



Cloud Development, 2021 fall. Homework 1

Report

Functions

made by Zhuman Rakhat

Almaty 2021

Task

In the Lab 1 all uploaded images have original size, which can be really big. To make the response of the site better and faster, develop an Azure Function, which will react on a new image adding event and will create a thumbnail of the image added and put it in another container, which will be used as a thumbnail storage for the site.

- The function trigger type should be an Azure Blob Storage trigger.
- The language of the code to your taste.
- For check-in, please, upload a code of the function created and a screenshot with the function integration page.
- Tip: use samples and documentation for ideas.

Report

Create storage account

The screenshot shows the 'Create a storage account' wizard in the Microsoft Azure portal, specifically the 'Basics' tab. The header includes the Microsoft Azure logo, a search bar, and user information (r_zhuman@kbtu.kz). The breadcrumb trail is 'Home > Create a resource >'. The main title is 'Create a storage account' with a close button. Below the title are tabs for 'Basics', 'Advanced', 'Networking', 'Data protection', 'Tags', and 'Review + create'. The 'Basics' tab is active, showing a description of Azure Storage and a link to 'Learn more about Azure storage accounts'. The 'Project details' section asks for a subscription (selected: 'Azure for Students') and a resource group (selected: 'Serverless', with a 'Create new' link). The 'Instance details' section includes a link for legacy account types and fields for 'Storage account name' (blobstoragehw), 'Region' ((Europe) North Europe), 'Performance' (Standard selected, Premium unselected), and 'Redundancy' (Locally-redundant storage (LRS) selected). At the bottom are buttons for 'Review + create', '< Previous', and 'Next : Advanced >'. A scrollbar is visible on the right side of the form.

Microsoft Azure Search resources, services, and docs (G+/) r_zhuman@kbtu.kz АО "КАЗАХСТАНСКО-БРИТАНСКОЕ...

Home > Create a resource >

Create a storage account

Basics Advanced Networking Data protection Tags Review + create

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

Project details

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription * Azure for Students

Resource group * Serverless [Create new](#)

Instance details

If you need to create a legacy storage account type, please click [here](#).

Storage account name ⓘ * blobstoragehw

Region ⓘ * (Europe) North Europe

Performance ⓘ * ☒ Standard: Recommended for most scenarios (general-purpose v2 account) ☐ Premium: Recommended for scenarios that require low latency.

Redundancy ⓘ * Locally-redundant storage (LRS)

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

Create 2 container for origin images and resized images

Microsoft Azure

Search resources, services, and docs (G+)

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АО "КАЗАХСТАНСКО-БРИТАНСКОЕ...

RZ

Home > blobstoragehw_1632573948514 > blobstoragehw

blobstoragehw

Storage account

Containers

✕

Search (Ctrl+)

Container

Change access level

Restore containers

Refresh

Delete

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage Explorer (preview)

Data storage

Containers

File shares

Queues

Tables

Security + networking

Networking

Azure CDN

Access keys

Shared access signature

Encryption

Security

Data management

Geo-replication

Data protection

Search containers by prefix

Show deleted containers

	Name	Last modified	Public access level	Lease state	
<input type="checkbox"/>	\$logs	9/25/2021, 6:46:17 PM	Private	Available	***
<input type="checkbox"/>	origin	9/25/2021, 6:46:59 PM	Private	Available	***
<input type="checkbox"/>	resized	9/25/2021, 6:47:16 PM	Private	Available	***

Create function app and store connection string

Microsoft Azure

Search resources, services, and docs (G+)

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АО "КАЗАХСТАНСКО-БРИТАНСК...


