Microsoft

Windows Virtual Desktop (WVD) – Technical FAQ

1. What is Windows Virtual Desktop (WVD)

1. **What is Windows Virtual Desktop?**

Windows Virtual Desktop is a comprehensive desktop and app virtualization service running on the cloud. It is the only service that delivers simplified management, multi-session Windows 10, optimizations for Office 365 ProPlus, and support for Remote Desktop Services environments. With Windows Virtual Desktop, you can deploy and scale your Windows desktops and apps on Azure in minutes, with built-in security and compliance.

2. **What are the key benefits of WVD?**
https://docs.microsoft.com/en-us/Azure/virtual-desktop/overview#key-capabilities

- ✓ Multi-session Windows 10 that delivers the cost advantages of server-based virtualization
- ✓ The best service to virtualize Office 365 ProPlus running in multi-user virtual scenarios
- ✓ The only service to provide Windows 7 virtual desktop with free Extended Security Updates, giving you more options to support legacy applications while you transition to Windows 10
- ✓ Bring your existing Remote Desktop Services (RDS) and Windows Server desktops and apps
- ✓ Manage Windows 10, Windows Server, and Windows 7 desktops and apps all with a unified management experience on Azure
- ✓ Seamlessly virtualize both desktops and apps

3. **What is the new Windows 10 multi-session?**
Windows Virtual Desktop enables a capability of Windows 10 Enterprise multi-session available only in Azure. This allows full fidelity access to a Windows 10 experience – including the user experience, Office ProPlus support, Microsoft Edge, Cortana, per user search index and access to the Microsoft Store – while taking advantage of the cost efficiency of shared compute resources previously only available with server-based virtualization.

4. **Is Windows 10 Multi-session a feature of Windows or Azure WVD service? Will Windows 10 multi session be offered by competitors?**

Windows 10 Enterprise multi-session is a feature exclusively of Windows Virtual Desktop, not Windows, therefore is only available as part of the WVD service

5. **What operating systems are supported by WVD?**

   Windows 10 multi-session, Windows 10 single-session, Windows 7 single-session, Windows Server 2012 R2, Windows Server 2016, and Windows Server 2019. For a complete and updated list, please refer to: https://docs.microsoft.com/en-us/Azure/virtual-desktop/overview#requirements

6. **How does the WVD solution reduce costs for companies?**
   The complex components that make up the management of RDS/VDI solutions on-premise is now replaced by the WVD service. WVD service is free to use. Additionally, it removes the overhead of managing & maintaining core services like broker/gateway/web access/SQL etc. reducing a lot of management overhead & OpEx costs.

7. **Will WVD support Microsoft Office?**
   Yes. The best experience of Office is with Office 365 ProPlus, which is supported by Windows 10 multi-session. Perpetual versions of Office will not be supported by Windows 10 multi-session but will be supported on Windows Server operating systems with Windows Virtual Desktop.

8. **Can we try WVD out now as a POC?**
   Yes, WVD is in General Availability since September 2019. You can use Azure Free trial Subscriptions or your existing Azure Subscriptions to try WVD.

9. **What is required to run WVD?**
   You need an Azure Tenant, a Subscription with enough resource creation permissions are all it takes for WVD to run. If the prerequisites are met, it is possible to run WVD.

2. WVD Pricing & Features

1. **Where can I find the WVD pricing details?**
   More details on WVD pricing and other information can be found at https://Azure.microsoft.com/pricing/details/virtual-desktop/

2. **Is there a Pricing calculator for WVD?**

Please refer to these pages which provide helpful information on pricing: https://Azure.microsoft.com/en-us/pricing/details/virtual-desktop/

If you want to extend WVD using other VM families: https://Azure.microsoft.com/en-gb/pricing/details/virtual-machines/windows/

If you are a Microsoft employee, you can also check WVD Cost Calculator in the internal Wiki

3. **If a customer has a global footprint, are there regions of the world where WVD will not be offered?**
   Microsoft is adding WVD support for more regions. Refer to this link for regional availability of WVD. https://azure.microsoft.com/en-us/global-infrastructure/services/?products=virtual-desktop&regions=all

4. **What Permissions and Accounts Required for Windows Virtual Desktop?**

Tenant Creator

- Create an Account in Azure Active Directory, or in ADDS and synchronize to Azure AD.
- This account should have Owner or Contributor RBAC role on the Subscription where you will deploy WVD.
- Account should also have Global Admin rights to the Azure Active Directory.
- Use this account to create the WVD tenant, assign tenant creator and tenant owner to the Admin account (see below).

Admin/Automation account:

- Create an Account in Azure Active Directory, or in Active Directory Domain Service and synchronize to Azure AD.
- Account should have Owner or Contributor RBAC role on subscription where you will deploy WVD
- Add the account as RD Owner of the Tenant using New-RdsRoleAssignment PowerShell Command.
- This account can be used to create the tenant, then create and manage host pools.
- Do not enable MFA on this account.

Domain Join Account:

Create an account that has rights to join computers to the Active Directory Domain. The DC should be running in Azure and accessible from the VNET that you use to deploy your host pool

5. **How can I get started with Windows Virtual Desktop?**
   WVD is in General Availability and can be accessed by following this [link](#).

6. **Is AppLayering a feature of WVD?**
   WVD does not have AppLayering as part of the service yet. All existing Microsoft and 3rd party technologies like AppV, Liquidware, Citrix, etc. can be used to do AppLayering. Please keep checking the WVD documentation for AppLayering support in the future.

7. **Does Windows 10 multi-session SKU support persistent sessions out of the box to ensure an unchanged user experience?**
   Yes, this is available as an out of the box feature.

8. **When using GPU enabled machines for Win10 multi-session, are there any issues when multiple users connect to the same machine and share the GPU?**

   No, GPU sharing works with RDSH with Windows 10 multi-session using the Azure N-SKUs. Sizing is key, so make sure you have followed the right sizing guidelines.

9. **Will Windows Virtual Desktop be supported with Virtual Desktop Access (VDA)**
   Yes. Virtual Desktop Access (VDA) will be supported in Windows Virtual Desktop

10. **What is the rough GA timeline?**
    WVD is in GA now. https://Azure.microsoft.com/en-us/global-infrastructure/services/?products=virtual-desktop&regions=all

11. **What is the WVD Service SLA?**
    WVD is a fault tolerant and highly available service with multiple instances throughout the globe (including Europe). Being the service is provided as an

entitlement to M365/Windows there is no financially backed SLA, but our published goals are 99.5% and we have maintained that throughout the preview and GA of the product.

https://Azure.microsoft.com/en-us/support/legal/sla/virtual-desktop/v1_0/

12. **Currently, the WVD service is only available in East US 2/Central US. If my customer is from Japan (or elsewhere), how can I use WVD?**
WVD Service will expand to other regions in the coming months. Desktops and apps can be deployed on Virtual Machines (VMs) in any local Azure region. Please remember, the management solution and related data for these sessions will reside in the United States (US East 2 region). This may result in data transfer to the United States while you use the service. We'll start to scale out the management solution and data localization to all Azure regions in the future.

13. **After GA, once the WVD service is available in my local region, do I have to do anything with the host pools?**
This will not require any involvement by the customer if they're hosting their host pool in a local region. Once the WVD PaaS services are moved to a region near you, the clients connecting to the WVD service will automatically connect to the closest region based on the Azure Global Traffic manager services that will route via the closest entry point.

14. **Are there any plans to support MDT with WVD?**
WVD has ARM template and Marketplace offering that utilizes a sysprepped Windows image. MDT can be used to prepare that image.

15. **What would be the actual cost for WVD service?**
You need an Azure account to quickly deploy and manage your virtualization environment. Pay only for the virtual machines and storage you use and 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.

16. **What Office products are not supported in WVD now?**
    At this time Skype for business & Microsoft Teams are not supported. Teams
    support is under development. More information can be found [here](#).

17. **Can I use the Win 10 multi session VM with Citrix environments?**
    Yes, this is possible

18. **Can I use the Win 10 multi session VM with VMware environments?**
    Currently this is under development, but this will be available in the upcoming
    months.

19. **What is the support strategy for DR and HA?**
    WVD service itself is a cluster that has both DR and HA capabilities across
    regions. Session hosts can be HA if VMs are provisioned in such a state. DR of
    session host can be achieved either via Azure Site Recovery or a mix of manual
    and script processes.

20. **Our organization doesn't grant Global Admin access to AAD Tenant, how do
    we proceed with accessing WVD Service?**

    Global admin on AAD is only required to grant consent to WVD and to add users
    to the WVD Enterprise Application with Tenant Creator role. Please refer to this
    [tutorial](#).

    Please ask your Global admin to complete the first 2 steps in the above tutorial
    so that you don't need to have global admin rights to AAD and having
    contributor rights to the subscription would suffice.

21. **Does Windows 7 support publishing remote apps in addition to desktops?**
    No Windows 7 only supports publishing desktops. Also Note: Windows 8.x
    session hosts are not supported in WVD.

22. **How is WVD built/structured in the HA setup? Also, if WVD goes down in
    one geography/region, can we fail-over to another region? (eg. What about
    the url for web connections, which is the same for all regions?)**
    All the WVD endpoints are behind Azure Traffic Manager and the instances are
    stateless. This allows the service to remain up and running even if there is a
    catastrophic failure in a region without any changes required by the

customer. The service has multiple instances running across the US and Europe and can fail over to any of the instances immediately without any long-term disruption to the customer (a reconnect may be required). We are continuing to roll-out additional instances of the service to increase performance and add scale to the service.

23. **Can ephemeral disks be used with WVD?**
No, it is not recommended to use ephemeral disks for scaling. VMs with ephemeral disks cannot be turned on/off. They can be provision/deprovisioned and while provisioning is marginally better, it will not meet customer requirements as it takes approximately 4-5 minutes to completely provision. Hence, a user may end up sitting idle for that time, waiting for a desktop.

24. **Does it support Windows 10 VDI with persistent disks (without profile management)?**
Yes

25. **Does Microsoft plan to support WVD in other Regions like APAC and Brazil, so users from these regions can avoid latency & data sovereignty issues?**
Microsoft is beginning to rollout WVD to various Regions worldwide including APAC, but no specific dates are set. More information on this is at https://aka.ms/wvdroadmap.

