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What is Azure Cognitive Service

Cognitive Services are a set of machine learning algorithms that Microsoft has developed to solve problems in the field of Artificial Intelligence (AI). We can use these services to add AI capabilities in our application easily to provide more value to our customer without need of any data scientist. Cognitive Services brings AI within reach of every developer—without requiring machine-learning expertise. All it takes is an API call to embed the ability to see, hear, speak, search, understand and accelerate decision-making into your apps.



The Cognitive Services APIs are grouped into five categories.

1. **Vision:** This is a Microsoft Cognitive Service to build custom image classifiers. Custom Vision makes it easier and faster to build, deploy and improve image classifiers with artificial intelligence and machine learning. This service features facial analysis, handwriting recognition, optical character recognition (OCR) from images and real-time video analyses.
2. **Speech:** Through Azure's speech cognitive services API, you can integrate speech processing capabilities into any app or service. So, regardless of speech style, geography or technical term, the application allows users to recognize everything that's spoken and transcribe the text accordingly.
3. **Language:** Language and context-based meaning are two of the most important features that define communication. Through the cognitive services language API, you can develop apps that understand a wide variety of text.

4. Knowledge: Azure's cognitive services offer some of the most comprehensive and accurate database creation and search tools available. The knowledge API can leverage or create resources to be integrated into apps and services with several other capabilities. For instance, a Q&A service can be used to scan vast amounts of content and text and quickly extract the most relevant information. So, no matter the question, you're bound to find the answers you're seeking.

In this blog I will explain what **Vision Cognitive Services** and how we can use this in our application. I will also create demo application.

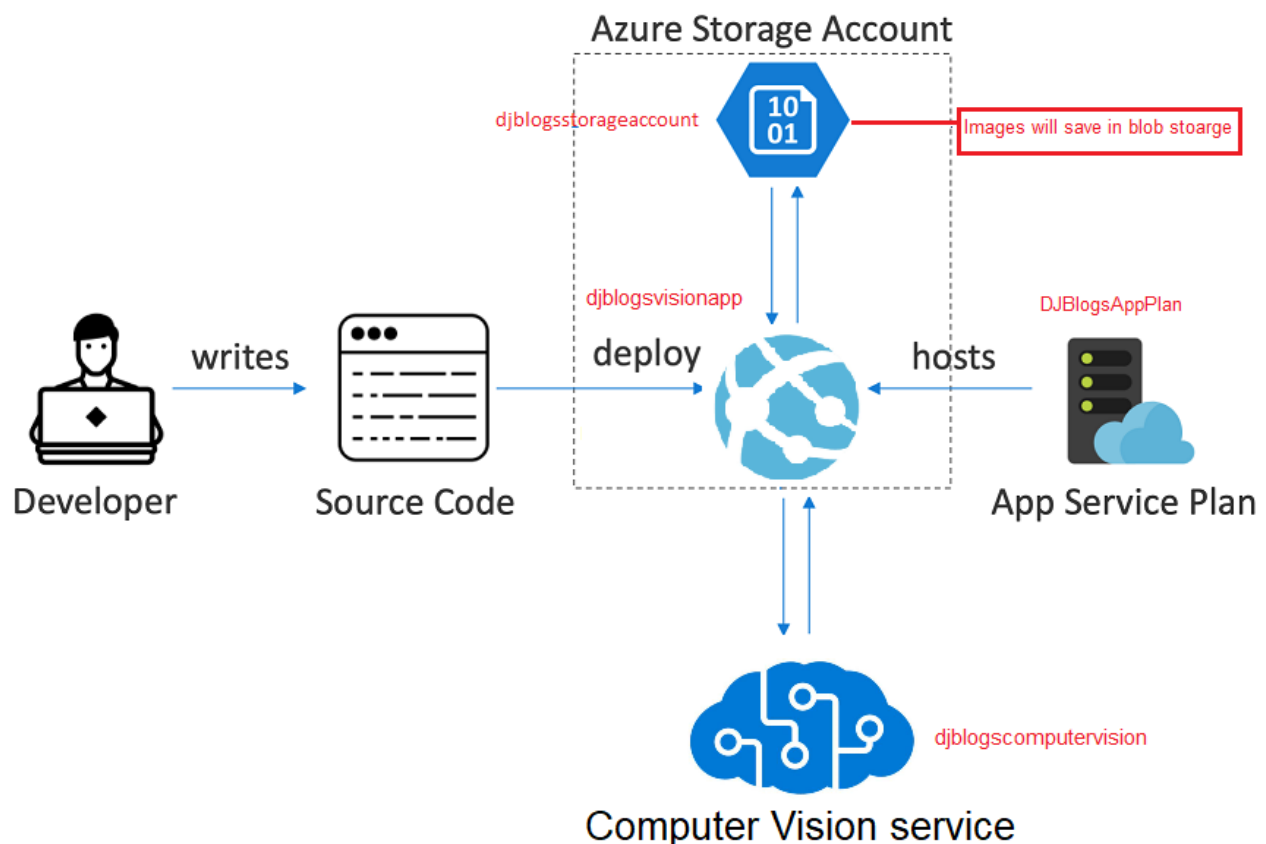
What is Computer Vision?