RZ

[Home](#) > [Create a resource](#) >

Create Function App

Basics | Hosting | Networking (preview) | Monitoring | Tags | **Review + create**

Summary

 **Function App**
by Microsoft

Details

Subscription	685e3fba-b439-43a1-a8a8-4812e242b2f9
Resource Group	Serverless
Name	image-resize-trigger
Runtime stack	.NET 3.1

Hosting

Storage	
Storage account	blobstorageehw

Plan (New)

Plan type	Consumption (Serverless)
Name	ASP-Serverless-85cc
Operating System	Linux
Region	North Europe
SKU	Dynamic

Monitoring (New)

Application Insights	Enabled
Name	image-resize-trigger
Region	North Europe

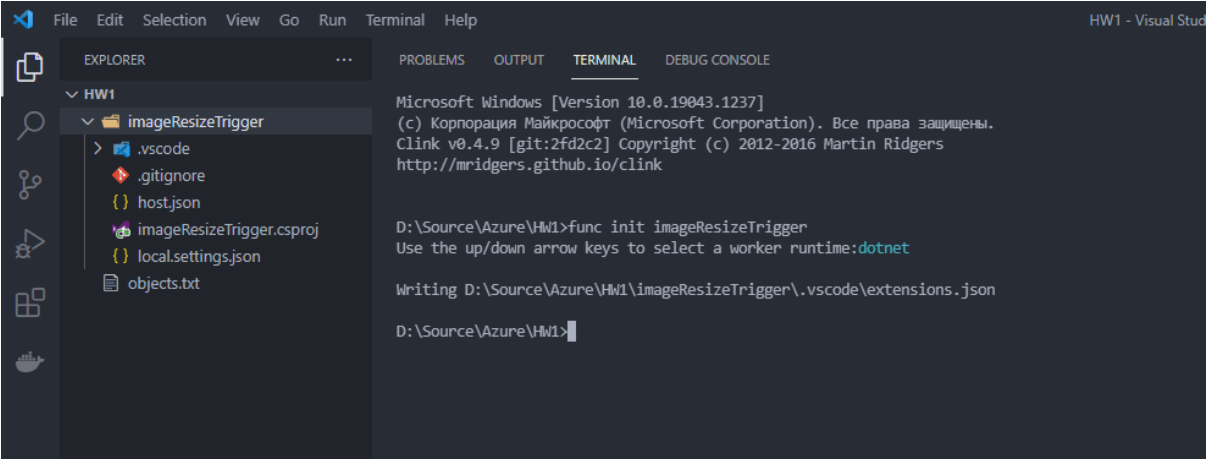
Create

< Previous

Next >

[Download a template for automation](#)

Create project and init



```
Microsoft Windows [Version 10.0.19043.1237]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.
Clink v0.4.9 [git:2fd2c2] Copyright (c) 2012-2016 Martin Ridgers
http://mridgers.github.io/clink

D:\Source\Azure\HW1>func init imageResizeTrigger
Use the up/down arrow keys to select a worker runtime:dotnet

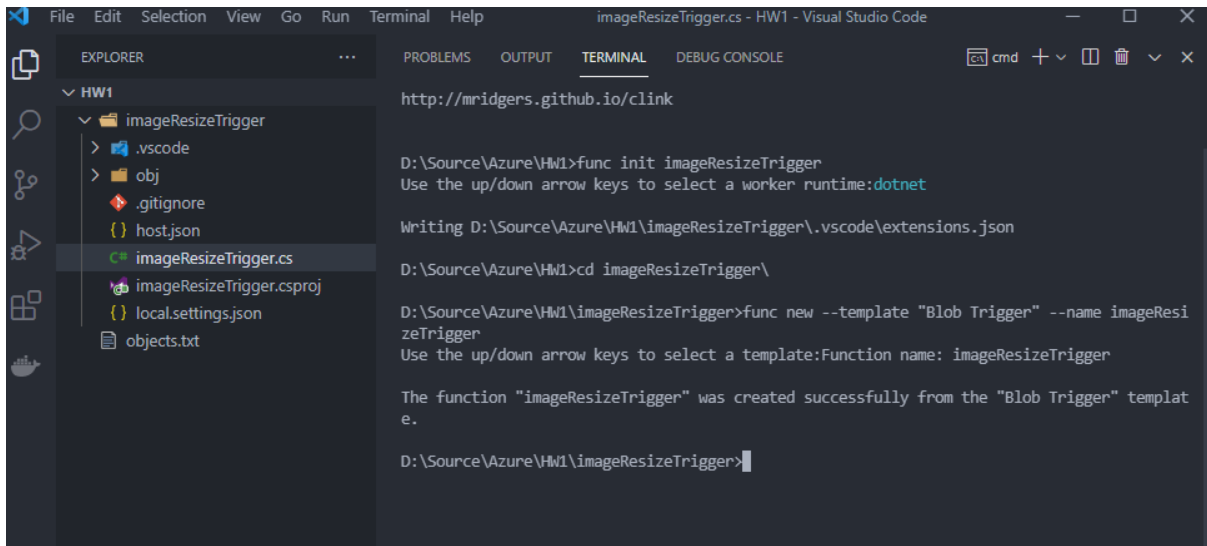
Writing D:\Source\Azure\HW1\imageResizeTrigger\.vscode\extensions.json

D:\Source\Azure\HW1>
```

