

# Tutorial S3: Batch Pool

This tutorial walks through how to connect all the resources you've created, including your Docker image and the storage container, to the creation of a Batch Pool of virtual machines.

This tutorial covers how to do the following steps through the Azure desktop portal:

1. Create a **Batch account**
2. Create a **Batch Pool** within the Batch account
3. Check on the nodes within the created Batch Pool
4. Get Batch account name and key (for NotebookS4)

When done correctly, each node of the pool you create will have read/write access to everything in your storage container, and each node will be capable of running your Docker image, including its computing environment and all script directories.

1. Creating a Batch account

# Start by creating a Batch account.

Home > Batch accounts >

## New Batch account

Provide basic Batch account info

**Basics** Advanced Networking Tags Review + create

Microsoft Azure Batch is a fully-managed cloud service that provides job scheduling and compute resource management for developers in organizations, independent software vendors, and cloud performance computing (HPC) applications running on workstations and clusters today can be readily enabled to run in Azure at scale, and with no on-premises infrastructure required. Common use cases include rendering, media transcoding, engineering simulations, Monte Carlo simulations, and software test execution, among others; all highly parallel, computationally intensive workloads that can be broken up into smaller pieces. Batch, you can scale from a few VMs, up to tens of thousands of VMs, and run the largest, most resource-intensive workloads. [Learn more](#)

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

Subscription \*

Resource group \*   
[Create new](#)

**Instance details**

Account name \*

Location \*

**Storage account**  
Specify an optional storage account. For best performance we recommend a storage account (general purpose v2) located in the same region as the associated Batch account. [Select a storage account](#)

[Review + create](#) [Previous](#) [Next: Advanced >](#)

0. Search “Batch Accounts”

1. Select an existing resource group

2. Give it a name

3. Put it in the region your resource group is in

4. Review and create

Quota errors can arise from the number of batch accounts allowed per region, or the number of nodes of a certain machine size allowed. You can request to be allowed more of these by going to your batch account page and following “Quotas → Request Quota increase”

See the following:  
<https://learn.microsoft.com/en-us/azure/batch/batch-quota-limit>

The screenshot shows the 'New support request' form in the Microsoft Azure portal. The breadcrumb trail is 'Home > tmdetect | Quotas >'. The form is currently on step 3, 'Additional details', of a four-step process. The 'Problem details' section asks for information to help resolve the issue, specifically a quota increase. It shows '1 request' with an 'Update details' link. A table below shows the 'Request Summary' and 'New Limit' for 'Batch accounts per region per subscription, westus2' with a limit of 5. The 'Advanced diagnostic information' section asks if advanced diagnostic information collection is allowed, with 'Yes (Recommended)' selected. The 'Support method' section shows 'Basic support' selected, 'C - Minimal impact' severity, 'Email' as the preferred contact method, and 'Business Hours' availability.

Microsoft Azure Search resources, services, and docs (G+)

Home > tmdetect | Quotas >

New support request ...

1. Problem description 2. Recommended solution 3. **Additional details** 4. Review + create

Tell us a little more information.  
Providing detailed, accurate information helps us resolve your issue faster.

**Problem details**  
Additional information is required to promptly process your request for a quota increase.

Request details

1 request  
[Update details](#)

Request Summary	New Limit
Batch accounts per region per subscription, westus2	5

**Advanced diagnostic information**  
To enable faster resolution, we recommend allowing Microsoft support to access your Azure resources to collect advanced diagnostic information. Access is read-only and is removed when your support request is closed. [Learn more](#)

Allow collection of advanced diagnostic information? \*

Yes (Recommended)  
 No

**Support method**

Support plan: Basic support

Severity: C - Minimal impact

Preferred contact method \*

**Email**  
A Support engineer will contact you over email.

**Phone**  
A Support engineer will contact you over the phone.

Your availability: Business Hours

[Previous](#) [Next](#)

## 2. Create a Batch Pool

# Now you can create a Pool.

The screenshot shows the Microsoft Azure portal interface. At the top, there is a navigation bar with the Microsoft Azure logo and a search bar. Below the navigation bar, the main content area is divided into several sections. On the left, there is a sidebar with various navigation options. The 'Pools' option is highlighted with a black arrow. The main content area displays the details for a specific batch account, including its name, status, location, and subscription information. A large black arrow points from the 'Pools' option in the sidebar to the main content area.

