



CPO550 - Lab 01:

Deploy host pools and session hosts by using the Azure portal (Entra ID)

Student Lab Manual

Fall 2026

Lab scenario

deploy Azure Virtual Desktop environment that uses Microsoft Entra joined session.

Objectives

- Deploy Microsoft Entra joined Azure Virtual Desktop session hosts.

Lab dependencies

- A Microsoft Entra user account (Odl_user) with the Owner role in the Azure subscription you will be assigned to you by school.

Submission Requirements

Take a screenshot whenever you see the camera icon () alongside task instructions. For better visibility, don't take screenshots in the dark mode.

Compile all screenshots into a single Word (.docx) or PDF file in the order of each task and provide a brief explanation of the significance of each screenshot. Underline or highlight all important information as shown in the provided sample screenshots at the end of this lab manual. Ensure your Odl_user account is clearly visible and underlined in every screenshot

Include your answers to the summary questions at the end of your report.

Important: Use the provided template in the Blackboard to submit your lab reports.

Instructions

Exercise 1: Implement an Azure Virtual Desktop environment using Microsoft Entra joined session hosts

The main tasks for this exercise are as follows:

1. Prepare the Azure subscription for deployment of an Azure Virtual Desktop host pool
2. Deploy an Azure Virtual Desktop host pool
3. Create an Azure Virtual Desktop application group
4. Create an Azure Virtual Desktop workspace
5. Grant access to Azure Virtual Desktop host pools
6. Summary questions

Task 1: Prepare the Azure subscription for deployment of an Azure Virtual Desktop host pool

1. From your local computer, start a web browser, navigate to the Azure portal at <https://portal.azure.com> and sign in with your Odl_user credentials.
2. In the Azure portal, start a PowerShell session in the Azure Cloud Shell.

Note: If prompted, in the **Getting started** pane, in the **Subscription** drop-down list, select the name of the Azure subscription you are using in this lab and then select **Apply**.

3. In the PowerShell session in the Azure Cloud Shell pane, run the following command to register the **Microsoft.DesktopVirtualization** resource provider:

```
Register-AzResourceProvider -ProviderNamespace Microsoft.DesktopVirtualization
```

Note: Do not wait for the registration to complete. This might take a couple of minutes.

4. Close the Cloud Shell pane.
5. In the web browser displaying the Azure portal, search for and select **Virtual networks** and, on the **Virtual networks** page, select **Create +**
6. On the **Basics** tab of the **Create virtual network** page, specify the following settings and select **Next**:
Note: Replace **<sName>** with your name.

Setting	Value
Subscription	The name of the Azure subscription you are using in this lab
Resource group	The name of a new resource group <sName>-cpoF67-11e-RG
Virtual network name	cpoF67-vnet11e
Region	The name of the Azure region where you want to deploy the Azure Virtual Desktop environment

7. On the **Security** tab, accept the default settings and select **Next**.
8. On the **IP addresses** tab, apply the following settings (modify the default if needed):

Setting	Value
IP address space	10.20.0.0/16

9. Edit the **default** subnet entry, in the **Edit subnet** pane, specify the following settings (leave others with their existing values) and select **Save**:

Setting	Value
Name	hp1-Subnet
Starting address	10.20.1.0
Enable private subnet (no default outbound access)	Disabled

10. Back on the **IP addresses** tab, select **Review + create** and then, on the **Review + create** tab, select **Create**.
11. In the web browser displaying the Azure portal, search for and select **Microsoft Entra ID**.
12. On the **Overview** page of the Microsoft Entra tenant associated with your subscription, in the **Manage** section of the vertical navigation menu, select **Users**.
13. Create a new user. For User principal name and the Display name type **cpoF67-User1-<sName>**.
14. Create another user. For User principal name and the Display name type **cpoF67-User2-<sName>**.
15. Create two groups. Name them **AVD-DAG-<sName>** and **AVD-RemoteApp-<sName>**.
16. Make **cpoF67-User1-<sName>** a member of **AVD-DAG-<sName>**.
17. Make **cpoF67-User2-<sName>** a member of **AVD-RemoteApp-<sName>**.



