



Desktop-as-a-Service (DaaS) Using Windows Virtual Desktop (WVD)

Line-of-Business (LOB) Applications Integration

Prepared for:

Service Provider Partners
Oct. 2019

Prepared by:

Microsoft – **One Commercial Partner (OCP)**

MICROSOFT MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS DOCUMENT.

Complying with all applicable copyright laws is the responsibility of the user. Without limiting the rights under copyright, no part of this document may be reproduced, stored in or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the express written permission of Microsoft Corporation. Microsoft may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Microsoft, our provision of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property. The descriptions of other companies' products in this document, if any, are provided only as a convenience to you. Any such references should not be considered an endorsement or support by Microsoft. Microsoft cannot guarantee their accuracy, and the products may change over time. Also, the descriptions are intended as brief highlights to aid understanding, rather than as thorough coverage. For authoritative descriptions of these products, please consult their respective manufacturers. © 2016 Microsoft Corporation. All rights reserved. Any use or distribution of these materials without express authorization of Microsoft Corp. is strictly prohibited. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

Contents

1. Overview	4
2. Prerequisites	4
Azure & Windows Active Directory Prerequisites	4
General Best Practices	4
Azure Networking	5
Azure Architectural Diagram	5
3. Set Friendly Names for Published Desktops	6
4. Customizing the user experience	7
Add or edit a single custom RDP property	7
Add or edit multiple custom RDP properties	7
Reset all custom RDP properties	8
5. Add Custom & Published Apps to the Desktop	9
Create a custom, master, Windows 10 multi-session VM	9
Create a WVD image from a template VM snapshot	15
Deploy a custom image to a WVD host pool using an ARM template	21
6. Support	24

1. Overview

Windows Virtual Desktop provides a complete user experience right out-of-the-box. During the setup process, default values may be applied to a variety of WVD components and objects. In this document, we'll show you how to customize the WVD user experience by modifying some of those default values.

2. Prerequisites

Azure & Windows Active Directory Prerequisites

Before getting started, **all** items listed below **must** be checked/validated to ensure the most basic requirements are in place to proceed with executing the remaining steps in this guide.

- An Azure Active Directory
- A Windows Server Active Directory in sync with Azure Active Directory. This can be enabled through:
 - Azure AD Connect
 - Azure AD Domain Services
- An Azure subscription, containing a virtual network that either contains or is connected to the Windows Server Active Directory
- A functioning Windows Virtual Desktop environment

General Best Practices

Since everyone's business and technical requirements vary across the board, it is always a good idea to familiarize yourselves with the standard best practices across the different Azure technologies & services.

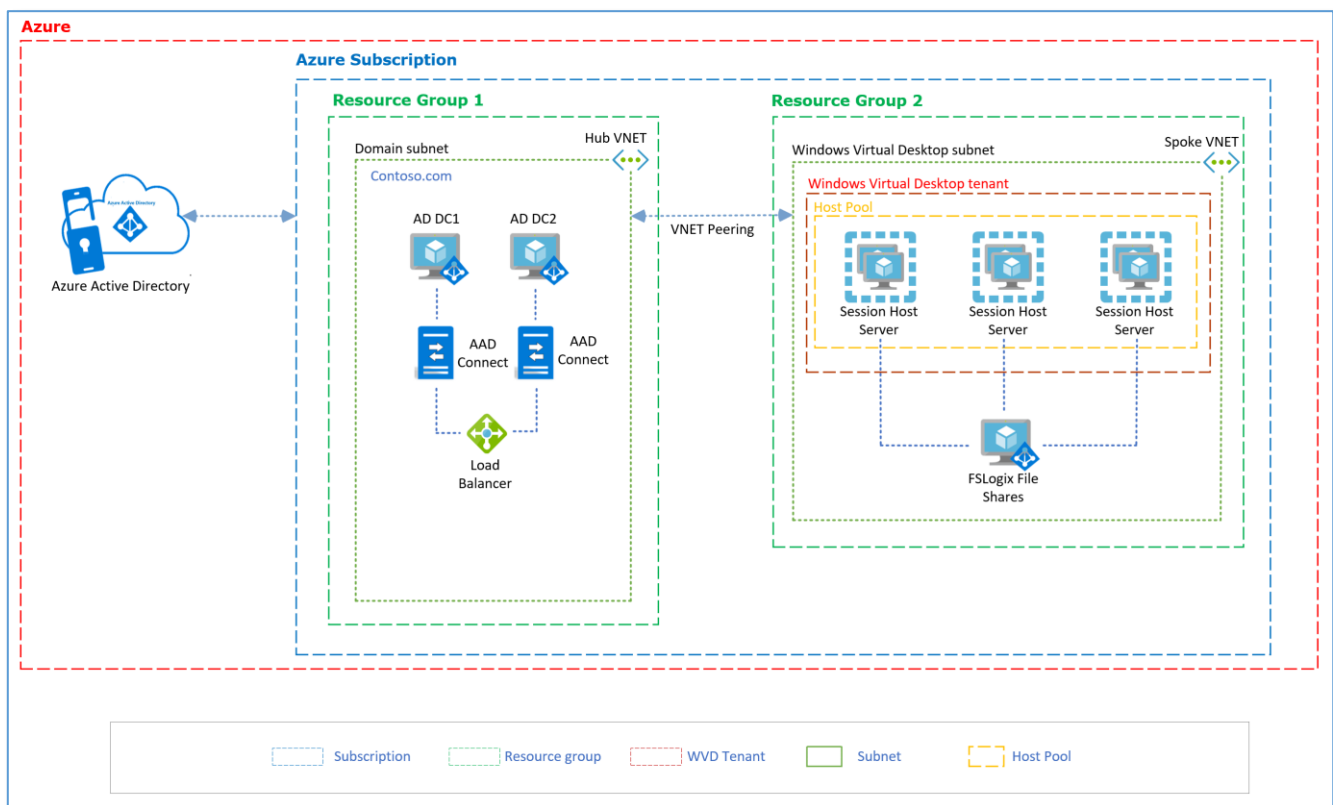
- Please follow the guidance [here](#) to maintain a consistent naming convention across your resources, unless you are already using a naming system.
- [Azure security best practices and patterns](#)
- Azure Active Directory Hybrid Identity [best practices](#)
- [Azure identity management and access control security best practices](#)
- Azure Networking & security [Best Practices](#)
- Azure Storage security [overview](#)
- [Best practices for Azure VM security](#)

Azure Networking

The recommendation is to design your Azure Networking using a [Hub-Spoke topology](#). Consider the HUB like a DMZ deployed with your Virtual network Gateways and other security/edge appliances like Firewalls Etc. while the Spoke will act as the backend zone where your session hosts servers are deployed to and is peered with the HUB. This is our design for this walk-through, so you'll need this already setup before proceeding.

Azure Architectural Diagram

Below is a diagram of the Azure environment that we'll use. It shows the objects created in Azure and their relationships within the environment. In this example, the company name will be Contoso.



3. Set Friendly Names for Published Desktops

When you deploy a WVD published desktop for the first time, the default name of "Session Desktop" is applied. Each subsequent deployment of a Published Desktop will be automatically given the same name. If a user elects to work with multiple published desktops, then they are unable to determine which is which, since they both have the same name.

1. Download and import the [Windows Virtual Desktop PowerShell module](#) to use in a PowerShell session if you haven't already.
2. Using the below command, you can set friendly desktop names to uniquely identify multiple desktops published to a user.

