

Cognitive Services

Build smarter, more engaging experiences with knowledge & intelligence services from Microsoft.

What are Azure Cognitive Services?

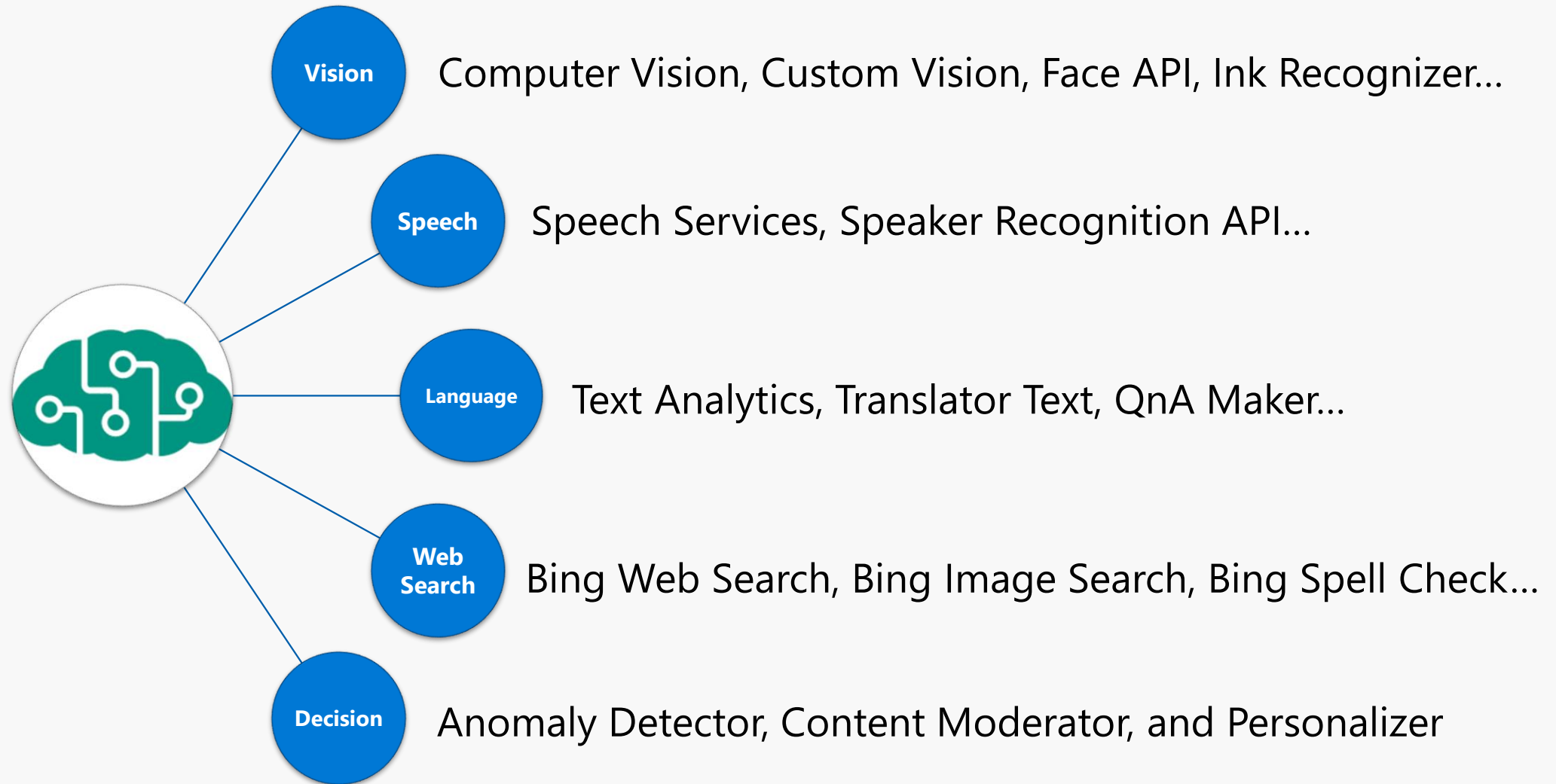
APIs, SDKs, and services

Build intelligent applications

No direct AI or data science skills or knowledge

The goal: To help developers create applications that can see, hear, speak, understand, and even begin to reason

The catalog of services



Why Microsoft Cognitive Services ?

