

VMware Horizon on Azure deployment guide

Rev 2.2 Niall Currid

Purpose

The purpose of this guide is to setup and deploy Horizon Cloud on Azure using WVD to rapidly enable our customers to provide work from home desktops via Windows 10 Enterprise Virtual Desktop.

This guide does not cover application group provisioning of specific on integration with profile management, such as FSLogix, which is extensively documented.

Pre-Requisites and Important Considerations

1. Begin by reviewing the prerequisites and requirements document [here](#)
2. Important Azure considerations prior to deployment:

Important: Before launching the pod deployment wizard and starting to deploy your pod, in addition to the requirements below, you must be aware of the following key points:

- a. No Microsoft Azure Policies or Policy Definition configured in the Microsoft Azure environment block, deny, or restrict creation of the pod's components. As an example, you and your IT team must verify that none of your Microsoft Azure Policies block, deny, or restrict creation of components on Azure storage account. For information about Azure Policies, see the [Azure Policy documentation](#).
- b. The pod deployer requires that your Azure storage account allow for the deployer to use the Azure StorageV1 account type. Ensure that your Microsoft Azure Policies do not restrict or deny the creation of content requiring the Azure StorageV1 account type.
- c. As part of the pod and gateway deployment processes, Horizon Cloud creates resource groups (RGs) in your Microsoft Azure subscription that do not have tags on them, including the initial resource group that is created for the temporary jump box that orchestrates those deployment processes. Pod deployment will fail if you try to deploy a pod into a Microsoft Azure subscription that has any type of resource tag requirement at the time of deployment, or at the time of pod upgrades or adding a gateway configuration to a pod.

You must verify that your Microsoft Azure Policies allows creation of the pod's untagged resource groups in the target subscription. For the list of RGs that the deployer creates, see the Administration Guide's [Resource Groups Created For a Pod Deployed In Microsoft Azure](#) topic.

- d. All cloud-connected pods must have line-of-sight to the same set of Active Directory domains at the time you deploy those pods.

Commented [BW1]: do they mean Domain controllers? or just domains?

During a typical deployment, you can expect the following resources to be deployed:

Minimum Microsoft Azure capacity available for Horizon Cloud infrastructure in addition to the expected desktop and app workload. Note that as long as this capacity is made available, Horizon Cloud will automatically deploy these VMs and no manual installation is required.

- Pod Deployment Engine, also known as the Jump Box (transient) — 1 x Standard_F2
- Pod/Pod Manager with High Availability enabled — 2 x Standard_D4_v3 (if no Standard_D4_v3 in the region, 2 x Standard_D3_v2)
- Pod/Pod Manager without High Availability enabled — 1 x Standard_D4_v3 (if no Standard_D4_v3 in the region, 1 x Standard_D3_v2)
- Microsoft Azure Database for PostgreSQL Service — Generation 5, Memory Optimized, 2 vCores, 10 GB Storage
- External Unified Access Gateway (optional) — 2 x Standard_A4_v2

Internal Unified Access Gateway (optional) — 2 x Standard_A4_v2

Requirements for deployment

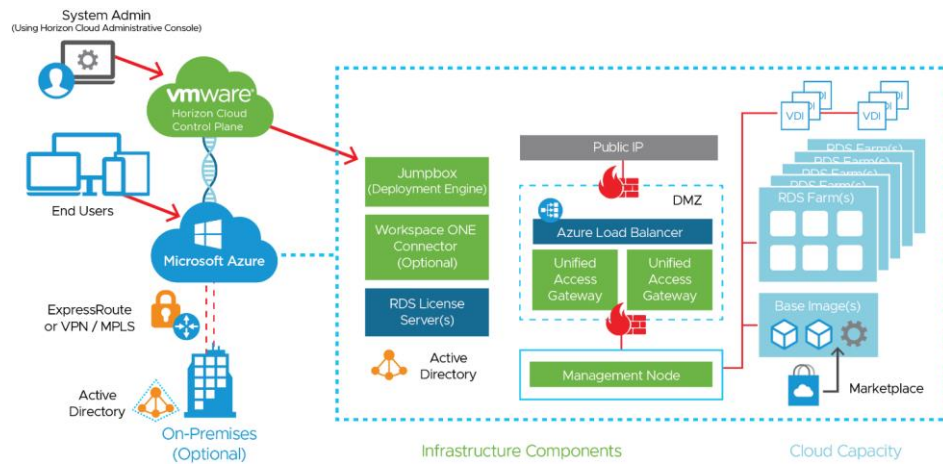
1. [Three](#) non-overlapping address ranges in CIDR format in the pod's VNet, reserved for subnets.
 - Management subnet — [/27](#) minimum
 - Tenant subnet — [/27](#) minimum [/24](#) - [/22](#) preferred, based on the number of desktops and RDS servers
 - DMZ subnet — [/28](#) minimum when Unified Access Gateway is deployed in the pod's VNet (optional)

Subnets can either be created manually on the VNet or by Horizon Cloud during deployment. If using manually created subnets, no other resources can be attached.