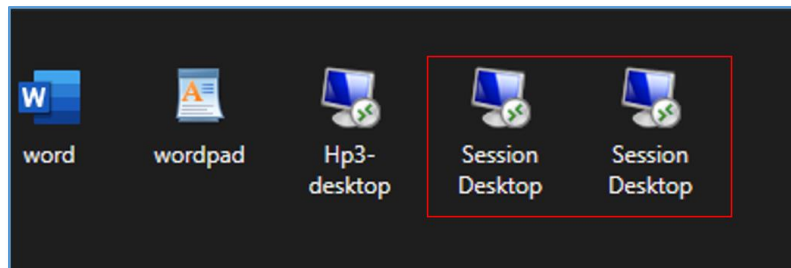
#Update the respective variables first and then execute command:

```
$tenantName = "ContosoCorpWVD"
```

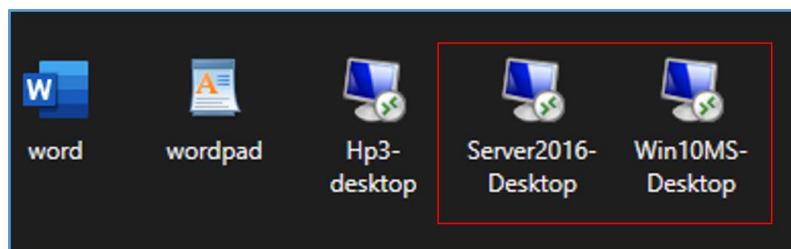
```
$AppGroupName = "w10MS"
```

```
Set-RdsRemoteDesktop -TenantName $tenantName -HostPoolName $HostPoolName `
-AppGroupName $AppGroupName -FriendlyName "Win10MS-Desktop"
```

Before...



After...



4. Customizing the user experience

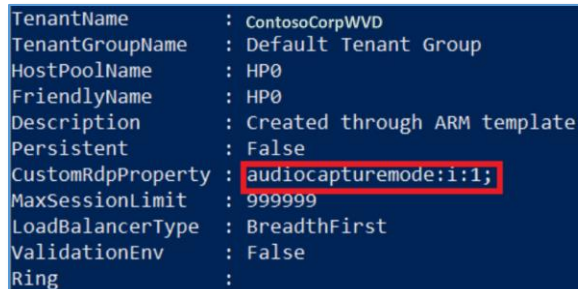
Customizing a host pool's Remote Desktop Protocol (RDP) properties, such as multi-monitor experience and audio redirection, lets you deliver an optimal experience for your users based on their needs.

Add or edit a single custom RDP property

To add or edit a single customized RDP property, run the following PowerShell cmdlet:

```
# Enable audio/microphone redirection:
$tenantName = "ContosoCorpWVD"
$hostpoolName = "HP0"
$RDPProperty = "audiocapturemode:i:1"

Set-RdsHostPool -TenantName $tenantName -Name $hostpoolName `
-CustomRdpProperty $RDPProperty
```



A screenshot of a PowerShell terminal window showing the output of the `Set-RdsHostPool` command. The output lists various properties of the host pool, including `TenantName`, `TenantGroupName`, `HostPoolName`, `FriendlyName`, `Description`, `Persistent`, `CustomRdpProperty`, `MaxSessionLimit`, `LoadBalancerType`, `ValidationEnv`, and `Ring`. The `CustomRdpProperty` value is `audiocapturemode:i:1;`, which is highlighted with a red rectangular box.

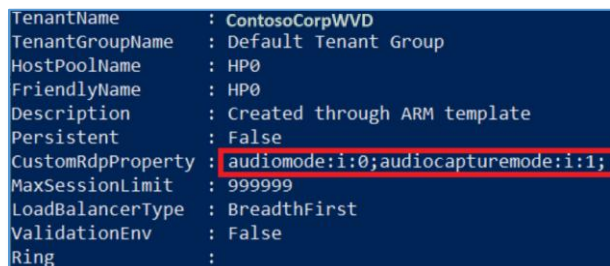
Add or edit multiple custom RDP properties

You may add or edit more than one property at a time by using a semicolon separator.

In the following PowerShell cmdlet, we enable sound to play on the local system, and enable audio redirection to the remote desktop:

```
# Play sound locally & enable audio redirection:
$tenantName = "ContosoCorpWVD"
$hostpoolName = "HP0"
$RDPProperty = "audiomode:i:0;audiocapturemode:i:0"

Set-RdsHostPool -TenantName $tenantName -Name $hostpoolName `
-CustomRdpProperty $RDPProperty
```



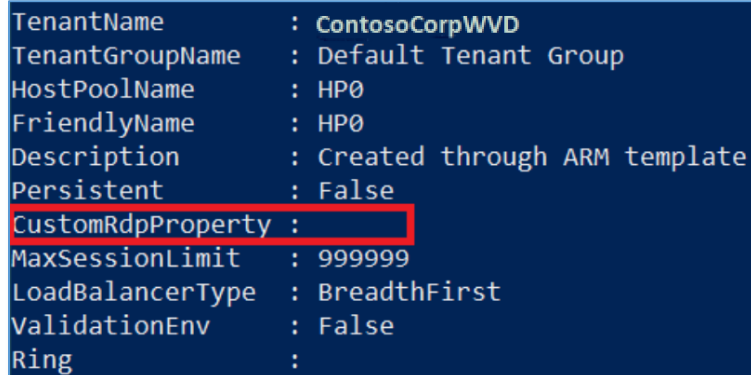
A screenshot of a PowerShell terminal window showing the output of the `Set-RdsHostPool` command. The output lists various properties of the host pool, including `TenantName`, `TenantGroupName`, `HostPoolName`, `FriendlyName`, `Description`, `Persistent`, `CustomRdpProperty`, `MaxSessionLimit`, `LoadBalancerType`, `ValidationEnv`, and `Ring`. The `CustomRdpProperty` value is `audiomode:i:0;audiocapturemode:i:1;`, which is highlighted with a red rectangular box.

Reset all custom RDP properties

You can reset all properties back to their defaults as well. Below, we'll do just that to our Contoso HP0 host pool:

```
# Reset all properties:
$tenantName = "ContosoCorpWVD"
$hostpoolName = "HP0"

Set-RdsHostPool -TenantName $tenantName -Name $hostpoolName `
  -CustomRdpProperty ""
```



```
TenantName       : ContosoCorpWVD
TenantGroupName  : Default Tenant Group
HostPoolName     : HP0
FriendlyName     : HP0
Description      : Created through ARM template
Persistent       : False
CustomRdpProperty : 
MaxSessionLimit  : 999999
LoadBalancerType : BreadthFirst
ValidationEnv     : False
Ring             :
```

See [Remote Desktop RDP file settings](#) for a full list of supported properties and their default values.

5. Add Custom & Published Apps to the Desktop

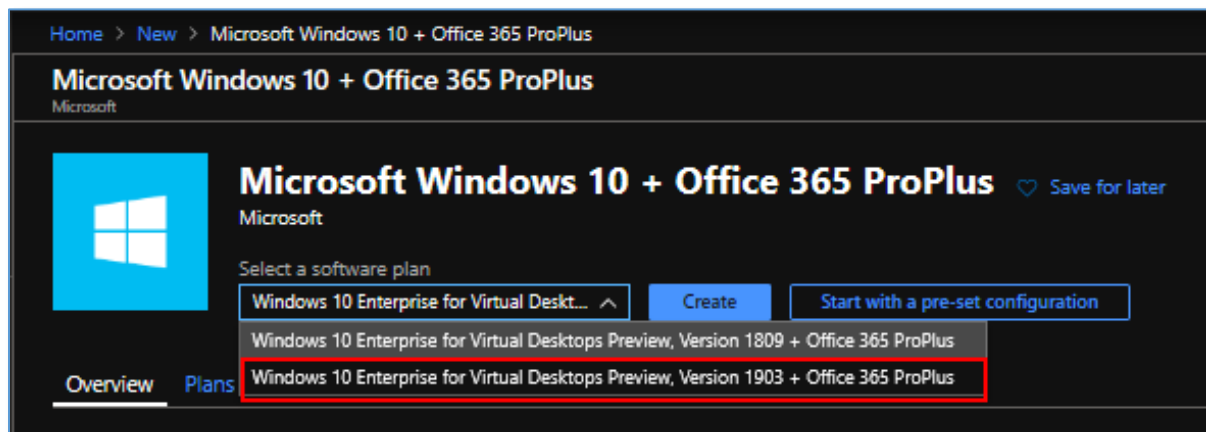
If your organization uses a custom application that's usually installed on the users' desktop, then you'll have to create a template, or master, image of a VM. Most often, this will be based on the new Windows 10 Enterprise for Virtual Desktops (Multi-User) Operating System, which is now available from the Azure Marketplace. After provisioning a VM, you can start installing custom applications on the machine. When you're done, you must capture the machine as an image to use as a base for your Windows Virtual Desktop deployment.