Set connection string in config file

```
local.settings.json
{
  "IsEncrypted": false,
  "Values": {
    "AzureWebJobsStorage": "DefaultEndpointsProtocol=https;AccountName=blogstorageehw;AccountKey=3HR5896ND6rIBscnlgzTrFa/3lG1F37tOMheUqbOW6RNag/RlOe2duHrPsyK6+NVNpcnMP+1lToSe9uONY60CQ==;EndpointSuffix=core.windows.net",
    "FUNCTIONS_WORKER_RUNTIME": "dotnet",
    "BlobConnectionString": "DefaultEndpointsProtocol=https;AccountName=blogstorageehw;AccountKey=3HR5896ND6rIBscnlgzTrFa/3lG1F37tOMheUqbOW6RNag/RlOe2duHrPsyK6+NVNpcnMP+1lToSe9uONY60CQ==;EndpointSuffix=core.windows.net"
  }
}
```

Create Blob trigger



The screenshot shows the Visual Studio Code interface with the Explorer, Terminal, and Output panes. The Explorer pane shows the file structure of the 'imageResizeTrigger' project. The Terminal pane shows the commands used to create the function.

```
imageResizeTrigger.cs - HW1 - Visual Studio Code

EXPLORER
  HW1
    imageResizeTrigger
      .vscode
      obj
      .gitignore
      host.json
      imageResizeTrigger.cs
      imageResizeTrigger.csproj
      local.settings.json
      objects.txt

TERMINAL
  http://mridgers.github.io/clink

  D:\Source\Azure\HW1>func init imageResizeTrigger
  Use the up/down arrow keys to select a worker runtime:dotnet

  Writing D:\Source\Azure\HW1\imageResizeTrigger\.vscode\extensions.json

  D:\Source\Azure\HW1>cd imageResizeTrigger\

  D:\Source\Azure\HW1\imageResizeTrigger>func new --template "Blob Trigger" --name imageResizeTrigger
  Use the up/down arrow keys to select a template:Function name: imageResizeTrigger

  The function "imageResizeTrigger" was created successfully from the "Blob Trigger" template.

  D:\Source\Azure\HW1\imageResizeTrigger>
```