Easy

Roll your own with REST APIs
Simple to add: just a few lines of code required



Flexible

Make the same API code call on iOS, Android, and Windows
Integrate into the language and platform of your choice








Tested

Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning
Quality documentation, sample code, and community support








Cognitive Services

microsoft.com/cognitive

 Vision	 Speech	 Language	 Knowledge	 Search
Computer Vision	Custom Recognition	Bing Spell Check	Academic Knowledge	Bing Web Search
Emotion	Speaker Recognition	Linguistic Analysis	Entity Linking	Bing Image Search
Face	Speech	Language Understanding	Knowledge Exploration	Bing Video Search
Video	Translator	Text Analytics	Recommendations	Bing News Search
		WebLM		Bing Autosuggest

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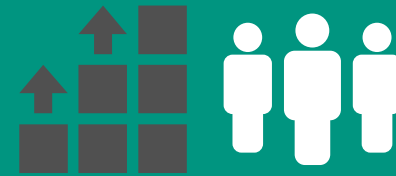
Bing

Bing beyond search in bing.com

Smarter, more
engaging experiences



Trusted by industry-
leading experiences



Introducing Bing Search API v5

Search API v5



Web Search



Image Search



Video Search



News Search



Autosuggest



Spell Check

Enhanced Search and Filtering Capabilities

Web-
Scale

Secure
(HTTPS)

High
Performance

REST

schema.org

JSON-LD 

Ongoing Improvements and Support

Web Search API

Get relevant web and answer results and metadata with one API call

<https://bingapis.azure-api.net/v5/search?q=nasa>

Web
Results

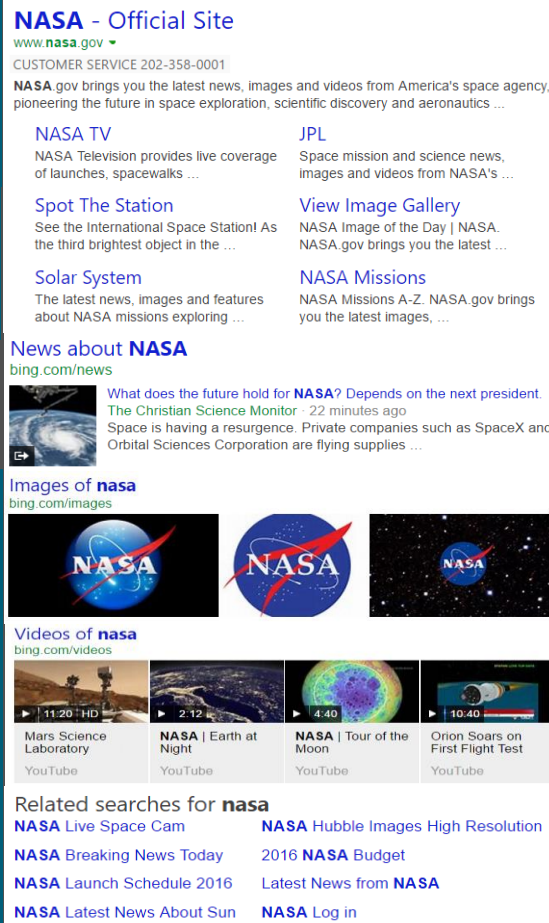
Deep
Links
(1st Algo)

News
Results

Image
Results

Video
Results

Related
Searches



The screenshot shows a Bing search results page for the query 'NASA'. It includes sections for the official NASA website, NASA TV, Spot The Station, Solar System, NASA Missions, News about NASA, Images of NASA, Videos of NASA, and Related searches for NASA. The results are organized into a grid-like layout with various links and images.