2. [NTP](#) server or servers available and accessible from the Horizon Cloud pod and Unified Access Gateway instances.
3. [Configure the VNet \(Virtual Network\) DNS server](#), pointing to a valid DNS server that can resolve both internal machine names and external names.
4. [Outbound internet access on the VNet to specific DNS names that must be resolvable and reachable using specific ports and protocols.](#)
5. [FQDN for external and or internal user access \(Required when deploying a pod with Unified Access Gateway\).](#)
6. [Certificate or certificates for Unified Access Gateway in PEM format matching the FQDN](#)
7. [Service principal and authentication key created for each subscription with contributor role assigned on the subscription.](#)
8. [Required resource providers registered in each Microsoft Azure subscription. See step 8.b in \[Create the Required Service Principal Needed by the Horizon Cloud Pod Deployer by Creating an Application Registration\]\(#\).](#)

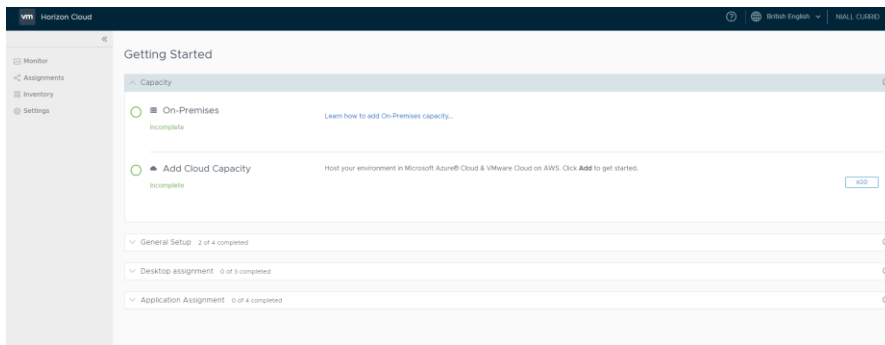
Architecture Overview

In a typical deployment of HCoA, these are the components:



Begin Deployment


1. Log into the Horizon Cloud Portal:
 - a. [VMware Horizon portal](#)
 - b. *If you do not have an account, signup [here](#) for a 45 day trial*
2. After logging in successfully, you will receive the following screen:



Add Capacity

- 3.1. Select the ADD button to the right, and you will be prompted to select the cloud – (Please) Select Azure

Add capacity

	
Microsoft® Azure	VMware Cloud on AWS
Host desktops and applications on Horizon Cloud on Azure. To add Microsoft Azure pods, click Select.	Host desktops and applications on VMware Cloud on AWS (powered by Horizon 7). VMware Cloud More...
SELECT	SELECT

4.2. Next, you'll be prompted for your subscription details, Azure AD Tenant ID and the application ID that you setup in the prerequisites. Complete all fields and click ADD.

Add Microsoft Azure Capacity

1. Subscription

2. Pod Setup

3. Gateway Settings

4. Summary

Choose the Microsoft Azure subscription you want to apply or add a new one.

Pod Subscription

Apply Subscription:*

Add New

Subscription Name:*

Environment:*

Azure

Subscription ID:*

Directory ID:*

Application ID:*

This field is required.

Application Key:*

This field is required.

CANCEL

ADD

5.3. Complete the POD setup fields:

Add Microsoft Azure Capacity

×

1. Subscription

2. Pod Setup

3. Gateway Settings

4. Summary

Enter your pod details here to configure and connect it.

Details

Pod Name:*WUS2-YVR-01 ⓘ

Location:*Vancouver, Canada ⓘ Edit

Microsoft Azure Region:*West US 2 ⓘ

Description: ⓘ

Networking

Virtual Network:*USW2-HCoA-vnet [HCoA] ⓘ

Use Existing Subnet: ⓘ

Management Subnet:*Horizon-mgmt [10.3.1.0/24] ⓘ

Desktop Subnet:*Horizon-Hosts [10.3.2.0/24] ⓘ

NTP Servers:*ca.pool.ntp.org ⓘ

Use Proxy: ⓘ

Workspace ONE Access

Workspace ONE Access Tenant: ⓘ

Data Centre Region:*Canada ⓘ

Tenant Name:*soonto ⓘ

Username:*admin ⓘ

Email:*niallcurrid@outlook.com ⓘ

CANCEL

BACK

NEXT

6.4. Complete the UAG Setup. Refer to [here](#) for more informatio on UAG deployment considerations.
The certificate has to be in PEM format

Add Microsoft Azure Capacity

1. Subscription

2. Pod Setup

3. Gateway Settings

4. Summary

External UAG

Enable External UAG?

