected)

+ Create App Group    Edit App Group    Delete App Group    Refresh

App Group Name	Friendly Name	Type
Desktop Application Group (Desktop Application Group)	Desktop Application Group	Desktop App Group
RDSGAppGroup03		Remote App Group

"RDSGAppGroup03" Details of RdsgWvdAppHostpool03

Summary    Apps (selected)    Users

+ Publish Apps from the Start menu    + Publish App from Path    Remove Apps    Refresh

Name	Path	Alias	Require Command Line
Chrome	C:\Program Files (x86)\Google\Chrome\Application\chrome.exe		
cmd	C:\Windows\System32\cmd.exe		
Explorer	C:\Windows\explorer.exe		
Microsoft Access	C:\Program Files\Microsoft Office\root\Office16\MSACCESS.EXE		

# Ultimate solution

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains a navigation menu with various service icons and links. The main content area is titled "Windows Virtual Desktop on Azure" and displays the following information:

- Subscription : Foo\_Subscription
- Region : East US
- Created date : 10/2/2018 1:59 PM

Below this, there are two summary metrics:

- 23 hostpools
- 0 users

Under the "Manage" section, there are links to Hostpools, Users, Workspaces, Tenants, Tenant Groups, and an option to Update access token.

A "Learn more about Windows Virtual Desktop on Azure" section features three blue buttons with white text:

- Get started
- Documentation
- Learn about billing

The bottom section is titled "Community" and includes links to:

- MSDN Forums
- Stack Overflow
- @AzureSupport on Twitter

The status bar at the bottom shows the Windows taskbar with various pinned application icons.