In this section, we will create, make a snapshot of, and deploy a custom image to a host pool. In our example, we'll be using the Windows 10 O365 SKU, and will install an application on to it.

Create a custom, master, Windows 10 multi-session VM

We'll build a custom VM and use it as a master for creating future images. These images are then deployed to WVD host pools.

1. In the **Azure Portal**, search for "**windows 10**" and select the latest version of **Windows 10 Enterprise for Virtual Desktops Preview + Office 365 ProPlus**



2. Click **Create** and complete the parameters for your environment. Example below shows our walk-through parameters. We're also allowing Remote Desktop port access from the Web:

Home > New > Microsoft Windows 10 + Office 365 ProPlus > Create a virtual machine


Create a virtual machine


Basics | Disks | Networking | Management | Advanced | Tags | Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. Looking for classic VMs? [Create VM from Azure Marketplace](#)


Project details


Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.


* Subscription  Contoso Subscription


* Resource group  RG-ContosoCorpWSAD
[Create new](#)


Instance details

* Virtual machine name  W10Ent0365VDP ✓


* Region  (US) East US 2


Availability options  No infrastructure redundancy required


* Image  Windows 10 Enterprise for Virtual Desktops Preview, Version 1903 + Office 365 ProPlus ✓
[Browse all public and private images](#)

* Size  **Standard D2 v2**
2 vcpus, 7 GiB memory
[Change size](#)

Administrator account


* Username  sysadmin ✓

* Password  ✓

* Confirm password  ✓

Inbound port rules

Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.

* Public inbound ports  ☐ None ☒ Allow selected ports

* Select inbound ports


RDP

☐ HTTP (80)

☐ HTTPS (443)

☐ SSH (22)

☒ RDP (3389)



3. Click **Disks**, select **Standard Disks** and create a new storage account:

The screenshot shows the 'Create a virtual machine' wizard with the 'Disks' tab selected. The 'OS disk type' is set to 'Standard HDD'. Under 'Data disks', there is a message: 'Adding unmanaged data disks is currently not supported at the time of VM creation. You can add them after the VM is created.' In the 'Advanced' section, 'Storage account' is set to '(new) rgcontosoocorpwsaddisks' with a 'Create new' button highlighted.

The screenshot shows the 'Create storage account' dialog. The 'Name' field contains 'contosoowvdmasterimages'. The 'Account kind' is 'Storage (general purpose v1)'. The 'Performance' is set to 'Standard'. The 'Replication' is set to 'Locally-redundant storage (LRS)'.

4. Click **Networking** and set **NIC network security group** to **None**:

The screenshot shows the 'Create a virtual machine' wizard with the 'Networking' tab selected. The 'Virtual network' is 'advNET'. The 'Subnet' is 'adSubnet (10.0.0.0/24)'. The 'Public IP' is '(new) W10Ext0365VDP-ip'. The 'NIC network security group' is set to 'None'. A warning message states: 'All ports on this virtual machine may be exposed to the public internet. This is a security risk. Use a network security group to limit public access to specific ports. You can also select a subnet that already has network security groups defined or remove the public IP address.' The 'Accelerated networking' is set to 'Off'. The 'Load balancing' section has a question 'Place this virtual machine behind an existing load balancing solution?' with 'No' selected.

5. Click the **Management** tab and disable **Boot diagnostics**:

Create a virtual machine

Basics Disks Networking **Management** Advanced Tags Review + create

Configure monitoring and management options for your VM.

Azure Security Center
Azure Security Center provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

✓ Your subscription is protected by Azure Security Center basic plan.

Monitoring

Boot diagnostics ☐ On ☒ Off

OS guest diagnostics ☐ On ☒ Off

Identity

System assigned managed identity ☐ On ☒ Off

Auto-shutdown

Enable auto-shutdown ☐ On ☒ Off

6. Click **Review + create**, then **create**:

Create a virtual machine

✓ Validation passed

Basics Disks Networking Management Advanced Tags **Review + create**

PRODUCT DETAILS

Standard D2 v2
by Microsoft
[Terms of use](#) | [Privacy policy](#)

Subscription credits apply ⓘ
0.1140 USD/hr
[Pricing for other VM sizes](#)

TERMS

By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the [Azure Marketplace Terms](#) for additional details.

Basics

Subscription	Contoso Subscription
Resource group	RG-ContosoCorpWSAD
Virtual machine name	W10EntO365VDP
Region	(US) East US 2
Availability options	No infrastructure redundancy required
Username	sysadmin

Disks

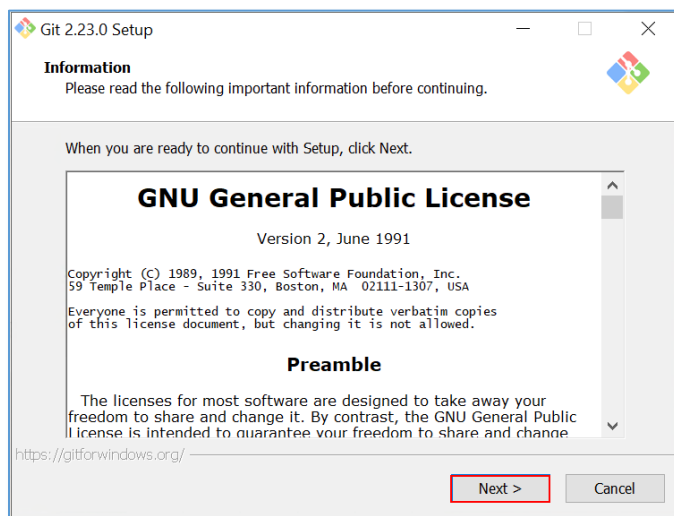
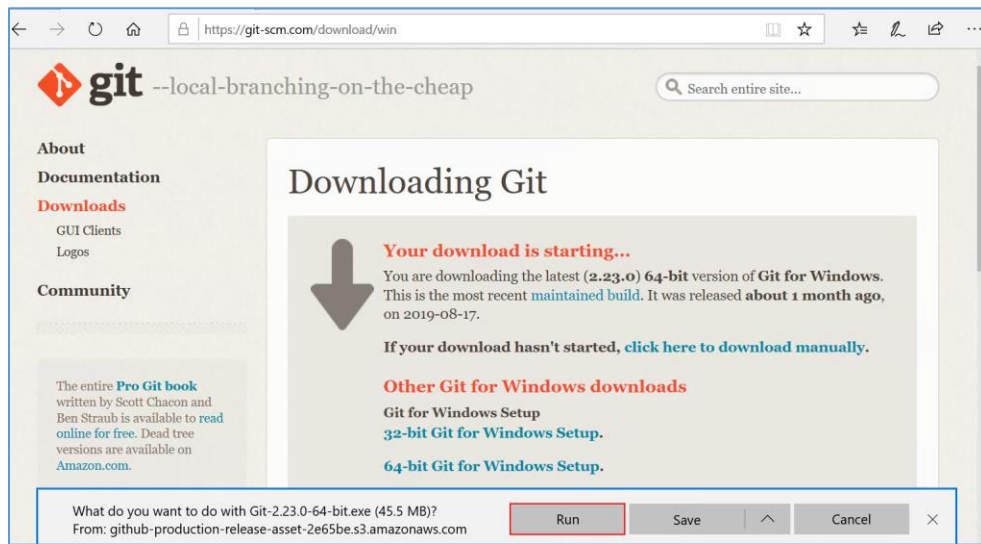
OS disk type	Standard HDD
Use managed disks	No
Storage account	(new) contososowdmasterimages
Use ephemeral OS disk	No