Microsoft Azure

Search resources, services, and docs (G+)

Home >

tmdetect Batch account

Search

Refresh Delete Keys

Storage account

Networking

Keys

Authentication mode

Locks

Features

Applications

Pools

Jobs

Job schedules

Certificates

Monitoring

Alerts

Metrics

Diagnostic settings

Essentials

Resource group (move) [krausszoe](#)

Status Online

Location West US 2

Subscription (move) [Zoe Krauss](#)

Subscription ID f387c92a-68b5-4d09-8497-e3a4a7199af0

Tags (edit) [Click here to add tags](#)

See more

Account endpoint tmdetect.westus:

Node manager e04a5b52-a9e3-

Identity type None

Public network : All networks

Pool allocation : Batch service

Show data for last: 1 hour 6 hours 1 day 7 days 30 days

vCPU minutes

Failed tasks

Within your batch account, navigate to “Pools” on the sidebar.

Home > tmdetect | Pools >

## Add pool

tmdetect

### POOL DETAIL

Pool ID \* ⓘ

testpool ✓

Display name ⓘ

Enter a display name (optional) ✓

Identity ⓘ

None  User assigned

Name the pool whatever you'd like. The Display name and Identity are unimportant.

# Add pool

tmdetect OPERATING SYSTEM

Select "Marketplace" to deploy VMs using an Azure Marketplace image, "Cloud Services" to deploy Cloud Service worker role VMs (deprecated) or "Custom Image - Shared Image Gallery" to deploy using a custom VM image, or "Graphics and rendering" if you want to deploy VMs with premium graphics and rendering applications pre-installed (deprecated).

Image Type

Enable unverified image

Publisher \*

Offer \*

Skus \*

Batch Node Agent SKU ID

Enable automatic updates (Windows only)

Disk Encryption Configuration

Data disks [Data disks](#)

Ephemeral OS disk

Container configuration

Container type

Container image names

Container registries [0 container registry](#)  
[Container registries](#)

The operating system portion is important.

Here is where we will specify that each node in the pool will be capable of running the Docker image.

Select the Image Type, Publisher, Offer, SKU shown here, and change Container Configuration to "Custom".

The important thing here is to specify the "Container Type" as "Docker compatible".

OK

# Add pool

tmdetect

VM size \* Standard\_D2s\_v3 - 2 vCPUs, 2 GB Memory

[View full pricing details](#)

## SCALE

Mode **Fixed** Auto scale

Target dedicated nodes 4

Target Spot/low-priority nodes 0

Total target vCPUs: 8

Resize timeout \* 15

minutes

Next you decide the size of your pool. The pool will be made up of N nodes which are each an individual virtual machine (VM), the size of which you choose in VM size under Node Size.

The Target dedicated nodes describe how many of the VMs of the size you chose will be in the pool. All other default inputs are fine.

We will connect each node in the pool to the storage container by running a Start Task on each node.

**START TASK**

Start task ⓘ

Max task retry count ⓘ

Command line \* ⓘ

```
/bin/bash -c "sudo apt -y install nfs-common && mkdir -p /tmp/data && sudo mount -o sec=sys,vers=3,nolock,proto=tcp seismiccloud2.blob.core.windows.net/seismiccloud2/seismiccloud /tmp/data && sudo chmod -R 0755 /tmp/data"
```

User identity ⓘ

Wait for success ⓘ  True  False

Resource files [Resource files](#)

Environment settings [Environment settings](#)

We'll walk through what this command contains on the next slide.

**Make sure your User identity is set to Admin. You'll need this for permissions.**



## Start-up command:

```
/bin/bash -c "sudo apt -y install nfs-common && mkdir -p /tmp/data && sudo mount -o  
sec=sys,vers=3,nolock,proto=tcp seismiccloud.blob.core.windows.net:/seismiccloud/seismiccloud /tmp/data &&  
sudo chmod -R 0755 /tmp/data"
```

Check the following link for details on the construction of this command:

<https://learn.microsoft.com/en-us/azure/storage/blobs/network-file-system-protocol-support-how-to>

The && symbols represent separate bash commands.

**>> sudo apt -y install nfs-common**

**>> mkdir -p /tmp/data**

This creates an empty directory to mount the storage container within.

**>> sudo mount -o sec=sys,vers=3,nolock,proto=tcp**

**<accountname.blob.core.windows.net:/accountname/containername> /tmp/data**

This is the command that actually mounts the storage container to the directory you made above. Within the <>, the names refer to the storage account and the storage container within the account.

**>> sudo chmod -R 0755 /tmp/data**

And then this changes the permissions so you can write to it.

## VIRTUAL NETWORK

Pool endpoint configuration

Inbound NAT pool

Virtual network ⓘ

krausszoe\_vnet

[create new](#)

Subnet

default

IP address provisioning type ⓘ

**BatchManaged** UserManaged NoPublicIPAddresses

Create and manage public IP addresses automatically.

OK

The last thing you need to specify outside of default settings is the virtual network that all of these resources are in.

Go ahead and create your pool!