Task 2: Deploy an Azure Virtual Desktop host pool

1. From your local computer, in the web browser displaying the Azure portal, search for and select **Azure Virtual Desktop**, on the **Azure Virtual Desktop** page, in the **Manage** section of the vertical navigation menu, select **Host pools** and, on the **Azure Virtual Desktop | Host pools** page, select **+ Create**.
2. On the **Basics** tab of the **Create a host pool** page, specify the following settings and select **Next : Session hosts** > (leave other settings with their default values):

Setting	Value
Subscription	The name of the Azure subscription you are using in this lab
Resource group	The name of a new resource group <sName>- cpoF67-21e-RG
Host pool name	<sName>-cpoF67-hp1
Location	The name of the Azure region where you want to deploy your Azure

Setting	Value
	Virtual Desktop environment
Validation environment	No
Preferred app group type	Desktop
Host pool type	Pooled
Create Session Host Configuration	No
Load balancing algorithm	Breadth-first

3. **Note:** When using the Breadth-first load balancing algorithm, the max session limit parameter is optional.
4. On the **Session hosts** tab of the **Create a host pool** page, specify the following settings and select **Next : Workspace** > (leave other settings with their default values):

Setting	Value
Add virtual machines	Yes
Resource group	Defaulted to same as host pool
Name prefix	<sName>-sh
Virtual machine type	Azure virtual machine
Virtual machine location	The name of the Azure region where you want to deploy your Azure Virtual Desktop environment
Availability options	No infrastructure redundancy required
Security type	Trusted launch virtual machines
Image	Windows 11 Enterprise multi-session, Version 23H2 + Microsoft 365 Apps
Virtual machine size	Standard D2s_v3
Number of VMs	2
OS disk type	Standard HDDf
OS disk size	Default size (128GiB)
Boot Diagnostics	Enable with managed storage account (recommended)
Virtual network	cpoF67-vnet11e
Subnet	hp1-Subnet

Setting	Value
Network security group	Basic
Public inbound ports	No
Select which directory you would like to join	Microsoft Entra ID
Enroll VM with Intune	No
User name	Student
Password	Any sufficiently complex string of characters that will be used as the password for the built-in administrator account
Confirm password	The same string of characters you specified previously

Note: The password should be at least 12 characters in length and consist of a combination of lower-case characters, upper-case characters, digits, and special characters.

- On the **Workspace** tab of the **Create a host pool** page, confirm the following setting and select **Review + create**:

Setting	Value
Register desktop app group	No

- On the **Review + create** tab of the **Create a host pool** page, select **Create**.

Note: Wait for the deployment to complete. This might take about 20 minutes.



Task 3: Create an Azure Virtual Desktop application group

- From your local computer, in the web browser displaying the Azure portal, search for and select **Azure Virtual Desktop** and, on the **Azure Virtual Desktop** page, select **Application groups**.
- On the **Azure Virtual Desktop | Application groups** page, note the existing, auto-generated **<sName>-cpoF67-hp1-DAG** desktop application group, and select it.
- On the **<sName>-cpoF67-hp1-DAG** page, in the **Manage** section of the vertical navigation menu, select **Assignments**.
- On the **<sName>-cpoF67-hp1-DAG | Assignments** page, select **+ Add**.
- Checkmark **AVD-DAG-<sName>** group and click **Select**.
- Navigate back to the **Azure Virtual Desktop | Application groups** page, select **+ Create**.
- On the **Basics** tab of the **Create an application group** page, specify the following settings and select **Next : Applications >**:

Setting	Value
Subscription	The name of the Azure subscription you are using in this lab
Resource group	<sName>-cpoF67-21e-RG
Host pool	<sName>-cpoF67-hp1
Application group type	Remote App
Application group name	<sName>-cpoF67-hp1-Office365-RAG

8. On the **Applications** tab of the **Create an application group** page, select **+ Add applications**.
9. On the **Add application** page, specify the following settings and select **Review + add**, then select **Add**:

Setting	Value
Application source	Start menu
Application	Word
Display name	Microsoft Word
Description	Microsoft Word
Require command line	No

10. Back on the **Applications** tab of the **Create an application group** page, select **+ Add applications**.
11. On the **Add application** page, specify the following settings and select **Review + add**, then select **Add**:

Setting	Value
Application source	Start menu
Application	Excel
Display name	Microsoft Excel
Description	Microsoft Excel
Require command line	No