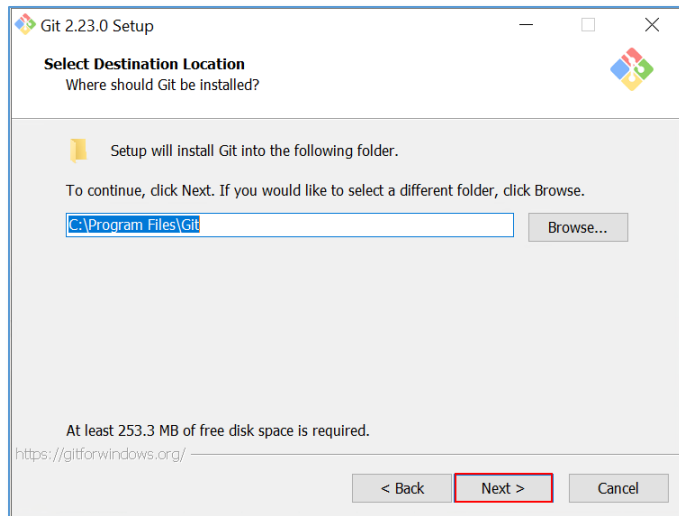
Deployment in progress... Running ×

Deployment to resource group 'RG-ContosoCorpWSAD' is in progress.

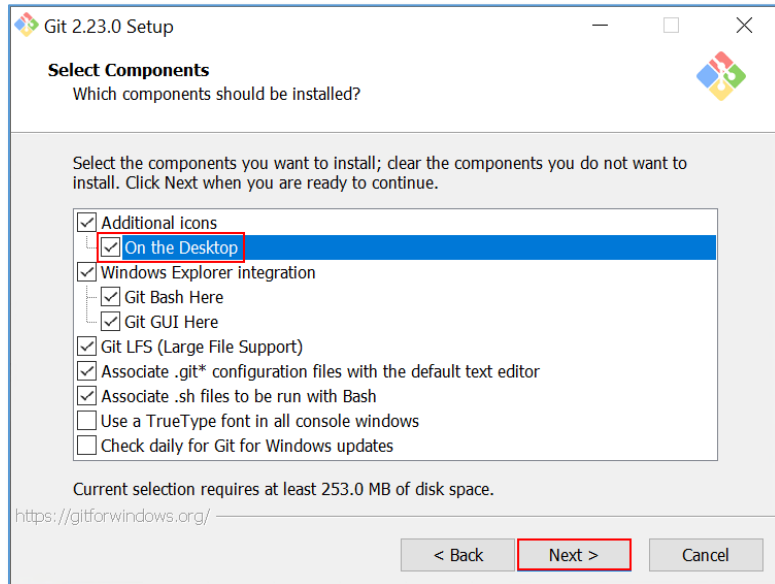
a few seconds ago

7. Once the deployment is completed, **logon** to the VM and **customize** it for capturing. Detailed instructions may be found [here](#) for each topic:
 - a. Disable Automatic Updates
 - b. Setup FSLogix if in use
 - c. Configure Windows Defender
 - d. Configure session time-out policies
 - e. Time zone redirection
 - f. Disable Storage Sense
8. **Install** any additional **applications** and **add shortcuts** to any hosted apps. In our example below, we will be installing the Microsoft Windows GitHub client:

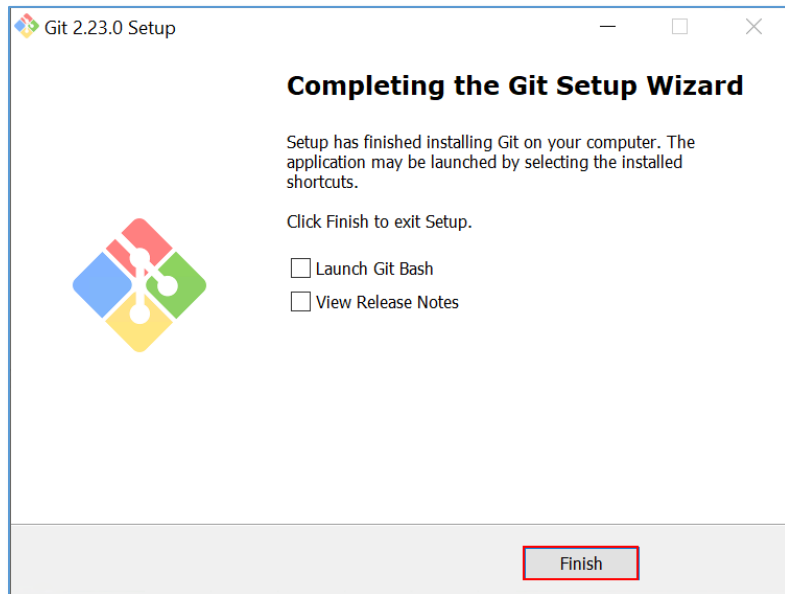




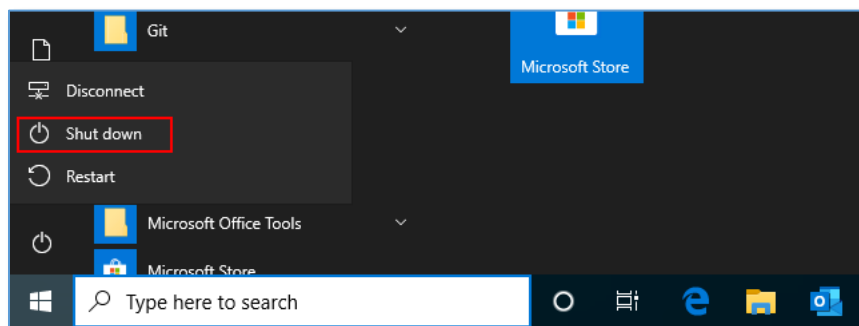
add a desktop icon:



accept all defaults for remaining dialog windows and finish the install:



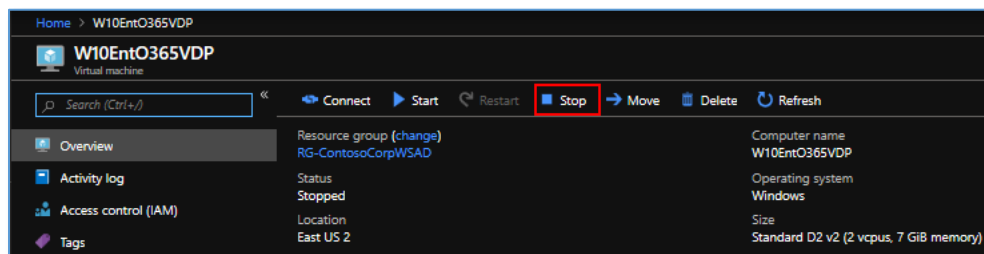
9. After installing all apps and making any additional changes, **shut down** the VM:

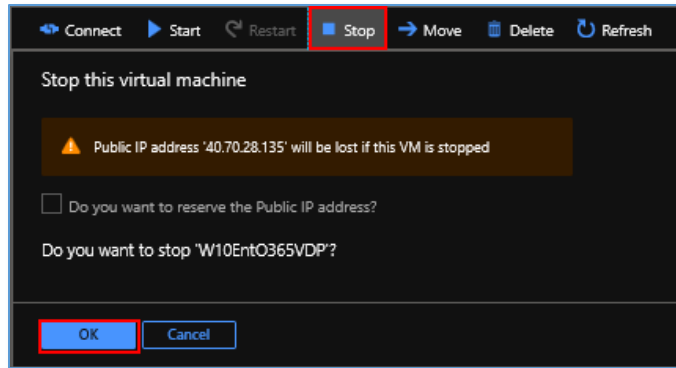


Create a WVD image from a template VM snapshot

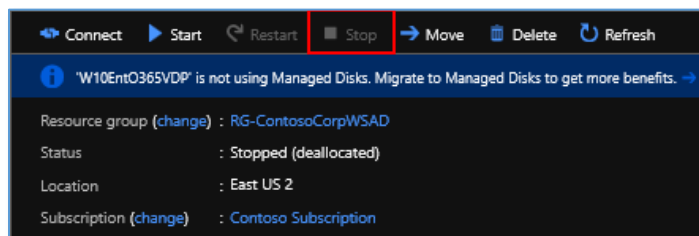
We'll use a snapshot of a VM to make the WVD deployment image. This way, we can update the original VM with changes, but still go back to that, or any other, snapshot at any time.

