

# Cognizant<sup>®</sup>

## Microsoft Business Group

### Azure Migration Guide

Presented to:

Noble Drilling Corp.

3/19/2021

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## TABLE OF CONTENTS

Summary .....	4
Deployment Considerations .....	5
Current Deployment Topology .....	5
Prepare On-Prem and Azure for AZ Migrate .....	6
Deploy Azure Migrate project in the portal.....	6
Deploy Assessment appliance server .....	7
Deploy Migration appliance server .....	12
Discover Servers for Assessment on the appliance Server .....	21
Run Azure migrate assesSments In the portal/RevieWing Assessments .....	23
Running Azure Migrate Assessments .....	23
Reviewing Azure Migrate Assessments .....	24
Install mobility agents on physical servers to be replicated .....	26
Prerequisites .....	26
Windows GUI Install .....	27
Windows Command Line Install.....	29
Linux Install .....	30
Begin replication through Azure Migrate.....	32
Configure Migration settings of replicated Servers .....	36
failover testing setup .....	38
Failover Testing Process .....	39
Failover Testing Procedure .....	39
Failover Testing Checklist .....	39
Migration In Azure Migrate .....	40
Migration/Application/server testing .....	42
Application Testing Procedure .....	42
Application Testing Checklist .....	42
Post Failover Configurations.....	43
Recommended post failover configuration .....	43
Post Failover Cleanup .....	43
Infrastructure Testing .....	45
Infrastructure Testing Procedure .....	45

Infrastructure Testing Checklist .....45

Rollback .....46

Rollback Procedure .....46

## SUMMARY

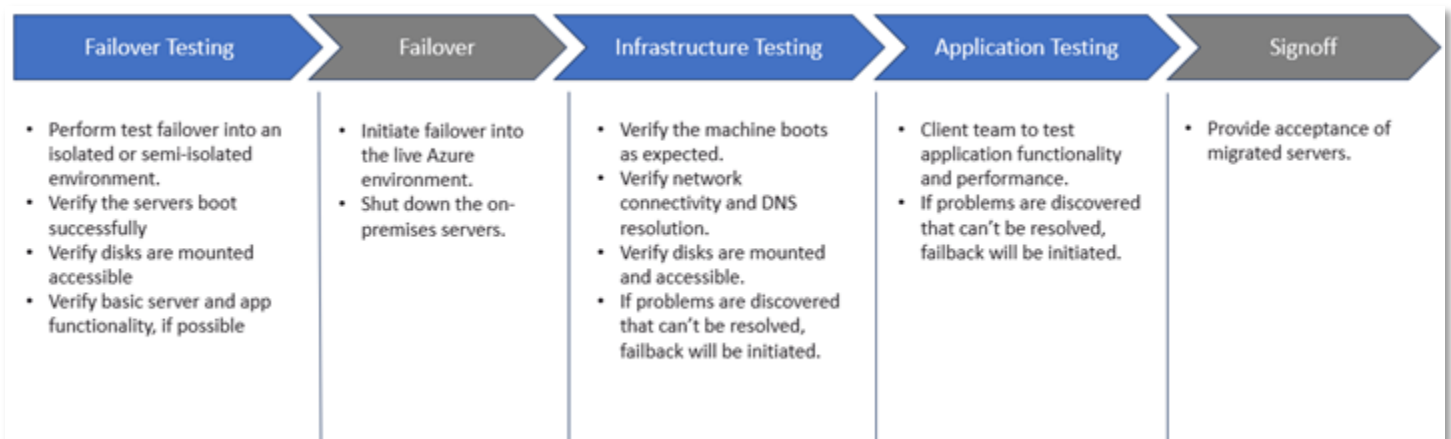
This document is intended to provide guidance for migrations to Azure along with testing before and after rehosting of a server or workload to Azure. It is important to perform testing on workloads moving to the cloud to verify:

- Migration tooling functionality
- Proper bandwidth and network connectivity
- Verify right sizing to ensure acceptable performance level is still being achieved in Azure
- Verify any established benchmarks are being met in Azure
- Verify no compatibility issues exist that may have been previously unaccounted for

There are three types of testing that should be performed during the migration lifecycle:

1. Failover testing - this testing takes place before migration to ensure the failover to Azure happens with as little interruption in service as possible. This could be as short as verifying the VM boots, to as much as fully testing an application in an isolated environment in Azure.
2. Virtual infrastructure testing - this testing takes place after failover and ensures the VMs and Azure virtual infrastructure are all configured and performing as expected.
3. Application testing - this testing will be performed by the application teams that understand the workload that has been migrated. This testing should be a full QA test of the workload to ensure that it is performing as expected and suitable to continue as production.

### Workload Migration Lifecycle

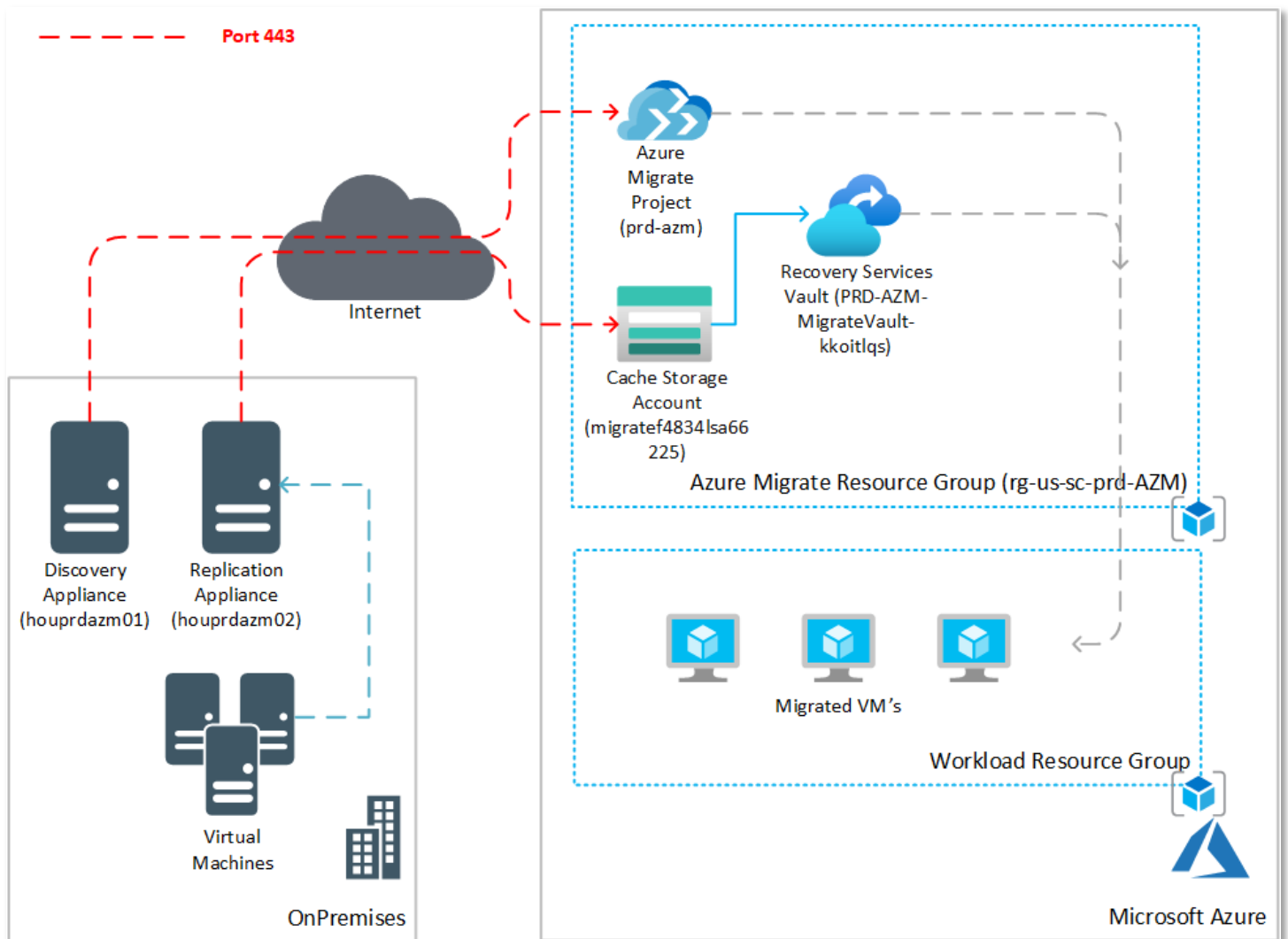


## DEPLOYMENT CONSIDERATIONS

- When replicating a physical server (non-VMware or Hyper-V virtual machines included), the assessment portion of Azure Migrate will not interact with the migration tooling.
- Each migration project will be limited to one region (one-to-one relationship), to replicate to multiple regions one Azure Migrate project and Configuration/Process server will need to be created.

## CURRENT DEPLOYMENT TOPOLOGY

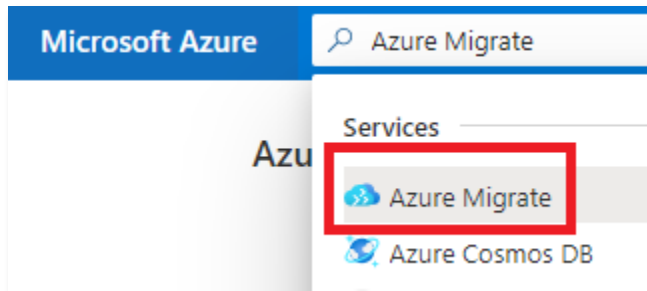
Below is the current topology for Noble, The Discovery Appliance is performing sizing and dependency mappings of virtual machines and the Replication Appliance is replicating selected virtual machines using the Mobility Agent installed on each server into the Azure Migrate Project via the Cache Storage account and storing that data within the Recovery Services Vault for failover into Azure.



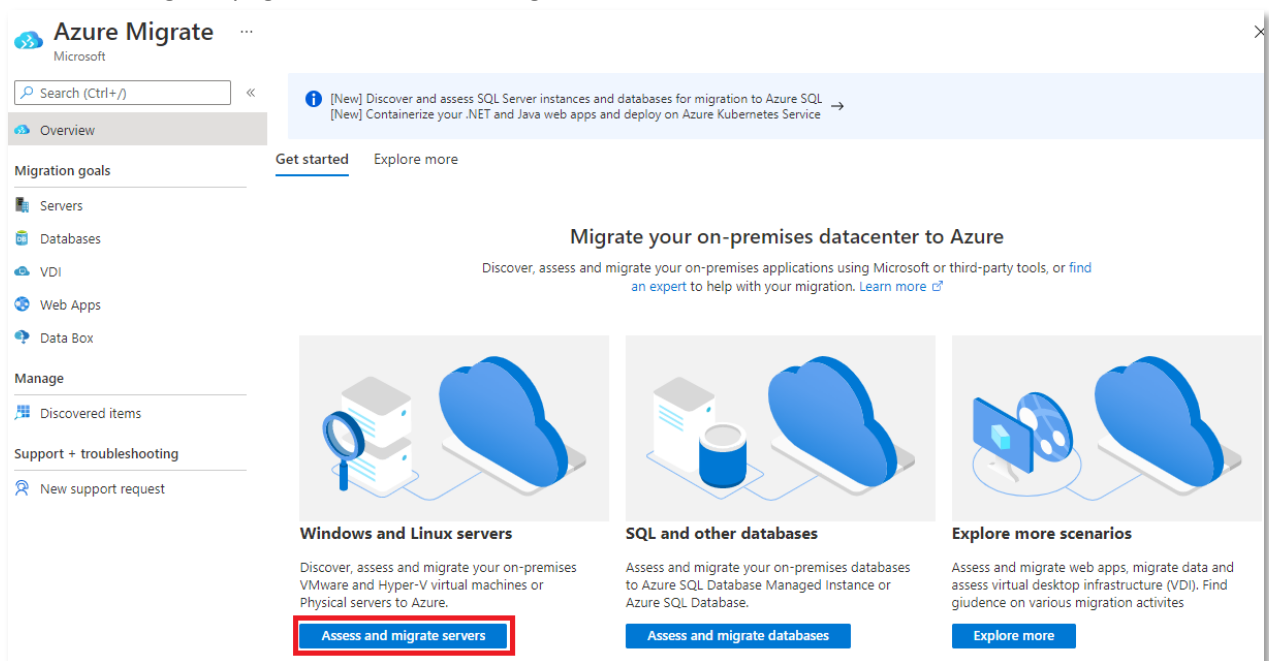
## PREPARE ON-PREM AND AZURE FOR AZ MIGRATE