☒

PGDN*

horizon.soconto.com

DNS Addresses:

Routes:

Certificate*

soconto3v-soconto3d393514-1c50-48b9-ade9-d1fde63509b-20200323.pem

Change

Load Balancer

Enable Public IP?

☒

Type:

☐ Basic

☒ Standard

Networking

DMZ Subnet*

Horizon-DMZ (10.3.3.0/24)

Two-Factor Authentication Settings

Enable two-Factor Authentication?

☐

Internal UAG

Enable Internal UAG?

☒

PGDN*

horizon.int.soconto.com

DNS Addresses:

Routes:

Certificate*

soconto3v-soconto3d393514-1c50-48b9-ade9-d1fde63509b-20200323.pem

Change

Load Balancer Type:

☐ Basic

☒ Standard

Two-Factor Authentication Settings

Enable two-Factor Authentication?

☐

CANCEL

BACK

VALIDATE & PROCEED

7.5 After you complete these fields, you will see a summary of information. Click submit to proceed with the deployment. This phase will take approx. 10-15 minutes.

8.6 After the Azure POD is successfully created, move onto configure Active Directory. Click on configure beside Active Directory in the main window. Complete the fields. Note, you should have your DNS properly setup on your vNet prior to this step.

NetBIOS Name:

SOCONTO

DNS Domain Name:

soconto.com

Protocol:

LDAP

Bind Username:

hcs_bind

Bind Password:

Auxiliary Account #1

Bind Username:

aux-hcs_bind

Bind Password:

Add Auxiliary Bind Account

Advanced Properties

CANCEL

DOMAIN BIND

9.7. Once the domain bind is successful, you will be prompted for a Domain Join Account. This account is for joining your provisioned Windows Systems to your domain. This account should have the following privileges:

Domain join account

- a. Active Directory domain join account which can be used by the system to perform Sysprep operations and join computers to the domain, typically a new account (domain join user account)
- b. Is a member of the Horizon Cloud Administrators Group
- c. Set account password to Never Expire
- d. This account requires the following Active Directory permissions: List Contents, Read All Properties, Read Permissions, Reset Password, Create Computer Objects, Delete Computer Objects.
- e. This account also requires the Active Directory permission named Write All Properties on all descendant objects of the target Organizational Unit (OU) that you plan to use for farms and VDI desktop assignments.
- f. For additional details and requirements, see [Service Accounts That Horizon Cloud Requires for Its Operations](#)

Domain Join

Primary DNS Server IP:*

10.3.0.4

①

Secondary DNS Server IP:

1.1.1.1

①

Default OU:

OU=HCS_Desktops,DC=soconto,DC=com

①

Join Username:*

domain_join

①

Join Password:*

①

Add Auxiliary Join Account

CANCEL

SAVE

10.8. Add the Horizon Administrator Group:

Active Directory groups

- Horizon Cloud Administrators — Active Directory security group for Horizon Cloud administrators. Contains the Horizon Cloud administrative users and domain join account. This group is added to the Super Administrators role in Horizon Cloud.

Add Administrator

User Group:

Active Directory Search

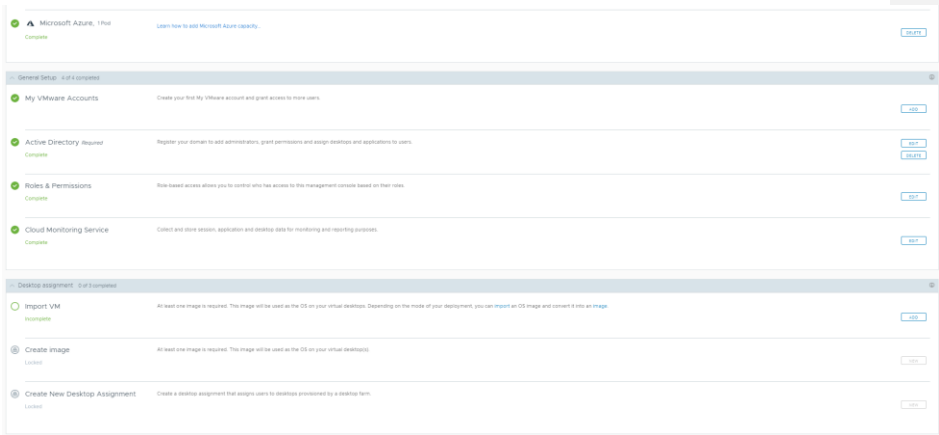
Selected User Group:

SOCONTO\HCS_Admins

CANCEL

SAVE

11.9. At this point you should have completed the General Setup stage, and have a screen as follows:

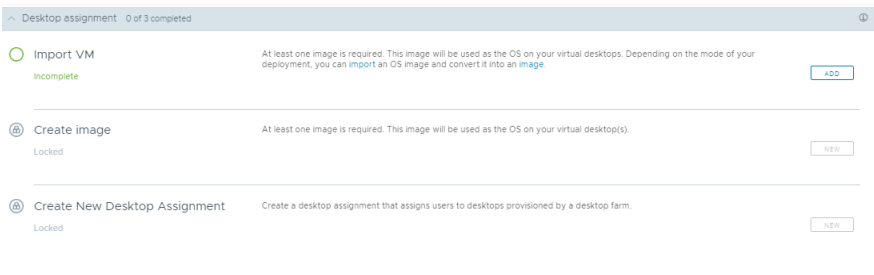


Desktop Assignment

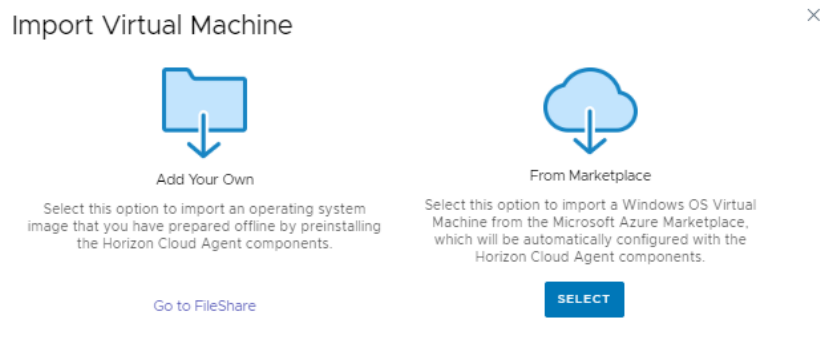
12.1. This phase of the deployment completes the following tasks:

- Imports a VM
- Allows for preparation & customization of the image
- Creation of an image for your VDI/RDSH systems
- Creates a Desktop farm for your PODs/Users to consume

13.2. On Import VM, click ADD to begin



14.3. You will have the option to Import a Virtual Machine or Import a Windows OS Virtual Machine from the marketplace, which will automatically be configured with the Horizon Cloud Agents.



To creating Desktop Images for a Horizon Cloud Pod in Microsoft Azure, see:
<https://docs.vmware.com/en/VMware-Horizon-Cloud->

1.4. For this deployment, I will select an image from the Marketplace.

Import Virtual Machine – Marketplace

×

Destination Pod

Location*

Vancouver, Canada

ⓘ

Pod*

WUS2-YVR-01

ⓘ

Virtual Machine Details

OS*

Windows 10 Enterprise multi-sessi...

ⓘ

Include GPU*

☐

ⓘ

Domain Join:

☐

ⓘ

Enable Public IP Address*

☐

ⓘ

Optimise Windows Image*

☒

ⓘ

Admin Credentials for the Virtual Machine

Username*

admin_local

ⓘ

Password*

ⓘ

Verify Password*

ⓘ

Properties

Name*

Win10-1909-01

ⓘ

Description:

Windows 10 MultiSession with OfficeProPlus build 1909

ⓘ

[Advanced Options ▹](#)

CANCEL

IMPORT

- Select an OS – I have selected Windows 10 Multisession 1909 with Office
 - Options for GPU (if available in your selected region)
 - Domain Join – Select this option if it is your finalized image for Pod Deployment only.
 - Enable Public IP – for RDP access to machine for customizations.
 - Optimize Windows Image – details [here](#)
 - Admin Credentials for the VM, Create the admin username that will be used for the local admin account to access the VM's operating system, and also used during the convert to image process. This username can be a maximum of 15 characters in length, cannot end in a full stop (".") and cannot be a username that is not permitted in Microsoft Azure, like "guest" or "administrator".
- a.g.** Properties - Give a unique name to the desktop that will be used to create an image. This image will be used as the operating system on the virtual desktops.


[g.h.](#) Here is a list of Windows OS Images available as of writing this:















Windows 10 Enterprise multi-session,
1903 + Office 365 ProPlus
Windows 10 Enterprise multi-session,
1909 + Office 365 ProPlus
Windows 10 Enterprise multi-session,
1903
Windows 10 Pro, 1903
Windows 10 Pro N, 1903
Windows 10 Enterprise multi-session,
1909
Windows 10 Pro, 1909
Windows 10 Pro N, 1909
Windows 10 Pro, 1803
Windows 10 Pro N, 1803
Windows 10 Pro, 1809
Windows 10 Pro N, 1809
Windows 7 Enterprise (Tech Preview)
Windows Server 2012 R2 Datacenter
Windows Server 2016 Datacenter
Windows Server 2019 Datacenter

[h.i.](#) Here is a list of the advanced options that you can enable:

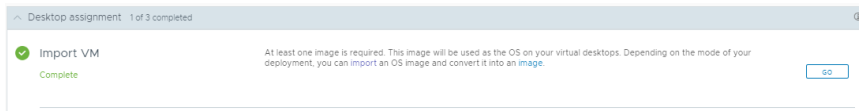
Advanced Options

Horizon Agent Features

 Horizon agent features installed by default for VM preparation are already enabled. Disable these features if you do not want them to be installed.