26. **When will the MSIX app attach feature be Generally Available?**
Microsoft announced this new feature will be added soon. A private [preview](#) was announced at Ignite 2019, but no date for GA is published yet.

27. **Is there a solution or service to convert legacy MSI to MSIX? Is the tool released or planned?**
The tool for converting legacy MSI to new MSIX is released and a detailed explanation on how to use it is available on this [link](#).

28. **Is the AAD Join a feature released as part of WVD GA?**
No, the AAD join feature was not released part of WVD GA, but is getting worked on to be released soon. Please keep an eye out on the [Azure updates feed](#).

29. **When will the WVD be available in US Virginia?**
WVD preview is going to be available from 2020 H1 in US Virginia.

30. **Is there a public roadmap for customers on the Windows Virtual Desktop Service?**
Yes, The Public Roadmap can be found on this [link](#).

31. **Is there a "Copy/Paste files" between WVD client and server (local machine) feature available on Windows Virtual Desktop?**
The Copy/Paste feature between WVD client and server (local machine) is going to be implemented in first half of CY2020

32. **Is there a Multi-tab feature available to open a new application window in a new browser tab rather than having to switch between different windows inside one tab?**
No, this feature is currently unavailable. Details available on this [link](#).

3. WVD Licensing

1. **How can I apply Linux rates (don't pay additional $ for OS licensing) for WVD session hosts?**
Please follow the instructions at https://docs.microsoft.com/en-us/Azure/virtual-desktop/apply-windows-license

2. **What is the supported licensing model?**
You can find the latest information [here](#)

3. **What can I do to get Linux rates for WVD Session Host VMs?**
Please refer [here](#) on how to apply WVD Licenses to Session Host VMs

4. **How does WVD leverage other solutions like Citrix & VMWare Horizon**
Citrix and VMware management solutions are **"approved providers"** for WVD. For customers this means they have a unified SLA between the providers and Microsoft, and they can leverage their WVD entitlements with these solutions:
a) Citrix Cloud
b) Citrix Essentials
c) Citrix Managed Desktop
d) VMware Horizon on Azure (in development, check with VMware for dates)

   1. Citrix Cloud is a supported management solution for WVD

a. Users can leverage their WVD entitlements (including Windows 10 EVD on Azure and Win7 ESU on Azure)
    b. Users are not exposed to the underlying architecture of Citrix Cloud (it is offered as a PaaS solution)
2. Windows 10 EVD is only available on Azure when used with WVD or WVD + Approved provider
    a. Citrix and VMware do not need, nor should they use this OS to support their infrastructure roles
    b. Citrix and VMware do not host the customers VMs except with the new Citrix Managed Desktops (which can use Win 10 EVD).
    c. Customers pay for the IaaS they use to host the virtual apps and desktops, not the infrastructure (Citrix and VMware charge a license fee).

5. **I see the below warning when I login to the WVD session hosts. What could be causing this?**

This is only during the preview so please ignore the same. You can also point the session hosts to an RDS licensing server and make this error go away
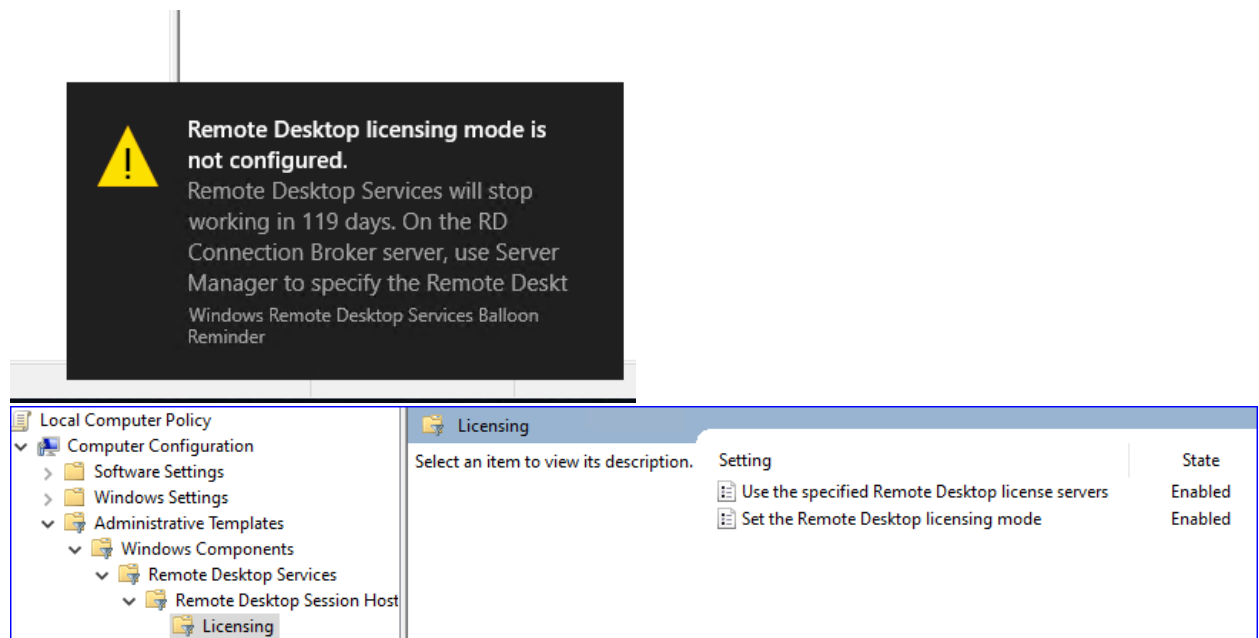
you can easily suppress these notifications by enabling the following local or group policy:

**Computer Configuration -> Administrative Templates -> Windows
Components -> Remote Desktop Services -> Remote Desktop Session Host -
> Licensing -> Hide notifications about RD Licensing problems that effect
the RD Session Host server:**
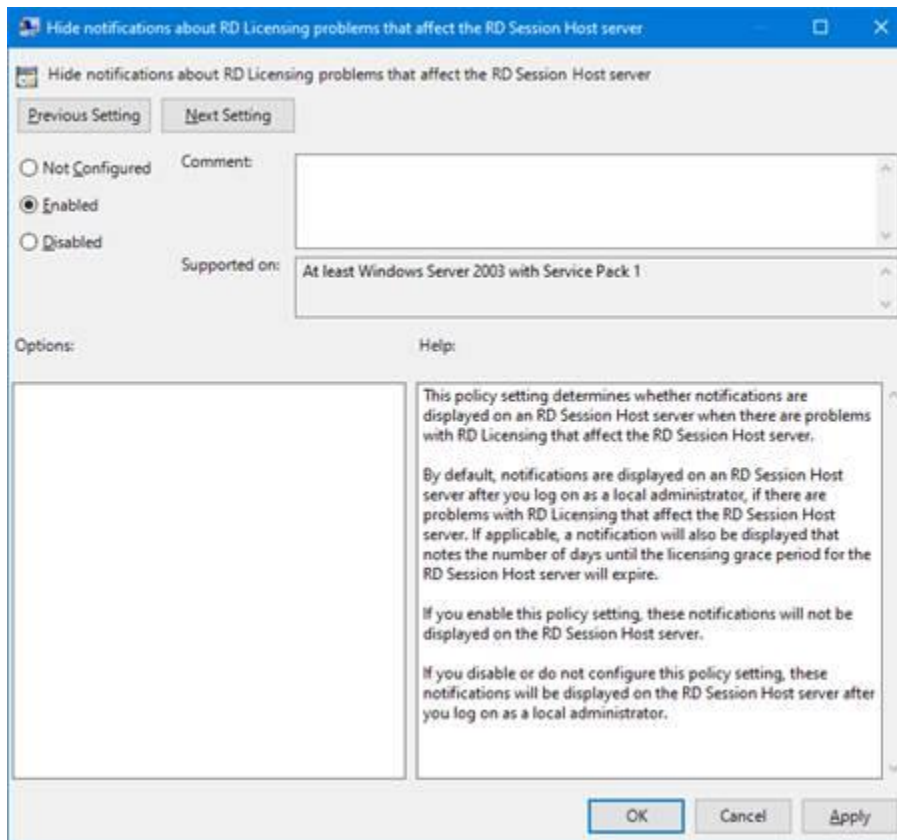
Another option is to switch to per user mode licensing:

- Open the local group policy editor (gpedit.msc)
- Go to Computer Configuration -> Administrative Templates -> Windows
  Components -> Remote Desktop Services -> Remote Desktop Session
  Host -> Licensing
- Set the Remote Desktop licensing mode to "Per User"

6. **How to manage/define Licenses if there is existing User CAL licenses and
Device CAL Licenses?**
Windows Virtual Desktop only uses **Per User** licenses, even if user is bringing
their RDS CALs.

4. User profile Management & FSLogix Integration

1. **What FSLogix capabilities are included in Windows Virtual Desktop?**

   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 i

   mages 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

2. **How do customers access FSLogix technology?**
   Access to FSLogix technology, are included for users licensed for Microsoft 365 Business, A3, A5, F1, E3, E5, Windows E3 and Remote Desktop Services (RDS) CAL licenses at no additional cost.

3. **What FSLogix capabilities are included in Windows Virtual Desktop?**
   All FSLogix technologies including, Profile Container, App Masking and Java Redirection will be available for Windows Virtual Desktop customers.

4. **When can expect FSLogix integration to be built into WVD?**
   FSLogix full integration will be post WVD General Availability.

5. **What FSLogix features in Windows Virtual Desktop complement Citrix?**

   Citrix offers enterprise management of Windows Virtual Desktop, including all the functionalities from Citrix platforms. The addition of FSLogix technologies into a combined Citrix and Windows Virtual Desktop offering enhances Citrix environments in the following ways:

• **Easier application management**. Using FSLogix App Masking with Citrix App Layering lets customers extend their existing functionality while further simplifying application management. Customers can reduce the number of silos and delivery groups as well as enforce device-based licensing, all without additional backend infrastructure.

• **Full Office 365 ProPlus support**. Citrix User Profile Management supports Outlook OST file redirection. However, for customers who need support for all their users' Office 365 data, including OneDrive and SharePoint, FSLogix Profile Container and Office 365 Container can help successfully deploy Office 365. Note that Office 365 Container is a Citrix-ready product.