12. Back on the **Applications** tab of the **Create an application group** page, select **+ Add applications**.
13. On the **Add application** page, specify the following settings and select **Review + add**, then select **Add**:

Setting	Value
Application source	Start menu
Application	PowerPoint
Display name	Microsoft PowerPoint
Description	Microsoft PowerPoint
Require command line	No

14. Back on the **Applications** tab of the **Create an application group** page, select **Next : Assignments >**.
15. On the **Assignments** tab of the **Create an application group** page, select **+ Add Microsoft Entra users or user groups**.
16. Checkmark **AVD-RemoteApp-<sName>** group and click **Select**.
17. Back on the **Assignments** tab of the **Create an application group** page, select **Next : Workspace >**.
18. On the **Workspace** tab of the **Create a workspace** page, specify the following setting and select **Review + create**:

Setting	Value
Register application group	No

19. On the **Review + create** tab of the **Create an application group** page, select **Create**.

Note: Wait for the Application Group to be created. This should take less than 1 minute.

Note: Next you will create an application group based on file path as the application source.

20. In the web browser displaying the Azure portal, search for and select **Azure Virtual Desktop** and, on the **Azure Virtual Desktop** page, select **Application groups**.
21. On the **Azure Virtual Desktop | Application groups** page, select **+ Create**.
22. On the **Basics** tab of the **Create an application group** page, specify the following settings and select **Next : Applications >**:

Setting	Value
Subscription	The name of the Azure subscription you are using in this lab
Resource group	<sName>-cpoF67-21e-RG
Host pool	<sName>-cpoF67-hp1
Application group type	RemoteApp

Setting	Value
Application group name	<sName>-cpoF67-hp1-Utilities-RAG

23. On the **Applications** tab of the **Create an application group** page, select **+ Add applications**.
24. On the **Add application** page, on the **Basics** tab, specify the following settings and select **Next**:

Setting	Value
Application source	File path
Application path	C:\Windows\system32\cmd.exe
Application identifier	Command Prompt
Display name	Command Prompt
Description	Windows Command Prompt
Require command line	No

25. On the **Icon** tab, specify the following settings and select **Review + add**, then select **Add**:

Setting	Value
Icon path	C:\Windows\system32\cmd.exe
Icon index	0

26. Back on the **Applications** tab of the **Create an application group** page, select **Next : Assignments >**.
27. On the **Assignments** tab of the **Create an application group** page, select **+ Add Microsoft Entra users or user groups**.
28. Checkmark **AVD-RemoteApp-<sName>** group and click **Select**.
29. Back on the **Assignments** tab of the **Create an application group** page, select **Next : Workspace >**.
30. On the **Workspace** tab of the **Create a workspace** page, specify the following setting and select **Review + create**:

Setting	Value
Register application group	No

31. On the **Review + create** tab of the **Create an application group** page, select **Create**.

Note: Wait for the Application Group to be created. This should take less than 1 minute.



Task 4: Create an Azure Virtual Desktop workspace

1. From your local computer, in the web browser displaying the Azure portal, search for and select **Azure Virtual Desktop** and, on the **Azure Virtual Desktop** page, select **Workspaces**.
2. On the **Azure Virtual Desktop | Workspaces** page, select **+ Create**.
3. On the **Basics** tab of the **Create a workspace** page, specify the following settings and select **Next : Application groups** >:

Setting	Value
Subscription	The name of the Azure subscription you are using in this lab
Resource group	<sName>-cpoF67-21e-RG
Workspace name	<sName>-cpoF67-21-ws1
Friendly name	<sName>-cpoF67-21-ws1
Location	The name of the Azure region into which you deployed resources in the first exercise of this lab or a region close to it

4. On the **Application groups** tab of the **Create a workspace** page, specify the following settings:

Setting	Value
Register application groups	Yes

5. On the **Workspace** tab of the **Create a workspace** page, select **+ Register application groups**.
6. On the **Add application groups** page, select the plus sign next to the <sName>-cpoF67-hp1-DAG, <sName>-cpoF67-hp1-Office365-RAG, and <sName>-cpoF67-hp1-Utilities-RAG entries and click **Select**.
7. Back on the **Application groups** tab of the **Create a workspace** page, select **Review + create**.
8. On the **Review + create** tab of the **Create a workspace** page, select **Create**.



