

Microsoft ML Stack

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Agenda

- Intro to Azure
- Intro to Microsoft AI Platforms
- Intro to Turn Key AI
 - **Demo:** Custom Vision API
- Intro to Custom AI Technologies:
 - **Demo:** Azure ML Services – Solve MNIST problem with custom modeling (deep learning / Scikit-learn) and AutoML
- Q&A

Target Audience

- App Developers
- Data Scientists

Security & Management



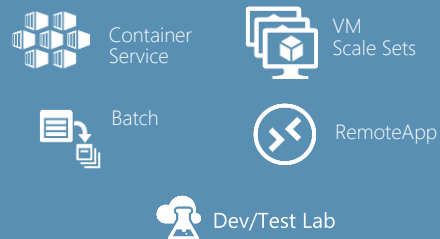
Media & CDN



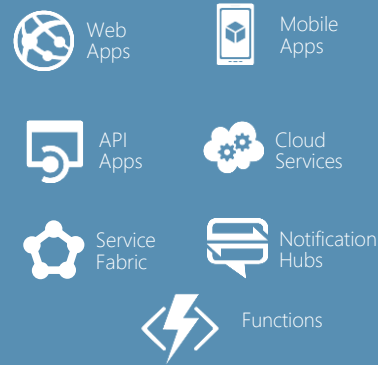
Integration



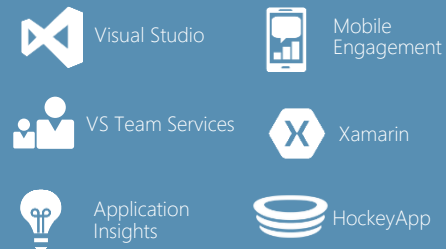
Compute Services



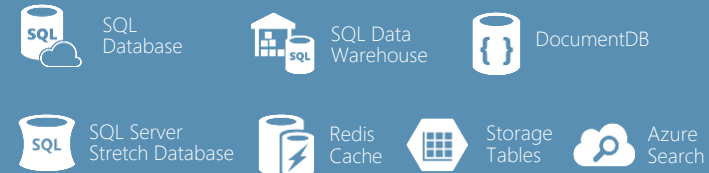
Application Platform



Developer Services



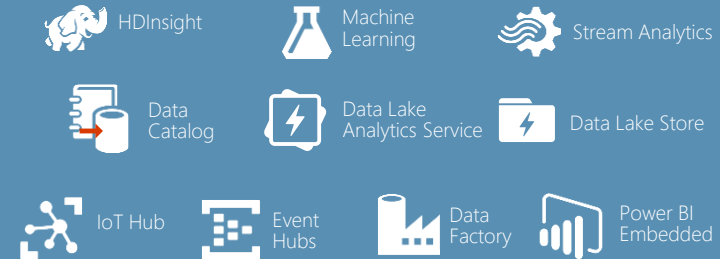
Data



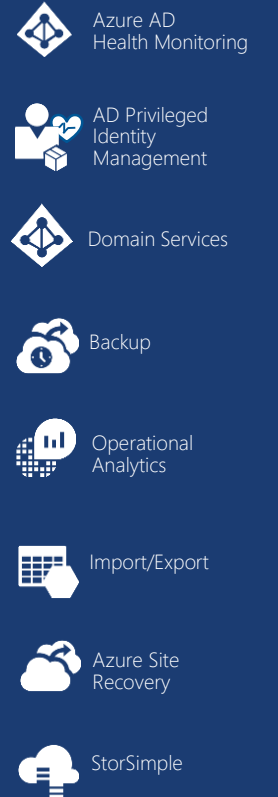
Intelligence



Analytics & IoT



Hybrid Cloud



Compute



Storage



Networking



Datacenter Infrastructure (54 Regions)



Microsoft  Linux



Machine Learning on Azure

Sophisticated pretrained models

To simplify solution development



Vision



Speech



Language



Search

Popular frameworks

To build advanced deep learning solutions



Pytorch



TensorFlow



Keras



Onnx

Productive services

To empower data science and development teams



Azure
Databricks



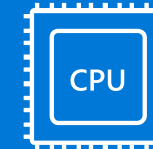
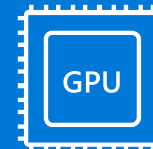
Azure
Machine Learning