### Deploy Azure Migrate project in the portal

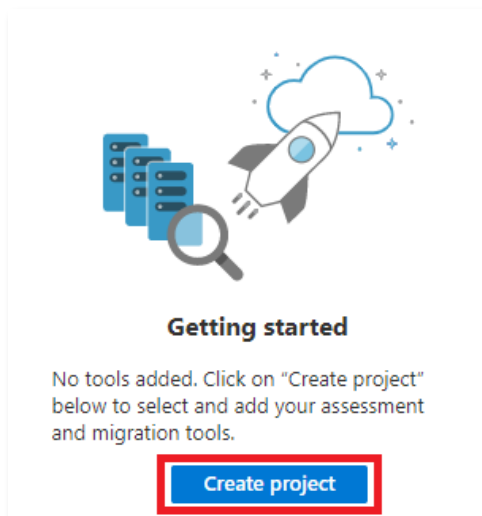
- Navigate to the Azure portal and search for Azure Migrate



- Once on the Azure Migrate page select Assess and migrate servers



- Select create project



- Select the subscription and resource group to create the Azure Migrate project under
  - Make sure to select the proper geography for where your servers will migrate to

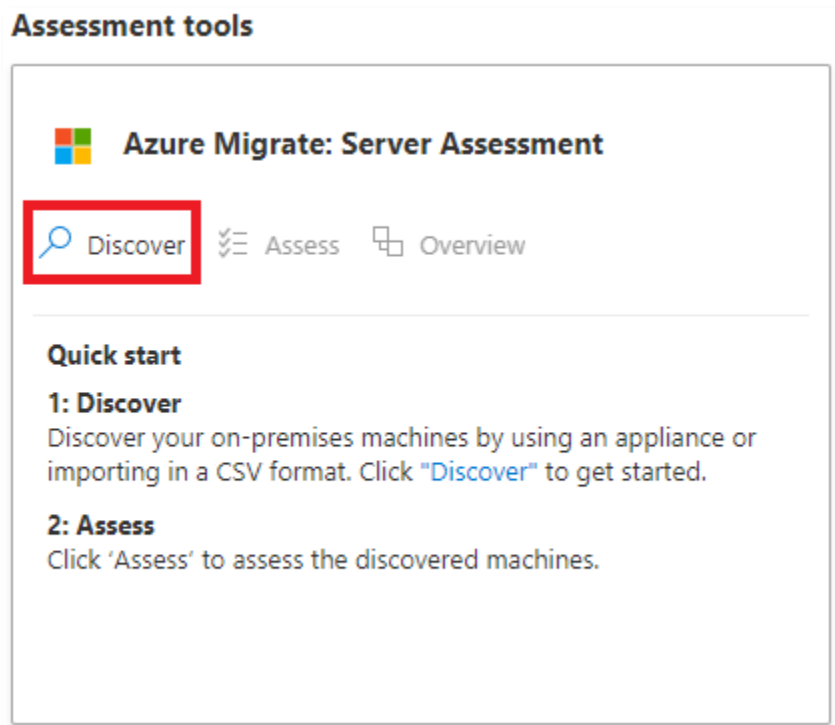
The screenshot shows the 'Create new project' form in Azure Migrate. It includes fields for 'Subscription' (set to 'Azure subscription 1'), 'Resource group' (set to '(New) rg-Azure-Migrate-Project' with a 'Create new' link), and 'PROJECT DETAILS'. Under 'PROJECT DETAILS', there is a description: 'Specify the name of the migrate project and the preferred geography.' followed by 'Migrate project' (set to 'Azure-Migrate-Project') and 'Geography' (set to 'United States').

- Your project has been created and you can now begin the Assessment process.

## Deploy Assessment appliance server

**Prerequisites: VM with Windows Server 2016, 16GB of RAM, 8 vCPUs and 80GB of storage**

- In the Azure Migrate project select the Discover button under the Azure Migrate: Server Assessment section



- Once on the Discover machines page open the dropdown and select Physical or other (AWS, GCP, Xen, etc.)

- Fill in the Name your appliance section (Make sure this matches the name of your discovery server)
- Generate your key and copy the information down.
- Download the Azure Migrate appliance zip file. Make sure to copy the zip file and key info to your appliance.



- Extract the Azure Migrate Installer .zip and run the AzureMigrateInstaller.ps1 file

```
Administrator: Windows PowerShell
Execution Policy Change
The execution policy helps protect you from scripts that you do not trust. Changing the execution policy might expose you to the security risks described in the about_Execution_Policies help topic at
http://go.microsoft.com/fwlink/?LinkID=135170. Do you want to change the execution policy?
[Y] Yes [A] Yes to All [N] No [L] No to All [S] Suspend [?] Help (default is "N"): _
```

Type A for “Yes to All”

```
This deployment will help you discover and assess Physical or other virtualization (AWS, GCP, Xen, etc.) to an Azure Migrate project for Public cloud.
If this is not the desired appliance scenario, you need to execute the script again by providing the parameter -Scenario with value [VMware/Physical/HyperV] and -Cloud value [Public/USGov/USNat]. For example: .\AzureMigrateInstaller.ps1 -Scenario VMware -Cloud Public
Enter [Y] to continue with deployment of Physical or other virtualization (AWS, GCP, Xen, etc.) appliance or [N] to abort:
```

Type Y to continue

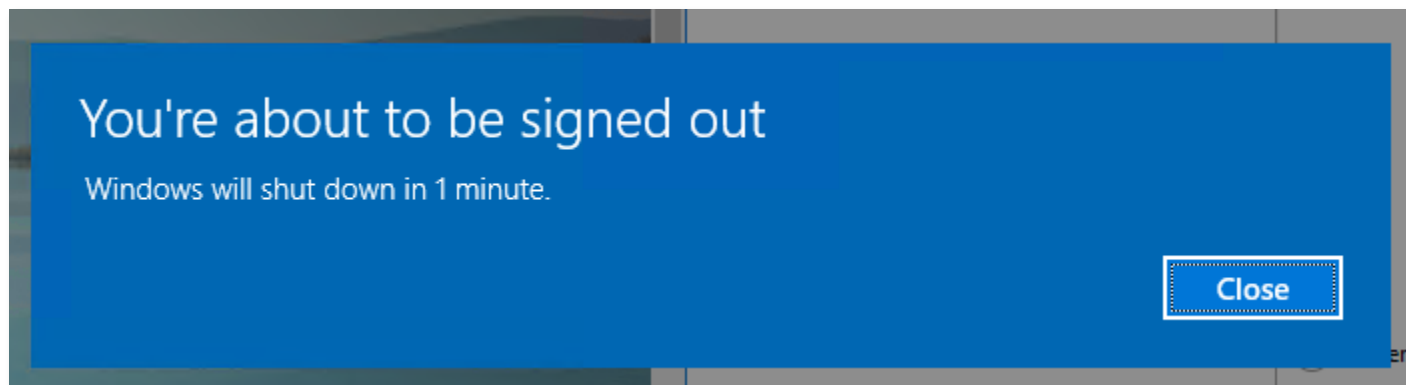
- When prompted you can install the latest version of Microsoft Edge

```
The latest Azure Migrate appliance configuration manager is not supported on Internet Explorer 11 or lower so you would need to install any of these browsers to continue with appliance configuration manager -Edge (latest version), Chrome (latest version), Firefox (latest version).
Do you want to install New Edge browser now (highly recommended)? [Y/N] - You may skip Edge browser installation (select 'N') in case you are already using a browser from the above list.
Y
```

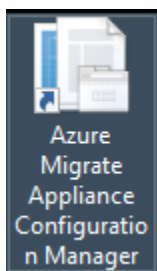
- Allow the installer to remove Internet Explorer

```
The latest Azure Migrate appliance configuration manager is not supported on Internet Explorer 11 or lower. You can either uninstall Internet Explorer using this script and open the appliance URL https://AZ-MGR-DISC-01:44368 on any other browser except Internet Explorer.
Do you want to remove Internet Explorer browser from this machine now? This will force a machine reboot immediately. Press [Y] to continue with the uninstallation or [N] to manually uninstall Internet Explorer...
```

- The installer will finish and restart the system automatically.



- Once the system restarts the Appliance Configuration Manager will automatically open
  - (If this does not happen you can also open the shortcut on the desktop.)



- The system will run through the prerequisites and verify the system is ready to start discovery.

- Take the key we generated in the Azure Migrate portal and enter it into the box and click Login



## 2. Register with Azure Migrate

To register the appliance to the Azure Migrate project in your subscription, you will need to provide the Azure Migrate project key, generated on the portal. [Learn more](#) about how the Azure Migrate project key is generated.

You need to login to Azure to complete the registration. When you click on Login, the Azure Migrate project key will be validated. After successful login, the appliance registration steps will be initiated.

AZ-MGR-DISC-01;PROD;4ec8afa5-831c-49a5-92b2-87e4ce7fa801;/subscriptions/ba3a`

Login

- Click on Copy code & Login to be brought to the Microsoft login page. Here we will associate the appliance using an Azure account with Administrator rights to the Azure tenant.

## Continue with Azure Login

If you are logging in for the first time or logging in again as your login has expired, you will need a device code to authenticate with Azure. Clicking on the button below will copy the code and open a new tab.

**Device code :** R9G3MTKV3

Copy code & Login

- Once the login is complete you will be shown this screen.



- The appliance will register with the Azure Migrate Project which can take up to 10 minutes

✓ The appliance has been successfully registered. [View details](#)

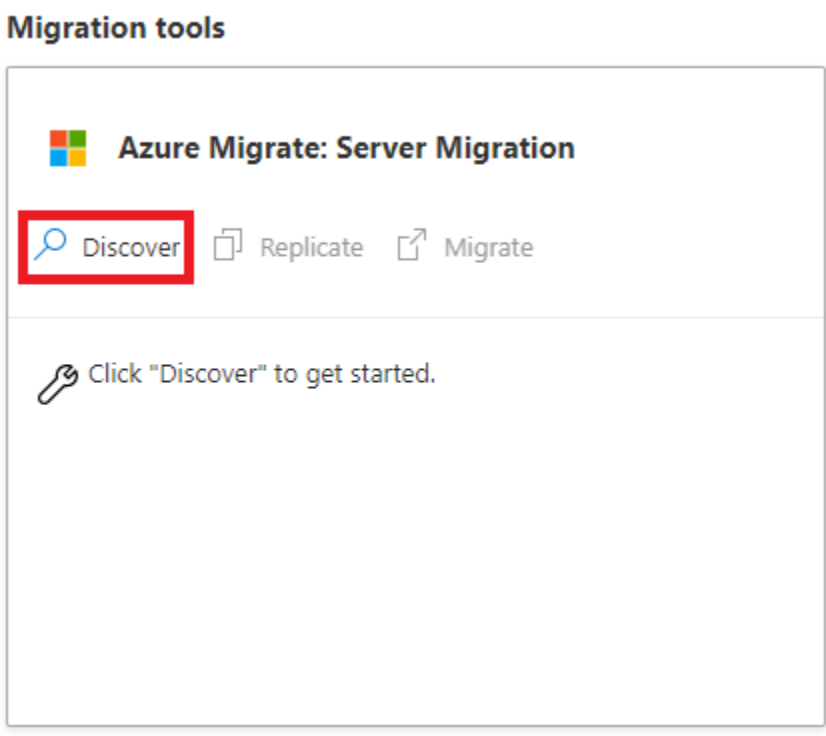
## Deploy Migration appliance server

**Prerequisites: VM with Windows Server 2016, 16GB of RAM, 8 vCPUs and 300GB of storage**

Note: The virtual machine can be provisioned with one or two vNICs for redundancy

Replication appliance detailed sizing information: [Azure Migrate Server Migration Scaling | Microsoft Docs](#)

- In the Azure Migrate project select Discover under the Azure Migrate: Server Migration section



- Select Physical or other for the virtualization type and your Target migration region

### Discover machines ...

Are your machines virtualized? ⓘ

Physical or other (AWS, GCP, Xen, etc.) ▼

Target region ⓘ

South Central US ▼

**i** The target region for migration, once confirmed, cannot be changed for the project. After confirmation, the Server Migration tool (in this project) will allow replication and migration only to the selected target region.