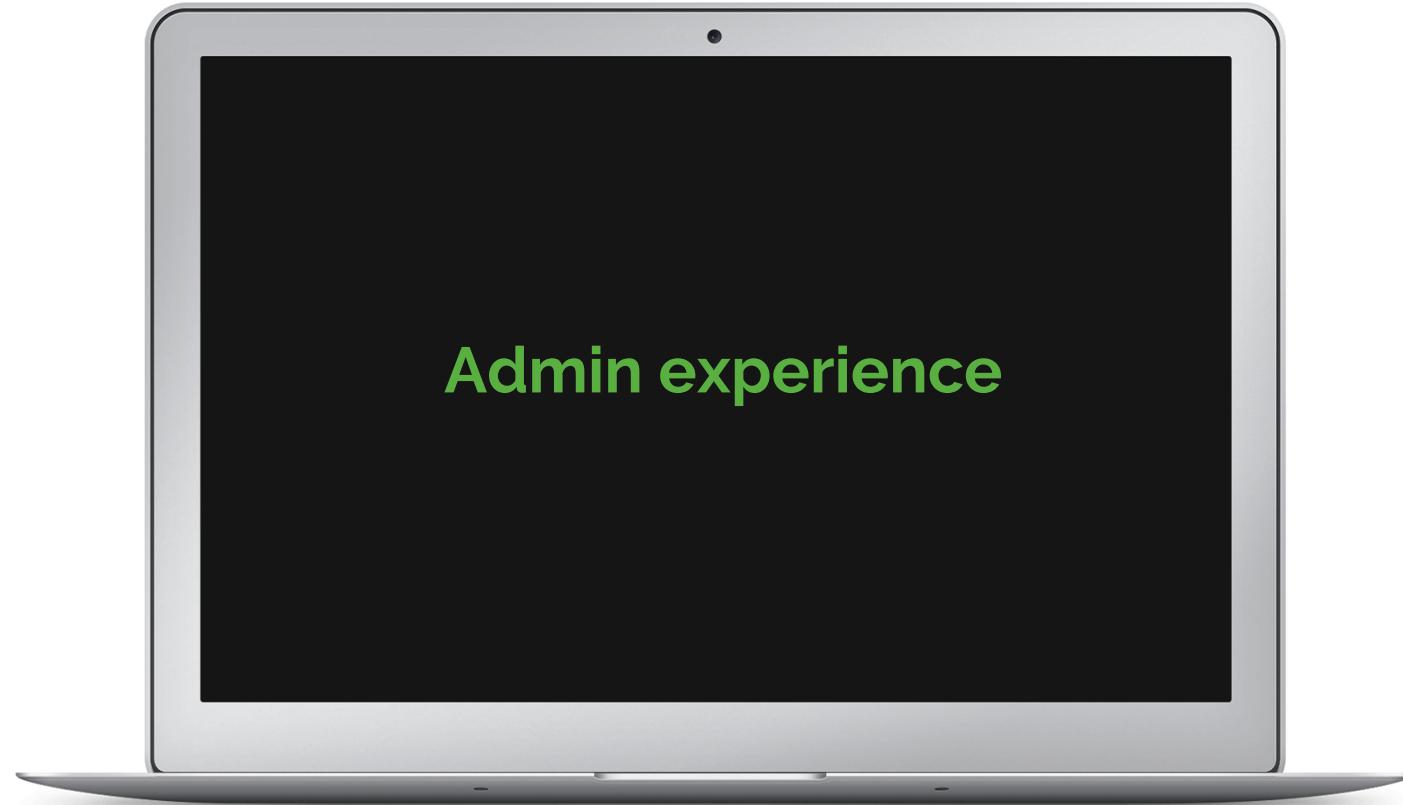
# Diagnostics UI

- Look up diagnostic activities (management, connection, or feed)
- Gather session host information for connection activities
  - Review virtual machine (VM) performance details
  - See which users are signed in to the session host, send messages and sign off users

The screenshot shows the Microsoft Windows Virtual Desktop Diagnose Issues Activity feed page. At the top, there is a navigation bar with the Microsoft logo, the text "Windows Virtual Desktop > Diagnose Issues", and a user profile for "Freek Berson RDS Owner". Below the navigation bar, there is a search bar with fields for "User UPN\*" (containing "rdmitest@rdmi.cloud") and "Activity type\*" (containing "Connection"). There is also a "New Search" button. Below the search bar, there is a table with the following columns: Start time, End time, Outcome, Service error, Error code, Session host, Client, Client IP, Host pool, Tenant, and Activity ID. The table contains three rows of data, each corresponding to a connection activity for the user "rdmitest@rdmi.cloud".

Start time	End time	Outcome	Service error	Error code	Session host	Client	Client IP	Host pool	Tenant	Activity ID
8/19/2019 7:47:54 AM	8/19/2019 7:49:53 AM	Failure	False	ConnectionFailedClientDisconnect	<a href="#">RDSGWVDAPP3-0.rdmi.cloud</a>	WINDOWS 10.0.18956	82.217.137.208:63208	RdsgWvdAppHostpool03	'Default Tenant Group' :: 'RdsgrWvdTenant03'	4652d6f0-a72c-491a-a574-2d1fe3ea0000
8/19/2019 7:44:24 AM	8/19/2019 7:45:20 AM	Success			<a href="#">RDSGWVDAPP3V-0.rdmi.cloud</a>	WINDOWS 10.0.18956	82.217.137.208:63160	RdsgWvdAppHostpool03val	'Default Tenant Group' :: 'RdsgrWvdTenant03'	1a362585-0abb-433d-a230-7e0c16b50000
8/19/2019 7:43:50 AM	8/19/2019 7:45:39 AM	Success			<a href="#">RDSGWVDAPP3-0.rdmi.cloud</a>	WINDOWS 10.0.18956	82.217.137.208:63160	RdsgWvdAppHostpool03	'Default Tenant Group' :: 'RdsgrWvdTenant03'	0ea01b6-19a2-4b98-934b-dfd190380000

# Demo



# Licensing

To run Windows 10 multi-session, Windows 10, or  
Windows 7

Microsoft 365 F1, E3, E5, A3, A5, Business  
Windows 10 Enterprise E3, E5  
Windows 10 Education A3, A5  
Windows 10 VDA per user