Computer vision is part of **Vision Cognitive Services**. Azure's Computer Vision service gives you access to advanced algorithms that process images and return information based on the visual features you're interested in. For example, Computer Vision can determine whether an image contains adult content, find specific brands or objects, or find human faces.

We will create one demo application to understand it very well. I am using 3 azure services for this demo.

1. Computer Vision Cognitive Services (**djblogscomputervision**)
2. Storage account (**djblogstorageaccount**)
3. Web App (**djblogsvisionapp**)

This is the demo app diagram which we will build step by step and will save code in my GitHub repository

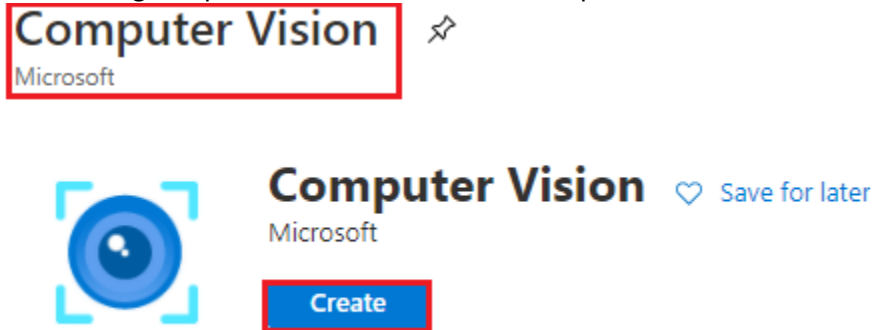


Computer Vision Cognitive Services

First, we will create computer vision cognitive service which help us to analyze the image and will give all image information as response. Then we will show that response data in our web app.

We need to follow below steps to computer vision cognitive service.

1. Go to azure portal <https://portal.azure.com>
2. Once we login in portal then need to create Computer Vision.



3. Click on create button it will open create **Computer Vision** form. I have filled form as below

← → ↻ 🏠 portal.azure.com/#create;Microsoft.CognitiveServicesComputerVision

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

Home > Cognitive Services > Marketplace > Computer Vision >

Create Computer Vision

Project details

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

Subscription * ⓘ 1. [Redacted] ▼

Resource group * ⓘ 2. DJBlogs ▼
[Create new](#)

Instance details

Region * ⓘ 3. Central US ▼

Name * ⓘ 4. djblogscomputervision ✓

Pricing tier * ⓘ 5. Free F0 (20 Calls per minute, 5K Calls per month) ▼

[View full pricing details](#)

6. **Review + create** < Previous Next : Tags >

4. I have selected free pricing tier for this demo project. In free tier we can do only 20 API calls per minute. You can choose pricing tier based on your requirement but for demo project you can select free tier.
5. Filled form as above then just click on **Create**. It will create **Computer Vision** endpoint and Keys which help us to consume the **Computer Vision** API.

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

Home > djblogscomputervision

djblogscomputervision | Keys and Endpoint

Cognitive Services

Search (Ctrl+/) << Regenerate Key1 Regenerate Key2

Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems

RESOURCE MANAGEMENT

Quick start 1.
Keys and Endpoint
Pricing tier
Networking
Identity
Billing By Subscription
Properties

These keys are used to access your Cognitive Service API. Do not share your keys. Store them securely– for example, using Azure Key Vault. We also recommend regenerating these keys regularly. Only one key is necessary to make an API call. When regenerating the first key, you can use the second key for continued access to the service.

Show Keys

KEY 1
2. [Redacted]

KEY 2
[Redacted]

ENDPOINT
3. <https://djblogscomputervision.cognitiveservices.azure.com/>

LOCATION ⓘ
centralus

6. You can see in above screen got both API endpoint and keys. We will use then to call **Computer Vision** API from WebApp to analyze the image.