Installed packages:

dotnet add package Microsoft.Extensions.DependencyInjection --version 5.0.2

dotnet add package Microsoft.Azure.Functions.Extensions --version 1.1.0

dotnet add package Microsoft.Extensions.Azure --version 1.1.1

dotnet add package SixLabors.ImageSharp --version 1.0.3

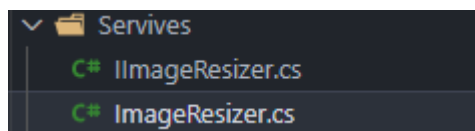
```
D:\Source\Azure\HW1\imageResizeTrigger>dotnet add package SixLabors.ImageSharp --version 1.0.3
.0.3
  Определение проектов для восстановления...
  Writing C:\Users\zhuma\AppData\Local\Temp\tmp8C97.tmp
  info : Добавление PackageReference для пакета "SixLabors.ImageSharp" в проект "D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj".
  info : Идет восстановление пакетов для D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj...
  info : GET https://api.nuget.org/v3-flatcontainer/sixlabors.imagesharp/index.json
  info : OK https://api.nuget.org/v3-flatcontainer/sixlabors.imagesharp/index.json 593 мс
  info : GET https://api.nuget.org/v3-flatcontainer/sixlabors.imagesharp/1.0.3/sixlabors.imagesharp.1.0.3.nupkg
  info : OK https://api.nuget.org/v3-flatcontainer/sixlabors.imagesharp/1.0.3/sixlabors.imagesharp.1.0.3.nupkg 115 мс
  info : Установлено SixLabors.ImageSharp 1.0.3 из https://api.nuget.org/v3/index.json с хэшем содержимого oRmZEITad+0tL22ZfAbLps6doDV+Z0/oH0dtXLpIBwn1sgai3QxxDQPjohHlDeUp/CTzRKVrFFbC4ZITnL2UBg==.
  info : Пакет "SixLabors.ImageSharp" совместим со всеми указанными платформами в проекте "D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj".
  info : Ссылка PackageReference для пакета "SixLabors.ImageSharp" версии "1.0.3" добавлена в файл "D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj".
  info : Фиксация восстановления...
  info : Запись файла ресурсов на диск. Путь: D:\Source\Azure\HW1\imageResizeTrigger\obj\project.assets.json
  log  : Установлен D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj (за 5,99 sec).

  D:\Source\Azure\HW1\imageResizeTrigger>
```

Edit imageResizeTriger.cs

```
using System;
using System.IO;
using Microsoft.Azure.WebJobs;
using Microsoft.Azure.WebJobs.Host;
using Microsoft.Extensions.Logging;
namespace imageResizeTrigger
{
    public class imageResizeTrigger
    {
        [FunctionName("imageResizeTrigger")]
        public void Run(
            [BlobTrigger("origin/{name}")] Stream inputBlob,
            [Blob("resized/{name}", FileAccess.Write)] Stream
outputBlob,
            string name,
            ILogger log)
        {
            log.LogInformation($"C# Blob trigger function Processed
blob\n Name:{name} \n Size: {inputBlob.Length} Bytes");
        }
    }
}
```

Create new folder Services, then interface and class



Implement interface IImageResizer.cs

```
using System;
using System.IO;
using System.Collections.Generic;
using System.Text;

namespace imageResizeTrigger.Services
{
    public interface IImageResizer
    {
        void Resize(Stream input, Stream output);
    }
}
```

Implement class using library ImageSharp

```
using System.IO;
using SixLabors.ImageSharp;
using SixLabors.ImageSharp.Formats.Jpeg;
using SixLabors.ImageSharp.Processing;

namespace imageResizeTrigger.Services
{
    public class ImageResizer: IImageResizer
    {
        public void Resize(Stream input, Stream output)
        {
            using (Image image = Image.Load(input))
            {
                image.Mutate(x => x.Resize(image.Width / 2,
image.Height / 2));
                image.Save(output, new JpegEncoder());
            }
        }
    }
}
```

Add new class Startup for configure new function

```
using Microsoft.Azure.Functions.Extensions.DependencyInjection;
using Microsoft.Extensions.DependencyInjection;
using imageResizeTrigger.Services;

[assembly: FunctionsStartup(typeof(imageResizeTrigger.Startup))]
namespace imageResizeTrigger
{
    public class Startup: FunctionsStartup
    {
        {
            public override void Configure(IFunctionsHostBuilder builder)
            {
                builder.Services.AddSingleton<IImageResizer,
ImageResizer>();
            }
        }
    }
}
```