Machine Learning
VMs

Powerful infrastructure

To accelerate deep learning



Flexible deployment

To deploy and manage models on intelligent cloud and edge



On-premises



Cloud



Edge

Intro to Turn-Key AI

Cognitive Services

Infuse your apps, websites, and bots with human-like intelligence



Vision

- Image Tagging, Thumbnails
- OCR, Handwriting recognition
- Face detection
- Emotion recognition
- Video insights - people detection, visual search, etc.
- Image and video moderation

Custom Vision Service



Speech

- Speech to text (Speech Transcription)
- Customized speech Transcription (complex word, noisy environment)
- Text to speech
- Speaker ID and authentication
- Real-time speech translation

Custom Speech Service



Language

- Contextual language understanding – customized intent analysis
- Sentiment analysis, key phrase detection
- text translation up to 60+ languages
- Text Moderation
- Spell checking

Language Understanding



Knowledge

- Customized decision making with reinforcement learning
- Q&A service and bot training with personality

Custom Decision Service



Search

- Visual Search with object detection
- Comprehensive news, image, and video results
- Customized search experiences
- Automatic search suggestions
- Entity information augmentation

Bing Custom Search

CUSTOMIZATION

Why Microsoft Cognitive Services?

Easy

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



Flexible

Integrate into the language and platform of your choice
Breadth of offerings helps you find the right API for your app
Bring your own data for your custom experience



Tested

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

GitHub

 **stackoverflow**

 **msdn**

uservoice 



Vision



Computer Vision API

Distill actionable information from images



Face API

Detect, identify, analyze, organize, and tag faces in photos



Emotion API

Personalize experiences with emotion recognition



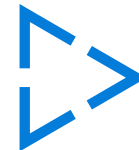
Content Moderator

Machine-assisted moderation of text and images, augmented with human review tools



Custom Vision Service

Customizable web service that learns to recognize specific content in imagery



Video Indexer

Process and extract smart insights from videos



Vision

Image-processing algorithms to smartly identify, caption, and moderate your pictures





Speech



Translator Speech API

Easily conduct real-time speech translation with a simple REST API call



Bing Speech API

Convert speech to text and back again, and understand its intent



Speaker Recognition API

Give your app the ability to know who's talking



Custom Speech Service

Fine-tune speech recognition for anyone, anywhere

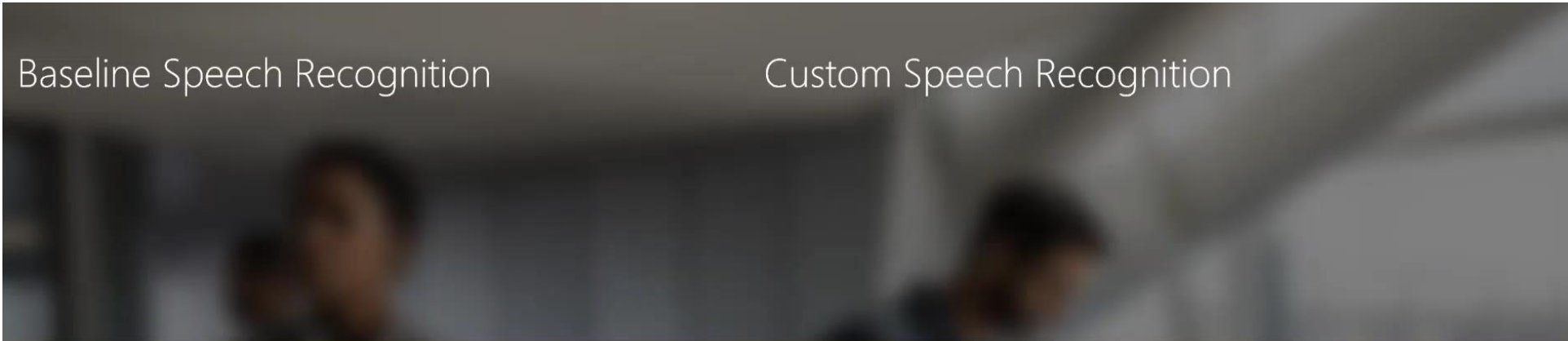


Speech

Convert spoken audio into text, use voice for verification, or add speaker recognition to your app