API Endpoint: <https://djblogscomputervision.cognitiveservices.azure.com>

2 Keys: Confidential information

Now our **Computer Vision** API ready to consume. We will consume it from WebApp.

Storage account

We will use Storage account as database to save uploaded images from our WebApp. I am using storage account **djblogsstorageaccount** to save images. If you want to learn more about please take a look into this [What is Azure Storage Account](#).

I am using already created storage account **djblogsstorageaccount** to save images in blob. Need follow steps to create block inside storage account.

1. Go to azure portal <https://portal.azure.com>
2. Once we login in portal you need to select the **djblogsstorageaccount** storage account.

Microsoft Azure

Search resources, services, and docs (G+/)

Home > **djblogsstorageaccount** Storage account

Search (Ctrl+/) 1. Open in Explorer Move Refresh Delete Feedback

Overview

Activity log

Tags

Diagnose and solve problems

Access Control (IAM)

Data transfer

Storage Explorer (preview)

Settings

Access keys

Geo-replication

CORS

Configuration

Encryption

Classic alerts in Azure Monitor is announced to retire in 2021, it is recommended that you upgrade your classic alert rules to retain alerting functionality with the new ARM storage accounts. [See Continue alerting with ARM storage accounts.](#)

Essentials

Resource group (change) : DJBlogs

Status : Primary: Available

Location : Central US

Subscription (change) : Visual Studio Enterprise

Subscription ID : d9c34c8c-c1d5-4ea8-99c8-aa13e8d48355

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

Performance : Standard

Replication : Locally-redundant storage (LRS)

Account kind : Storage (general purpose v1)

2. Containers Scalable, cost-effective storage for unstructured data [Learn more](#)

File shares Serverless SMB and NFS file shares [Learn more](#)

Tables Tabular data storage [Learn more](#)

3. Now we add new **images** container inside blob containers to save images inside it.

Home > **djblogsstorageaccount** Storage account

djblogsstorageaccount | Containers

Search (Ctrl+/) + Container Change access level Restore containers Refresh Delete

Search containers by prefix

Name	Last modified
------	---------------

New container

Name * 1. images ✓

Public access level ⓘ 2. Container (anonymous read access for containers and blobs) ✓

Blobs within the container can be read by anonymous request, but container data is not available. Anonymous clients cannot enumerate the blobs within the container.

Advanced

3. Create Discard

Web App

As you know, we will create WebApp that will consume **Computer Vision** API. I had explained it in previous blog. How we can create WebApp. If you want to learn it in detail, please take a look into [Create Web App](#). Creating WebApp for upload image and display image information. Follow below steps to create it.

1. Go to azure portal <https://portal.azure.com>
2. Once we login in portal then need to create WebApp. It will open below form as below

portal.azure.com/#create/Microsoft.WebSite

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

Home > DJBlogs > New > Web App >

Create Web App

Subscription * ⓘ 1. [Redacted]

Resource Group * ⓘ 2. DJBlogs
[Create new](#)

Instance Details

Name * 3. djblogsvisionapp ✓
.azurewebsites.net

Publish * 4. ☒ Code ☐ Docker Container

Runtime stack * 5. .NET Core 3.1 (LTS)

Operating System * 6. ☐ Linux ☒ Windows

Region * 7. Central US
[Not finding your App Service Plan? Try a different region.](#)

App Service Plan

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app.
[Learn more](#) ⓘ

Windows Plan (Central US) * ⓘ 8. DJBlogsAppPlan (F1)
[Create new](#)

9. [Review + create](#) < Previous Next : Monitoring >

3. Once we click on **Create**, it will create WebApp. Then we will download WebApp publisher from azure portal and publish directly from visual studio.

Microsoft Azure

Search resources, services, and docs (G+)

Home > **djblogsvisionapp** App Service

Search (Ctrl+/)

Download publisher from azure portal and publish directly from visual studio

Get publish profile

Click here to access our Quickstart guide for deploying code to your app →

Essentials

Resource group (change) : DJBlogs

Status : Running

Location : Central US

Subscription (change) : [REDACTED]

Subscription ID : [REDACTED]

Tags (change) : Click here to add tags

URL : **https://djblogsvisionapp.azurewebsites.net**

App Service Plan : **DJBlogsAppPlan (F1: Free)**

FTP/deployment username : No FTP/deployment user set

FTP hostname : ftp://waws-prod-dm1-109.ftp.azurewebsites.windows.r

FTPS hostname : ftps://waws-prod-dm1-109.ftp.azurewebsites.windows.r

Diagnose and solve problems

Application Insights

App Service Advisor

WebApp URL: <https://djblogsvisionapp.azurewebsites.net>

- We will create .net core MVC application which will use both **Storage Account** and **Computer Vision**. We will store this information in **WebApp** configuration **Application settings** section. It will look like as below in azure portal.