1. From the Azure Portal, **Stop** the template VM:

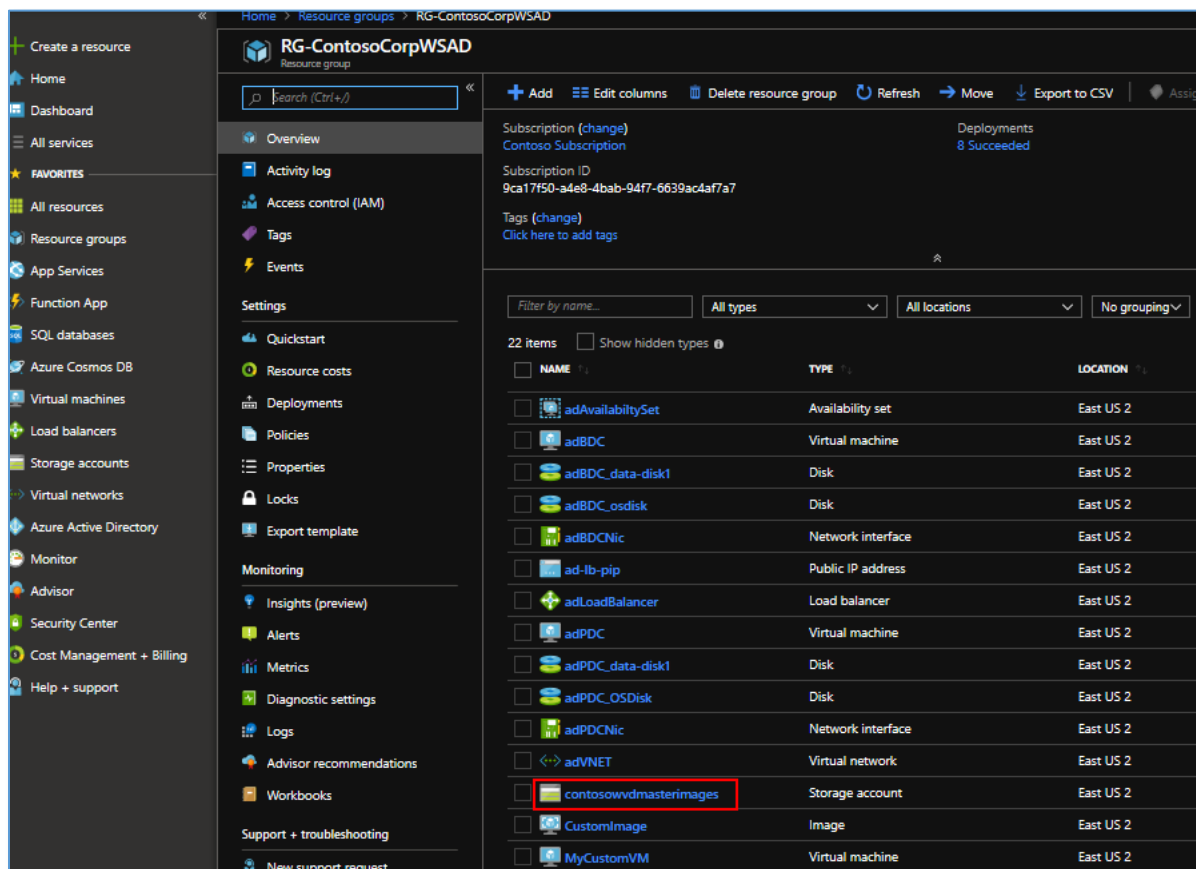




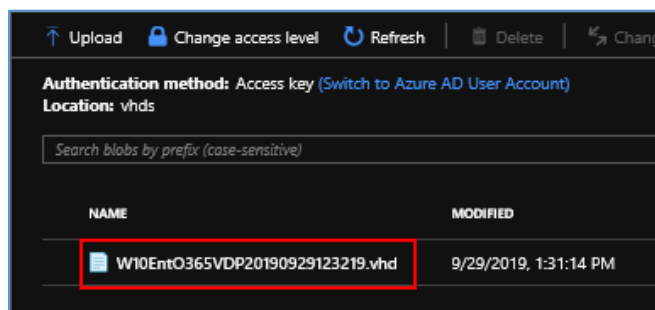
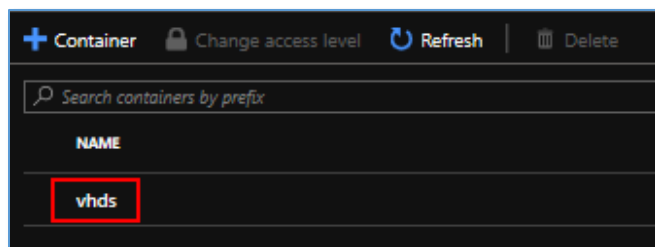
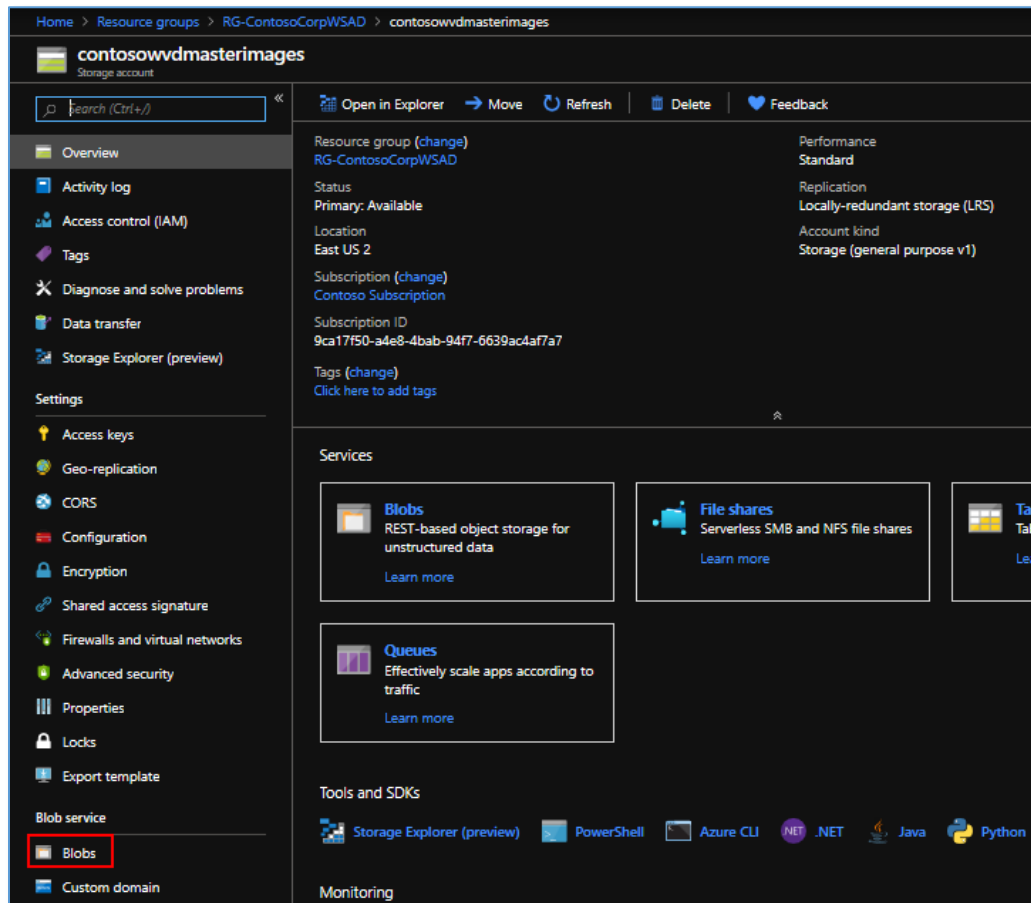
Click **Refresh** until Stop is greyed-out:



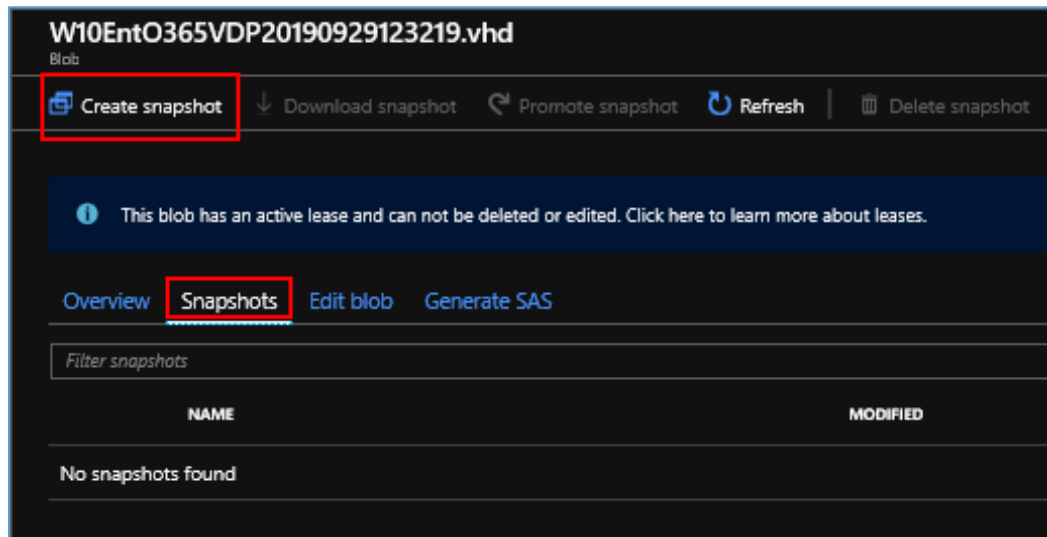
2. Within the VMs resource group, click the storage account name:



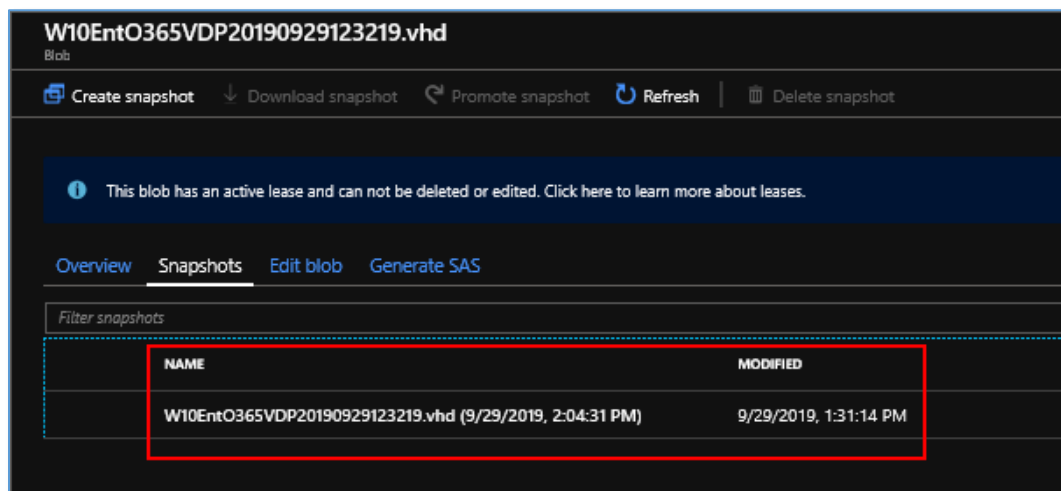
3. Click **Blobs** then **vhds** then the **VHD file name**::



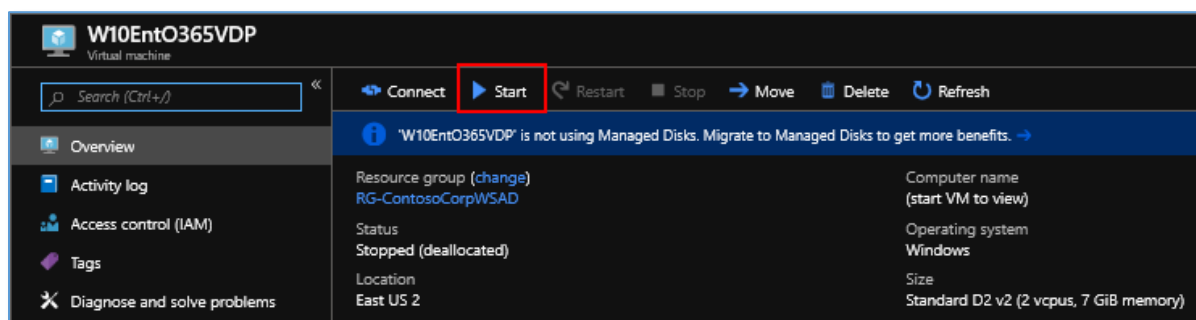
4. Select the **Snapshots** tab and click **Create snapshot**:



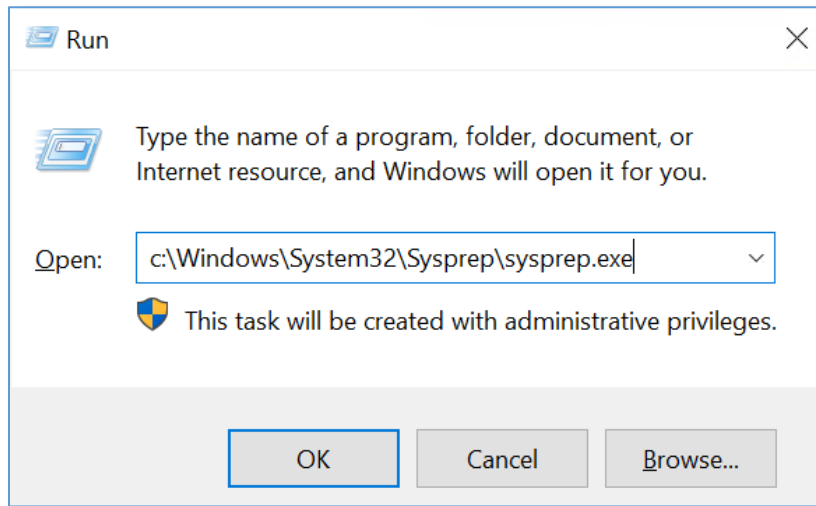
The snapshot is created:



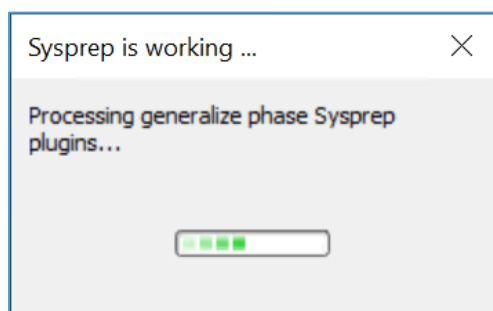
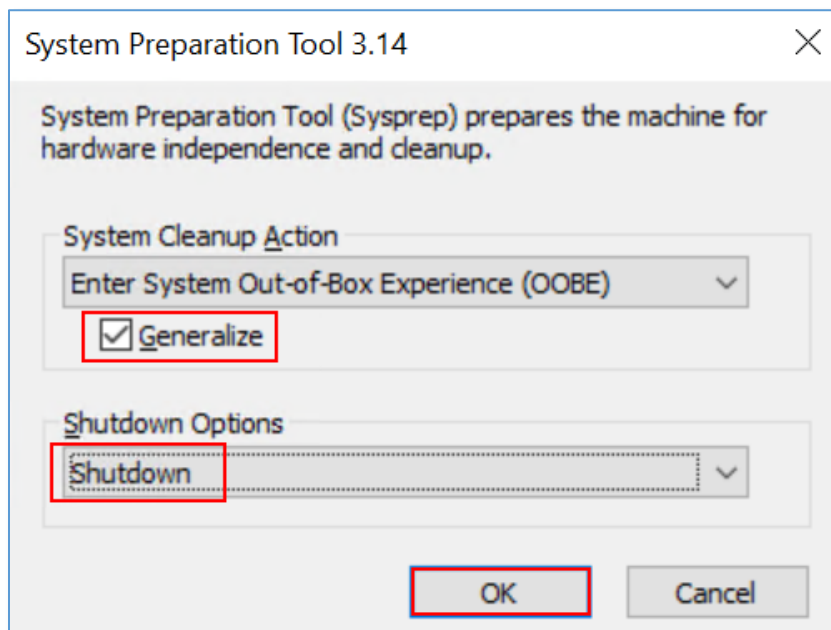
5. **Restart** the VM in Azure:



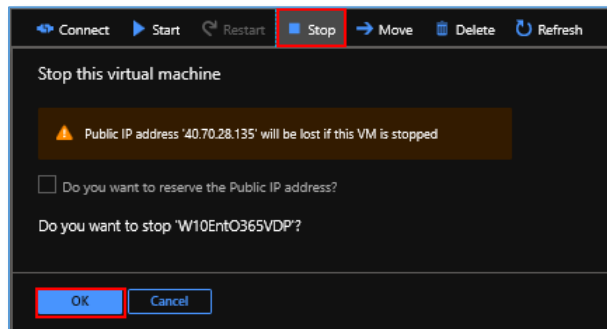
6. Logon to the VM and **run** `c:\Windows\System32\Sysprep\sysprep.exe`:



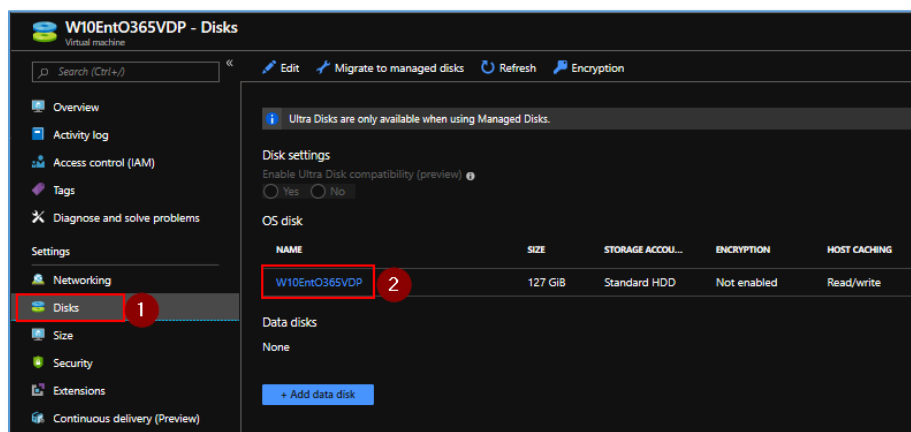
7. Select **Generalize**, **Shutdown**, and **OK**:



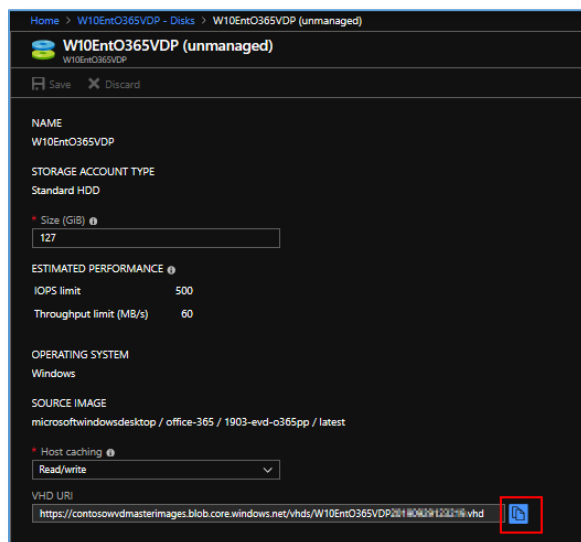
8. Back in Azure Portal, once the VM stops, deallocate it with the **Stop** button:



9. Click the VM name (open it's blade), click **Disks**, then click the OS **disk** name:



10. Copy the disks **VHD URI** and paste it to **Notepad** for use later:



The image is now ready for deployment into a Windows Virtual Desktop host pool.

Deploy a custom image to a WVD host pool using an ARM template

1. Browse to the [Create and provision WVD host pool](#) ARM Template, click **Deploy to Azure**, and complete the parameters as shown below, substituting your own values:
 - RdsH Image Source = Select: CustomVHD
 - Vm Image Vhd Uri = VHD URI copied from Notepad (OS disk URI)
 - RdsH Name Prefix = As shown below, we chose "W10EntO365"

BASICS

* Subscription: Contoso Subscription

* Resource group: RG-ContosoWVD

* Location: (US) East US 2

SETTINGS

_artifacts Location: https://raw.githubusercontent.com/Azure/RDS-Templates/master/wvd-templates/Cr...

_artifacts Location Sas Token:

RdsH Image Source: CustomVHD

Vm Image Vhd Uri: https://contosowvdmasterimages.blob.core.windows.net/vhds/W10EntO365VDP201...

RdsH Gallery Image SKU: Windows-10-Enterprise-multi-session-with-Office-365-ProPlus

RdsH Custom Image Source Name:

RdsH Custom Image Source Resource Group:

RdsH Name Prefix: W10EntO365

Additional required parameters:

* Domain To Join: contosocorpwvd.com

* Existing Domain UPN: adadministrator@contosocorpwvd.com

* Existing Domain Password:

Ou Path:

* Existing Vnet Name: adVNET

New Or Existing Vnet: existing

* Existing Subnet Name: wvdSubnet

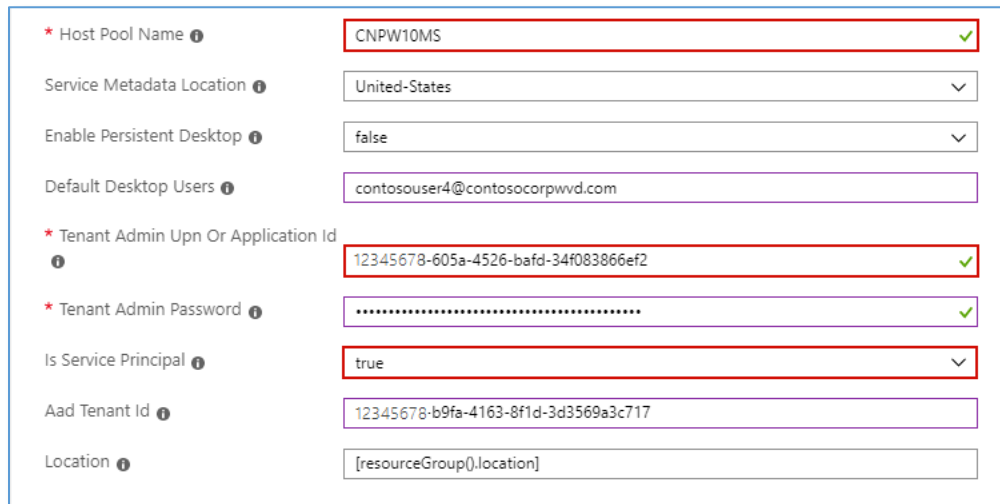
* Virtual Network Resource Group Name: RG-ContosoCorpWSAD