To run Windows Server 2012 R2, 2016, 2019

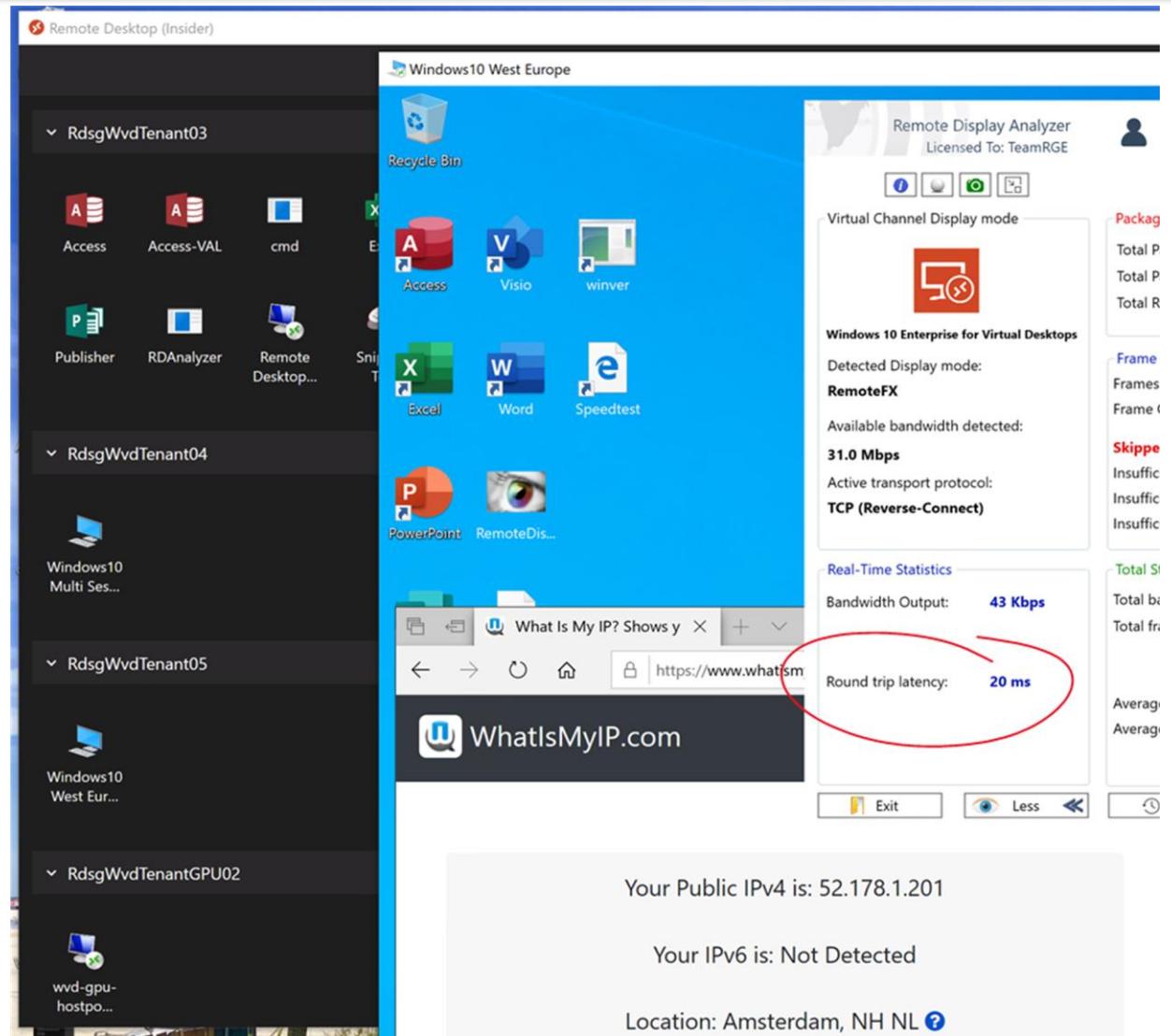
Remote Desktop Services (RDS) Client Access License (CAL) with  
active Software Assurance (SA)