Edit trigger function to use function for resize

```
using System;
using System.IO;
using Microsoft.Azure.WebJobs;
using Microsoft.Azure.WebJobs.Host;
using Microsoft.Extensions.Logging;
using imageResizeTrigger.Services;

namespace imageResizeTrigger
{
    public class imageResizeTrigger
    {
        private readonly IImageResizer imageResizer;

        public imageResizeTrigger(IImageResizer imageResizer)
        => this.imageResizer = imageResizer;

        [FunctionName("imageResizeTrigger")]
        public void Run(
            [BlobTrigger("origin/{name}")] Stream inputBlob,
            [Blob("resized/{name}", FileAccess.Write)] Stream
outputBlob,
            string name,
            ILogger log)
        {
            log.LogInformation($"C# Blob trigger function Processed
blob\n Name:{name} \n Size: {inputBlob.Length} Bytes");

            try
            {
                this.imageResizer.Resize(inputBlob, outputBlob);

                log.LogInformation("Reduced images saved to blob
storage");
            }
            catch (Exception e)
            {
                log.LogError("Resize fails",e);
            }
        }
    }
}
```


Build app

```
[2021-09-25T15:41:51.535Z] Found D:\Source\Azure\HW1\imageResizeTrigger\imageResizeTrigger.csproj. Using for user secrets file configuration.
```

Functions:

```
imageResizeTrigger: blobTrigger
```

For detailed output, run func with --verbose flag.

```
[2021-09-25T15:41:58.996Z] Executing 'imageResizeTrigger' (Reason='New blob detected: origin/blt.jpg', Id=f3215642-ee06-4b4f-a8a3-1c5ada123097)
```

Name:blt.jpg

Size: 2174293 Bytes

```
[2021-09-25T15:42:00.183Z] Executing 'imageResizeTrigger' (Reason='New blob detected: origin/burger.jpg', Id=a050a55a-d27a-4189-b47b-87e59161dd23)
```

Name:burger.jpg

Size: 1947092 Bytes

```
[2021-09-25T15:42:09.579Z] Executed 'imageResizeTrigger' (Succeeded, Id=a050a55a-d27a-4189-b47b-87e59161dd23, Duration=9831ms)
```

```
[2021-09-25T15:42:09.656Z] Reduced images saved to blob storage
```

```
[2021-09-25T15:42:09.814Z] Executed 'imageResizeTrigger' (Succeeded, Id=f3215642-ee06-4b4f-a8a3-1c5ada123097, Duration=11330ms)
```

Results

Container origin

Microsoft Azure

Home

blobstoragehw

>

Search resources, services, and docs (Ctrl+J)

r.juman@bbu.kz

AD "KASAKSTANCO-SPEYTSKIK"

origin

Container

Search (Ctrl+J)

Upload

Change access level

Refresh

Delete

Change tier

Acquire lease

Break lease

View snapshots

Create snapshot

Overview

Diagnose and solve problems

Access Control (IAM)

Settings

Shared access tokens

Access policy

Properties

Metadata

Authentication method: Access key (Switch to Azure AD User Account)

Location: origin

Search blobs by prefix (case-sensitive)

Show deleted blobs

Add filter

Name	Modified	Access tier	Blob type	Size	Lease state
<input type="checkbox"/> blt.jpg	9/25/2021, 9:26:52 PM	Hot (inferred)	Block blob	2.07 MiB	Available
<input type="checkbox"/> burger.jpg	9/25/2021, 9:31:12 PM	Hot (inferred)	Block blob	1.86 MiB	Available

Container resized

Microsoft Azure portal interface showing the 'resized' container. The 'blobs' tab is selected, displaying a table of blobs. The 'Size' column is highlighted with a red box, showing values of 492.09 KB and 272.33 KB.