☒ Confirm that the target region for migration is "South Central US"

Create resources

- Azure Migrate will deploy the necessary resources for you and bring you to the following screen

Home > Azure Migrate >

## Discover machines

Are your machines virtualized? ⓘ  
Physical or other (AWS, GCP, Xen, etc.)

Target region ⓘ  
Central US

Do you want to install a new replication appliance or scale-out existing setup?  
Install a replication appliance [Help me choose](#)

**The replication appliance (Configuration Server) is a virtual appliance that is deployed on-premises or on cloud, co-located with the machines you are looking to migrate. The repl the steps outlined below to set up and configure the replication appliance.**

- 1. Download and install the replication appliance software.**  
Create a new Windows Server 2016 machine by following the [Configuration Server sizing guidelines](#).  
[Download](#) the replication appliance software installer and use it to complete installation of the replication appliance software on the newly created Windows Server 2016 machine.
- 2. Configure the replication appliance and register it to the Azure Migrate project**  
Download the registration key file and use it to register the replication appliance to this project. The replication appliance installer will ask for a registration key.  
[Download](#)
- 3. Finalize registration**  
Prepare for replication by finalizing registration for the replication appliance (Configuration Server). Select the replication appliance from the drop down to finalize registration for it.

**⚠ The Configuration Server must be registered to the project to proceed with this step. Complete step 2 to proceed.**

Select Configuration Server  
Select Configuration Server

[Finalize registration](#)

- Select Install a replication appliance in the dropdown

Are your machines virtualized? ⓘ  
Physical or other (AWS, GCP, Xen, etc.)

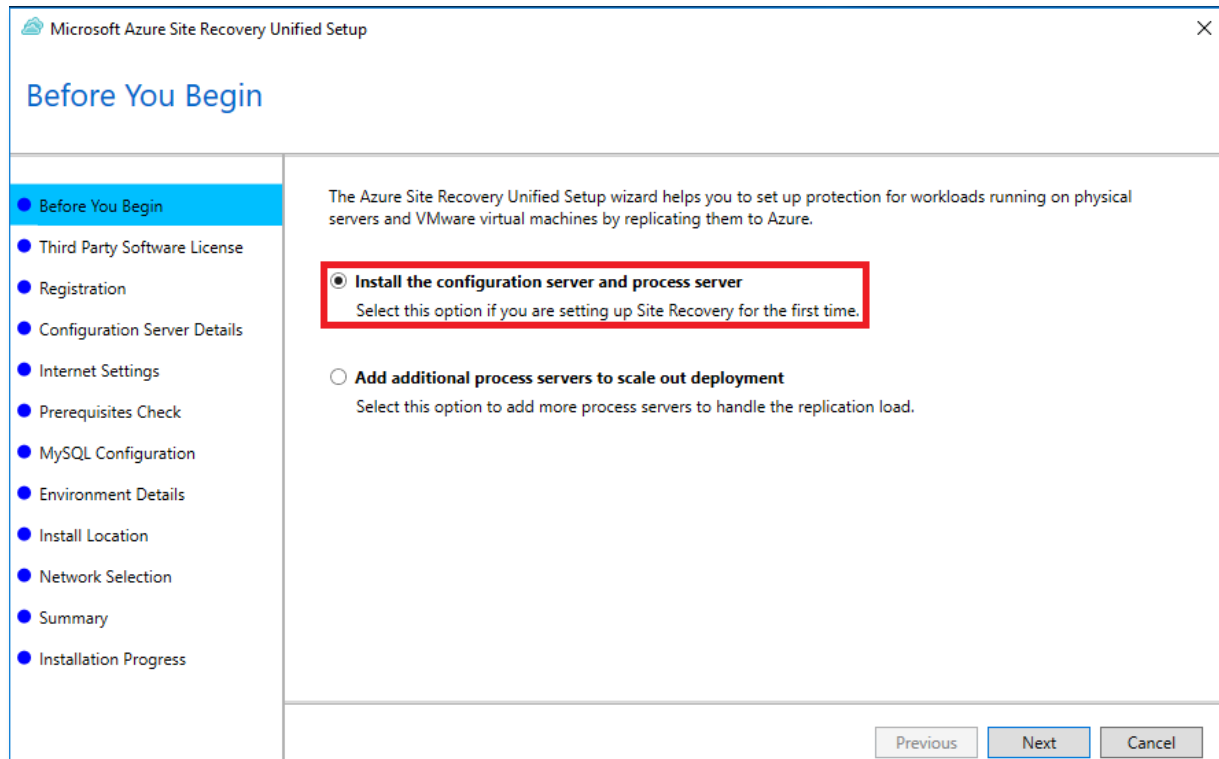
Target region ⓘ  
South Central US

Do you want to install a new replication appliance or scale-out existing setup?  
Install a replication appliance

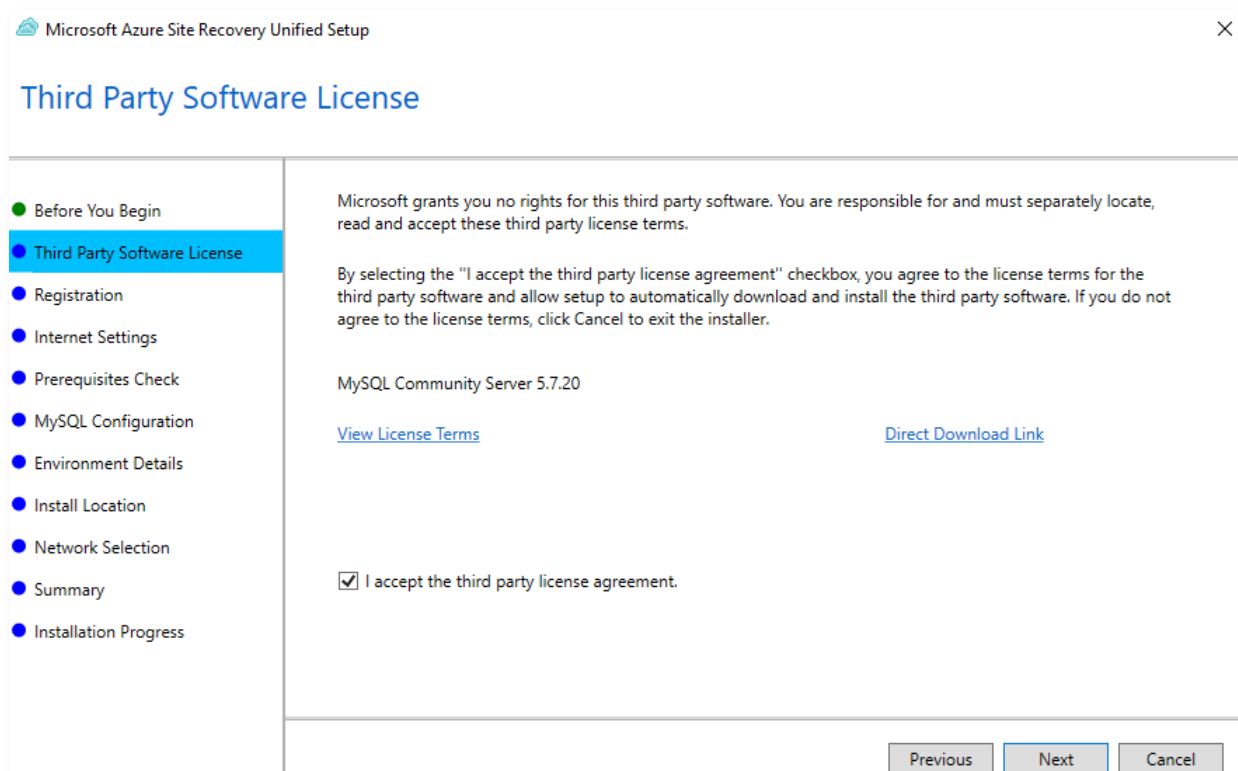
- Click the two links to download the replication appliance software and the registration key file
  - The installer is based on the target region chosen in the step above and can be downloaded from: [http://aka.ms/unifiedinstaller\\_scus](http://aka.ms/unifiedinstaller_scus) (South Central Us)

- 1. Download and install the replication appliance software.**  
Create a new Windows Server 2016 machine by following the [Configuration Server sizing guidelines](#).  
[Download](#) the replication appliance software installer and use it to complete installation of the replication appliance software on the newly created Windows Server 2016 machine.
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[Download](#)

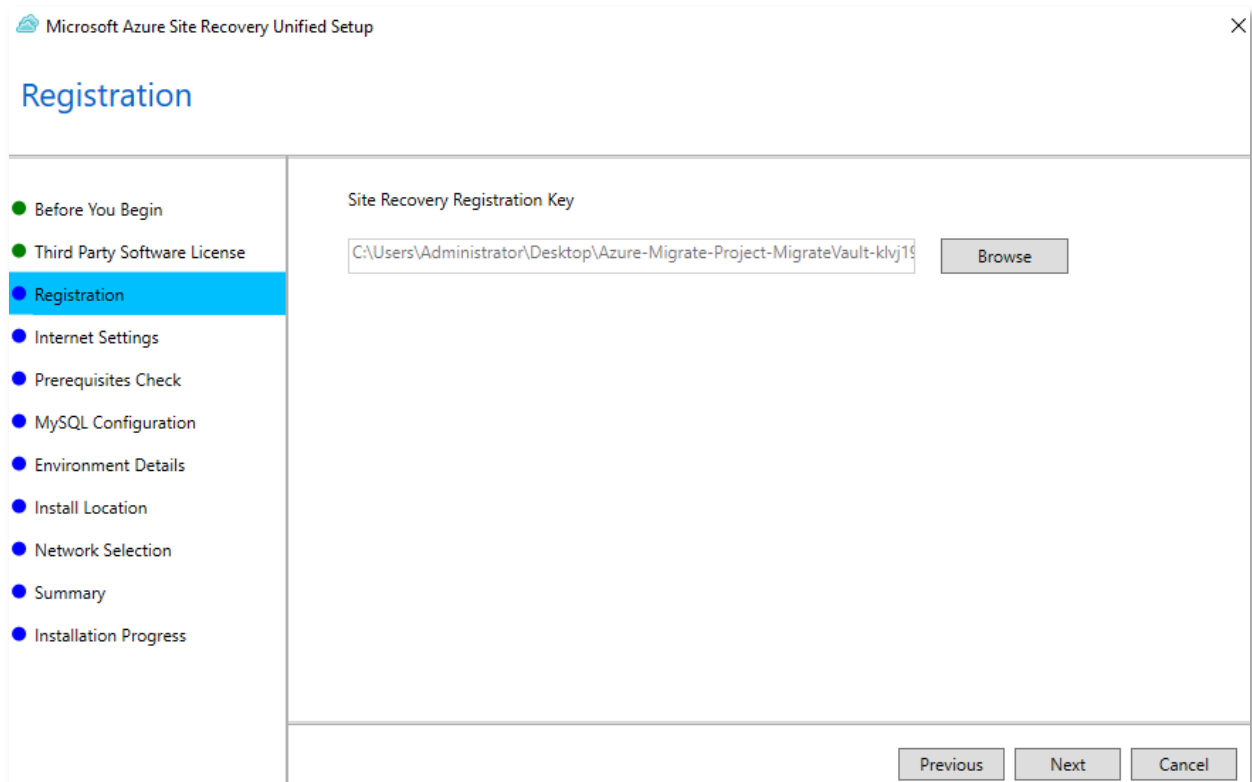
- Copy the installer and key file to your replication appliance and run the installer
  - Make sure "Install the configuration server and process server" is selected



- Accept the license agreement for SQL to be installed on the appliance



- Select your key file previously downloaded from the Azure portal



- Configure any necessary settings for connecting to Azure, the system will verify the settings once you click Next.
- The system will run through prerequisite checks and notify of any errors.