# Multi region

- First region is East US
- West Europe recently added (Validation Hostpool)
- Azure Traffic Manager to support multi region

rdgateway-r1.wvd.microsoft.com = East US  
rdgateway-r0.wvd.microsoft.com = Multiple



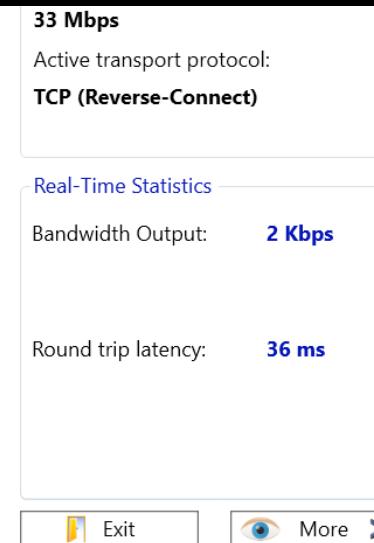
Connecting from Europe:

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18362.10019]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>nslookup rdgateway-r0.wvd.microsoft.com
Server: gent.dnscache02.telenet-ops.be
Address: 195.130.131.2

Non-authoritative answer:
Name: waws-prod-am2-269.cloudapp.net
Address: 13.69.68.9
Aliases: rdgateway-r0.wvd.microsoft.com
rdgateway-r0-prod.trafficmanager.net
mrs-weur0c001-rdgateway-prod.azurewebsites.net
waws-prod-am2-269.sip.azurewebsites.windows.net

C:\WINDOWS\system32>
```



# Multi region

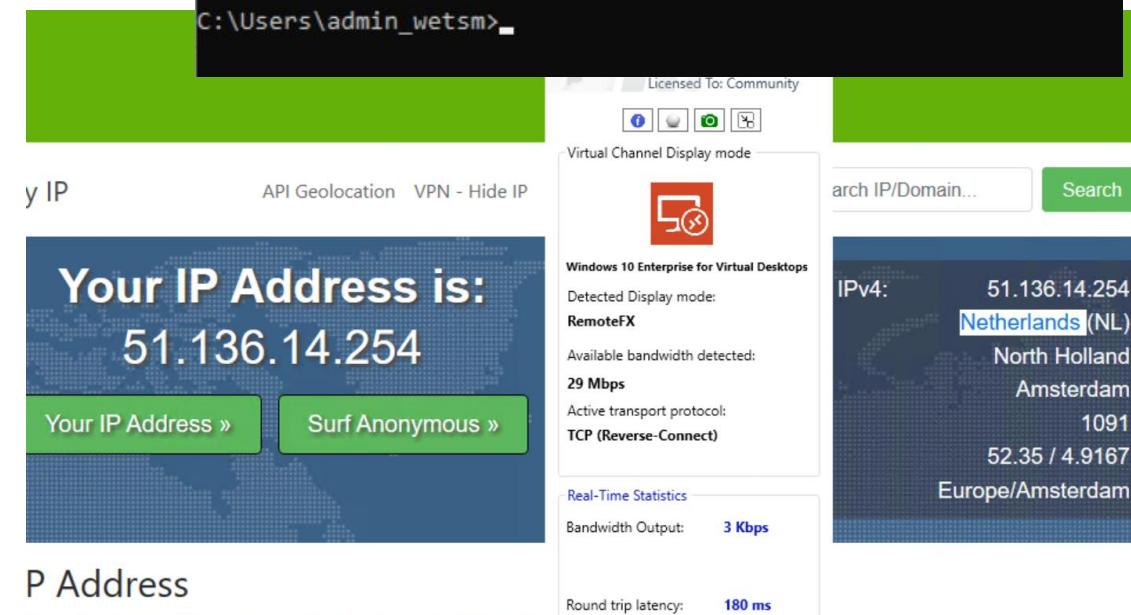
Connecting from US:

```
Administrator: C:\windows\system32\cmd.exe
Microsoft Windows [Version 10.0.18362.356]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\admin_wetsm>nslookup rdgateway-r0.wvd.microsoft.com
Server: UnKnown
Address: 168.63.129.16