• **Full Windows Profile redirection**. FSLogix does not offer traditional User Environment Management, but customers can pair Citrix Workspace Environment Management with FSLogix Profile Container. Only FSLogix Profile Container appears as a local profile to the system, meaning all applications (including Office 365) work seamlessly. The result of the Workspace Environment Management/Profile Container combination is the best possible user experience for end users.

6. **Can I use Azure Files to store my user profiles?**
   Yes you can and the recommendation is to secure access using Azure Active directory using the instructions [here](#)

7. **What other storage solutions can be used for user profile containers?**
   [Azure Netapp Files](#)
   [Azure Files](#)
   [File Server – SOFS with S2D](#)
   https://docs.microsoft.com/en-us/Azure/virtual-desktop/store-fslogix-profile

Azure Storage in WVD comparison

	Azure NetApp Files	Azure Files	Storage Spaces Direct (S2D)
Status	GA (based on whitelisting only)	GA	GA (Azure Compute)
Platform service	Yes, Azure Native solution	Yes, Azure Native solution	No, self-managed (Azure IaaS)
Regional Availability	**Limited (US East, US West, EU West, EU North, US South Central, US Central. Azure NetApp Files continues to be rolled out in new Azure regions.**	Ring 0 Azure service – broad available	**Azure Compute supported DC regions** **Ultra Disks are only available in East US 2, North Europe, and Southeast Asia**
Protocols	NFS v3.0, SMB v3.1	SMB v2.1/3. and REST	NFS v3, v4.1, SMB v3.1
Security Compliance	ISO completed, FedRamp in progress	All Azure supported certificates	All Azure supported certificates
AD integration	Native AD / traditional Active Directory	Azure AD and Azure AD Domain Services *Support for traditional Active Directory expected at Ignite*	Native AD / traditional Active Directory
Tiers and performance	Standard Premium Ultra **Up to 320k IOPS w/ 4GBps per Volume ~1ms latency**	Standard Premium **Up to max 100k IOPs per share w/ 5GBps per share ~3ms latency**	Standard HDD Up to 500 IOPS Per-disk limits Standard SSD Up to 4k IOPS Per-disk limits Premium SSD Up to 20k IOPS Per-disk limits **Up to Ultra-Disk Storage 160K IOPS Per-disk limits w/ 2GBps per disk ~1ms latency (VMs do have separate IOPs limits)**
Capacity	100TiB per Volume	100TiB per Share	Max. 32 TiB per disk
Redundancy	LRS equivalent	LRS/ZRS/GRS	LRS/ZRS/GRS
Access	Cloud only	On-prem, Cloud and Hybrid (Azure file sync)	Cloud only
Minimum	**Minimum capacity pool 4TiB, min volume size 100GiB**	No minimum	At least 2 Virtual Machines on Azure IaaS + costs for disks
Pricing	Standard Provisioned LRS $0,15/GiB per month Premium Provisioned LRS $0,30/GiB per month **Ultra Provisioned LRS $0,40/GiB per month**	Standard PAYGO $0,06/GiB per month + transactions charges Premium LRS $0,24/GiB per month + transactions charges	Standard HDD $0.05/GB per month + additional VM charges Standard SSD $0.145/GB per month + additional VM charges Premium SSD $0,195/GB per month + additional VM charges Ultra SSD $0.000164/GB per hour + additional VM charges
Differentiators	Native AD support w/ Full NTFS support (good alternative for S2D > Azure Managed Service) Requires 4 TiB minimum of storage Snapshots Low latency / higher IOPs capacity with Ultra Integrates with on-prem ONTAP NetApp file systems	Native Azure Solution – deep integration within Microsoft Azure eco-system e.q. Azure Files Sync Snapshots and Azure backup integration Broad region coverage	Uses Azure IaaS – Compute (self-managed) Snapshots and Azure backup integration Broad region coverage

8. What type of separation is there in the Win10 RDS solution between users?
Same as the separation in Windows Server OSes like Windows Server 2012 R2.

9. Is it possible to use a software VPN client on client machines with WVD?
Yes.

10. Can it operate with users as local admin to install their own apps?
Yes, but not recommended, unless this environment is been setup to be used by one user per VM.

11. How can I setup a quota for User Profiles through FsLogix?
This can be done using the SizeInMBs property as part of the profile container configuration. Follow the reference for more details.

12. Is it possible to migrate from WVD Win 10 single session to Win 10 multi-session if there is FSLogix in Win 10 single session and with lenience to loose couple User data including profiles on WVD Win 10 single session host? And Is it possible to point the same user to same Containers after they are migrated to Win 10 multi-session host
Yes, you can use FS Logix Profile Container with a single session and then migrate the user to use the same Profile Container in a multi-session.

13. **Can FSLogix AppMasking support application outside of O365 ecosystem (Non Microsoft application like Acrobat Reader, Acrobat professional, Sap login client, ERP logon provisioning and so on)**
    Yes, it will.

14. **How can I replicate User profiles from 1 region to another? (Ex: DR region)**
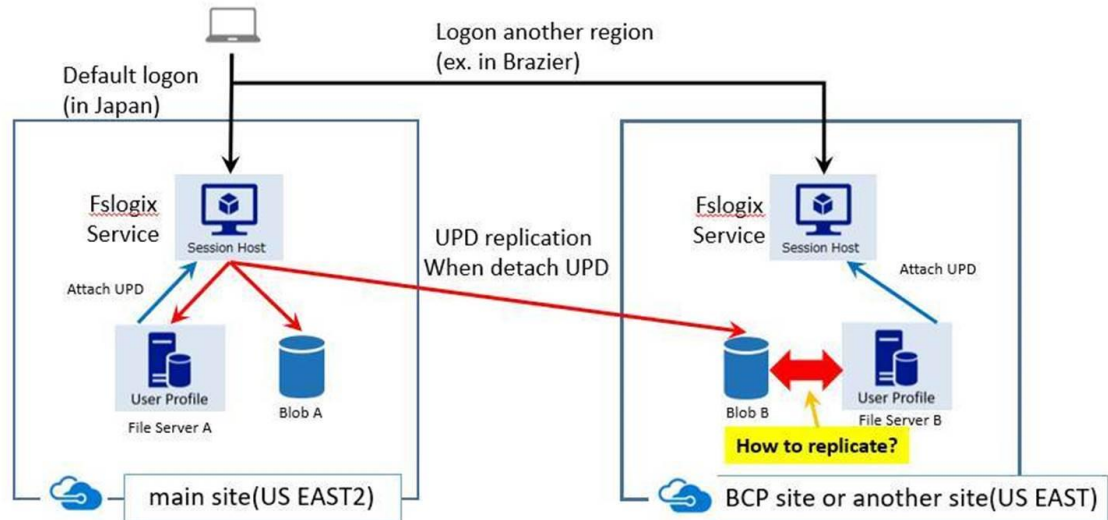
    Azure File Sync can be used to replicate UDP/FSloigx profiles from one location to another.

15. **How to manage the Storage Quota/Limitation on User's Disk Profile?**
    FSLogix is preferred user profile solution and has a configuration to specify the maximum size.

16. **How do I manage the Storage Quota/Limitation on a User's Disk on their profile? Where do we specify the disk sizing limit in the configuration?**
    The sizing of the disk is same as the size created for the VHD. This can be configured with "SizeInMBs". Details can be found on this link.

17. **Can OneDrive be used with WVD?**
    Yes, OneDrive can be published as a RemoteApp on WVD. This will launch Windows Explorer directly to the local OneDrive folder. The first time a user launches the app it will go through the OneDrive authentication against AAD and will present the normal windows you go through, once authenticated and gone

through the welcome screens it will start syncing user OneDrive to the Session host.

5. Networking Scenarios

1. **Can I allow native port 3389 access into the environment (locked via VPN or IP address) and facilitate access by adding the desired users to the local Remote Desktop Users group?**

    No port 3389 is not allowed for WVD, WVD uses only reverse connect. Port 3389 can be used for troubleshooting "To help secure your Windows Virtual Desktop environment in Azure, we recommend you don't open inbound port 3389 on your VMs. Windows Virtual Desktop doesn't require an open inbound port 3389 for users to access the host pool's VMs. If you must open port 3389 for troubleshooting purposes, we recommend you use just-in-time VM access."

2. **Is there a data transfer fee for service communication?**
    Traffic between WVD VMs and control plane is charged as a regular outbound traffic from the VNet. It can be free if VMs are located in the same region as a control plane. See details here https://Azure.microsoft.com/en-us/pricing/details/bandwidth/

3. **Is it possible to limit the source IP addresses that can access the remote desktop session endpoint?**
    The control plane accepts connections from all clients, and it doesn't have IP filtering. You can do such filtering on your network equipment for networks managed by you.

4. **Is it possible to create an ExpressRoute gateway in a host pool VNet and connect it with ExpressRoute private peering as described here?**
    Host pool VNets are just regular VNets and Expressroute configuration is no different for them.

5. **What happens if I configure forced tunneling?**
    In a forced tunneling configuration it is recommended to either enable Azure App Service service endpoint on the host pool subnet or configure routing on the

VNet (with CSR or similar appliances) to route all traffic to WVD control plane directly without the ExpressRoute tunneling.

If you will enable forced tunneling without service endpoints or custom routing, you would introduce additional network latency for the remote sessions, however they would work even the user experience will be degraded.

6. **We'd like to lock down access to the WVD by IP address. Can I have NSG's established on the VNET/Subnet where the host pools reside?**
NSGs on the subnet where the VMs are located and are being use is possible. However, restricting the traffic to the WVD service is not possible. The service itself is globally resolvable. If a customer is looking to limit the access to it this will require Intune / MDM to limit.

7. **Is it safe to assume that a customer can use what's built into Azure (or a third-party offerings) in the VNET attached to the session host to provide inbound/outbound network control?** Yes, that is correct. The virtual machines are in your network/Azure environment, and you can control inbound/outbound with your own NSG's, Azure Firewall, or 3rd party appliances. Whitelisting would then be applied to those controls to allow communication to the WVD Gateway/Broker, etc.?