Enable Flash MMR:	<input type="checkbox"/>	
3D Support in Windows 10 Multi-Session:	<input checked="" type="checkbox"/>	
MMR for Terminal Services:	<input checked="" type="checkbox"/>	
Client Drive Redirection:	<input checked="" type="checkbox"/>	
Skype for Business:	<input checked="" type="checkbox"/>	
Webcam Support (Real Time Audio Video RTAV):	<input checked="" type="checkbox"/>	
Smart Card:	<input type="checkbox"/>	
ThinPrint:	<input checked="" type="checkbox"/>	
Scanner Redirection:	<input type="checkbox"/>	
USB Redirection:	<input type="checkbox"/>	
URL Redirection:	<input type="checkbox"/>	
Serial Port Redirection:	<input type="checkbox"/>	
Geolocation Redirection:	<input type="checkbox"/>	
Help Desk:	<input checked="" type="checkbox"/>	

[16.5.](#) Once the import process has completed, you can click Go to proceed with image customization.



17.6. You should now be presented with an imported VM with an agent status of Active. If its not active, select the VM and from the MORE menu, select “Reset Agent Pairing”

Imported VMs

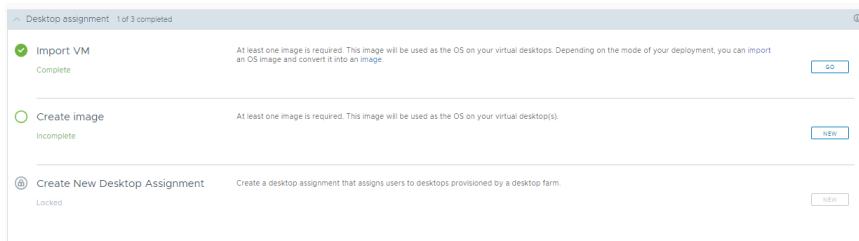
These virtual machines (VMs) are imported from various sources. Examples include unmanaged VMs imported by Horizon Cloud Operations and VMs imported from Horizon Cloud Pods. Those with supported OSes can be converted to assignable images using Convert to Image. Imported VMs can be designated as Utility VMs and put on the Utility VMs page (under Settings) using the Migrate to Utility VMs action.

[IMPORT](#) [SHUTDOWN](#) [RESTART](#) [MORE](#) 1 item Filter

<input type="checkbox"/>	status	Name	OS	IP Address	Agent status	Location	Pod	Description
<input type="checkbox"/>	●	Win10-1909-01	Windows 10 Enterprise ...	10.3.2.5	Active (19.4.0)	Vancouver, Canada	WUS2-VVR-01	Windows 10 Multisession...

18.7. At this point now, you can login to this imported VM and begin your customizations. When you have completed your customizations, return to the main deployment menu (Settings > Getting Started). Leave the machine powered on, as the next step (Create Image) requires the VM to be powered on.

19.8. The next step is the Create an image. Click on Create Image > New



20.9. Complete the required fields for the new image.

×

Convert Virtual Machine to Image

OS Properties

Admin credentials for the Virtual Machine: ⓘ

CANCEL

PUBLISH

Monitor

Dashboard

Activity

Reports

Notifications

Assignments

Inventory

Settings

Activity

Admins

Users

Audit Logs

24 Feb

WU12-YVR-01

All Status

CANCEL TASKS

Last refreshed - 00:26 PDT

Description	Status	% Completion	Time
Converting desktop Win10-909-01 to an image	Successful	100%	00:11
Resetting Agent Pairing on Win10-909-01	Successful	100%	23/03/2020, 22:19

23.12. Create Desktop Farm – Create a farm of virtual machines that will be used to provision desktops.

Desktop assignment 2 of 4 completed

<input checked="" type="checkbox"/> Import VM	At least one image is required. This image will be used as the OS on your virtual desktops. Depending on the mode of your deployment, you can import an OS image and convert it into an image.	GO
<input checked="" type="checkbox"/> Create image	At least one image is required. This image will be used as the OS on your virtual desktop(s).	GO
<input type="checkbox"/> Create Desktop Farm	Create a farm of virtual machines that will be used to provision desktops.	NEW

24.13. Select New on Create Desktop Farm, you will be presented with the following:

New Farm

1. Definition
2. Management
3. Summary

Name: Win10-WVD-001

Description: Windows 10 Multi-session Farm

VM Names: hcswin10-

Farm Type: ☐ Applications ☒ Desktops

Location: Vancouver, Canada

Pod: WUS2-YVR-01

Filter Models: Series equals SS Add

Model: Standard_B2ms (2 CPUs, 8 GiB Me...