Search Response

```
{
  "_type": "SearchResponse",
  "queryContent": {...},
  "webPages": {...},
  "news": {...},
  "images": {...},
  "videos": {...},
  "relatedSearches": {...},
  "rankingResponse": {...}
}
```



Ranking Response

```
{
  "answerType": "WebPages",
  "resultIndex": 0, ...
},
{
  "answerType": "News",
  "resultIndex": 1, ...
}
```

*screenshots show actual search results on bing.com

Vertical Search APIs

Get more results, features and metadata tailored to each search vertical

Image Search API



source: nasa.gov

<https://bingapis.azure-api.net/v5/images/search?q=shuttle+launch>

- Enhanced metadata and filters (size, license, style, freshness, color)
- Image insights (entity recognition, visually similar)

Video Search API

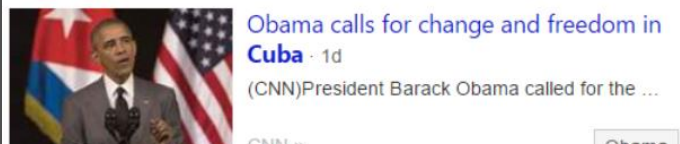


source: youtube.com

<https://bingapis.azure-api.net/v5/videos/search?q=viral+videos>

- Enhanced metadata and filters (price, resolution, length, freshness)
- Motion thumbnails (video preview)

News Search API



source: cnn.com

<https://bingapis.azure-api.net/v5/news/search?q=cuba>

- News by category/market, and trending news
- Rich article metadata (featured entities)

*screenshots show actual search results in bing.com

Accessing the APIs

1. Obtain API subscription key from microsoft.com/cognitive
2. Call REST endpoint, and pass API key via special header

```
GET https://bingapis.azure-api.net/v5/search?q=nasa HTTP/1.1  
OCP-Apim-Subscription-Key: <API KEY>
```

LUIS + Computer Vision

Language Understanding Models



"News about
flight delays"

```
{
  "entities": [
    {
      "entity": "flight_delays",
      "type": "Topic"
    }
  ],
  "intents": [
    {
      "intent": "FindNews",
      "score": 0.99853384
    },
    {
      "intent": "None",
      "score": 0.07289317
    },
    {
      "intent": "ReadNews",
      "score": 0.0167122427
    },
    {
      "intent": "ShareNews",
      "score": 1.0919299E-06
    }
  ]
}
```

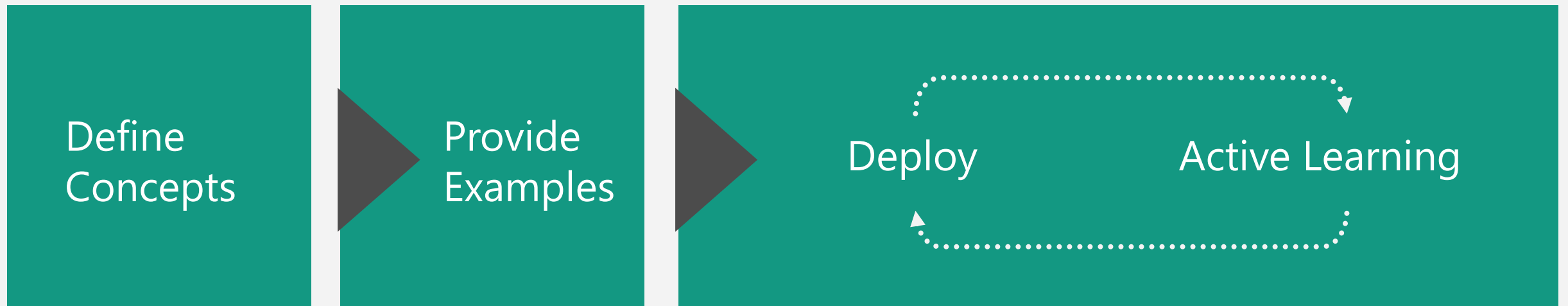
Language Understanding Models

Reduce labeling effort with interactive featurizing

Seamless integration to Speech API

Deploy using just a few examples with active learning

Supports 5 languages (English, Chinese, Italian, French, Spanish)