8. **Can we connect between Virtual Network on Windows Virtual Desktop and VPN on "On Premises"?**
Yes, a VPN or ExpressRoute is preferred for large organizations that need to connect back to on-premise. Please create the following FW Rules with your subnet CIDR as the source.

Source	Destination (Target FQDNs)	Protocol	Port	Purpose/Name
Session Host Subnet	*.wvd.microsoft.com	HTTPS	443	Service communication
Subnet should be created for WVD	login.windows.net	HTTPS	443	
	*.microsoftonline.com	HTTPS	443	
	*.msftauth.net	HTTPS	443	
	*.msauth.net	HTTPS	443	
	*.global.metrics.nsatc.net	HTTPS	443	
	*.metrics.nsatc.net	HTTPS	443	

hosts. This can make it easier to identify WVD traffic	mrsglobalsteus2prod.blob.core.windows.net	HTTPS	443	Infra Agent, Stack and Monitoring agent updates
	gsm*.blob.core.windows.net	HTTPS	443	Service telemetry
	production.diagnostics.monitoring.core.windows.net	HTTPS	12000	Service telemetry
	prod.warmpath.msftcloudes.com	HTTPS	443	Service telemetry
	http://169.254.169.254/metadata/instance/network/interface/0/ipv4/ipAddress/0/	HTTP	80	VM telemetry, ACR
	http://169.254.169.254/metadata/instance/compute	HTTP	80	VM telemetry, ACR
	169.254.169.254			VM telemetry, ACR
	https://catalogartifact.Azureedge.net/publicartifacts/rds.wvd-provision-host-pool-2636b3e1-9f2b-4349-aeeb-5d84d41b6a3e-preview/Artifacts/DSC/Configuration.zip	HTTPS	443	Marketplace deployments
	https://raw.githubusercontent.com/Azure/RDS-Templates/master/wvd-templates/Create%20ahttps://raw.githubusercontent.com/Azure/RDS-Templates/master/wvd-templates/Create%20and%20provision%20WVD%20host%20pool/nd%20provision%20WVD%20host%20pool/	HTTPS	443	Github Deployments
	https://rdweb.wvd.microsoft.com	HTTPS	443	Windows 10/7 Client. Subscribing makes the resources available on your local PC. https://docs.microsoft.com/en-us/Azure/virtual-desktop/connect-windows-7-and-

			[10#subscribe-to-a-feed](#)
https://rdweb.wvd.microsoft.com/webclient/index.html	HTTPS	443	Web Client

9. **What's the best practice in order to control the Internet access for users who are connected to the session host? (from a monitoring side)**
Combination of [Network Security Groups,](#) [Azure Firewall](#) rules can be used for controlling the Internet Access from users. Please refer to the Azure Documentation for more details on securing and monitoring internet access.

10. **Can I install the WVD agent on an on-premise VM (infrastructure)that will then show up on the rdweb interface(s) for them to connect (Express Route or other connectivity)?**
WVD does not support managing on-prem machines/VMs. Microsoft announced at Ignite 2019 that support for Azure Stack Hub is in the future and a private preview is in the offering now. Customers who need hybrid management are recommended to use Citrix and WVD. You can split your deployments between WVD and Citrix and use WVD to manage the Azure infrastructure and keeping the on-premise solution managed by Citrix.

11. **Could utilising Public peering from our ExpressRoute be employed to keep traffic internal to the company?**
ExpressRoute has 3 types of peering – Public peering, Private peering and Microsoft peering.
Public peering is a deprecated service, even it supports Azure Web Apps and therefore should work with WVD, we never validated this scenario. ExpressRoute PG may have more answers to this.
Private peering is not used by default, unless customers are using forced tunnelling to the on-premises network. In such cases, customers may see additional latency because traffic from the VM will pass customer's firewall. To improve the performance, they need to configure their Azure virtual networks to route WVD traffic directly, by enabling Service Endpoint for App service.
Microsoft peering can be used for clients sitting on the customer network, this configuration should improve reliability, increase speed and reduce latency. Microsoft Peering is fully supported for the access to the WVD control plane.

12. **How to optimize the connection and user experience while working through WVD to reduce the latency?**
Microsoft is continuously adding WVD service instances to new geographies. While this gets extended to all regions, a customer can place the VMs in current geographies (United States, Europe, Japan) to reduce the latency on the backend.

13. **Is Remote Desktop IP virtualization possible on WVD?**
No, currently this is not supported on WVD with Windows server 2019 more details are available at this [link](#).

14. **Where can I find the current Windows Virtual Desktop Gateway Locations?**
WVD Gateway Locations in Staging (validation) and Production can be found at below locations:

Stage (host pool in validation mode):
https://www.whatsmydns.net/#CNAME/rdgateway-r0-prod.trafficmanager.net

Production: https://www.whatsmydns.net/#CNAME/rdgateway-prod-geo.trafficmanager.net

6. Security & Compliance

1. **What are the URLs and IP's that need to be whitelisted for session hosts to securely communicate with the WVD PaaS service?**

Please create the below FW Rules against the VNET/Subnet where the WVD session hosts are deployed. *As an example, there is reference screenshot of how these rules are created on Azure Firewall*

Source	Destination (IP/URL)	Protocol	Port	Purpose
Session Host Subnet The Subnet	*.wvd.microsoft.com	HTTPS	443	Service communication
	login.windows.net	HTTPS	443	
	*.microsoftonline.com	HTTPS	443	

where the session hosts are deployed	*.msftauth.net	HTTPS	443	
	*.msauth.net	HTTPS	443	
	*.global.metrics.nsatc.net	HTTPS	443	
	*.metrics.nsatc.net	HTTPS	443	
	mrsglobalsteus2prod.blob.core.windows.net	HTTPS	443	Infra Agent, Stack and Monitoring agent updates
	gsm*.blob.core.windows.net	HTTPS	443	Service telemetry
	production.diagnostics.monitoring.core.windows.net	HTTPS	12000	Service telemetry
	prod.warmpath.msftcloudes.com	HTTPS	443	Service telemetry
	http://169.254.169.254/metadata/instance/network/interface/0/ipv4/ipAddress/0/	HTTP	80	VM telemetry, ACR
	http://169.254.169.254/metadata/instance/compute	HTTP	80	VM telemetry, ACR
	169.254.169.254			VM telemetry, ACR
	https://catalogartifact.Azureedge.net/publicartifacts/rds.wvd-provision-host-pool-2636b3e1-9f2b-4349-aeeb-5d84d41b6a3e-preview/Artifacts/DSC/Configuration.zip	HTTPS	443	Marketplace deployments
Client Machines The client machines that need egress access to WVD URL's	https://rdweb.wvd.microsoft.com	HTTPS	443	Windows 10/7 Client. Subscribing makes the resources available on your local PC. https://docs.microsoft.com/en-us/Azure/virtual-desktop/connect-windows-7-and-10#subscribe-to-a-feed
	https://rdweb.wvd.microsoft.com/webclient/index.html	HTTPS	443	Web Client

Edit application rule collection

Name wvd-rlues

* Priority 200

* Action Allow

Rules
FQDN tags

NAME	SOURCE ADDRESSES	FQDN TAGS
	*, 192.168.10.1, 192.168.10.0/24, 192.168.10.2 – 192.168.1...	0 selected

ℹ FQDN tags may require additional configuration. Learn more.

Target FQDNs

NAME	SOURCE ADDRESSES	PROTOCOL:PORT	TARGET FQDNS		
wvd-*.wvd.microsoft.com	10.3.0.0/16	Https:443	*.wvd.microsoft.com	🗑	⋯
AAS-login.windows.net	10.3.0.0/16	Https:443	login.windows.net	🗑	⋯
AAD-*.microsoftonline.com	10.3.0.0/16	Https:443	*.microsoftonline.com	🗑	⋯
AAD-*.msftauth.net	10.3.0.0/16	Https:443	*.msftauth.net	🗑	⋯
AAD-msauth.net	10.3.0.0/16	Https:443	*.msauth.net	🗑	⋯
MMA Outbound	10.3.0.0/16	Https:12000	production.diagnostics.monitoring.core.windows.net	🗑	⋯
Blob	10.3.0.0/16	Https:443	mrsglobalsteus2prod.blob.core.windows.net	🗑	⋯
Metric	10.3.0.0/16	Https:443	*.global.metrics.nsatc.net	🗑	⋯
Metrics-API-Allregions	10.3.0.0/16	Https:443	*.metrics.nsatc.net	🗑	⋯

2. **Can hard tokens be used with WVD?**

   Yes. WVD supports conditional access, Azure MFA where hard tokens can be configured. Please see the below links that provide such guidance.

   https://support.yubico.com/support/solutions/articles/15000024567-using-yubikeys-with-Azure-mfa
   https://www.linkedin.com/pulse/using-fido2-security-keys-windows-virtual-desktop-freek-berson/

3. **How secure is WVD?**

   This is a very broad topic. If we are talking about the service (it is as secure as any other service in Azure). If we are talking about VMs running in your subscription, then it goes into what the enterprise/customer needs and policies are.

4. **What protocols does WVD use? (RDP/HTTP/HTTPS/HDX/ICA?)**

   The WVD service relies on HTTP/HTTPS & RDP protocols.

5. **Is Azure Disk Encryption (with customer managed keys in Azure Key Vault) supported?**
   WVD does not do anything that should break it. You would most likely need to customize our ARM template to enable disk encryption on VM creation.

6. **Will WVD be included in Azure Security Center and Azure Monitor/Log Analytics?**

   We do not have any custom alerts yet for either. However, you can feed all the Diagnostic activities to your own Log Analytics service.

7. **Is the WVD Management plane retaining any customer info?**
   No. The management plane is not hosting any customer info – it's purely acting as a gateway to the host pool.

8. **What should I do to be GPDR compliant?**
   GDPR will likely be up to the customer to implement any necessary controls for the host pools. The broker/management plane etc., that are part of WVD – probably won't be any different to existing controls that are handled by Microsoft.

9. **What type of encryption is supported with WVD? Does it work with BYOK?**
   The entire infrastructure is a service. Above questions do not apply here.

10. **How do security products (e.g. 3rd party AV) work with WVD?**
    Yes, at the end of the day the customer is just deploying VM's - anything that can run on a VM will work, so the customer can install their preferred AV product if they wish.