Disk Type: Premium SSD

Disk Size: 127 GiB
Increasing this disk size could entail guest OS operations on the resulting VMs. For details, click here.

Image: [TC] Win10-1909-01 Details

Preferred Protocol: Blast Extreme

Preferred Client Type: Browser

Domain: SOCONTO

Join Domain: ☒

Encrypt Disks: ☐

NSX Cloud Managed: ☐

Farm Size

Min VMs: 1

Max VMs: 5
49 Remaining (based on your subscription quota)

Power-Off Protect Time: 30 Minutes

Sessions per VM: 10
50 sessions (Max Capacity)

CANCEL NEXT

a. Name: A friendly name for the farm and provide a description.

- b. VM Names: This is where you can provide a naming convention for your VMs which will be numerically incremented. Try to keep this under 15 characters.
- c. Farm Type: Select application or Desktops.
- d. Filter Models: This allows you to filter for a specific VM type. I have selected a B series for reduced costs.
- e. The next few options are pre-completed for you, please read [this](#) if you are not familiar with VMware's Display Protocols
- f. Complete the remaining fields.

25.14. Management, setting the maintenance and timeout handling on the farm

New Farm

1. Definition

2. Management

3. Summary

Rolling Maintenance

Maintenance Type: Scheduled

Recurrence: Weekly

Recurrence Day: Sunday

Scheduled Hour: 00

Concurrent Quiescing VMs: 1

VM Action: Rebuild

Power Management

Power Management Mode: Optimised Power

Timeout Handling

Log Off Disconnected Sessions: 60

Max. Session Lifetime: 10080

Session Timeout Interval: 1440

Schedule Power Management

Work-Hours

5 Selected

09:00

17:00

☐

America/Vanc...

5

Add a row

CANCEL

SAVE & EXIT

PREVIOUS

NEXT

26.15. Click next to see a summary and submit to create the farm. This step can take up to 30 minutes.

27.16. The final step is to assign users to the desktop farm. Select New to continue.

Desktop assignment

3 of 4 completed

✓

Import VM

Complete

At least one image is required. This image will be used as the OS on your virtual desktops. Depending on the mode of your deployment, you can [import an OS image and convert it into an image](#).

GO

✓

Create image

Complete

At least one image is required. This image will be used as the OS on your virtual desktop(s).

GO

✓

Create Desktop Farm

Complete

Create a farm of virtual machines that will be used to provision desktops.

GO

○

Create New Desktop Assignment

Incomplete

Create a desktop assignment that assigns users to desktops provisioned by a desktop farm.

NEW

28.17. Assign Desktops. There are three options to consider:

- a. **Dedicated:**
Persistent VDI desktop experience which is mapped to a single user.
- b. **Floating:**
Non-Persistent VDI desktop experience which multiple users can use at different times (i.e. resets after each user session).
- c. **Session:**
Non-persistent RDSH published desktop experience shared across multiple users (i.e. terminal services).

For this document, I'm selecting Session using Windows 10 Multisession, which is similar to RDSH

Assign Desktops

1. Definition
2. Users
3. Summary

Type: ⓘ

Dedicated Floating Session

Fixed Attributes ⓘ

Location: ⓘ

Pod: ⓘ

Farm: ⓘ

Flexible Attributes ⓘ

Assignment Name: ⓘ

CANCEL < BACK NEXT >

[29.18.](#) Select your Active Directory User Group and click next and submit.

Assign Desktops

1. Definition

2. Users

3. Summary

Users/User Groups

SOCONTO Active Directory Search

Selected Users/User Groups

SOCONTO\HCS_Users

CANCEL

< BACK

NEXT >

30.19. At this point now, the deployment of Horizon should be completed for you.

Desktop assignment 4 of 4 completed

Import VM

Complete

At least one image is required. This image will be used as the OS on your virtual desktops. Depending on the mode of your deployment, you can import an OS image and convert it into an image.

GO

Create image

Complete

At least one image is required. This image will be used as the OS on your virtual desktop(s).

GO

Create Desktop Farm

Complete

Create a farm of virtual machines that will be used to provision desktops.

GO

Create New Desktop Assignment

Complete

Create a desktop assignment that assigns users to desktops provisioned by a desktop farm.