Microsoft Azure Site Recovery Unified Setup

## Prerequisites Check

Prerequisites Check : Passed: 6, Failed: 0, Warning: 3, Skipped: 0

Re-Run

	Prerequisites check	Status
✓	Min Memory and CPU checks	<a href="#">Passed</a>
✓	Restart pending	<a href="#">Passed</a>
✓	Min OS version and Domain Controller check	<a href="#">Passed</a>
✓	Checking for required IIS configurations	<a href="#">Passed</a>
✓	Checking for incompatible Group Policies	<a href="#">Passed</a>
✓	Global time sync check	<a href="#">Passed</a>
✓	Free space requirements	<a href="#">Passed</a>
✓	Checking for Static IP Addresses	<a href="#">Passed</a>
✓	Checking for Strawberry Perl(v5.8.8)	<a href="#">Passed</a>

Previous Next Cancel

- Configure a password for the MySQL root account

Microsoft Azure Site Recovery Unified Setup

## MySQL Configuration

MySQL root password

MySQL database (svsystems user) password

Note: Passwords must

- ✓ Contain at least one letter
- ✓ Contain at least one number
- ✓ Contain at least one special character (!@#%\$)
- ✓ Be between 8-16 characters
- ✓ Contain no spaces

Previous Next Cancel



- Select No when prompted "Do you want to protect VMWare virtual machines"

The screenshot shows the 'Environment Details' step of the Microsoft Azure Site Recovery Unified Setup. On the left, a list of steps includes 'Before You Begin', 'Third Party Software License', 'Registration', 'Internet Settings', 'Prerequisites Check', 'MySQL Configuration', 'Environment Details' (highlighted in blue), 'Install Location', 'Network Selection', 'Summary', and 'Installation Progress'. The main area contains the text: 'If you want to protect VMware virtual machines, Azure Site Recovery need to check for additional components. Do you want to protect VMware virtual machines?'. Below this text are two radio buttons: 'Yes' and 'No'. The 'No' radio button is selected. At the bottom right, there are three buttons: 'Previous', 'Next' (highlighted in blue), and 'Cancel'.

- Select your install location, make sure this is on a drive with 600GB+ of storage

The screenshot shows the 'Install Location' step of the Microsoft Azure Site Recovery Unified Setup. On the left, the same list of steps is shown, but 'Install Location' is now highlighted in blue. The main area is titled 'Install location' and features a text input field containing the path 'C:\Program Files (x86)\Microsoft Azure Site Recovery'. To the right of the input field is a 'Browse' button. At the bottom right, there are three buttons: 'Previous', 'Next' (highlighted in blue), and 'Cancel'.

- Select the appropriate network interfaces for replication and failover

Microsoft Azure Site Recovery Unified Setup

## Network Selection

- Before You Begin
- Third Party Software License
- Registration
- Internet Settings
- Prerequisites Check
- MySQL Configuration
- Environment Details
- Install Location
- Network Selection**
- Summary
- Installation Progress

1. Select a Network Interface Card(NIC) for connectivity with on-premises machines.

Network Interface:

2. Select a Network Interface Card (NIC) for connectivity with Azure components for failback.

Network Interface:

Port for receiving replication traffic:

Note : Azure Site Recovery Unified Setup will open two ports for inbound connection on this server.

- Port 443 will be used by a web server which orchestrates replication operations. This port will be opened on all Network Interfaces assigned to this computer.
- The data transport port specified above will be used to send/receive replication data. This port will be opened only on the Network Interface selected above.

- The system will give you a summary and you can start the installation process.

Microsoft Azure Site Recovery Unified Setup

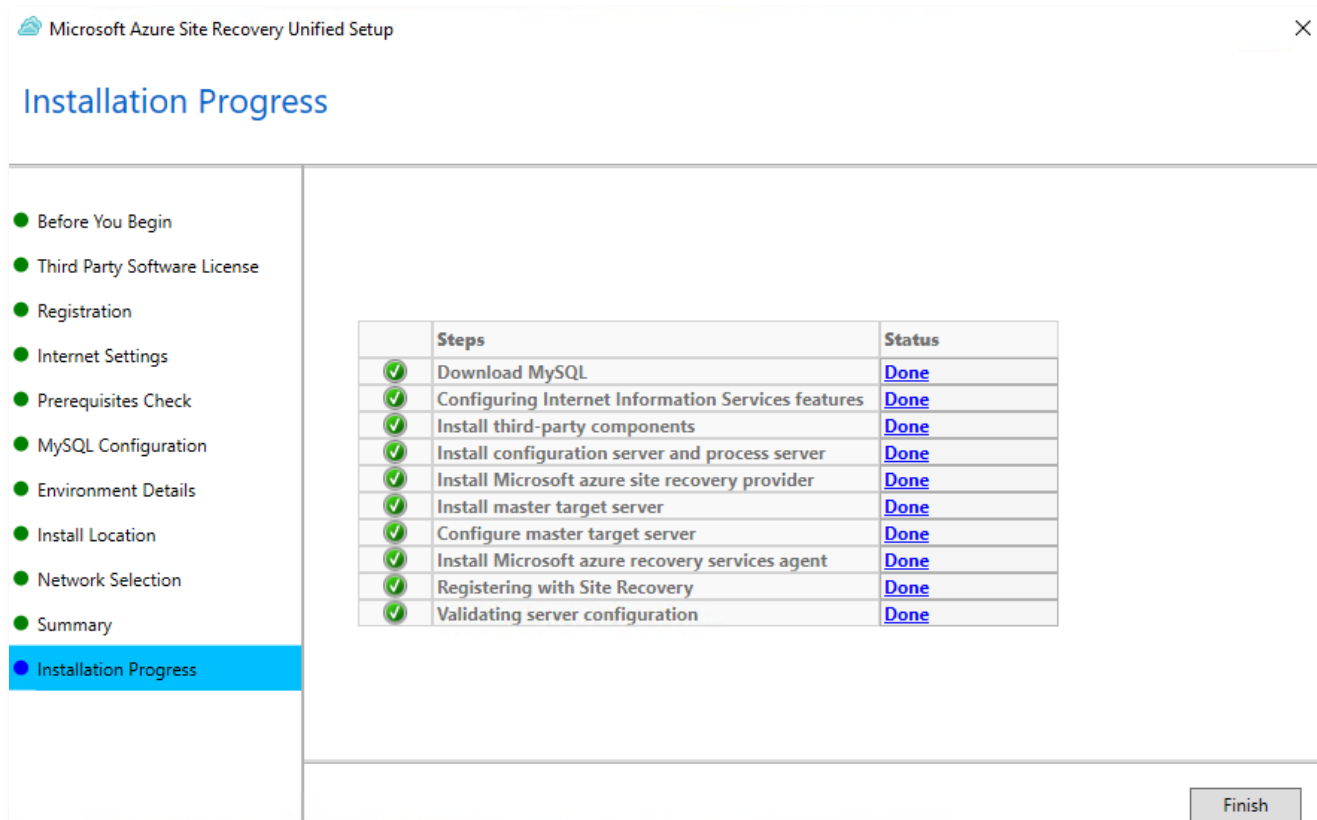
## Installation Progress

- Before You Begin
- Third Party Software License
- Registration
- Internet Settings
- Prerequisites Check
- MySQL Configuration
- Environment Details
- Install Location
- Network Selection
- Summary
- Installation Progress**

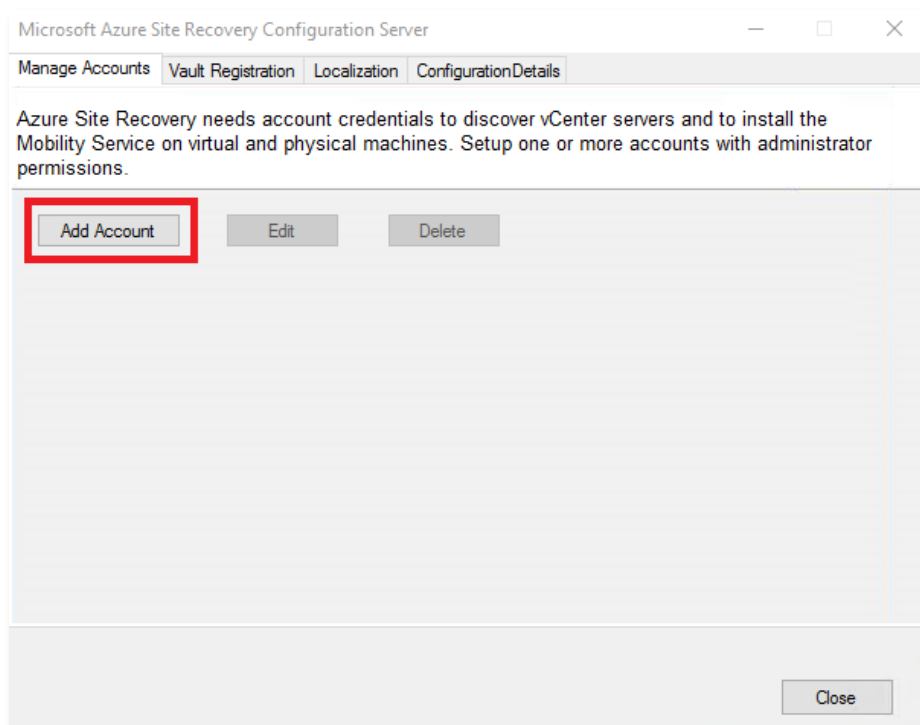
Currently: Configuring the master target server (approximately 2 minutes)

	Steps	Status
✓	Download MySQL	Done
✓	Configuring Internet Information Services features	Done
✓	Install third-party components	Done
✓	Install configuration server and process server	Done
✓	Install Microsoft azure site recovery provider	Done
✓	Install master target server	Done
	Configure master target server	Configuring
	Install Microsoft azure recovery services agent	Pending
	Registering with Site Recovery	Pending
	Validating server configuration	Pending

- Once the installation is complete you can click Finish to close the installer.
  - You will receive a popup with a connection passphrase, make sure to document this as it will be needed when installing the Mobility service on servers for replication.



- The Microsoft Azure Site Recovery Configuration Server application will now open, click the Add Account button



- Enter a set of dummy credentials, ie. Admin for the username and password

**Account Details**

Friendly name (used in Azure)

User name   
(Domain\User name)

Password

Confirm password

- Navigate back to the Azure Migrate portal
  - Select your configuration server under Finalize Registration and click Finalize registration

Home > Azure Migrate >

## Discover machines

Are your machines virtualized? [?](#)  
Physical or other (AWS, GCP, Xen, etc.)

Target region [?](#)  
South Central US

Do you want to install a new replication appliance or scale-out existing setup?  
Install a replication appliance [Help me choose](#)

**The replication appliance (Configuration Server) is a virtual appliance that is deployed on-premises or on cloud, co-located with the machines you are looking to migrate. The replication appliance coordinates and manages replication for the servers that are being migrated. Follow the steps outlined below to set up and configure the replication appliance.**

- 1. Download and install the replication appliance software.**  
Create a new Windows Server 2016 machine by following the [Configuration Server sizing guidelines](#).  
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Prepare for replication by finalizing registration for the replication appliance (Configuration Server). Select the replication appliance from the drop down to finalize registration for it.  