11. **Does WVD have support for 'Credential Guard' and 'Remote Credential Guard'?**
    WVD does not support Remote Credential Guard because Credential Guard would be needing vTPM's which Azure VMs do not support today.

7. Connecting to WVD

1. **What is the preferred connectivity model for connecting to the WVD Brokers for an Enterprise (internet gateway, express route)?**

WVD Brokers/Gateways are hosted on Azure Web App service, so client connections will be coming from internet or via Microsoft Peering. The VMs by default access brokers over the internet gateway (recommended for PoC), however, if custom routing is configured, then Service Endpoint is recommended

2. **How can end users access WVD?**
- [Connect with Windows 7 and Windows 10](#)
- [Connect with the web client](#)

3. **What are the differences between HTML & Desktop clients?**

- HTML 5 Client:
    - RemoteApps are not available from the client's local start menu.
    - Users must first open a browser and sign in, connection must be re-established manually after client reboots.
    - Copy/Paste clipboard access is functional for text etc., but you can't copy/paste files between client and VM.
    - Full screen experience is useable but not as native an experience as the Windows client.
    - Printing pass thru is still a bit convoluted but can be done.
    - HTML client has the ability to load up a session from just about any machine and have instant access to apps/desktop sessions

4. **How can I access WVD from Android, Mac or iOS devices?**

    Existing remote desktop clients for Android, Mac, iOS clients will be extended to support WVD. Link [here](#).

5. **What type of devices can connect to Windows Virtual Desktop?**

    Any device with a HTML5 capable browser can connect to WVD. WVD also supports the following OS platforms listed [here](#). Support for Android, MacOS and iOS is still in Preview.

6. **What thin clients are supported?**
    Microsoft is actively working on adding thin client support to WVD. Time lines are being worked on. Please check back later for more details.

7. **Does WVD support SSO?**
    Currently, the WVD SSO flow requires ADFS. The reason that it's not native right now Windows does not allow tokens for an interactive RDP logon. Instead, it

requires hard credentials, which WVD as a service never sees since the first authentication is strictly against Azure AD.

Please note that SSO + smartcard logons are only supported using the desktop client and not the Web client yet.

8. **Will Wyse thin clients or PCoIP be supported?**

   We are working with Dell and other 3rd party vendors, though there are no specific dates yet. Connections from PCoIP are not supported in WVD currently.

9. **Do we need a static IP address for VM's in a Persistent (VDI) Host pool?**

   Not necessarily, it does not need to be static. Once a user accesses a persistent pool, they are assigned to a VM and recurring sessions from that user will connect to the same VM.

10. **Is it possible to store Windows Credentials using Windows Virtual Desktop remote desktop App?**
    Yes, this is possible. When you launch a WVD RemoteApp or Desktop, you can select 'Save My Credentials' and store the Credentials for later login.

    Also, if you would like to block a user from storing credentials for later use.
    It can be done by changing the setting on the VM side by enabling "Do not allow Stored Credentials".

11. **Does Microsoft have a preferred hardware vendor for thin clients?**

    iGEL is the first to market with a thin client WVD endpoint that was announced during Ignite 2019. Here is a link to iGELs early access program for thin client for WVD.

12. **How many times will the prompt for credentials be seen by the user while connecting to a WVD session or starting an application?**

    Currently, while a user tries to launch either a wvd session or an application there is a 2-step authentication, 1. Authenticating against Azure AD (where WVD is managed) 2. Authenticating the user against the DC. (domain credentials) will be prompted twice for credentials.

1. **Connecting to WVD** is where a user subscribes to a feed using Azure Active Directory Credentials. This is a one-time operation and after subscribing to the feed, won't be prompted again.
2. **Starting an application,** a normal Windows authentication to the host where an application or full desktop is hosted. Windows Hello with BIO or PIN is also supported, granted.

Also, with the upcoming feature that allows VMs to be domain joined to Azure AD early 2020 it should be possible to enable SSO that will not require the credential prompt the second time.

8. Identity & Access Management (IAM)

1. **How do I choose between traditional AD, AD in Azure & AAD-Domain Services?**
   Please see below for details:

Domain join strategy

Option	Target	Pros	Cons
Use VM with DC in your Azure subscription	Smaller customers or PoC	• Can sync with on-premises DCs via VPN or ExpressRoute • All familiar AD Group Policies can be used • Virtual machines can be paused or stopped to reduce costs	Adds additional management of a VM and AD in Azure
Use Azure AD DS	"Born in the cloud" organizations	• Great for test or isolated environments that do not need connectivity to on-premises resources. • Azure AD will be your leading source for identities.	AD DS results in a fixed charge per month
Use VPN or ExpressRoute for connectivity from Azure to on-premises DCs	Hybrid customers	• No AD DS or Domain Controller required in Azure	Additional latency could add delays during user authentication to VMs Not suitable for cloud only tests

2. **Does the Web Access/Gateway support SSO integration with 3rd parties? (DUO)**
   SSO requires ADFS and if third party identity system is using the credentials, it must be fully synched and present in the ADFS.

3. **Can we have all VMs completely in the cloud isolated from their on-prem domain and have them Azure-AD joined? Is it possible?**
    Microsoft realizes the ask and are working towards supporting it although, there is no concrete ETC (estimated time to complete) at this time.

4. **I have an existing Azure AD Domain services instance but I cannot fully manage it. Can I deploy another AAD-DS instance in the same Azure tenant to test WVD?**
    Unfortunately, Azure AD Domain Services has a restriction that you can only deploy One instance of it **per Azure AD tenant**.

5. **Can I setup WVD with Intune (for session hosts) and enable conditional access?**
    You should be able to add a conditional access policy explicitly for WVD as it stands today. If you go to **Azure Active Directory**, **Enterprise applications**, then search for/select **Windows Virtual Desktop client**, you can set policies there

6. **Is MFA supported?**
    MFA is supported for end users but not for the admin account that is used to manage WVD.

7. **Can we use the login certification (password less certification) of face or fingerprint on Windows Virtual Desktop?**
    Yes, you can use Windows Hello (face, PIN, fingerprint) for Windows Virtual Desktop. For this to work, the user must be on the corporate network or VPN.

8. **What if there are multiple Active directory forests and/or domains? Will it work in WVD?**

    The WVD session host VMs can join whichever forest (and OU within forests). As long as the user trying to connect to that VM can be authenticated, it should work!

9. **How can WVD force users to login through MFA every time?**

    Using MFA users will be passed through, when a user re-connect without being challenged for Multiple Authentication, this is by design of Azure AD.

Azure Active Directory is currently working on a feature to enforce MFA with each logon but there is no ETA for now. But there is an alternative workaround by configuring the new "Sign in frequency (Preview)" feature. During testing this feature did not challenge the RD session for an hour as long as the session stays open. If 1 hour has passed after previous MFA challenge and the RD session has to be setup again an MFA will be enforced again.

10. **Can you use a 'group' for the 'list of users' that can access a hostpool?**
No, this is not possible now, but Microsoft is working on this addition and is targeted to be available by first half of the calendar year 2020.

11. **How to enable MFA for external users?**
MFA can be enabled using Azure MFA which is detailed on how it works can be found at this [link](#).

12. **Will WVD support the option of users resetting the password on WVD like that was available with RDWebAccess?**
WVD mostly deals with infrastructure and connected user pain points and the identity password reset is not considered for now. Instead Azure AD Connect and Password write-back to reset the password can be an option.

13. **Can Windows Virtual Desktop work without an Azure Active Directory or Azure Directory Domain Services by using Windows AD Domain Controllers running on Azure Virtual Machines?**
Yes, User can move or create new Domain Controllers in a Virtual Network. But the users in Domain Controller must be synchronized to Azure AD. If they do not match, the logon process will not work.

14. **What is the Estimated Schedule for Azure Active Directory only (no Active Directory requirement)?**

Basic support for AAD/MDM is expected H1 of CY20. Customers can enroll a VM into Azure AD and, if configured in Azure AD, auto-enrolled into MDM. Customer can connect to these VMs using Windows 10 clients that are:
- Hybrid Azure Active Directory Joined to the same tenant as the destination VM (or)
- Azure AD Joined to the same tenant as the destination VM (or)
    i. A work account has been added using an account that matches the tenant as the destination VM.

Note: The "basic" part refers to the limited client devices that can be used to connect. We expect to expand supported client devices in H2 of CY20.

9. WVD Management & Operations

1. **If customer starts with Breadths-First algorithm and realizes the spread of sessions is sparse and would like to consolidate sessions for better density later, is it doable? In other words, can sessions be migrated from one Host to another?**
    No, sessions cannot be migrated. However, you can either have a session host stop connecting sessions or log off users and ask them to reconnect.

2. **Can changing the default behavior of the VM power off button from 'power off' action to 'restart' like other VDI products such as Citrix and VMWare supported in WVD?**
    This is not supported today but will be taken as feedback for a future release. The administrator can hide the Shutdown option completely. This can be controlled using:
    > Key: HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\PolicyManager\default\Start\HideShutDown
    > Type: DWORD (32bit)
    > Name: Value
    > Value: 1 or 0

3. **When can I expect autoscaling options built in?**
    Autoscaling is something we are tracking for post-GA and more details will be provided as it become available.

4. **When a connection is made, the client is prompted to give access to clipboard and printer. Can this be suppressed?**
    There is not currently any method for suppressing this dialog overall. The user may select "Do not show again" if they want their permissions to be saved. We will not be able to suppress this dialogue if the users will ever need access to clipboard/printer redirection as this is a strict privacy requirement.

5. **How do I access the base machine web cam for video calling in the session host pool. Is there any option to use base machine resources without any 3rd party software?**
    Connect to WVD using Powershell and run the below command against your host pool.
    Set-RdsHostpool -tenant $wvdtenant -name $hostpoolname -CustomRdpProperty camerastoredirect:s:*

    Also, you can see other supported redirections using
    https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/clients/rdp-files

6. **How do we restrict cut & paste between the client and WVD host?**
    Yes – this would require the use of the custom RDP properties to prevent the clipboard use. Clipboard redirection properties can do this using PowerShell. Please follow this link at https://docs.microsoft.com/en-au/powershell/module/windowsvirtualdesktop/set-rdshostpool

7. **Do folders created in the 'c' drive of a session host persist between sessions?**
    No, because the host pool contains multiple sessions hosts and user logins are assigned to ANY available session host. So, saving anything to the system-drive is not optimal since that drive is local to each session host and the content on it won't roam.