3. Check on node status  
within the created Pool

# test | Overview Pool

Search Refresh Add job Scale Delete View node

- Overview
- Activity log
- General
- Properties
- Nodes
- Settings
- Certificates
- Start task
- Application packages
- Scale
- Metadata
- Node communication mode

Essentials

Current vCPUs	: 4	Batch account	: tmdetect
Dedicated nodes	: 2	Pool ID	: test
Spot/low-priority nodes	: <a href="#">0 (Learn more)</a>	Operating System	: microsoft-azure-batch ubuntu-server-container 20-04-l...
Auto scale	: false	VM size	: standard_d2s_v3
Metadata	: <a href="#">Click here to view Metadata</a>	Allocation state	: Steady

### Nodes heat map



If you click on the Pool you created, you'll see a "Nodes Heat Map" on the Overview Screen.

Each square shown represents one node in the pool, or one individual virtual machine.

The color of the square tells you if the node is running a job, starting up, etc. They will be green if running!

If the nodes appear to have a start task failed, there is a way to look into this...

# test | Overview

Search Refresh Add job Scale Delete View node

- Overview
- Activity log
- General
- Properties
- Nodes
- Settings
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- Node communication mode

## Essentials

Current vCPUs	: 4	Batch account	: tmdetect
Dedicated nodes	: 2	Pool ID	: test
Spot/low-priority nodes	: <a href="#">0 (Learn more)</a>	Operating System	: microsoft-azure-batch ubuntu-server-container 20-04-l...
Auto scale	: false	VM size	: standard_d2s_v3
Metadata	: <a href="#">Click here to view Metadata</a>	Allocation state	: Steady

## Nodes heat map



Idle	2
Running	0
Creating	0
Starting	0
Rebooting	0

To look into what's happening on each Node, click "Nodes" on the sidebar.

# tvmps\_12d80bbf0656e5c5602e9679485372b1d42d22ba7eeddd490f4dbd2519740e4c\_d

- Refresh
- Reboot
- Reimage
- Disable
- Connect
- Delete node
- Upload batch logs

## Overview

### General

- Properties
- Files
- Recent tasks
- Start task info
- Certificate references

### Users

- Add user account
- Update user account
- Remove user account

### Essentials

Batch account	: <a href="#">tmdetect</a>	State transition time	: Friday, February 3, 2023 at 13:03:52
Pool ID	: <a href="#">test</a>	Last boot time	: Friday, February 3, 2023 at 10:38:38
VM size	: standard_d2s_v3	State	: idle
Operating System	: microsoft-azure-batch ubuntu-server-container 20-04-l...	Is dedicated	: true
Total tasks run	: 2 (0 Running tasks, 0 Total tasks succeeded)	Remote login information	: 40.64.96.216:50000

Path://

Location: [root](#) /

File name	Creation time	Last modified	Size	Content type	File mode
applications					...
fsmounts					...
shared					...
startup					...
volatile					...
workitems					...



Click on one of the displayed Nodes and you will see the file system of the virtual machine displayed. Many of these folders are just default on each Azure virtual machine. The “startup” folder, though, can give us some insight if the startup task failed.

### tvmps\_12d80bbf0656e5c5602e9679485...

Search

Refresh Reboot

#### Overview

#### General

Properties

Files

Recent tasks

Start task info

Certificate references

#### Users

Add user account

Update user account

Remove user account

Friday, February 3, 2023 at 13:03:52

Last boot time

Friday, February 3, 2023 at 10:38:38

State

idle

Is dedicated

true

Remote login information

40.64.96.216:50000

Path: /

Location: root / startup

File name	
[.]	...
certs	...
wd	...
stderr.txt	...
stdout.txt	...

### stderr.txt

tvmps\_12d80bbf0656e5c5602e9679485372b1d42d22ba7eeddd490f4dbd2519740e4c\_d

Download Delete Refresh

```

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

debconf: unable to initialize frontend: Dialog
debconf: (Dialog frontend will not work on a dumb terminal, an emacs shell buffer,
or without a controlling terminal.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:

```

Under the “startup” folder, the “stderr.txt” file will contain any error outputs from the startup task.

4. Get Batch account  
name and key

# Navigate to your Batch account

Home > tmdetect

 **tmdetect | Keys**  
Batch account

 Regenerate primary  Regenerate secondary

 Access control (IAM)

 Tags

 Diagnose and solve problems

## Settings

 Quick start

 Properties

 Quotas

 Identity

 Encryption

 Storage account

 Networking

 **Keys**

 Authentication mode

 Locks

## BATCH ACCOUNT CREDENTIALS

Batch account

tmdetect

Account endpoint

https://tmdetect.westus2.batch.azure.com

Primary access key

Secondary access key

Scroll down to Settings, and click on “Keys”

Your **batch account name** is here

And your **access key** is here.  
Copy it and save it to a secure place.

Now you have a pool all set-up with the ability to run the Docker image, and read and write to your storage container!

Next up: create jobs and send them to this pool. See Jupyter Notebook tutorial NotebookS4.