GO

Connect to your Horizon Desktops

31.20. From your Horizon Cloud Console, go to Settings > Capacity and click on the Pod you created. Scroll down to the bottom and you should see your Gateway Settings

Gateway Settings

Internal UAG ⓘ

Deployment Status:

Ready

FQDN:

horizon.int.soonto.com

Session Timeout:

36000000 Milliseconds

Update status:

Synchronised

Unified Access Certificate:

Certificate uploaded

Load Balancer

Private IP:

10.3.2.15

Type:

Standard

External UAG ⓘ

Connection Status:

Update status:

Synchronised

Unified Access Certificate:

Certificate uploaded

Deployment Status:

Ready

FQDN:

horizon.soonto.com

Session Timeout:

36000000 Milliseconds

Load Balancer

Public IP Enabled:

Yes

Public IP:

52.149.27.90

Type:

Standard

Public IP for Horizon FQDN:

52.149.27.90

FQDN:

vmw-hcs-b575a2c3-80d3-4b6c-8984-3249e0aee08c-uag.westus2.cloudapp.azure.com

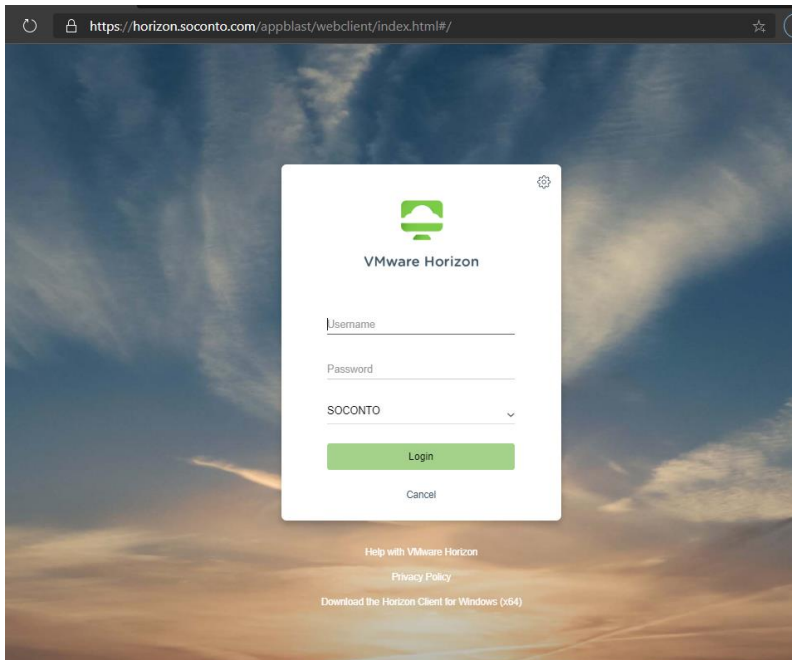
Networking

DMZ Subnet:

Horizon-DMZ

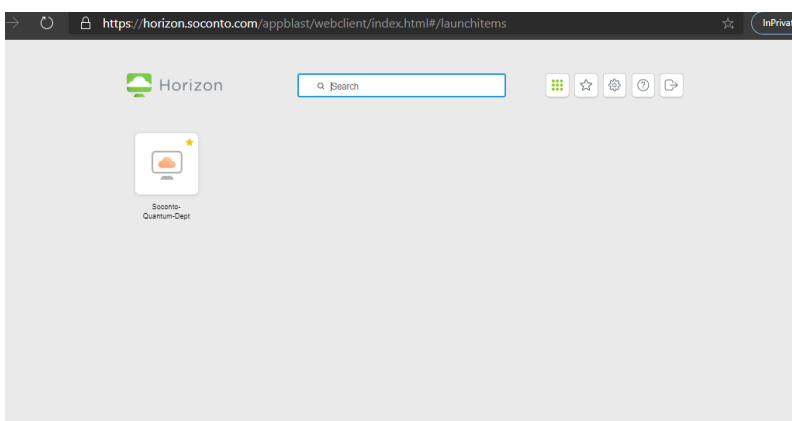
32.21. From this screen, you can see the Public and private IP addresses for your Gateways. You can create an A Record on your public DNS to point to your Public IP Address. The FQDN for the DNS name should match that of your SSL certificate.