8. **What is the process of updating WVD agents?**
    WVD agents get updated when Microsoft pushes a service update. Existing agent on the VM works with the WVD service to determine what's the appropriate version and it is updated automatically.

9. **Is there service connectivity loss during the agent upgrade**
    We have recently made a change in the agent which would ensure there is no loss of connectivity while agent upgrade is in place. We continue to leverage the old agent while new agent is getting installed. In case new agent install fails , old agent will continue. We have recently updated documentation to have this as default agent and we are in process in updating marketplace to carry the same agent.

10. How does the backend infrastructure work? Can I manage the services like Broker, Gateway Etc.

No, you cannot and you do not need to. Microsoft manages them for like any other PaaS service which is fully scalable and fault tolerant.

11. Is there a User Interface for WVD management?

This is under construction. More details will be released soon.
https://docs.microsoft.com/en-us/Azure/virtual-desktop/manage-resources-using-ui

12. What is the difference between a Desktop AppGroup vs. a regular RemoteApp AppGroup?

Desktop Appgroups provide a complete desktop experience for the users Vs RemoteApp where the user can only launch apps (Ex: Outlook, word ETC.) as if they are running locally

13. Is there way to change the configurations (like VMs size, pooled versus personal, new custom image) of an existing host pool?

- Change RDP configurations of host pool by following this link at Azure Docs
- VM Sizes can be changed. Use the Azure portal to scale up a VM sizes of session hosts running in a host pool.
- New custom image configurations can be found at this link on Azure Docs
- Changing pooled versus personal or vice versa is not possible currently.

14. Does WVD create a default desktop application group?

Yes this 'Desktop' group is automatically added whenever a new host pool is created. Although, users are not added automatically (unless, mentioned during deployment time).

15. Are there any plans to support groups for app group assignment?

Yes, although security groups are unsupported today, the product team is aware and plan to support soon.

16. What does it mean to be BreadthFirst / Non-Persistent.

Non-persistent means "Shared desktop" Vs allocating 1 VM to each user (VDI in the traditional sense). With WVD, Win 10 multi session solves this problem and

saves costs, by allowing multiple users to share the same Windows 10 session. You can read [Configure the Windows Virtual Desktop load-balancing method](#) for load balancing details.

17. **With our breadth/depth load balancing, does that also include a way to automatically add virtual machines to the pool? When you add a VM to a pool can you specific a larger size, e.g. first one is a D3 and then you would spin up a D4? Honestly not sure why they would do it this way.**
    Currently not possible using the existing scripts. The idea at present is to spin up (and deallocate) machines you require and add additional hosts to the pool if necessary. The automated process would be possible using an automation script but this can also be where partners like Citrix can add value.

18. **Can sessions be migrated from one Host to another?**
    No, sessions cannot be migrated. However, you can either have a session host stop connecting sessions or log off users and ask them to reconnect.

19. **How do I add another VM to the pool? Do I just re-run the "Provision a host pool" in the portal and specify the already existing pool?**
    Yes, you can do that. Additionally, you can also follow https://docs.microsoft.com/en-us/Azure/virtual-desktop/create-host-pools-powershell (better control from RG placement and naming convention perspective)

20. **I grouped my remote applications into folders, but I don't see them using the desktop and/or web client**
    Folders are not currently supported in WVD. This is a backlog item and we do not yet have a timeline for, yet. We will continue to track requests for folders and provide a time line.

21. **Does my host pool scale? Is it automatic?**
    Please refer to this link: [Automatically scale session hosts](#)

22. **Is there is a mechanism to add an additional server to a host pool, or creating a second host pool and adding a new server to it (if I wanted to have two pools for example, sales and service)**

Yes, there is, by manually by provisioning the VM, installing WVD agents and then completing registration. By running the ARM template, a second time, but specifying same input and changing the number of hosts. For example, if during the first run 3 hosts were created, and the template is ran again with (exactly) same input but with session count increased to 6, the template is "smart" enough to figure out that only 3 new hosts are needed.

23. **Is there a way to link WVD from other Office 365 or Azure AD portal pages, such as office.com or myapps.microsoft.com?**
This is part of our backlog scenario for integration with M365 where the WVD web feed can be integrated.

24. **Can I update a host pool from non-persistent to Persistent AFTER deployment?**
No. you need to set the host pool persistence value during deployment time only.

25. **Can I add audio input/mic redirection?**
Yes, you can by using the command Set-Rdshostpool -TenantName <tenantName> -host poolName <hostPoolName> -CustomRdpProperty audiocapturemode:i:1
additional values for -CustomRdpProperty can be found at https://docs.microsoft.com/en-us/windows-server/remote/remote-desktop-services/clients/remote-desktop-app-compare#supported-rdp-settings

26. **How do we fix the DST/change Time Zone on Windows 10 machines?**
To fix this, import the respective registry settings from a working Windows 10 machine.

27. **Is there a way to change (update app setting or install app) the settings of the created VMs at once?**
No, we do not have an automatic update/rollout mechanism. We have an ARM template to help you rollout an updated image to a host pool: [Update existing WVD host pool](#).

28. **Can VMs be started and or stopped, triggered by sign-in or sign-out on Windows Virtual Desktop?**

There is no automatic way to start/stop the VMs based on user login. However, if you base the "login" from Azure AD logs, this may be possible.

29. **Will WVD provision another VM to accommodate new users dynamically in a Non-Persistent environment?**
Scaling host pools can be handled using instructions at [Automatically scale session hosts.](#)

30. **How can Windows Updates be staged in a maintenance window to ensure system availability after users login (given that all hosts should be at same patch or update level)?**
You can use the Update Management solution to manage updates and patches for your hosts. Please use Azure automation for updating and patching needs as documented here [Azure Docs.](#)

31. **How can I send an SMS to users before logging them off the host pools?**
The scaling script can be modified to include an API call to the SMS system before logging off users.

32. **How is breadth and depth mode configured specifically and where?**
https://docs.microsoft.com/en-us/Azure/virtual-desktop/host-pool-load-balancing

```
Set-Rdshost pool -TenantName "tenantname" -Name "hostpooname" -
BreadthFirstLoadBalancer -MaxSessionLimit <int> -ValidationEnv
<bool>  CommonParameters

Set-Rdshost pool -TenantName "tenantname" -Name "hostpooname" -
DepthFirstLoadBalancer -MaxSessionLimit 2 -ValidationEnv
<bool>  CommonParameters
```

33. **How does one enable audio and camera redirections?**
https://docs.microsoft.com/en-us/Azure/virtual-desktop/customize-rdp-properties

34. **Microsoft has introduced a new packaging format called MSIX. With the Windows 10 1809 release, we can use MSIX packages. What is the impact of using MSIX packages in Windows Virtual Desktop scenario?**

MSIX is for packaging apps and delivering them to Windows physical or virtual machines. Microsoft recommends utilizing MSIX for Windows Virtual desktop as the plans are to utlize this going forward for delivering applications.

35. How is printing with WVD managed?

Every printing feature that was supported in RDS 2016 on Azure, will work in WVD. Also, ThinPrint is a key partner that have solved most problems in VDI/RDSH environments for printing related problems.

36. How is Patch management handled in WVD

- We do not recommend in place updates (in place = on the VMs already being deployed to users)
- What we recommend is update your master image (using any process already utilized by the company). Upload image to Azure. Use our update template to provision VMs.
- Server OS patching using SCCM and Client OS using Intune (still under development)
- WS 2019 Admin Center there is tons of things there that are useful
- Third party (Citrix mainly, but there are others)

37. Is there support for API lifecycle management – provision, manage, decommission, move between regions etc?

Yes and no. The APIs asked about are part of Azure and not specific to WVD.

38. Is it possible to link session hosts to mobile device management if they are classical VMs?

Yes, you can hook it up to ConfigManager or Intune (with Hybrid AAD Join).

39. Is it possible to store Windows Credentials using WVD remote desktop App?

Yes, this is possible. When you launch a WVD RemoteApp or Desktop, you can select 'Save My Credentials' and store the Credentials for later login.
Also, if you would like to block a user from storing credentials for later use.
It can be done by changing the setting on the VM side by enabling "Do not allow Stored Credentials".

40. If a user leaves a session open and reconnects in from a different location or from same location after a time interval will the session hosts be scaled down to reduce the cost?

Existing scaling script can be configured to honor existing sessions and only turn off VMs that do not have any active sessions.

41. Is there a way to change Host Pool from Pooled to Personal Host Pool and vice-versa?
No, once a host pool is created it cannot be changed.

42. How to monitor concurrent connections (Load Balancing) of the user connecting to WVD?
There is an API called **Get-RdsUserSession** that reports all existing connections to the specified host pool.

43. How to shadow the User Connections like in the current RDS environment through RDS Connection Broker Server?
On WVD with the command **Get-RdsUserSession** on a host pool, the VM Name and Session ID will be obtained. And if there is jump box on the same network as the WVD VMs, then you can shadow the user through the built-in mstsc.exe from that jump box.

44. How often will the updates happen on Windows Virtual Desktop? What are "ValidationEnv" Updates?
ValidationEnv is just for Windows Virtual Desktop (WVD) Agent updates. Windows OS updates or KB's are not pushed by WVD. Subscribe to Windows Virtual Desktop Updates to get the latest updates

Note: It is recommended to set **ValidationEnv** parameter enabled to test the user connection latency with the associated geographical regions. Details on this link.

45. What is the root cause for non-responsive Windows 10 Enterprise Multi-session hosts issue?
There are two causes for this issue, one related to a deadlock within FSLogix and the second one where a weekly BiSrv cleanup exhausts system resources. In both scenarios WVD diagnostics show VMs in a "NoHeartBeat" state. Details on the work around (fix) can be found at this link.

46. What are the Virtual Machine recommendations when sizing for Desktops or RemoteApp host pools?
The table below provides more details on workload examples for a range of user types and Virtual Machine (VM) sizing.