Microsoft Azure

Search resources, services, and docs (G+)

Home > **djblogsvisionapp** App Service

Configuration

Search (Ctrl+/)

Refresh

Save

Discard

Click here to upgrade to a higher SKU and enable additional features.

Name	Value	Source
ANCM_ADDITIONAL_ERROR_PAGE_LINK	Hidden value. Click to show value	App Config
APPINSIGHTS_INSTRUMENTATIONKEY	Hidden value. Click to show value	App Config
APPLICATIONINSIGHTS_CONNECTION_STRING	Hidden value. Click to show value	App Config
ApplicationInsightsAgent_EXTENSION_VERSION	Hidden value. Click to show value	App Config
CloudBlobAccountName	Hidden value. Click to show value	App Config
CloudBlobContainer	Hidden value. Click to show value	App Config
CloudBlobKey	Hidden value. Click to show value	App Config
Endpoint	Hidden value. Click to show value	App Config
Key	Hidden value. Click to show value	App Config
XDT_MicrosoftApplicationInsights_Mode	Hidden value. Click to show value	App Config

- These **Application settings** consumed as **Environment Variable** in our C# code.

```

namespace WebApp.Utility
{
    6 references
    public class AppConstant
    {
        public static string CloudBlobContainer = Environment.GetEnvironmentVariable("CloudBlobContainer");
        public static string CloudBlobAccountName = Environment.GetEnvironmentVariable("CloudBlobAccountName");
        public static string CloudBlobKey = Environment.GetEnvironmentVariable("CloudBlobKey");
        public static string CloudBlobContainerURL = string.Format("https://{0}.blob.core.windows.net/{1}", CloudBlobAccountName, CloudBlobContainer);

        public static string Key = Environment.GetEnvironmentVariable("Key");
        public static string Endpoint = Environment.GetEnvironmentVariable("Endpoint");
    }
}

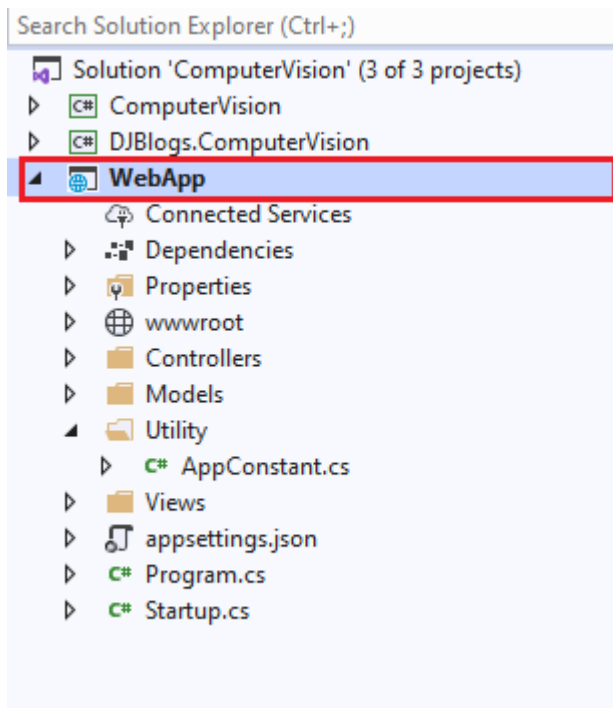
```

Blob container

Computer Vision API

6. In our code, I have created 3 projects inside one solution
 - a. DJBlogs.ComputerVision (C# class library for Computer Vision API)
 - b. ComputerVision (Console Application to test class library)
 - c. WebApp (MVC .NET core application)