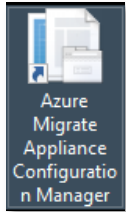
Select Configuration Server \*

[Finalize registration](#)

## DISCOVER SERVERS FOR ASSESSMENT ON THE APPLIANCE SERVER

### Permissions requirements for discovery: [Azure Migrate Permissions Requirements | Microsoft Docs](#)

- Login to your Discovery server and open the Azure Migration Appliance Configuration Manager shortcut on the desktop.



- If the system has not been accessed in some time you may need to reauthenticate with Azure.
- Add credentials for your Linux or Windows system you will be discovering for migration

**Step 1: Provide credentials for discovery of Windows and Linux physical or virtual servers**

You can provide multiple credentials for each OS type. [Learn more](#) about the permissions required on Windows and Linux credentials.

[Add credentials](#)

Search:

#	Source type	Friendly name	Username	Edit
1	Windows Server	WinAdmin	Administrator	<a href="#">Edit</a>
2	Linux Server (Password based)	LinuxAdmin	root	<a href="#">Edit</a>

- Add your servers for discovery by entering a single item, multiple items or using a CSV file

**Step 2: Provide physical or virtual server details**

[Learn more](#) about the prerequisites for physical server discovery.

[Add discovery source](#)

Search:

Filter status:

#	Source type	Friendly name	IP Address / FQDN	Port	Status	Delete
1	Windows Server	WinAdmin	192.168.1.156	5985	✓ Validation successful	<a href="#">Delete</a>
2	Linux Server	LinuxAdmin	192.168.1.165	22	✓ Validation successful	<a href="#">Delete</a>

- Once your servers have been added and validated click the Start discovery button and the discovery status will show on the status column for each server.

# ↑↓	Source type ↑↓	Friendly name ↑↓	IP Address / FQDN ↑↓	Port ↑↓	Status ↑↓	Delete
1	Windows Server	WinAdmin	192.168.1.156	5985	Starting discovery	--
2	Linux Server	LinuxAdmin	192.168.1.165	22	Starting discovery	--

You can revalidate the added physical or virtual servers by clicking on the button below.

Revalidate

Click on the button below to initiate discovery. After the discovery is complete, you can check the discovery status of the physical or virtual servers in the table above. [Learn more](#) about the metadata collected during discovery.

Starting Discovery

- Navigate to the Azure portal which will show Discovery in Progress until the process is complete.

**Azure Migrate: Server Assessment**

Discover
 Assess
 Overview

	Discovered servers	0
	Groups	0
	Assessments	0
	Notifications	0

Discovery is in progress

- Once the discovery is completed you can move on to performing the server assessment

## RUN AZURE MIGRATE ASSESSMENTS IN THE PORTAL/REVIEWING ASSESSMENTS

### Azure Migrate assessment options: [Azure Migrate assessment types](#) | [Microsoft Docs](#)

#### Running Azure Migrate Assessments

- In the Azure Migrate portal once discovery completes click the Assess button to begin assessment

The screenshot shows the 'Basics' tab of the Azure Migrate portal. It includes tabs for 'Basics', 'Select machines to assess', and 'Review + create assessment'. A descriptive paragraph explains that an assessment is created on a group of machines to determine Azure readiness. Below this, the 'Assessment details' section contains two dropdown menus: 'Assessment type' set to 'Azure VM' and 'Discovery source' set to 'Machines discovered from Azure Migrate appliance'. A 'Help me choose' link is next to the first dropdown. The 'Assessment properties' section, showing 4 of 14 properties, lists: Sizing criterion (Performance-based), Target location (South Central US), Reserved instances (3 years reserved), and Azure Hybrid Benefit (Yes). An 'Edit' link is available for these properties.

- Modify the Assessment properties to match your project needs and click Next
- Create an Assessment name, select a resource group or create one and select the servers to assess.

The screenshot shows the 'Select machines to assess' tab. It includes tabs for 'Basics', 'Select machines to assess', and 'Review + create assessment'. The 'Assessment name' field is filled with 'AzureMigrateAssessment'. Below, the 'Select or create a group' section has 'Create New' and 'Use Existing' buttons, with 'AzureMigrateGroup' selected. The 'Add machines to the group' section shows the 'Appliance name' as 'AZ-MGR-DISC-01 (Physical or other)'. A table lists machines for selection:

	Name	IP address	Operating system
<input checked="" type="checkbox"/>	dj-ubt05	192.168.1.165,fe80::20c:29ff:fe6e:2ae1	Ubuntu
<input checked="" type="checkbox"/>	DJ-WS05	192.168.1.156,fe80::5867:3d14:e5e5:8205	Microsoft Windows Server 2016 Standard


Below the table, it says 'Selected items : 2'. There are also links for 'Select all', 'Clear selection', and a search bar 'Search to filter machines'.




- Click Next, then Create and Assess.
- The Assessment will run and provide information within 24 hours. For the best results allow the assessment to run for a week or more for the best accuracy on system performance requirements.





## Reviewing Azure Migrate Assessments


- Navigate to the Azure Migrate portal. From here we will get the server sizing settings
- Under "Assessment tools" click the blue number to the right of Assessments

**Assessment tools**

 **Azure Migrate: Server Assessment**

 Discover  Assess  Overview


	Discovered servers	2
	Groups	1
	Assessments	1
	Notifications	0

 **Next step:** Start migrating your servers or optionally you can refine your application grouping with dependency analysis



Add more assessment tools? [Click here.](#)


- Click into your existing assessment


Home > Azure Migrate > Azure Migrate: Server Assessment

 **Azure Migrate: Server Assessment | Assessments** ...





rg-Azure-Migrate-Project

 Assess servers  Columns


 Overview

Name	Group	Assessment type	Status
 AzureMigrateA...	AzureMigrateGroup	Azure VM	Ready

Manage

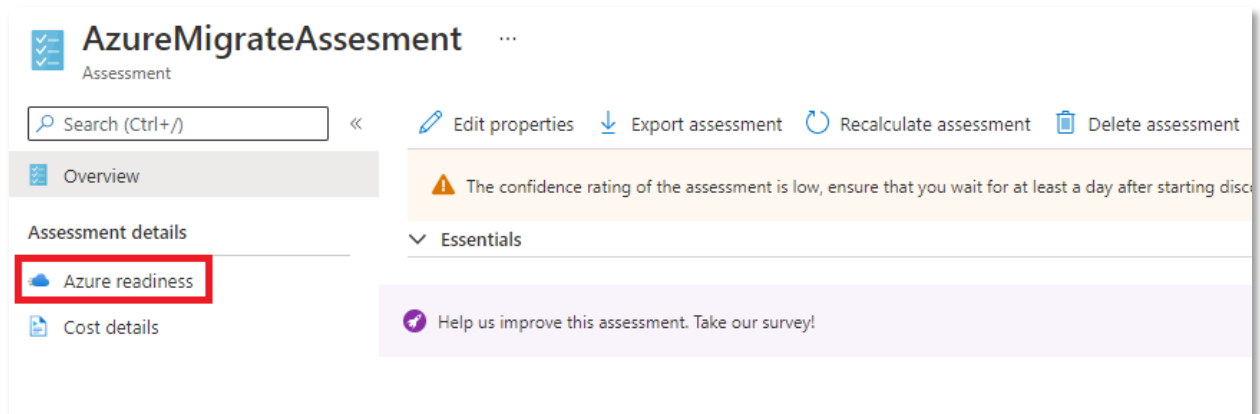
-  Assessments
-  Groups
-  Appliances
-  Notifications

Support + troubleshooting

-  New support request



- Click Azure readiness on the left hand side



- Click on the name of the server you are looking for sizing and disk information on
- From here we can get the virtual machine sizing information and disk type for the next steps in beginning replication. (In this example Standard\_F2 with the disk type as Standard SSD)

The screenshot shows the details for machine 'dj-ubt06'. In the 'Essentials' section, 'Azure VM size' is highlighted with a red box, showing 'Standard\_F2'. Below this, the 'Migration tool' is 'Azure Migrate: Server Migration' with the reason 'This machine is suitable for lift and shift migration to Azure'. The 'Compute' section shows 2 cores, 0% CPU utilization, 1988 MB memory size, and 0% memory utilization. The 'Storage' section contains a table with disk details:

Source disks	Target disk size GB	Target disk type	Read (Ops/ Sec)	Write (Ops/ Sec)	Read (MBPS)	Write (MBPS)	Mon
7 Disks	40	7 Standard, 0 Premium	0	0	0	0	3
dataDisk0	4	StandardSSD_E1	0	0	0	0	0.3
dataDisk1	4	StandardSSD_E1	0	0	0	0	0.3
dataDisk2	4	StandardSSD_E1	0	0	0	0	0.3
dataDisk3	4	StandardSSD_E1	0	0	0	0	0.3
dataDisk4	4	StandardSSD_E1	0	0	0	0	0.3
dataDisk5	4	StandardSSD_E1	0	0	0	0	0.3
rootDisk	16	StandardSSD_E3	0	0	0	0	1.2

The 'Network' section shows 1 network adapter with 0 MBPS in and 0 MBPS out.

## INSTALL MOBILITY AGENTS ON PHYSICAL SERVERS TO BE REPLICATED

Extra Documentation: [Mobility Agent Installation Linux-Windows Azure Migrate | Microsoft Docs](#)

Note: In the */Platform* parameter, you specify *VMware* if you migrate VMware VMs, or physical machines.

### Prerequisites

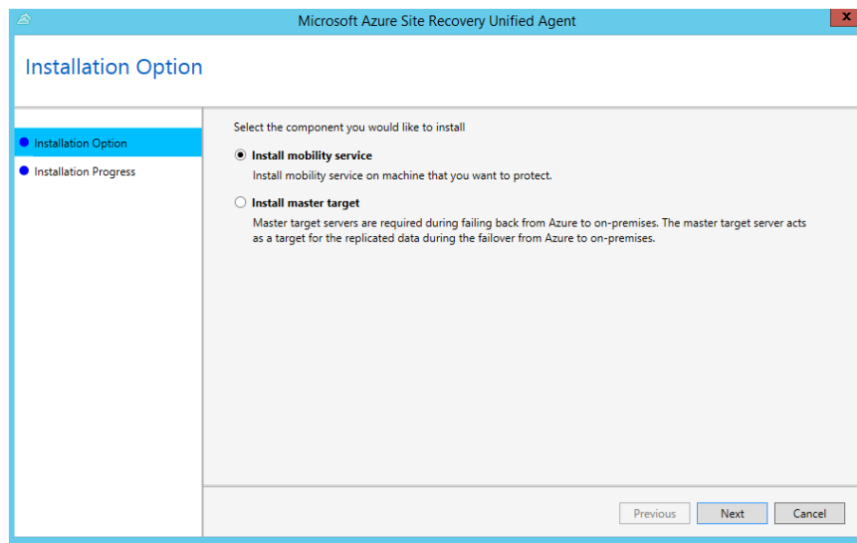
#### Generate Passphrase on Each Configuration Server and Locate Installer Files

- Sign in to your configuration server, and then open a command prompt window as an administrator.
- To change the directory to the bin folder, execute the following command:
  - `cd %ProgramData%\ASR\home\svsystems\bin`
- To generate the passphrase file, execute:
  - `genpassphrase.exe -v > MobSvc.passphrase`
- Your passphrase will be stored in the file located at
  - `%ProgramData%\ASR\home\svsystems\bin\MobSvc.passphrase`
- Locate the correct installer. Go to `%ProgramData%\ASR\home\svsystems\pushinstallsvc\repository` folder on configuration server. Check which installer you'll need based on the following table.