Workload Type	Example User	Example Apps

Light	Users doing data entry tasks	Database entry applications, Command line interfaces
Medium	Users such as consultants and market researchers	Above applications, Microsoft Word, static web pages
Heavy	Software engineers, content creators	Above applications, Microsoft Outlook, Microsoft PowerPoint, dynamic web pages
Power	Graphic designers, 3D modelers, machine learning researchers	Above applications, Adobe Photoshop, Adobe Illustrator, CAD/CAM

For each type of workload running on a virtual machine managed by Windows Virtual Desktop, a different VM configuration may be required. The table below suggests the number of users per virtual central processing unit (vCPU) and the minimum VM configuration for each workload.

Workload Type	Users per vCPU (maximum)	vCPUs / RAM / OS Storage* (suggested minimum)	Example Azure Instances	User Storage (suggested minimum)
Light	6	2 / 8 GB / 16 GB	D2s_v3, F2s_v2	30 GB
Medium	4	4 / 16 GB / 32 GB	D4s_v3, F4s_v2	
Heavy	2			
Power	1	6 / 56 GB / 340 GB	D4s_v3, F4s_v2, NV6*	

47. Is Application pool management exclusive to PowerShell or can be done via Azure portal?
Application pool management works both on PowerShell as well as Azure portal.

48. Is User Role assignment possible with AD groups?
Yes, User assignments are available in the Azure portal.

49. Where can users find documentation to create and manage Remote app groups here?
Documentation can be found at:
Create RemoteApp Groups + Add Apps: https://docs.microsoft.com/en-us/azure/virtual-desktop/manage-app-groups#create-a-remoteapp-group
Publish Built-in apps: https://docs.microsoft.com/en-us/azure/virtual-desktop/publish-apps

50. Why is it a slow process to start Remote App on WVD for the first time?

The initial start-up delay can be because of any of the following reasons, the user profile is getting setup for the first time on the host or Domain scripts /policies may causing delays, in case of windows server the inbuilt user profile service iss optimizing, etc. A little bit of delay (in seconds) is unavoidable but not in the 10s of seconds.

10. Migrating to WVD

1. **I have windows 7 machines and would like to move them to Azure/integrate with WVD. How do I handle this?**
   Windows 7 machines can be migrated to Azure using tools like Azure Migrate and/or Azure Site Recovery (ASR). This can be done either from on-premises to Azure or even between Azure regions.

2. **If the customer is using Windows Virtual Desktop in the US now, when that service becomes available in Australia, how can they migrate the VMs? Is there an official migration path? Does it require down time?**

   Depending on whether the OS running on the VMs is supported, ASR can be used to replicate to a different region and the VMs can be migrated with minimal downtime.

3. **Is there any way to migrate current on-premise VDIs or profiles to Azure WVD?**

   • Yes, use Azure Migrate to move on-premise VDI to WVD and install WVD agents manually (by running scripts from here)
   • Profiles can be migrated using Liquidware's ProfileUnity product (follow this link to WVD partner integrations and also see quick demo here.

4. **Is there a direct migration path from On-premise RDS to WVD? Or will we have to first migrate to RDS in Azure as IaaS and from there to WVD. Is that correct?**
   If the customer wants to use Win10 EVD with WVD, then they cannot migrate to WVD directly from on-premises. If they want to continue using their existing image (WS or Win10), they can definitely migrate their VMs as long they have the following also migrated/ setup – AD with AAD sync, VNET, user storage (optional if they want everything available in Azure). They can use Azure Site Recovery for the same.

The other option is to migrate all their on-prem resources using ASR to Azure (inclusive of RDS components) and then once they have a validated env, then they can connect the VMs to WVD. I would recommend this because we see customers get stuck in the AD and VNET creation/ sync step and then give up on WVD. This kind of phased-migration ensures that they get all the WVD pre-reqs in place before attempting to use WVD.

11.   WVD Monitoring & Telemetry

1. **How can we do "Windows Update" on Windows Virtual Desktop? Could you tell us if there are best practices for "Windows Update" on Windows Virtual Desktop ?**
   There's no restriction. The VMs are in your control, so it depends on how you would like to update. Please refer to WVD docs for more details.

2. **What would be our general response on how frequently would gold images recommended to be updated?**
   The pooled, non-persistent VDI should be easier to maintain because you just update the base image on a regular cadence. All user profile data would be saved in a profile share and nothing residual on the VM would need to be kept. We would imagine a push once a month with latest security fixes. On the other hand, the personal VMs is a bit more challenging, since you would most likely want to push security fixes through SCCM, Windows Update for Business, or Azure's update mechanism. Again, this would probably be once a month.

3. **How do we monitor WVD?**
   For the VMs Azure has a set of tools as well as existing monitoring solutions in Intune, SCCM. For the service we have diagnostic data published to AppInsights from where customer can query it and build in any reports that the organization needs (via tools like PowerBI). If we are talking about troubleshooting user experience then that can be done either via Rest API **/** PowerShell

4. **Why are there multiple stale sessions on my session hosts. Does WVD have an option to automatically refresh the VM's to an original state after each day?**
   WVD wont fix the problem of stale sessions. You would have to create settings to disconnect the idle sessions. In an environment with lots of short-lived sessions, this should be a fairly low timeout.

Setting	State
Set time limit for disconnected sessions	Not configured
Set time limit for active but idle Remote Desktop Services se...	Enabled
Set time limit for active Remote Desktop Services sessions	Not configured
End session when time limits are reached	Not configured
Set time limit for logoff of RemoteApp sessions	Not configured

Session timeouts are also best practice to enable as well as restarts, as they are doing slightly different things, Session timeouts kill off sessions no longer in use, whilst a restart clears out all the VM memory etc.

Session timeouts are "typically" set to 90 – 120 minutes allowing for a user's long lunch break! And kill them off at the end of the day – server restarts might be Weekly or less if need be

5. **Is it possible to create folder/subfolders to organize the published applications a user gets on WVD?**
   No, this is not supported now and might be supported in future but no tentative timelines.

12. WVD Deployment Issues

1. **AD domain join Issues**
   If you experience domain join issues with Active Directory and get the below error, please ensure the following items are validated

```
{

  "code": "DeploymentFailed",

  "message": "At least one resource deployment operation failed. Please list
deployment operations for details. Please see https://aka.ms/arm-debug for usage
details.",

  "details": [

    {
```

```
      "code": "Conflict",

      "message": "{\r\n  \"status\": \"Failed\",\r\n  \"error\":
{\r\n    \"code\": \"ResourceDeploymentFailure\",\r\n    \"message\": \"The
resource operation completed with terminal provisioning state
'Failed'.\",\r\n    \"details\": [\r\n      {\r\n        \"code\":
\"VMExtensionProvisioningError\",\r\n        \"message\": \"VM has reported a
failure when processing extension 'joindomain'. Error message: \\\"Exception(s)
occured while joining Domain
'bhnetwork.local'\\\".\"\r\n      }\r\n    ]\r\n  }\r\n}"

    }

  ]

}
```

- The VNET where the session hosts are being deployed to can ping/talk to your Domain Controllers
- Ensure your DNS servers are updated on the VNET OR VM-NIC to communicate with your domain controllers
  - https://docs.microsoft.com/en-us/Azure/virtual-network/manage-virtual-network#change-dns-servers
- The Admin UPN details (admin@domain.com) being provided has" Domain Join" capability.
- RDP to the Session host and follow instructions in the below link to understand why domain join fails
  - https://support.microsoft.com/en-us/help/4341920/troubleshoot-errors-that-occur-when-you-join-windows-based-computers-t
- Run the below command with the same admin UPN credentials to validate communication with the domain controller
  - **net use \\dcname\ipc$ /u:< domain\user > < password >**
- RDP to the session host and try to domain join manually to eliminate any issues with the VM extension
- In the Azure portal goto Virtual Machines > click on the session Host > Extensions to ensure the Domain Join VM extension is installed and ready
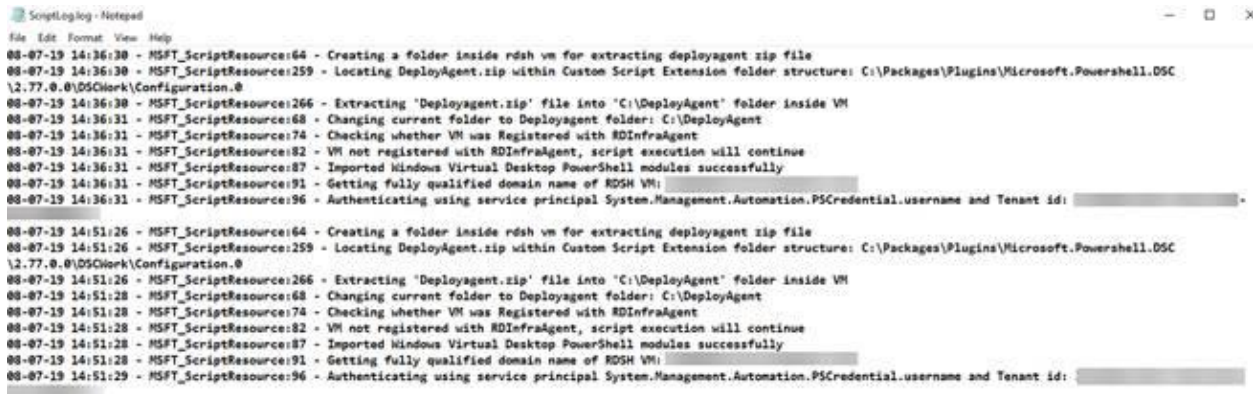
2. **Errors when deploying using a Service Principal**
   If you get the below error when deploying WVD using a service principal, please ensure the following is in place.