Task 5: Grant access to Azure Virtual Desktop host pools

Note: When using Microsoft Entra joined session hosts, you need to assign to Azure Virtual Desktop users and administrators appropriate Azure role-based access control (RBAC) roles. In particular, the *Virtual Machine User Login* role is required to sign in to session hosts, and the *Virtual Machine Administrator Login* role is required for the local administrative privileges.

1. From your local computer, in the web browser displaying the Azure portal, search for and select **Resource groups** then select <sName>-cpoF67-21e-RG.
2. On the <sName>-cpoF67-21e-RG page, in the vertical navigation menu, select **Access control (IAM)**.

3. From top of the page, select **+ Add** and then **Add role assignment**.
4. In the search textbox, enter **Virtual Machine User Login**, in the list of results, select **Virtual Machine User Login**, and then select **Next**.
5. On the **Members** tab, ensure that the **User, group, or service principal** option is selected, click **+ Select members**, in the **Select members** pane, locate the **AVD-RemoteApp-<sName>** group and click **Select**.
6. Back on the **Members** tab select **Next** then select **Review + assign**.
7. Back on the **<sName>-cpoF67-21e-RG | Access control (IAM)** page, select **+ Add** and **Add role assignment**.
8. On the **Role** tab, ensure that the **Job function roles** tab is selected, in the search textbox, enter **Virtual Machine Administrator Login**, in the list of results, select **Virtual Machine Administrator Login**, and then select **Next**.
9. On the **Members** tab, ensure that the **User, group, or service principal** option is selected, click **+ Select members**, in the **Select members** pane, locate and select the **AVD-DAG-<sName>** group, and click **Select**.
10. Back on the **Members** tab of the **Add role assignment** page, select **Review + assign**.



Task 6: Summary Questions

Please answer the following questions in *your own words*, and submit with your lab report:

- 1- The lab used Breadth-first load balancing for the pooled host pool—if user density increased significantly, explain a potential performance issue and recommend an alternative algorithm with justification.
- 2- Evaluate security implications of assigning Virtual Machine Administrator Login to AVD-DAG-<sName> at the resource group level—propose a least-privilege alternative and when it might still be necessary.
- 3- Suppose a new compliance requirement demands user data isolation—argue why switching from this pooled setup to a personal host pool would (or wouldn't) address it, including management trade-offs.
- 4- Reflect on your experience completing the Azure Virtual Desktop lab deploying Microsoft Entra joined session hosts. What key knowledge or skills did you gain about AVD architecture, Entra integration, or RBAC configurations, and what specific challenges did you encounter during deployment, troubleshooting, or resource setup?

Important Lab Cleanup Instructions

Do **NOT** delete any resources created in this lab. They are required for subsequent labs. To minimize costs, stop all virtual machines (VMs) immediately. Restart them only when beginning the next lab.

Microsoft Azure

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Subscription equals all

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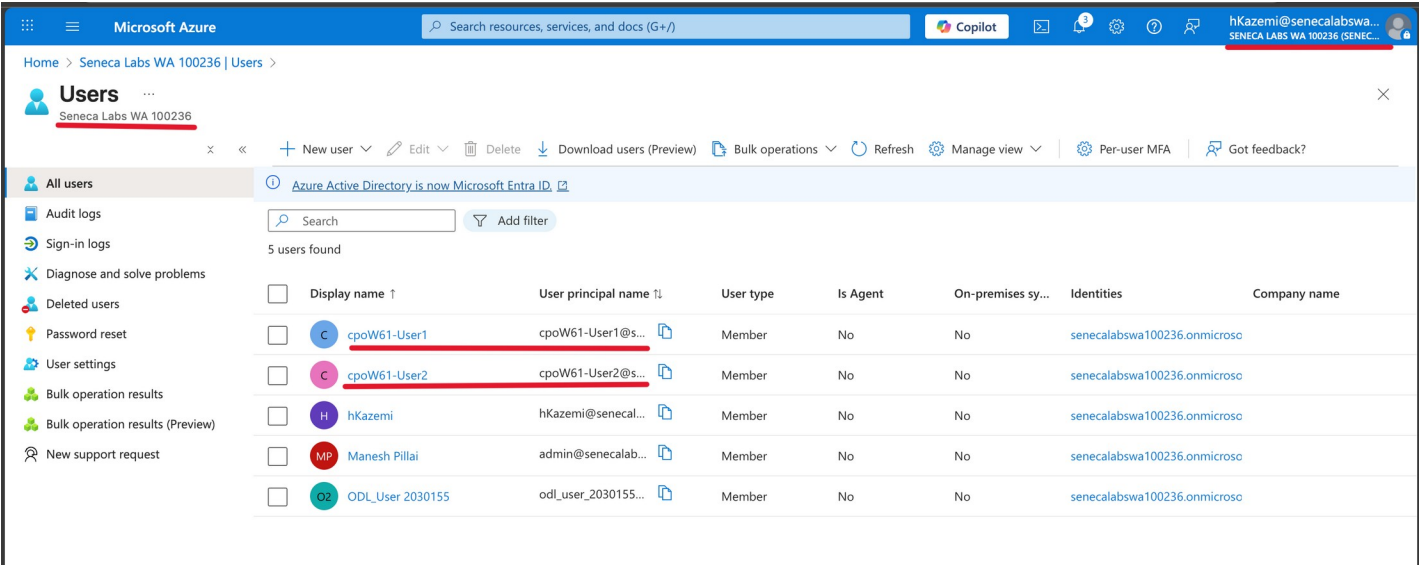
+ Add filter