Name	Modified	Access tier	Blob type	Size	Lease state
bh.jpg	9/25/2021, 9:42:09 PM	Hot (inferred)	Block blob	492.09 KB	Available
burger.jpg	9/25/2021, 9:42:09 PM	Hot (inferred)	Block blob	272.33 KB	Available

Deploy

>> az login

>> func azure functionapp publish image-resize-trigger

```
D:\Source\Azure\HW1\imageResizeTrigger>func azure functionapp publish image-resize-trigger
Microsoft (R) Build Engine версии 16.11.0+0538acc04 для .NET
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

Определение проектов для восстановления...
Все проекты обновлены для восстановления.
imageResizeTrigger -> D:\Source\Azure\HW1\imageResizeTrigger\bin\publish\imageResizeTrigger.dll

Сборка успешно завершена.
Предупреждений: 0
Ошибок: 0

Прошло времени 00:00:07.20

Getting site publishing info...
Uploading package...
Uploading 5 MB [#####]
Upload completed successfully.
Deployment completed successfully.
Syncing triggers...
Functions in image-resize-trigger:
imageResizeTrigger - [blobTrigger]
```

Microsoft Azure

Search resources, services, and docs (Ctrl+J)

Home > Serverless

Resource group

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Deployments

Security

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Properties

Locks

Cost Management

Cost analysis

Cost alerts (preview)

Budgets

Advisor recommendations

Monitoring

Insights (preview)

Alerts

Metrics

Diagnostic settings

Logs

Essentials

Subscription (change) : Azure for Students

Subscription ID : 685e3fba-b439-43a1-a8a8-48126242b2f9

Deployments : 1 Failed, 2 Succeeded

Location : North Europe

Tags (change) : [Click here to add tags](#)

Resources

Filter for any field...

Type == all X Location == all X Add filter

Showing 1 to 4 of 4 records. ☐ Show hidden types

No grouping List view

Name	Type	Location
ASP-Serverless-85cc	App Service plan	North Europe
blobstoragehw	Storage account	North Europe
image-resize-trigger	Function App	North Europe
image-resize-trigger	Application Insights	North Europe

< Previous Page 1 of 1 Next >

Unfortunately, testing on my plan is not valid

Microsoft Azure

Search resources, services, and docs (Ctrl+J)

Home > Serverless > image-resize-trigger

image-resize-trigger | Functions

Function App

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Security

Events (preview)

Functions

App keys

App files

Proxies

Deployment

Deployment slots

Deployment Center

Settings

Configuration

Authentication

Application Insights

Identity

Backups

Custom domains

TLS/SSL settings

Create Refresh Delete

Editing functions in the Azure portal is not supported for Linux Consumption Function Apps.

Filter by name...

Name	Trigger	Status
imageResizeTrigger	Blob	Enabled

Real time check after deploy (I forgot to show this moment after deployment, so I created everything anew and deployed)

Microsoft Azure

Search resources, services, and docs (G+)

Home > resizeblobimage > origin

Container

Search (Ctrl+F)

Upload Change access level Refresh Delete Change tier Acquire lease Break lease View snapshots Create snapshot

Authentication method: Access key (Switch to Azure AD User Account)

Location: origin

Search blobs by prefix (case-sensitive)

Show deleted blobs

Add filter

Name	Modified	Access tier	Blob type
<input type="checkbox"/> bahnmijpg	9/25/2021, 10:31:41 PM	Hot (Inferred)	Block blob
<input type="checkbox"/> bti.jpg	9/25/2021, 10:36:23 PM	Hot (Inferred)	Block blob
<input type="checkbox"/> sub.jpg	9/25/2021, 10:38:14 PM	Hot (Inferred)	Block blob