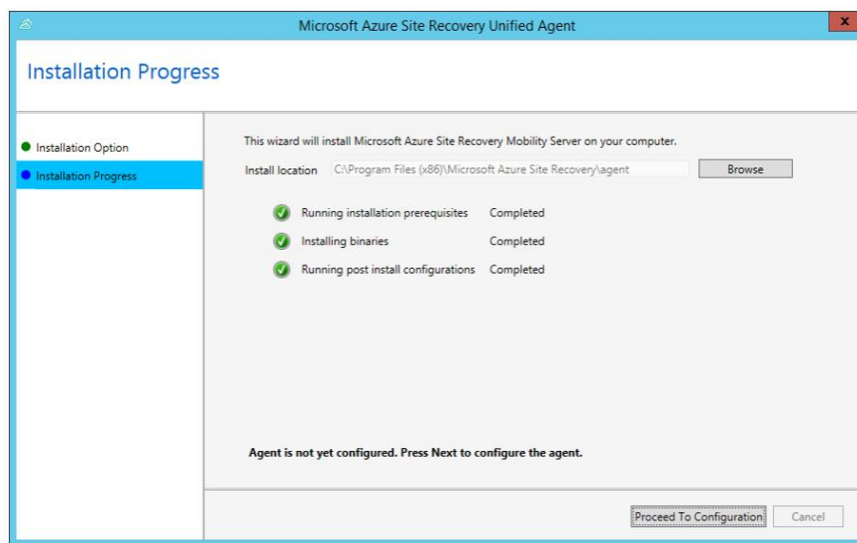
Installer file	Operating system (64-bit only)
Microsoft-ASR_UA*Windows*release.exe	Windows Server 2016; Windows Server 2012 R2; Windows Server 2012; Windows Server 2008 R2 SP1
Microsoft-ASR_UA*RHEL6-64*release.tar.gz	Red Hat Enterprise Linux (RHEL) 6.* CentOS 6.*
Microsoft-ASR_UA*RHEL7-64*release.tar.gz	Red Hat Enterprise Linux (RHEL) 7.* CentOS 7.*
Microsoft-ASR_UA*SLES12-64*release.tar.gz	SUSE Linux Enterprise Server 12 SP1,SP2,SP3
Microsoft-ASR_UA*SLES11-SP3-64*release.tar.gz	SUSE Linux Enterprise Server 11 SP3
Microsoft-ASR_UA*SLES11-SP4-64*release.tar.gz	SUSE Linux Enterprise Server 11 SP4
Microsoft-ASR_UA*OL6-64*release.tar.gz	Oracle Enterprise Linux 6.4, 6.5
Microsoft-ASR_UA*UBUNTU-14.04-64*release.tar.gz	Ubuntu Linux 14.04
Microsoft-ASR_UA*UBUNTU-16.04-64*release.tar.gz	Ubuntu Linux 16.04 LTS server
Microsoft-ASR_UA*DEBIAN7-64*release.tar.gz	Debian 7
Microsoft-ASR_UA*DEBIAN8-64*release.tar.gz	Debian 8

## Windows GUI Install

- Copy the installer and the passphrase file to a local folder (for example, c:\Temp) on the server that you want to protect and run it.
- In installation option, select install mobility service.
- Select the installation location > Install.



- Monitor the installation in Installation Progress. After the installation is finished, select Proceed to Configuration to register the service with the configuration server.



- In Configuration Server Details, specify the IP address and passphrase from the passphrase file you copied.

Microsoft Azure Site Recovery Unified Agent

## Registration

Configuration Server Details

Please enter configuration server details below

Configuration server IP address: 10.150.25.25

Configuration server passphrase: .....

Register Cancel

- Select Register to finish the registration.

Microsoft Azure Site Recovery Unified Agent

## Registration

Configuration Server Details

Please enter configuration server details below

Configuration server IP address: 10.150.25.25

Configuration server passphrase: .....

- ✓ Running registration prerequisites Completed
- ✓ Performing registration Completed
- ✓ Validating configuration Completed

Register Finish

## Windows Command Line Install

- Copy the installer and the passphrase file to a local folder (for example, C:\Temp) on the server that you want to protect
- Open a command prompt as Administrator
- Extract the agent installer by running the following commands:

```
cd C:\Temp
ren Microsoft-ASR-UA*Windows*release.exe MobilityServiceInstaller.exe
MobilityServiceInstaller.exe /q /x:C:\Temp\Extracted
cd C:\Temp\Extracted
```

- Run the following commands to install the Mobility Service:  
UnifiedAgent.exe /Role "MS" /InstallLocation "C:\Program Files (x86)\Microsoft Azure Site Recovery" /Platform "VmWare" /Silent
- After installation is finished, the Mobility Service must be registered to the configuration server. Run the following commands to register the agent with the Configuration Server:  
cd C:\Program Files (x86)\Microsoft Azure Site Recovery\agent  
UnifiedAgentConfigurator.exe /CSEndPoint <IP of Configuration Server> /PassphraseFilePath <PassphraseFilePath>

## Linux Install

- Copy the installer and the passphrase file to a local folder (for example, /tmp) on the server that you want to protect. In a terminal, run the following commands to change to the directory with the installer tar file and extract it:

```
cd /tmp
tar -xvf <filename>
```

- Install with the following command:  
`sudo ./install -r MS -v VmWare`

```
[root@oel7-test1 tmp]# ./install -r MS -v VmWare

Provide an agent installation location ? [Default: /usr/local/ASR] :

Role of the Agent
-----
Select the installation type

1. Mobility Service
   Install Mobility Service on source machines that you want to protect.

2. Master Target
   Install Master Target Server on machines that will act as a target for
   replicated data from your protected machines.

Please make your choice ? (1/2) [Default: 1]
All product pre-requisites are met.
Generating the certificate.
New RPM package InMageUx-9.23.0.0-1 has been successfully installed.

Filter driver kernel module is not loaded. Attempting to load it, please wait...
Filter driver kernel module loaded successfully.
Filter device /dev/involflt created successfully.
Generating initrd images.
^ISGenerated initrd images successfully.
Installation process has finished.
Check the log file /var/log/ua_install.log for detailed diagnostic messages or installation success/
failures...
Ux agent installation exit code : 0.
Check the log file /var/log/ua_install.log for detailed diagnostic messages or installation success/
failures...
Installer exiting with code: 0
[root@oel7-test1 tmp]#
```

- After installation is finished, the Mobility Service must be registered to the configuration server. Run the following command to register Mobility Service with the configuration server:

```
/usr/local/ASR/Vx/bin/UnifiedAgentConfigurator.sh -i <IP of Configuration Server> -P /tmp/MobSvc.passphrase
```

```
[root@oel7-test1 tmp]# /usr/local/ASR/Vx/bin/UnifiedAgentConfigurator.sh -i 192.168.1.222 -P /tmp/MobSvc.passphrase
Platform value in drscout.conf: VMware
Stopping Ux agent service...
Validating the passphrase.

Invoking an agent registration call...
Agent registration has completed successfully.
Starting UA Respawn daemon...
Agent configuration is completed successfully.
Check the log file /var/log/ua_install.log for detailed diagnostic messages or configuration success/failures...
Configurator exiting with code: 0
[root@oel7-test1 tmp]# _
```

## BEGIN REPLICATION THROUGH AZURE MIGRATE

### Prerequisites: Mobility Agent installed and configured on any servers to be replicated

- In the Azure Migrate portal click the Replicate button under the Azure Migrate: Server Migration section

#### Migration tools

**Azure Migrate: Server Migration**

Discover **Replicate** Migrate Overview

Discovered servers	2
Replicating servers	0
Test migrated servers	0
Migrated servers	0

**Next step:** Start replicating your servers to Azure

- Select Physical or other for the virtualization dropdown and verify your configuration server is selected along with the dummy credentials created with the configuration server.

Home > Azure Migrate >

## Replicate

Source settings Virtual machines Target settings Compute Disks Review + Start replication

The first step in migrating servers is to replicate them. Once replication completes, you can perform test migration before finally moving the servers to Azure.

Are your machines virtualized? \* ⓘ

Physical or other (AWS, GCP, Xen, etc.)

On-premises appliance \* ⓘ

AZ-MGR-CONF-01 (Replication Appliance)

Process Server \* ⓘ

AZ-MGR-CONF-01

Guest credentials \* ⓘ

Dummy Credentials



- On the next screen select "No, I'll specify the migration settings manually" and select the server(s) to migrate

Home > Azure Migrate >

## Replicate

Source settings **Virtual machines** Target settings Compute Disks Review + Start replication

Select machines to replicate (Learn how to [discover non-virtualized/other machines](#) for server migration.)

Import migration settings from an assessment? \* ⓘ

No, I'll specify the migration settings manually

\* Virtual machines ⓘ

Search to filter machines

< Previous Page 1 Next >

Name	IP Address	Boot Type
<input checked="" type="checkbox"/> dj-ubt06	192.168.1.166	BIOS

Selected items : 1

- Select the proper subscription, resource group and target vnet/subnet settings for your server
- If applicable apply the Azure Hybrid Benefit to reduce server licensing costs

Select target properties for migration. Migrated machines will be created with the specified properties.

Region ⓘ South Central US

Subscription \* ⓘ Noble-Prod

Resource group \* ⓘ rg-us-sc-prd-AZM

Virtual Network \* ⓘ vnet-us-sc-Isolated

Subnet \* ⓘ snet-us-sc-isolated

Availability options \* ⓘ No infrastructure redundancy required

Disk encryption type ⓘ Encryption at-rest with a platform-managed key

### Azure Hybrid Benefit

Apply Azure Hybrid Benefit and save up to 49% vs. pay-as-you-go virtual machine costs with an eligible Windows Server license.

Already have an eligible Windows Server License? \* ⓘ

☒ Yes ☐ No

☒ I confirm I have an eligible Windows Server license with Software Assurance or Windows Server subscription to apply this Azure Hybrid Benefit. \*

[Review Azure Hybrid Benefit compliance](#)

- On the next screen we will select the virtual machine sizing options (CPU and RAM configuration). Refer to the assessment created earlier for accurate right sizing.
- Switch back to your previous tab with the replication settings for compute sizing and enter the information from your Azure Migrate assessment.

Home > Azure Migrate >

## Replicate

Source settings Virtual machines Target settings **Compute** Disks Review + Start replication

Select the Azure VM size for machines that are being migrated. Additionally, select an Availability Set if the migrated machine should be part of one.

Name	Azure VM Name	Azure VM Size
dj-ubt06	dj-ubt06	Standard_F2 (2 Cores, 4 GB RAM)

- Select Next and on the Disks, screen select the disk type specified in our assessment
- The disk type you specify here cannot be changed unless replication is restarted or until after failover

Home > Azure Migrate >

## Replicate

Source settings Virtual machines Target settings Compute **Disks** Review + Start replication

Select the managed disk type to use for the disks of the migrated machine. Optionally, you may also choose to exclude certain disks from replication by unselecting those disks from the list of disks to replicate.

Name	Disks To Replicate	Disk Type
dj-ubt06	All selected	1 Standard SSD
	/dev/sda (OS Disk)	Standard SSD

- Click next to review the configured Target settings and if everything is correct click Replicate

Home > Azure Migrate >

## Replicate ...

Source settings   Virtual machines   Target settings   Compute   Disks   Review + Start replication

**Virtual machines selected : 1**

**Target settings**

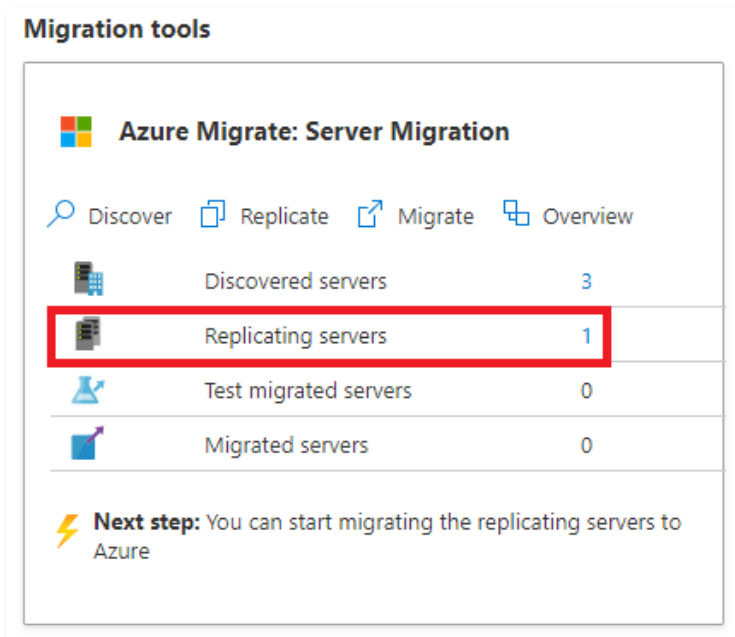
Subscription	Visual Studio Enterprise Subscription – MPN
Resource group	rg-us-sc-prd-ubt
Region	South Central US
Virtual Network	vnet-us-sc-isolated
Azure Hybrid Benefit	Do not apply

>>> **Next steps:** After initial replication completes, you can perform test migrations and migrate servers.