☐	Name ↑	Subscription	Resource Group	Location	Status	Operating syst...	Size	Public IP addr...	Disks
☐	 hKazemi-sh-0	⋮ Seneca Labs W...	hKazemi-cpoW...	East US	Stopped (deall...	Windows	Standard_D2s_v3	-	1
☐	 hKazemi-sh-1	⋮ Seneca Labs W...	hKazemi-cpoW...	East US	Stopped (deall...	Windows	Standard_D2s_v3	-	1

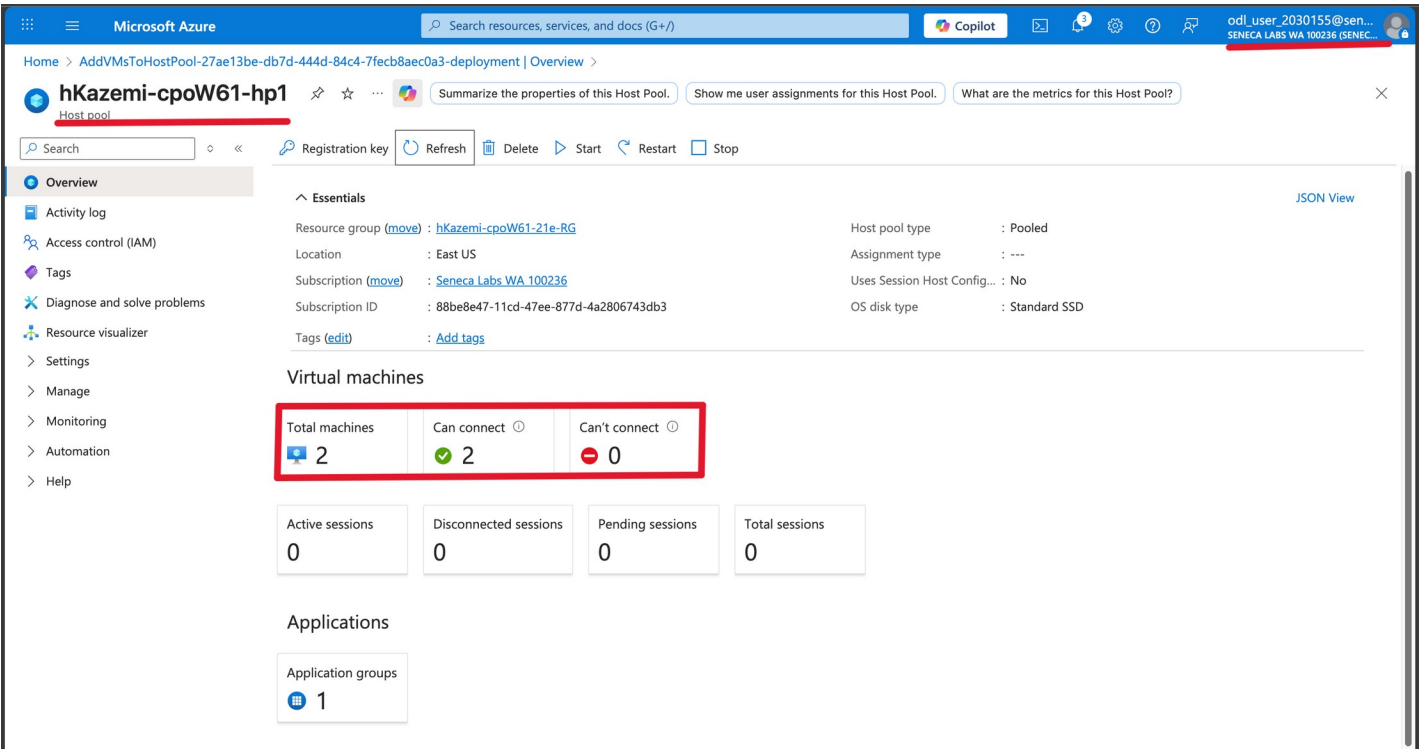
Sample Screenshots

Please ensure that all marked information in the samples is included, clearly visible, and underlined in your screenshots.

Task 1:



Task 2:



Task 3:

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options: Overview, Quickstart, Manage (Host pools, Application groups, Workspaces, App attach, Scaling plans, Users, Custom image templates), and Monitoring (Insights, Workbooks). The main content area is titled 'Azure Virtual Desktop | Application groups'. It includes a search bar, a 'Create' button, and a 'Manage view' dropdown. A filter bar shows 'Subscription equals all', 'Resource Group equals all', 'Type equals all', and 'Location equals all'. Below this is a table of application groups:

Name	Resource Group	Location	Subscription	Application group...	Host pool	Workspace
hKazemi-cpoW61-hp1-DAG	hKazemi-cpoW61-...	East US	Seneca Labs WA 1...	Desktop	hKazemi-cpoW61-	
hKazemi-cpoW61-hp1-Office365-RAG	hKazemi-cpoW61-...	East US	Seneca Labs WA 1...	RemoteApp	hKazemi-cpoW61-	
hKazemi-cpoW61-hp1-Utilities-RAG	hKazemi-cpoW61-...	East US	Seneca Labs WA 1...	RemoteApp	hKazemi-cpoW61-	

Task 4(a):