Upload Completed for sub.jpg

6.07 MiB | resizeblobimage

Select a file

Overwrite if files already exist

Advanced

Upload

Current uploads

Dismiss: Completed All

sub.jpg	6 MiB / 6 MiB	***
bit.jpg	2 MiB / 2 MiB	***

Microsoft Azure

Search resources, services, and docs (G+)

Home > resizeblobimage > resized > sub.jpg

Container

Search (Ctrl+F)

Upload Change access level

Authentication method: Access key (Switch to Azure AD User Account)

Location: resized

Search blobs by prefix (case-sensitive)

Show deleted blobs

Add filter

Name	...
<input type="checkbox"/> bahnmijpg	...
<input type="checkbox"/> bti.jpg	...
<input type="checkbox"/> sub.jpg	...

sub.jpg

Save Discard Download Refresh Delete Change tier Acquire lease Break lease

Overview Versions Snapshots Edit Generate SAS

Properties

URL <https://resizeblobimage...>

LAST MODIFIED 9/25/2021, 10:38:22 PM

CREATION TIME 9/25/2021, 10:38:22 PM

VERSION ID -

TYPE Block blob

SIZE 807.37 KiB

ACCESS TIER Hot (Inferred)

ACCESS TIER LAST MODIFIED N/A

SERVER ENCRYPTED true

ETAG 0x8D98042E3C0C738

VERSION-LEVEL IMMUTABILITY POLICY Disabled

CONTENT-TYPE application/octet-stream

CONTENT-MD5 C0Mf6zbDUuGVV/YMSDyOg==

LEASE STATUS Unlocked

LEASE STATE Available

LEASE DURATION -

COPY STATUS -

COPY COMPLETION TIME -

Metadata

Key	Value
AzureWebJobsParentId	a8ae4cb6-2cb8-435a-a347-a33643c4074a

Microsoft Azure

Search resources, services, and docs (G+)

Home > Serverless > imageresizerakhat > imageResizeTrigger

Function

Search (Ctrl+F)

Overview

Developer

Code + Test

Integration

Monitor

Function Keys

Invocations Logs

Success Count 3 Last 30 Days

Error Count 0 Last 30 Days

Invocation Traces

The twenty most recent function invocation traces. For more advanced analysis, run the query in Application Insights.

Run query in Application Insights Refresh

Filter invocations

Date (UTC)	Success	Result Code	Duration (ms)	Operation Id
2021-09-25 16:38:19.882	Success	0	2804	2d3ba0995802c5548ba24846ba9ff3e5
2021-09-25 16:36:28.459	Success	0	1598	31ccc913a7966e4883945a060bd33a8b
2021-09-25 16:35:58.170	Success	0	2626	709aeefebfb2c840901602243072b13

Cleaning up my subscription

```
>> az group delete --name Serverless --no-wait --yes
```

```
Bash
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

Welcome to Azure Cloud Shell

Type "az" to use Azure CLI
Type "help" to learn about Cloud Shell

rakhat@Azure:~$ az group delete --name Serverless --no-wait --yes
rakhat@Azure:~$
```

Microsoft Azure

Search resources, services, and docs (G+)

Azure services

- Create a resource
- All resources
- Quickstart Center
- Virtual machines
- App Services
- Storage accounts
- SQL databases
- Azure Cosmos DB
- Kubernetes services
- More services

Recent resources

Name	Type	Last Viewed
Serverless	Resource group	3 minutes ago

Navigate

- Subscriptions
- Resource groups
- All resources
- Dashboard

Tools

- Microsoft Learn (c) Learn Azure with free online training from Microsoft
- Azure Monitor Monitor your apps and infrastructure
- Security Center Secure your apps and infrastructure
- Cost Management Analyze and optimize your cloud spend for free

Useful links

- Technical Documentation (c) Azure Migration Tools
- Azure Services (c) Find an Azure expert
- Recent Azure Updates (c) Quickstart Center

Azure mobile app

App Store Google Play

<https://portal.azure.com/#create/hub>