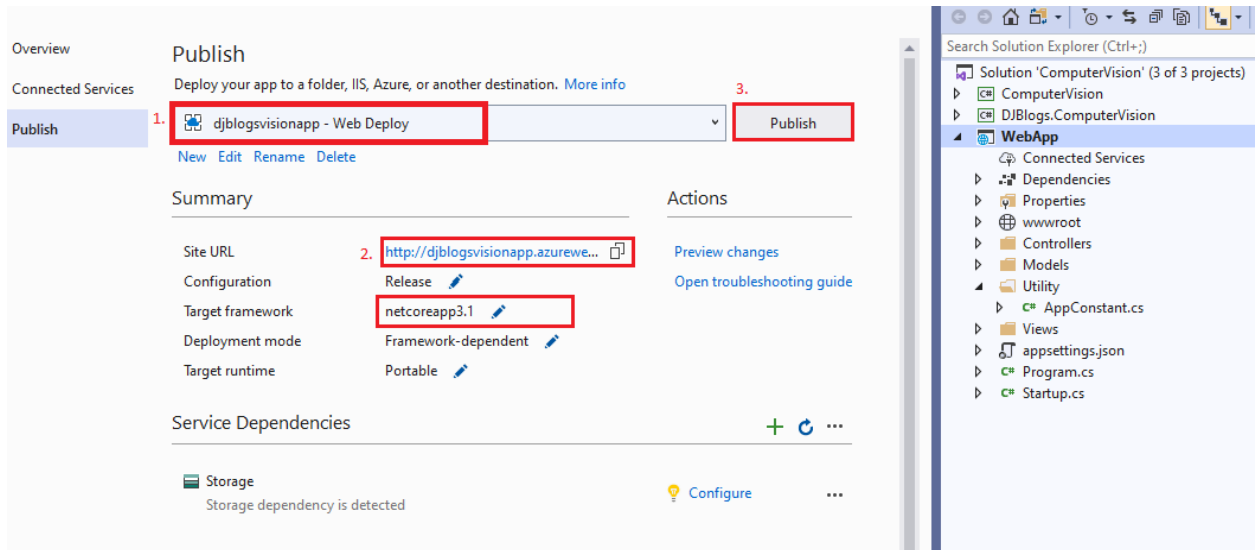
I have used "Microsoft.Azure.CognitiveServices.Vision.ComputerVision" NuGet to call vision API.



GitHub Code: <https://github.com/deepakjoshiinfo/DJBlogs.ComputerVision.App>

You can download code from GitHub.

4. Once all set we will publish our code in Azure WebApp with help of publisher profile as below



Application URL: <https://djblogsvisionapp.azurewebsites.net/>

- Once application deployed on azure you will see all the images stored in **Blob Storage** account



- If you want to upload new image you need to click on Upload link. You need to choose the image from your local machine

WebApp 1. Upload

Upload Image

Upload one or more files using this form:

2. Choose Files nike.png
3. Upload

7. Once you click on upload button it will uploaded in blob storage. Then you need to click in image it will display all information.

WebApp Upload

Click on image it will show all image information




man.jpg



nike.png

8. Once we will above man image it will show all information as below

Image Analysis



Summary
a man with his arms crossed with confidence 48.2 %

Categories
others_ with confidence 0.781 %
people_ with confidence 83.594 %

Brands
No brand logo found in image

Celebrities
No brand logo found in image

Landmarks
No landmark found in image

Tags
man with confidence 99.501 %
person with confidence 98.887 %
clothing with confidence 90.718 %

Objects
person with confidence 61.4 % at location(19, 155, 26, 222)

Faces
Male of age 30 at location (45, 45, 92, 92)

You can try it by uploading your images which you want to analyze.

URL: <https://djblogsvisionapp.azurewebsites.net/>

Hope you have got little idea about Azure Cognitive Services. This demo application helps you to understand computer vision services developed by Microsoft for image analysis.

Keep learning, keep sharing. Cheers

Where we can use?

Computer Vision can power many digital asset management (DAM) scenarios. DAM is the business process of organizing, storing, and retrieving rich media assets and managing digital rights and permissions.

GitHub

<https://github.com/Azure-Samples/cognitive-services-dotnet-sdk-samples>

URL: <https://www.customvision.ai/>

<https://westus.dev.cognitive.microsoft.com/docs/services/56f91f2d778daf23d8ec6739/operations/56f91f2e778daf14a499e1fa>

<https://westus.dev.cognitive.microsoft.com/docs/services/5adf991815e1060e6355ad44/operations/56f91f2e778daf14a499e1fa>

Introduction to Azure Logic Apps by Microsoft

<https://www.youtube.com/watch?v=aFRYCPdOxeM>

Hope it will help you to understand logic apps and how you can use them.

Keep sharing keep learning