33.22. Connect to the public address of your UAG Gateway and you should get a login screen:

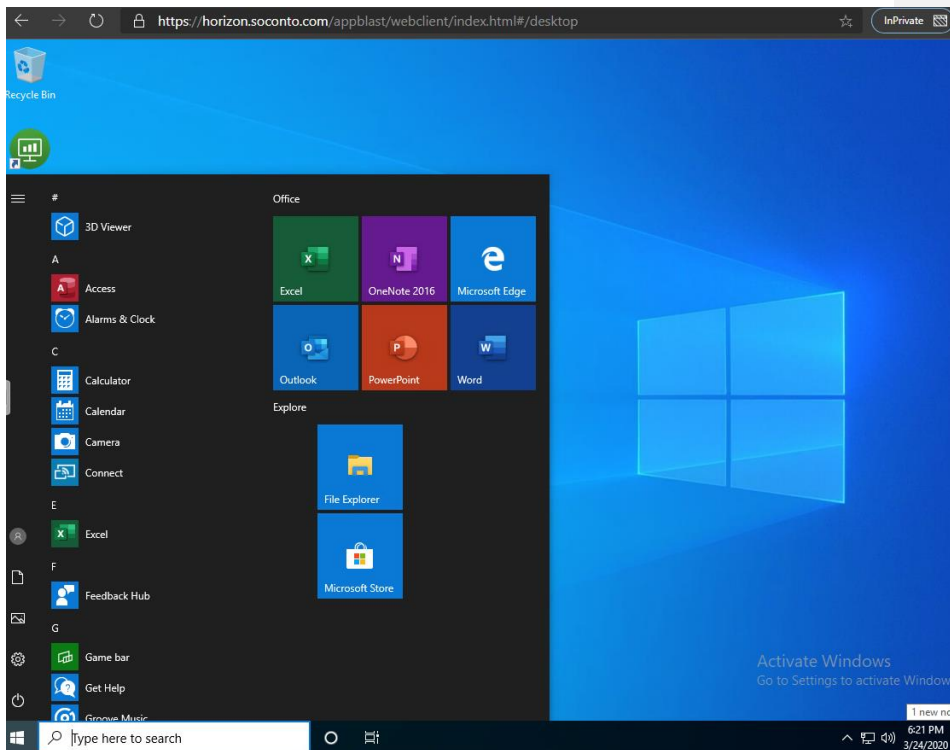


34.23. From this screen, login with the Active Directory Credentials of the group that you have assigned to this desktop farm. You can also select to download the Horizon Client for Windows.

35.24. After successful login, you can now see a list of your entitled desktops (and applications)



36.25. You should now be connected to your desktop



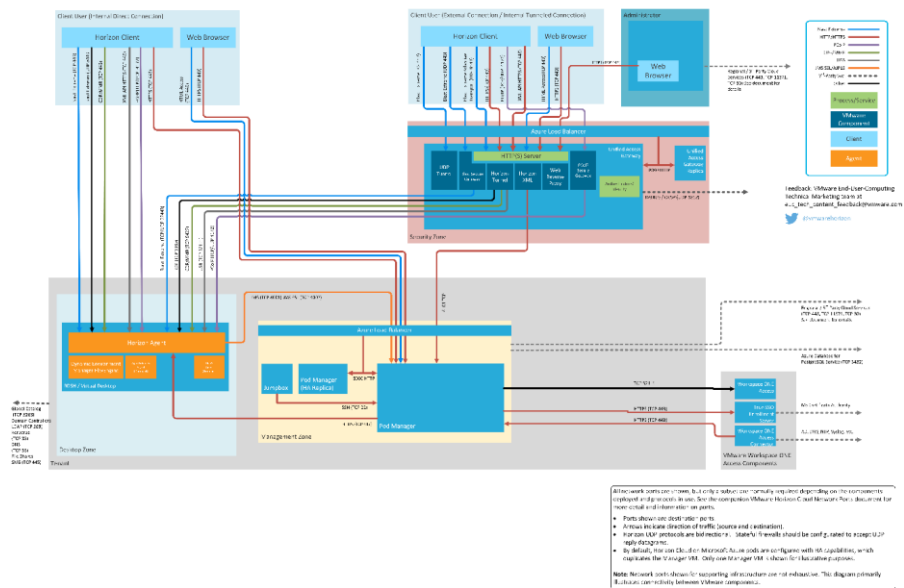
37.26. Integration of FSLogix profile management would be recommended and well documented [here](#)

38.27. Horizon Cloud on Azure also provides entitlement to Dynamic Environment Manager (DEM). More information on this can be found [here](#)

Resources

All connection types and display protocols: (link [here](#))

VMware Horizon Cloud on Microsoft Azure – All Connection Types, All Display Protocols



VMware Workspace ONE and VMware Horizon Reference Architecture

https://techzone.vmware.com/resource/workspace-one-and-horizon-reference-architecture#executive_summary

QuickStart Guide for Horizon on Azure:

<https://techzone.vmware.com/quick-start-tutorial-vmware-horizon-cloud-service-microsoft-azure#241579>

Technical Insights about Horizon Cloud on Microsoft Azure

<https://blogs.vmware.com/euc/2017/10/technical-insights-about-horizon-cloud-on-microsoft-azure.html>

Horizon Cloud on Microsoft Azure – FAQ

<https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/cloud-services/vmware-horizon-cloud-on-azure-faq.pdf>