Non-authoritative answer:
Name: waws-prod-mwh-015.cloudapp.net
Address: 13.77.160.237
Aliases: rdgateway-r0.wvd.microsoft.com
rdgateway-r0-prod.trafficmanager.net
mrs-wus2r0c002-rdgateway-prod.azurewebsites.net
waws-prod-mwh-015.sip.azurewebsites.windows.net

C:\Users\admin_wetsm>
```



# Windows Virtual Desktop Experience Estimator

**Estimate the quality of end user experience when connecting to Windows Virtual Desktop.**

You can estimate the connection round trip time (RTT) from your current location to each Azure region in which you are able to deploy virtual machines\*.

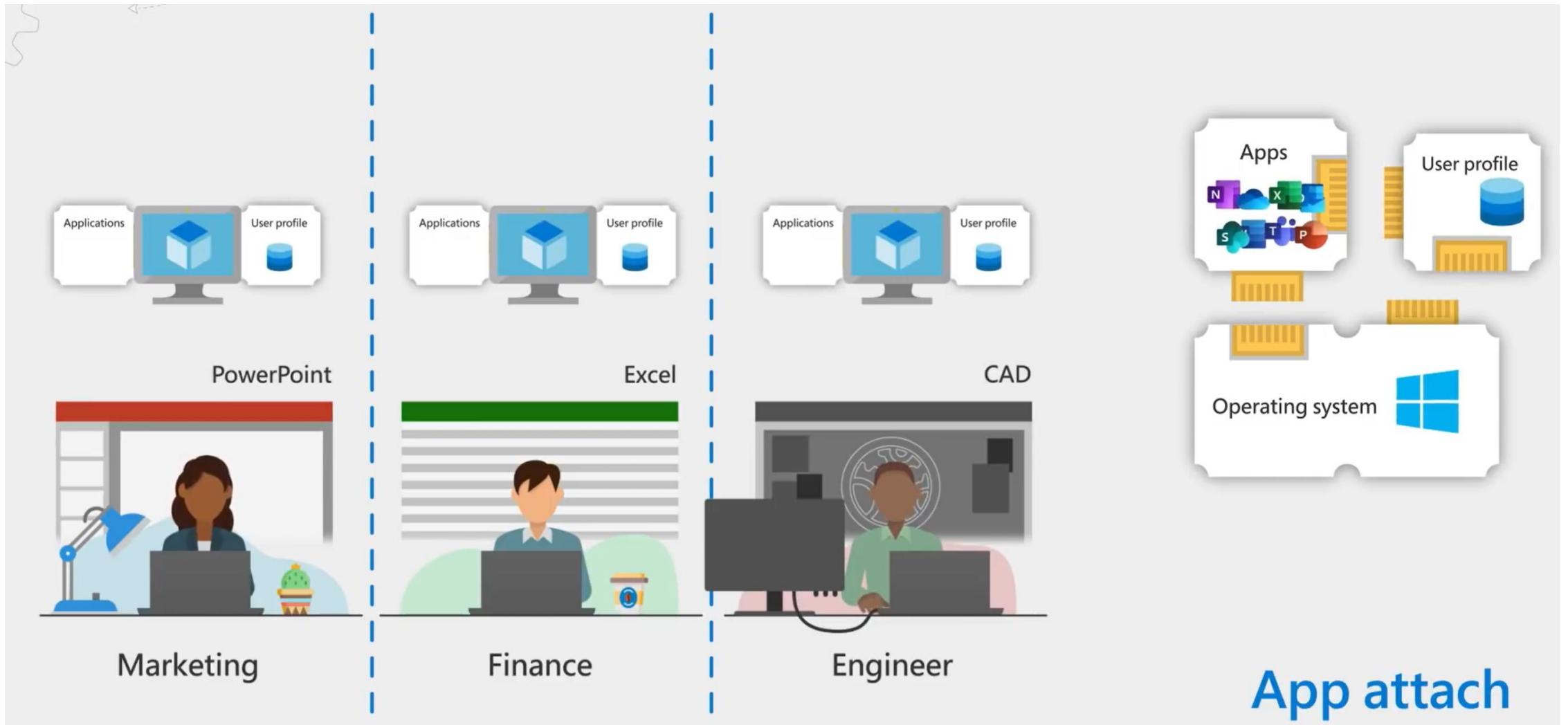
The Azure region recommended is based on connection round trip time (RTT) to your current location\*.

AZURE REGION	ROUND TRIP TIME (MS)
West Europe	32
France Central	41
Germany West Central	41
UK South	41
Germany North	42
Norway West	42
UK South 2	42