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains navigation options: Overview, Quickstart, Manage (Host pools, Application groups, Workspaces, App attach, Scaling plans, Users, Custom image templates), and Monitoring (Insights, Workbooks). The main content area is titled 'Azure Virtual Desktop | Workspaces'. It includes a search bar, a 'Create' button, and a 'Manage view' dropdown. A filter bar shows 'Filter by Name'. Below this is a table of workspaces:

Name	Friendly name	Type	Location
hKazemi-cpoW61-hp1...	Default Desktop	Desktop	East US
hKazemi-cpoW61-hp1...	hKazemi-cpoW61-hp1...	RemoteApp	East US
hKazemi-cpoW61-hp1...	hKazemi-cpoW61-hp1...	RemoteApp	East US

Task 4(b):

hKazemi-cpoW61-hp1-Office365-RAG | Applications

Application name	Application type	Require command line
Excel	Win32	No
PowerPoint	Win32	No
Word	Win32	No

Task 5:

hKazemi-cpoW61-21e-RG | Access control (IAM)

Name	Type	Role	Scope	Condition
Owner (3)				
Foreign Principal for 'Spektra Syst...	Foreign group	Owner	Subscription (Inhe...	None
https://senecalabswa100236.on...	Service principal	Owner	Subscription (Inhe...	None
Manesh Pillai	User	Owner	Subscription (Inhe...	None
Reader (1)				
ODL_User 2030155	User	Reader	Subscription (Inhe...	None
Cost Management Contributor (1)				
ODL_User 2030155	User	Cost Management Contributor	Subscription (Inhe...	None
Owner - Custom role v1 I60250 S1 (1)				
ODL_User 2030155	User	Owner - Custom role v1 I60250 S1	Subscription (Inhe...	None
Virtual Machine Administrator Login (1)				
AVD-DAG-hKazemi	Group	Virtual Machine Administrator Login	This resource	None
Virtual Machine User Login (1)				
AVD-RemoteApp-hKazemi	Group	Virtual Machine User Login	This resource	None