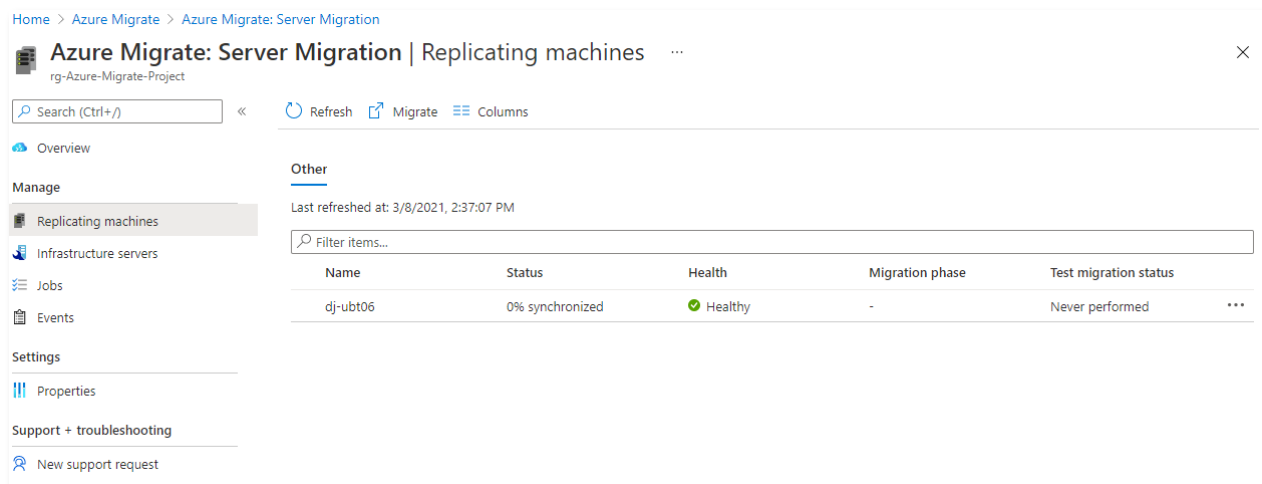
[Replicate](#) [Previous](#)

## CONFIGURE MIGRATION SETTINGS OF REPLICATED SERVERS

- Once a server is replicating you may need to adjust the sizing or network settings before failover
- To do this click on "Replicating servers"



- You will be presented with a list of the replicating servers from here you can click on the server you would like to adjust sizing or network information on.



- Once you click the appropriate server you will be presented with an overview of the information available

- Clicking Compute and Network along the left side will allow you to view and adjust those settings

The screenshot shows the Azure Migrate console for a migration named 'dj-ubt06'. The left sidebar has 'Compute and Network' highlighted with a red box. The main area is divided into three sections:

- Migration status:**

Status	0% synchronized
Health	Healthy
Test migration status	Never performed
Configuration issues	No issues
Last synchronized	-
- Server details:**

Appliance	DJ-WS05 (VMware)
VM ID	d5891b00-803d-11eb-a4c0-000c29eec89a
Operating System	Linux
- Replication settings and target configuration:**

Cache storage account(s)	migratea2b8f1sa737131
Target subscription	Visual Studio Enterprise Subscription ...
Target location	South Central US
Target Resource Group	rg-us-sc-prd-ubt
Target VM size	Standard_F2
Target Virtual Network	

- Click Edit at the top of the screen to allow you to adjust any of the available settings
- Once done make sure to click Save

The screenshot shows the 'Compute and Network' settings for the migration 'dj-ubt06'. The left sidebar has 'Compute and Network' highlighted. The main area is divided into three sections:

- Compute properties:**

Properties	On-Premises	Microsoft Azure
Name	dj-ubt06	dj-ubt06
Resource group	-	rg-us-sc-prd-ubt
Size	2 cores, 1.94 GB memory, 1 NICs	F2 (2 cores, 4 GB memory, 2 NICs)
Availability set	-	None
Proximity placement group	-	None
- Network properties:**

Properties	Target network
Virtual network	vnet-us-sc-isolated
- Network interfaces:**

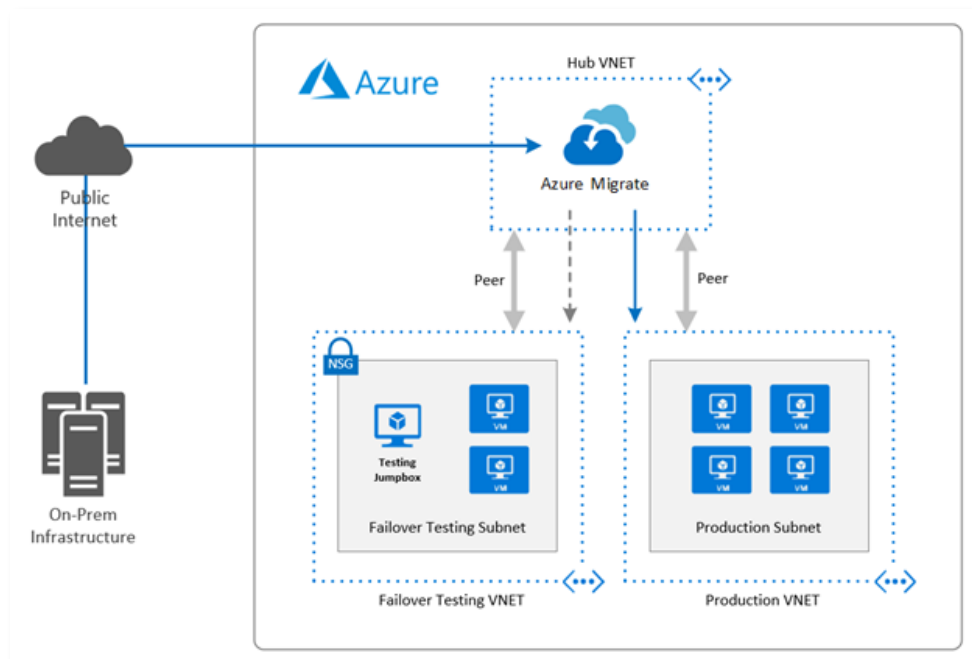
On-Premises network name	Target subnet	Target IP	Target Network Interface Type
ens160	snet-us-sc-isolated	DHCP assigned	Primary

## FAILOVER TESTING SETUP

Failover testing should take place before migrating into a live production Azure environment. During failover testing, VMs are brought online from the replicated server or workload data that has been copied to Azure storage. The VMs are created and brought online in an isolated or semi-isolated environment while the production on-premises source VMs are left online. Since the on-premises machines are online during this testing, it is important that the landing network is isolated to prevent Active Directory trust conflicts, testing server registration into production DNS, unwanted communication to production resources, etc.

A typical isolated testing environment would consist of a VNET that is peered to your hub network, a failover testing VNET and subnet, an NSG that isolates all but necessary traffic (such as RDP), and a jump box if desired.

Typical Failover Testing Topology



### Failover Testing Procedure

Failover testing should be a collaborative effort between the migration team and the workload/application team. After the source workloads have been replicated and are in sync to the desired RPO, A test failover via Azure Migrate will be initiated.

Infrastructure and application teams should participate and test as much as possible. If application testing is possible, it is highly recommended.

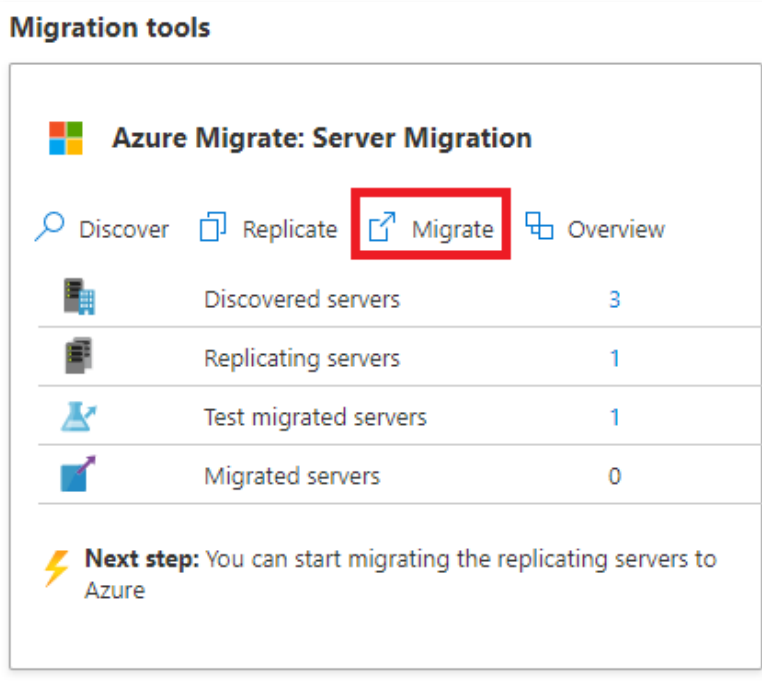
### Failover Testing Checklist

- ☐ Does the server boot as expected to the login screen? This can be checked via boot diagnostics?
- ☐ Did the server boot normally within the typical boot time without any new errors?
- ☐ Is the server accessible over the network?
- ☐ Is there any new latency experienced that is not acceptable?
- ☐ Can you log into the server as expected? During failover testing it may only be possible to test local logins due to the NSG blocking communication to an Active Directory.
- ☐ Are any new errors being reported in the system or application logs that may indicate a problem?
- ☐ Are disks mounted, appear to be at RPO, and in a healthy state?
- ☐ If possible, test disk performance to ensure deployed level of performance is acceptable.
  
- ☐ Are any services in a failed state that should be running? Will they start normally?
- ☐ If any services failed on first boot, do they start normally on following reboots?
- ☐ Are any new errors being reported in the system or application logs that may indicate a problem?
- ☐ If possible, test server or application performance against a benchmark. Should resizing be considered?

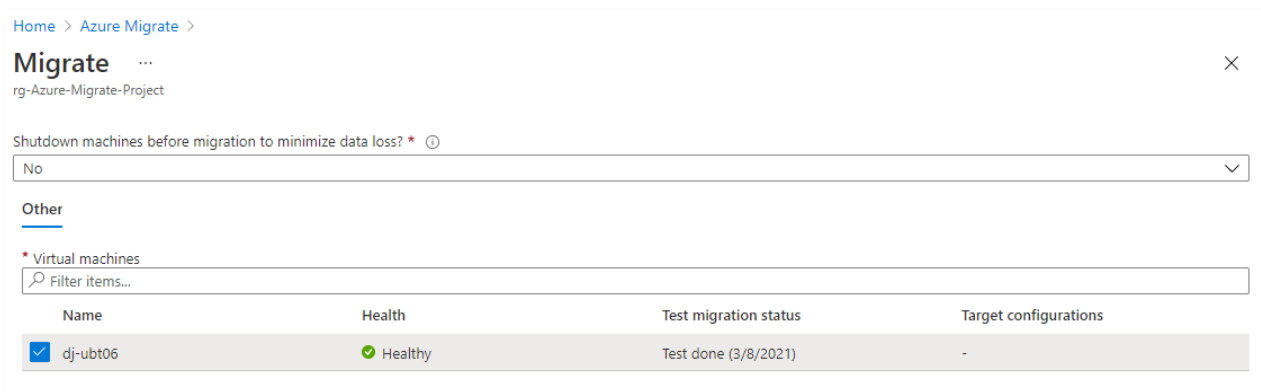
## MIGRATION IN AZURE MIGRATE

Once your server(s) are fully replicated to Azure and a test failover has been performed you can begin migration planning. A time should be chosen to minimize impact to the workload/application you are migrating. Make sure all applicable/infrastructure teams are involved and available.