UK West	44

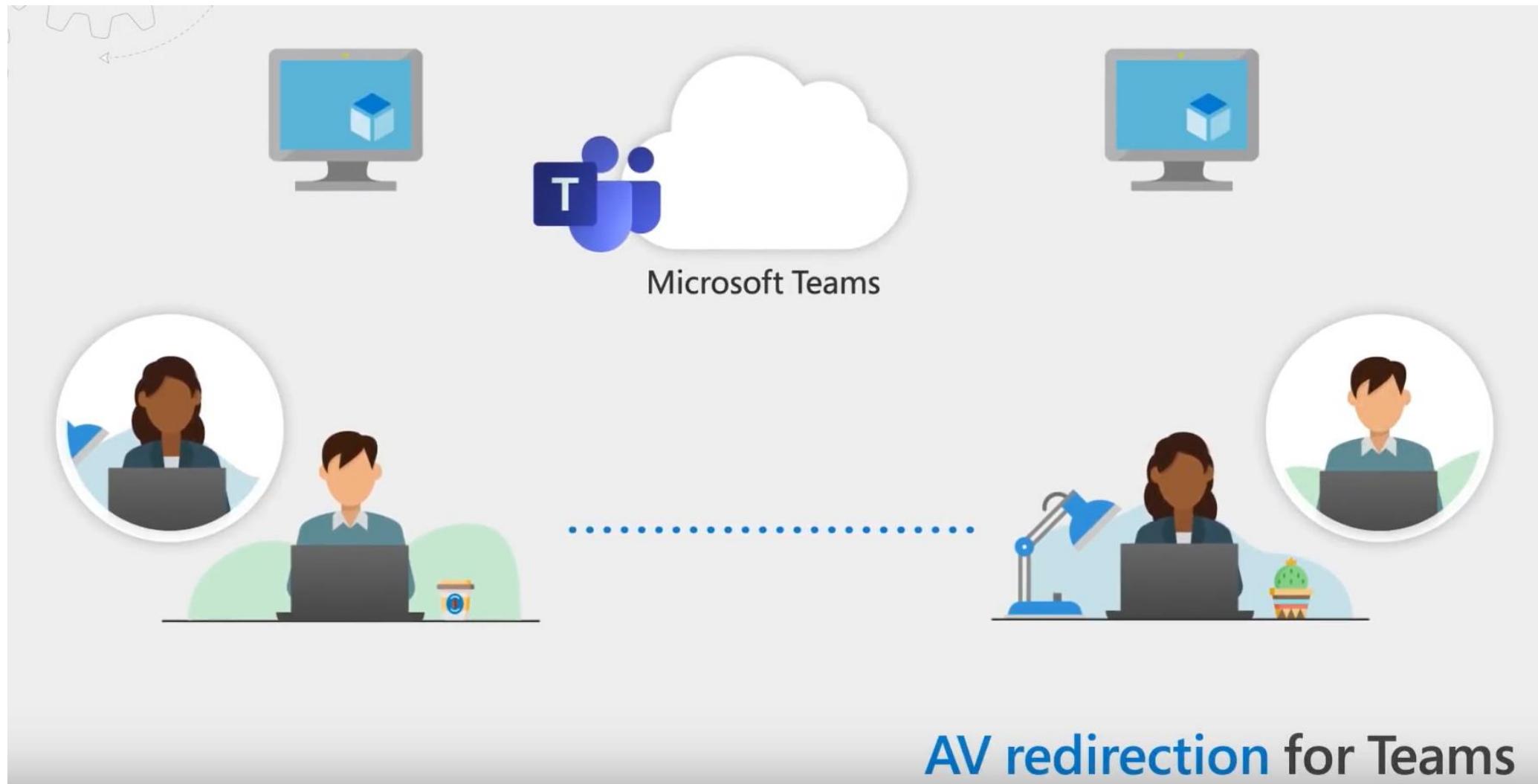
\*Actual experience will vary depending on network conditions, end user device, and the configuration of the deployed virtual machines.

The times displayed are estimates intended to help assess the quality of end user experience for your Windows Virtual Desktop deployment.

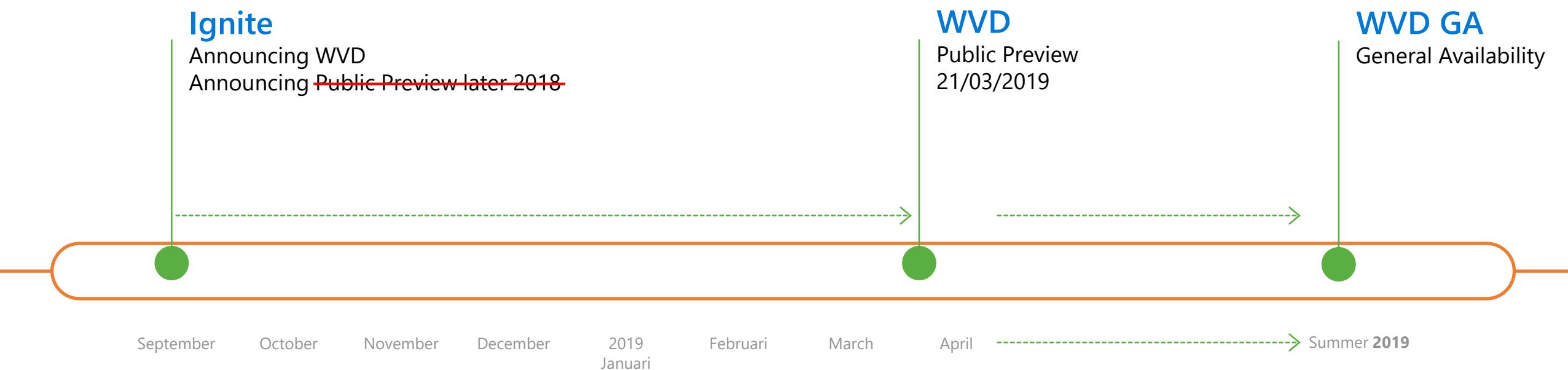
# Roadmap: AppAttach



# Roadmap: Teams A/V redirection



# Timeline



# FSLogix

Microsoft acquires FSLogix to enhance the Office virtualization experience

In November 2018, Microsoft acquired FSLogix, a next-generation platform that reduces the resources, time and labor required to support desktop and app virtualization.

FSLogix technologies enables faster load times for non-persistent users accessing Office 365



# Benefits for WVD

- Outlook caching + Windows Search support
- OneDrive for Business (and Files On-Demand) support
  - Per-Machine version of OneDrive now available
- Native SharePoint support in Windows Explorer
- Office 365 ProPlus computer activation license roaming
- Skype for Business GAL caching
- OneNote support + UWP
- Microsoft Teams support for Virtual Desktops coming soon
  - Per-Machine installation available now



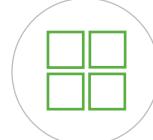
# FSLogix Technologies



## 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.

# Licensing

To Access FSLogix Technology:

Microsoft 365 F1, E3, E5, A3, A5, Business

Windows 10 Enterprise E3, E5

Windows 10 Education A3, A5

Windows 10 VDA per user

Remote Desktop Services (RDS) Client Access License (CAL) with

active Software Assurance (SA)



# Demo



# THANK YOU

QUESTIONS?



@MichaWets  
@FBerson



themicrosoftplatform.net  
blog.cloud-architect.be