Rds Broker URL: https://rdbroker.wvd.microsoft.com

Existing Tenant Group Name: Default Tenant Group

* Existing Tenant Name: ContosoCorpWVD

A few more, including the new host pool name and Service Principal credentials:



* Host Pool Name ⓘ CNPW10MS ✓

Service Metadata Location ⓘ United-States ▼

Enable Persistent Desktop ⓘ false ▼

Default Desktop Users ⓘ contosouser4@contosocorpwvd.com

* Tenant Admin Upn Or Application Id ⓘ 12345678-605a-4526-bafd-34f083866ef2 ✓

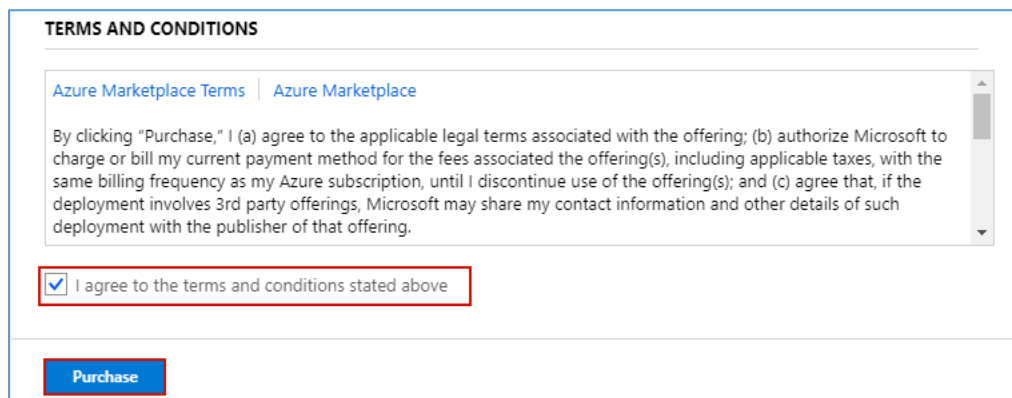
* Tenant Admin Password ⓘ ✓

Is Service Principal ⓘ true ▼

Aad Tenant Id ⓘ 12345678-b9fa-4163-8f1d-3d3569a3c717

Location ⓘ [resourceGroup().location]

2. Click **Purchase** to deploy the new host pool.



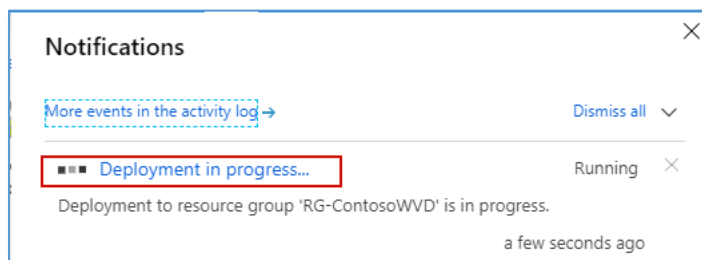
TERMS AND CONDITIONS

[Azure Marketplace Terms](#) | [Azure Marketplace](#)

By clicking "Purchase," I (a) agree to the applicable legal terms associated with the offering; (b) authorize Microsoft to charge or bill my current payment method for the fees associated the offering(s), including applicable taxes, with the same billing frequency as my Azure subscription, until I discontinue use of the offering(s); and (c) agree that, if the deployment involves 3rd party offerings, Microsoft may share my contact information and other details of such deployment with the publisher of that offering.

☒ I agree to the terms and conditions stated above

Purchase



Notifications ✕

[More events in the activity log](#) → [Dismiss all](#) ▼

■ ■ ■ **Deployment in progress...** Running ✕

Deployment to resource group 'RG-ContosoWVD' is in progress.

a few seconds ago

Expanding the notification details indicates the deployment progress:

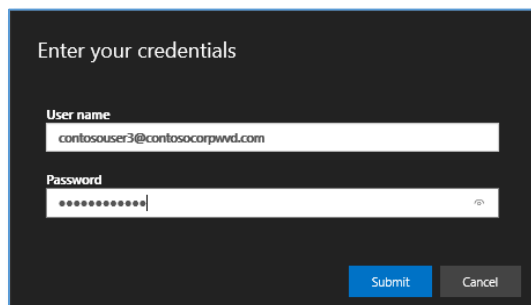
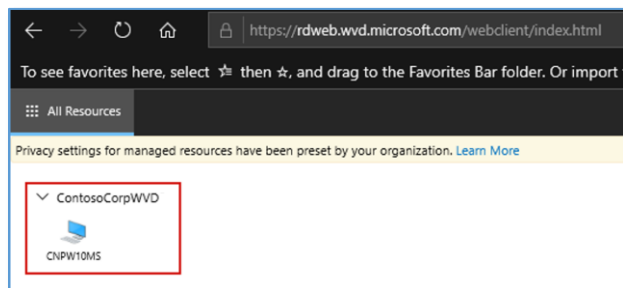
... Your deployment is underway

Deployment name: Microsoft.Template Start time: 9/29/2019, 4:45:13 PM
Subscription: Contoso Subscription Correlation ID: de4801ce-80ea-42ba-bdae-
Resource group: RG-ContosoWVD

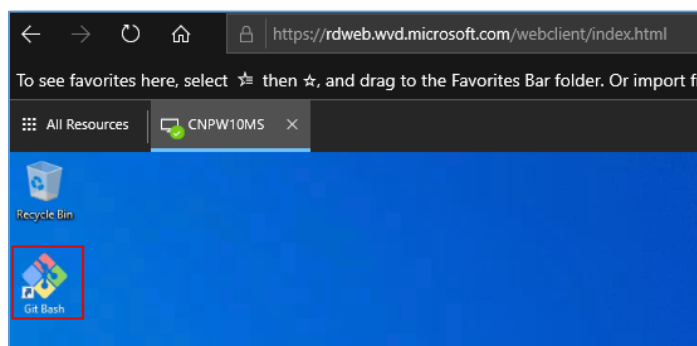
Deployment details (Download)

RESOURCE	TYPE	STATUS	OPERATION DETAILS
vmCreation-linkedTemplate	Microsoft.Resources/deployments	OK	Operation details
W10EntO365-availabilitySet	Microsoft.Compute/availabilitySets	OK	Operation details

Once the deployment completes, added default desktop users may access the host pool:



The desktop opens and shows GIT, our custom application, installed:



6. Support

Opening tickets

In case of an issue for Windows Virtual Desktop go to the Azure Portal and open a technical ticket based on your existing support plan at <https://azure.microsoft.com/en-us/support/create-ticket/>

Look for Service under **COMPUTE** and select **Windows Virtual Desktop-Preview**. You will find options to create tickets for the WVD service itself and for Office:

For Office issues you can file tickets during public preview in the Azure Portal when using Office in context of Windows Virtual Desktop.

Information you should provide for failed connection or management interactions when using the service:

- Use the diagnostics service to retrieve the **Activity ID** for failed connections or management interactions.
- Provide the approximate timeframe the issue happened

NOTE: This workflow will change post general availability.

Other resources you can leverage

Windows Virtual Desktop contains a number of knowledge articles as well as trouble shooting guides. Pay attention to the updated diagnostics chapter that provides Error scenarios you can mitigate: <https://docs.microsoft.com/azure/virtual-desktop/overview>

Exchange on our community forum on issues important to you for Windows Virtual Desktop: <https://techcommunity.microsoft.com/t5/Windows-Virtual-Desktop/bd-p/WindowsVirtualDesktop>

When setting up your environment you will be using other Azure Services. You can watch the health dashboard here to verify health state on any Azure service you are consuming: <https://azure.microsoft.com/en-us/status/>