- To begin the migration navigate to the Azure Migrate portal
- Click Migrate under the Migration tools section

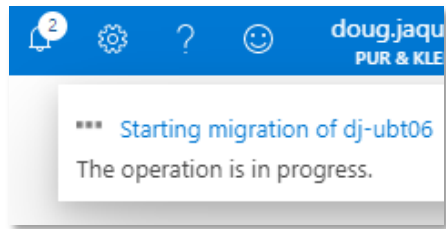


- Select the server(s) you wish to migrate, on the next screen and select Migrate
  - Select No for "Shutdown Machines before migration" as **with Physical migrations Azure migrate will not shutdown the server if you select Yes. Make sure to shutdown the server manually once you start the migration process.**





- Click the bell icon at the top right and then the migration event to see each step of the migration process



- Here you can see a migration in process

Home >

## Failover

Migration job

Export job Cancel Environment Details

Properties

Protected item	dj-ubt06
Job id	e3b90643-327e-46ec-be84-d6646c356016-2021-03-11T23:41:23.283Z-lbz ActivityId: 743b1114-2543

Job

Name	Status	Start time
Prerequisites check for failover	Successful	3/11/2021, 3:41:31 PM
Shut down the virtual machine	Skipped	
Synchronizing the latest changes	Skipped	
Start failover	In progress	3/11/2021, 3:41:32 PM
Start the replica virtual machine		

- Once the migration is complete you will see the following screen, you may now begin testing

Home >

## Failover

Migration job

Export job Environment Details

Properties

Protected item	dj-ubt06
Job id	e3b90643-327e-46ec-be84-d6646c356016-2021-03-11T23:41:23.283Z-lbz ActivityId: 743b1114-2543

Job

Name	Status	Start time
Prerequisites check for failover	Successful	3/11/2021, 3:41:31 PM
Shut down the virtual machine	Skipped	
Synchronizing the latest changes	Skipped	
Start failover	Successful	3/11/2021, 3:41:32 PM
Start the replica virtual machine	Successful	3/11/2021, 3:51:47 PM

Application testing should be performed after failover and infrastructure testing has passed validation. Application testing should be performed by the team that is responsible for the workload or applications that are being migrated. Since this workload is now considered production, we recommend that you perform any QA, benchmark, or load testing that would normally be performed after maintenance to ensure the application is performing as expected in Azure.

### Application Testing Procedure

The application testing procedure should be defined by the application team. This procedure should be based on any QA, benchmark, or load testing used in standard QA testing, maintenance, or upgrade testing. We suggest that you develop and have this process well documented, planned, and staffed before the migration.

### Application Testing Checklist

Since application testing is performed by the application team that understands the workload, we can only provide a very basic checklist. We suggest that you develop and have this process well documented before the migration.

- ☐ Did the applications start as expected?
- ☐ If applications did not start as expected, do they start after a reboot of the workload servers in the correct order?
- ☐ Are databases used by the workload accessible and performing as expected?
- ☐ Is there any new network latency introduced after the migration that is affecting performance of the application or parts of the application? Is it acceptable?
- ☐ Is the workload accessible from the expected URL or endpoint?
- ☐ Are end users able to access and login to the application and interact with it as they normally would?
- ☐ Are the application performance meeting predefined benchmarks and/or end user expectations?
- ☐ Are any new errors being reported in the system or application logs that may indicate a new problem?
- ☐ If possible, test disk performance to ensure deployed level of performance is acceptable.
- ☐ Test application performance against a benchmark. Should resizing of any virtual machines be considered?

## POST FAILOVER CONFIGURATIONS

Following a failover, steps should be taken to configure operations on the migrated VMs to ready them for production. When the VMs have been tested and the migration has been declared a success, the replicated items need to be cleaned up so they are removed from the Recovery Services Vault.

### Recommended post failover configuration

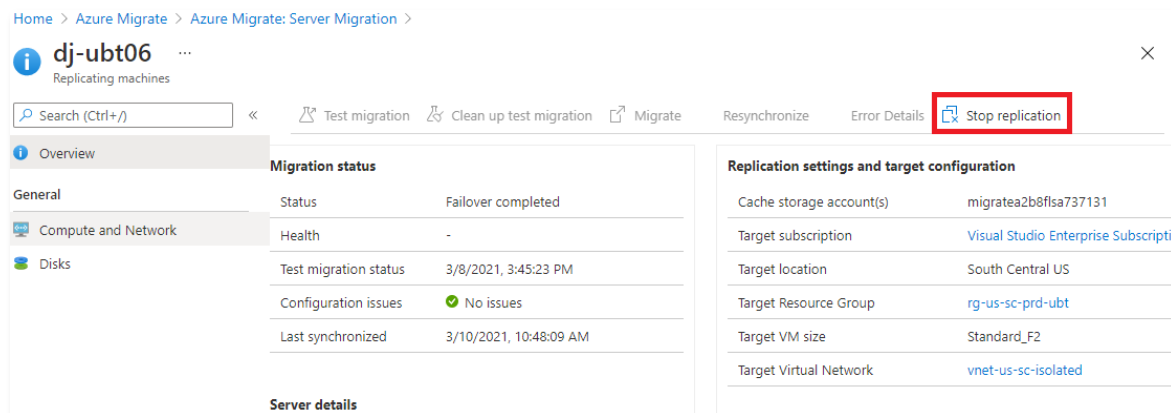
- Connect the VMs to a Log Analytics Workspace
- Enable Azure backups
- Apply Tags to migrated resources
- Verify boot diagnostics are configured and using a shared storage account
- Enable extended diagnostics if desired
- Add to a patching schedule
- Verify monitoring, change tracking, enable EMS, or any other desired platform features
- Optimize the OS for Azure – move the pagefile to the Azure temp disk, reconfigure boot settings, etc.

Guidance can be found here - [Microsoft Docs | Prepare VM's for migration](#)

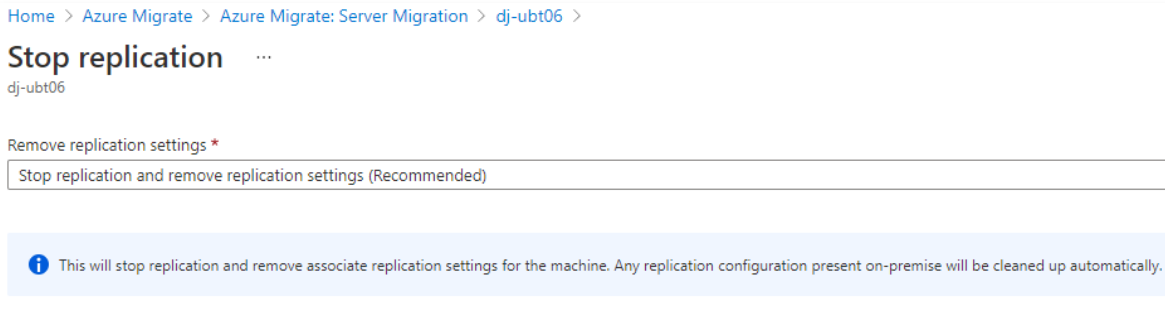
**Note:** The Azure VM agent is not supported on 32-bit operating systems. Certain platform features such as backups, VM extensions, run command, and any other features requiring the Azure VM agent will not be available.

### Post Failover Cleanup

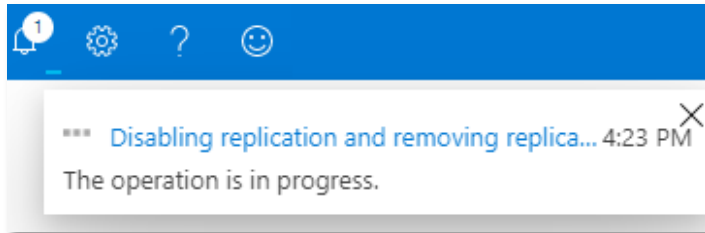
- Once the migration is successfully finished post migration cleanup can be performed. This includes stopping the replication to complete the migration. Navigate to the VM in the Azure Migrate project. Then select Stop replication.



- Select "Stop replication and remove replication settings" in the dropdown and click OK.



- The removal process will begin and notify you of any errors via the activity log



- We recommended that following a migration, whether successful or not, that a meeting is facilitated between all teams involved to discuss successes and misses during the migration. This will allow for continual improvements in the migrations process and execution, as well as help document known or newly discovered issues and prevent future problems.

## INFRASTRUCTURE TESTING

Infrastructure testing should take place after failover testing has been completed and any problems or concerns that were discovered have been resolved. During failover, Azure VMs are brought online from the replicated server or workload data that has been copied to Azure storage. The VMs are created and brought online in the production Azure environment and the production on-premises source VMs are shut down.

After failover, the Azure machines should be considered as production, and tested accordingly. It is critical that infrastructure and application testing are thorough to ensure that any problems are discovered and are resolved as quickly as possible.

### Infrastructure Testing Procedure

Infrastructure testing should be a collaborative effort between MBG and the client team. After the source workloads have been replicated and are in sync to the desired RPO and failover testing is complete, MBG will initiate the failover via Azure Site Recovery or Azure Migrate during the designated window and provide basic testing, as level of granted access allows.

Client infrastructure teams should participate and test as much as possible.

### Infrastructure Testing Checklist

- ☐ Does the server boot as expected to the login screen? This can be checked via boot diagnostics?
- ☐ Did the server boot normally within the typical boot time without any new errors?
- ☐ Is the server accessible over the network?
- ☐ Are DNS lookups resolving the new Azure IP as expected?
- ☐ Is there any new latency experienced that is not acceptable?
- ☐ Can you log into the server as expected?
- ☐ Are any new errors being reported in the system or application logs that may indicate a problem?
- ☐ Are disks mounted, appear to be at RPO, and in a healthy state?
- ☐ If possible, test disk performance to ensure deployed level of performance is acceptable.
- ☐ Are any services in a failed state that should be running? Will they start normally?
- ☐ If any services failed on first boot, do they start normally on following reboots?
- ☐ Are any new errors being reported in the system or application logs that may indicate a problem?
- ☐ Test server performance against a benchmark. Should resizing be considered?

## ROLLBACK

At times, unforeseen problems arise that may require a migration to be rolled back. Using Azure Migrate makes this process simple and it can be performed quickly to minimize downtime.

### Rollback Procedure

During testing, if a problem is discovered that cannot be resolved, or cannot be resolved in the designated failover window, the migration or the workload, or parts of the workload will be marked as failed and a rollback will be initiated. This will be a collaborative effort that will involve both Azure and on-prem resources and will require team resources with access to perform the activities. It is the responsibility of the testers to call out any failures in a timely fashion so they can be discussed, and a go / no-go decision can be made by the proper party.

#### Action items

---

- ☐ Stop the VMs targeted for rollback in Azure.
- ☐ Remove protected items from replicated items in Azure Migrate project.
- ☐ Start the source VMs on-premises.
- ☐ Reverse any DNS changes made during the migration.
- ☐ Verify login to the VM and that Active Directory trust has not been broken (Windows)
- ☐ Perform infrastructure testing on the on-premise VMs to verify they are back up and functioning as expected.
- ☐ Verify end users can access the servers and applications that have been rolled back and interact with them normally.
- ☐ Disable and restart replication of the VMs in Azure Migrate to re-establish sync.
- ☐ Gather all details of the problem that forced the rollback and schedule a planning session to determine remediation steps and how to proceed.