Updated Computer Vision API



Content of Image:

Categories

```
v0: [{ "name": "animal", "score": 0.9765625 }]
V1: [{ "name": "grass", "confidence": 0.9999992847442627 },
{ "name": "outdoor", "confidence": 0.9999072551727295 },
{ "name": "cow", "confidence": 0.99954754114151 },
{ "name": "field", "confidence": 0.9976195693016052 },
{ "name": "brown", "confidence": 0.988935649394989 },
{ "name": "animal", "confidence": 0.97904372215271 },
{ "name": "standing", "confidence": 0.9632768630981445 },
{ "name": "mammal", "confidence": 0.9366017580032349,
"hint": "animal" },
{ "name": "wire", "confidence": 0.8946959376335144 },
{ "name": "green", "confidence": 0.8844101428985596 },
{ "name": "pasture", "confidence": 0.8332059383392334 },
{ "name": "bovine", "confidence": 0.5618471503257751,
"hint": "animal" },
{ "name": "grassy", "confidence": 0.48627158999443054 },
{ "name": "lush", "confidence": 0.1874018907546997 },
{ "name": "staring", "confidence": 0.165890634059906 }]
```

Describe

```
0.975 "a brown cow standing on top of a lush green field"
0.974 "a cow standing on top of a lush green field"
0.965 "a large brown cow standing on top of a lush green field"
```


Translator

Translator API

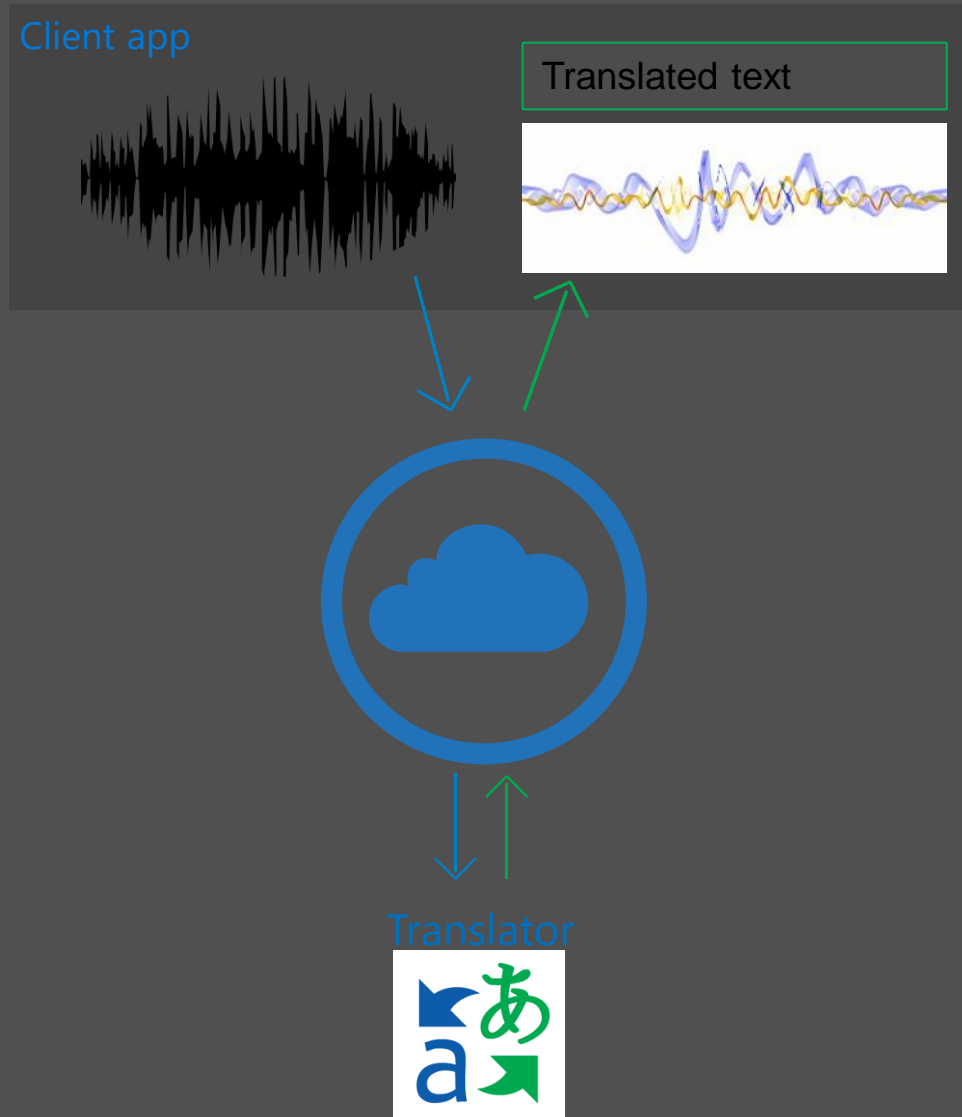
NEW:

- Translate speech

Not NEW – but still very useful:

- Translate text between 50 languages, any to any
- Highly customizable translation
 - Collaborative methods for engaging the community to improve translation
 - Self-service custom training, using your previously translated documents
- AJAX, REST and SOAP interface
- Methods:
 - Translate, Detect, Speak, AddTranslation, GetTranslations, BreakSentences
 - Array variants of the above

Speech Translation Service



Automatic Speech Translation

Send voice

Receive translated text

Receive translated audio

Optimized for conversations

Human-to-human conversations,
not only simple utterances

Languages supported

Speech languages: 8

Text languages: 50+

Pay-per-second

\$12/hour, 2 hours free

New: Translate Speech – Close to real-time

- Provided as a WebSocket API
 - Send: Stream of audio in PCM encoding
 - Receive: Stream of
 - Text of the partial recognition
 - Translated text of the partial recognition
 - Final recognition *
 - Final translation
 - Optional: Audio of the final translation (PCM encoding)

** Final recognition triggered by 500ms silence*

Same technology as used in Skype Translator

Example of a speech translation method call

```
wss://dev.microsofttranslator.com/api/speech?from=en-US&to=de-DE&voice=de-DE-Katja&features=TextToSpeech,Partial&profanity=Strict
```

http headers:

Accept: application/json; version=4

Authorization: {ADM token}

- Translate from English to German
- Choose a specific female voice
- Return audio
- Return partial results (before 500ms silence)
- Apply strict profanity filtering

Speech API Application Flow

1. Setup to receive audio
2. Get an OAuth token
3. Connect to Microsoft Translator via a websocket
4. OnConnect; setup header, and begin sending audio
5. Receive Messages, parse JSON to get Recognized Text and Translated Text
6. Receive Audio data in chunks
7. Play audio and display the text
8. Disconnect websocket when session is complete

Create a Cognitive Services resource

Multi-service resource (named **Cognitive Services**):

Access multiple Azure Cognitive Services with a single key and endpoint.

Consolidates billing from the services you use.

Single-service resource:

Access a single Azure Cognitive Service with a unique key and endpoint for each service created.

Use the free tier to try out the service.

Cmdlets:

`Get-AzCognitiveServicesAccountType`, `Get-AzCognitiveServicesAccountSku`, and `New-AzCognitiveServicesAccount`

Authentication

Each request to an Azure Cognitive Service must include an authentication header

Authenticate with:

A single-service subscription key

A multi-service subscription key

A token

Azure Active Directory (AAD)

Use `Ocp-Apim-Subscription-Key` header to authenticate with a subscription key for a specific service or a multi-service subscription key