{ "id": "/subscriptions/b54f955a-67c4-4680-888e-17bf609fe9c2/resourceGroups/feideu2-domainarchitectureworkstations-rg-005/providers/Microsoft.Resources/deployments/rds.wvd-provision-host-pool-20190807102412/operations/C6DF4D3859D7E0D2", "operationId": "C6DF4D3859D7E0D2", "properties": { "provisioningOperation": "Create", "provisioningState": "Failed", "timestamp": "2019-08-07T14:37:40.7598226Z", "duration": "PT7M41.2454611S", "trackingId": "03c15987-b851-4096-a91a-4663b7b86fc1", "statusCode": "Conflict", "statusMessage": { "status": "Failed", "error": { "code": "ResourceDeploymentFailure", "message": "The resource operation completed with terminal provisioning state 'Failed'.", "details": [{ "code": "VMExtensionProvisioningError", "message": "VM has reported a failure when processing extension 'dscextension'. Error message: \"DSC Configuration 'FirstSessionHost' completed with error(s). Following are the first few: PowerShell DSC resource MSFT_ScriptResource **failed to execute Set-TargetResource** functionality with error message: One or more errors occurred. **The SendConfigurationApply function did not succeed**.\"." }] } }, "targetResource": { "id": "/subscriptions/b54f955a-67c4-4680-888e-17bf609fe9c2/resourceGroups/feideu2-domainarchitectureworkstations-rg-005/providers/Microsoft.Compute/virtualMachines/WVDPOC99-0/extensions/dscextension", "resourceType": "Microsoft.Compute/virtualMachines/extensions", "resourceName": "WVDPOC99-0/dscextension" } }}

Troubleshooting:

In order to verify that the agents do not install RDP to the failed session hosts >> open C:\Windows\TEMP\scriptlogs.log . The output from the automation is shown below. The log shows the agent downloaded, extracted, but never installed via the SPN. This just continues to loop over and over.

Resolution:

1) Verify that the SPN created for WVD has the proper RDS Owner permissions AND is configured as being multi-tenant. WVD [SPN link](#)

   a. Specifically in the command pasted from the link above $svcPrincipal = New-AzureADApplication `-AvailableToOtherTenants` is what needs to be enabled for the SPN

   b. Often times an Azure admin may not have enabled the multi-tenant option which in the current preview can cause issues.

2) From the Azure portal navigate to **Azure AD→ App Registrations -->** in the **search bar** enter the SPN ID that was created. Click **search** to find the WVD App Registration. **Click** on the app registration.

   a. From the WVD App Registration navigate to **Authentication**

   b. Scroll down to Supported Account Types.

   c. Check the radial button **Accounts in any organizational directory (Any Azure AD directory – Multitenant. Note they may have to ask their Azure GA if they don't have rights to change this.**

3) Have the customer login to PowerShell using the SPN for WVD

4) Have them redeploy the template and all the agents should install.

3. If there is a deployment error on the WVD Session host and you are unable to open sites like either the Azure portal and/or Github and get a TLS error like below

Can't connect securely to this page

This might be because the site uses outdated or unsafe TLS security settings. If this keeps happening, try contacting the website's owner.

Your TLS security settings aren't set to the defaults, which could also be causing this error.

Try this:

- Go back to the last page

On the affected session host, goto Internet Options > Advanced and ensure TLS 1.2 is selected. If these settings are controlled by GPO, then please modify the GPO accordingly to unblock
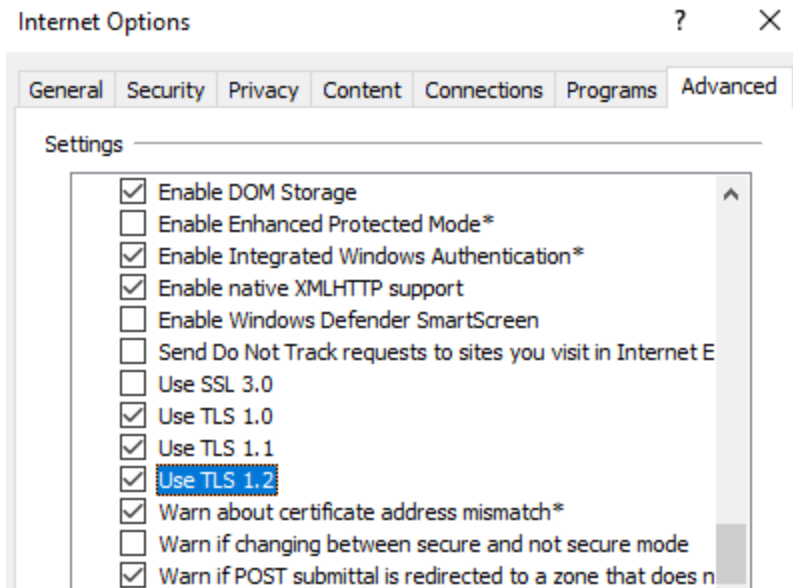
4. **Get error Details to help with other errors/Investigations**

   If there are errors during the hostpool / Session host provisioning process, then please do the following to get the error details to help with any investigations

   1. Please refer the trouble shooting section here. Additionally, you can also follow the below items
      - If the deployment fails half way through, In the Azure portal, goto the respective Resource Group > Deployments > Click the Error > click RAW ERRROR > copy that information (ref link)
      - Assuming the deployment completes (session host has been created) but there are errors with the WVD-Agent installation phase using PowerShell DSC, then:
        o RDP to the session host using the privateIP
        o Goto C:\Windows\TEMP\scriptlogs.log to find any related errors
      - Also connect to the WVD service using the Powershell module and run the command below to see the status of the session host.
        o Get-RdsSessionHost <tenantname> <hostpoolname>
      - Check to ensure that the account being used has the correct permissions on the WVD tenant by running the below cmdlet.
        ▪ Get-RdsRoleAssignment <TenantName> <TenantGroupName>
      - Take screenshots of the above outputs and send it along with the previous information to an engineer that will help you.

5. **I come across this error in my WVD deployment. "OrchestrateAsync: SID Value in the database is different than the value returned in the orchestration reply from the agent for the user" What should I do?**
This is a known bug and the engineering team is working on it. In the meantime, make sure you AD is synchronizing all users properly.

6. **Must Use Shared Volume Licensing Edition of Office**

   If you get the below error when accessing O365 applications on a WVD session hosts, please enable the registry key (in the NOTE section) of [How to enable shared computer activation for Office 365 ProPlus](#) and re-validate
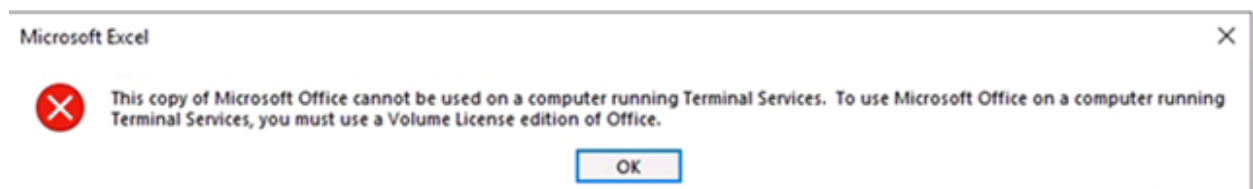
7. **Why does updating Fxlogic rules (add, remove or edit) not take effect?**
This can usually be because of the fact the profile is stale or the rules file has not propagated. Please flush the user profile and make sure the latest rules file is on the wvd session that is getting debugged.

8. **What causes exit with error code 21 on the RDS Diagnostic logs while trying to connect to a WVD session?**
Please confirm the use of a supported OS from the matrix [here](#).

9. **Why does excel errors out to open while trying to load plugins from applications that were masked using Fxlogic?**
In addition to masking the application installation paths, please make sure to mask the application's excel plugin keys on the Registry.

10. **Win10 desktop provisioned by Citrix Cloud (MCS) on Azure is showing its license Type as Windows_Server instead Windows _Client (while running Get-AzVM), is there a documentation that talks about licensing? to refer?**

To apply Windows license to session hosts, step by step instructions is documented at below link: https://docs.microsoft.com/azure/virtual-desktop/apply-windows-license

11. **How can we deploy Host pools with an existing custom image?**

Select **Custom image** during the host pool deployment, then opt for the resource group with the image and the image name or the full path if a Custom VHDs is used.

13. Windows 7

1. **Is Windows 7 32-bit supported as remote client. I read about extended support for Windows 7, does that apply to both 64 and 32 bit?**

   64-bit, 32-bit is being evaluated.

2. **What is the support model for Windows 7?**
   - Windows 7 is NOT supported during preview although it will be from GA.
   - Windows 7 will be published as a desktop only and not multi-session
   - Only 64bit is supported
   - Custom image upload and migration using ASR is also supported from GA.
   - There will be limited Teams support (no audio / video) and full support is planned for shortly after GA

3. **Is Remote App supported on the same OS level?**
   RemoteApp is not supported on Win 7. All other supported OS's support RemoteApp.

4. **What is the migration path for Windows 7 to WVD? 1) port the Windows 7 image to WVD in Azure, 2) update the image to Windows 10**
   We would recommend updating the image to Windows 10 Enterprise. If you encounter apps that do not work on Windows 10 – we have a free service with a dedicated engineering team available to resolve any issues. This service is called Desktop AppAssure.
   Alternatively, you can use the existing Windows 7 image with all apps as part of WVD and benefit from 3 years ESU. Make sure it's Windows 7 Enterprise, it's made ready for Azure and the WVD agent (to be released) is installed.

5. **Are remote peripherals remapping supported (COM and USB devices, like printers, scanners, barcode (*) readers, etc…)**
Yes, local client device redirection is supported

14. MISCELLANEOUS

1. **If the customer's O365 is in GCC, will that create authentication or machine domain join issues?**
No, this should not cause authentication errors, but it would cause additional latency since all VMs registered to WVD must be in Azure.

2. **How can one implement WVD in an MSP Partner Scenario?**

For each customer the MSP manages, create a WVD tenant in the customers AAD and deploy host pools in the same AAD that communicate with the WVD service.

3. **Is there a learning path to WVD?**

Yes, a step-by-step guidance is available at this [location](#).

4. **What is the Estimated Schedule for Intune support for WVD?**

It completely depends on which operating system is being used:
- Windows 10 Enterprise, Intune will support all functionality except policies that affect "hardware" that's missing. E.g. BitLocker as it requires a TPM which Azure doesn't offer (yet).
- Windows 10 Enterprise Multi-session: Intune is planning to add support for device-based apps/policies and will drop anything user-targeted. Some other features like Conditional Access might be impacted. This is to work around certain limitations. Intune might extend their capabilities in H2 of CY20 but has not committed yet.