Baseline Speech Recognition

Custom Speech Recognition





Language



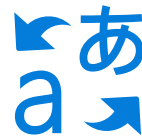
Text Analytics API

Detect sentiment, key phrases, topics, and language from your text



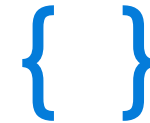
Bing Spell Check API

Detect and correct spelling mistakes within your app



Translator Text API

Easily conduct machine translation with a simple REST API call



Language Understanding Intelligent Service

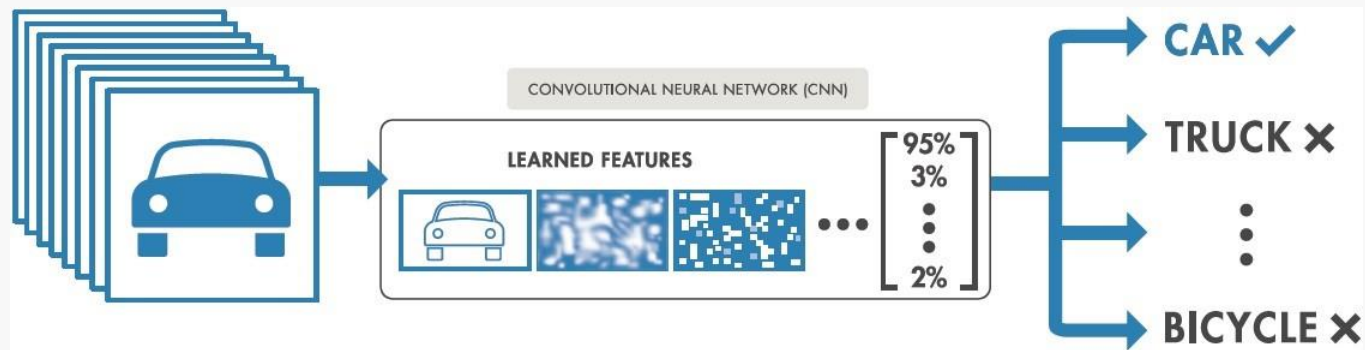
Teach your apps to understand commands from your users

Demo Computer Vision



Build Your Own Image Classifier

- Needs 10K-100K Per Class
- Requires Deep Learning expertise to train a quality model
- Weeks/months of tuning to reach quality models
- Hundreds of hours of training on expensive GPUs



Demo Custom Vision



Bing/Google for: Custom Vision with Python

Filter by title

Custom Vision Service
Documentation

> Overview

> Quickstarts

> Using the .NET SDK

> Using the Python SDK



Image classification

Object detection

> Using the Java SDK

> Using the Node.js SDK

Quickstart: Create an image classification project with the Custom Vision Python SDK

03/20/2019 • 4 minutes to read • Contributors      all

This article provides information and sample code to help you get started using the Custom Vision SDK with Python to build an image classification model. After it's created, you can add tags, upload images, train the project, obtain the project's published prediction endpoint URL, and use the endpoint to programmatically test an image. Use this example as a template for building your own Python application. If you

In this article

Prerequisites

[Install the Custom Vision SDK](#)

[Get the training and prediction keys](#)

[Get the sample images](#)

[Add the code](#)

[Run the application](#)

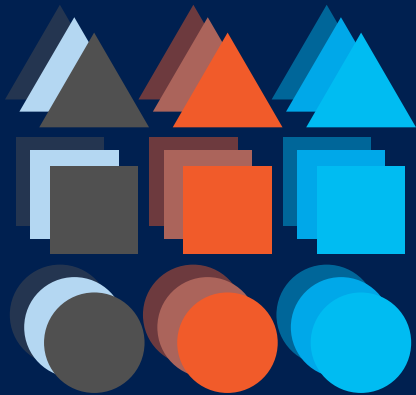
[Clean up resources](#)

Intro to Custom AI



Custom AI

Building your own AI models for Transforming Data into Intelligence



Prepare Data



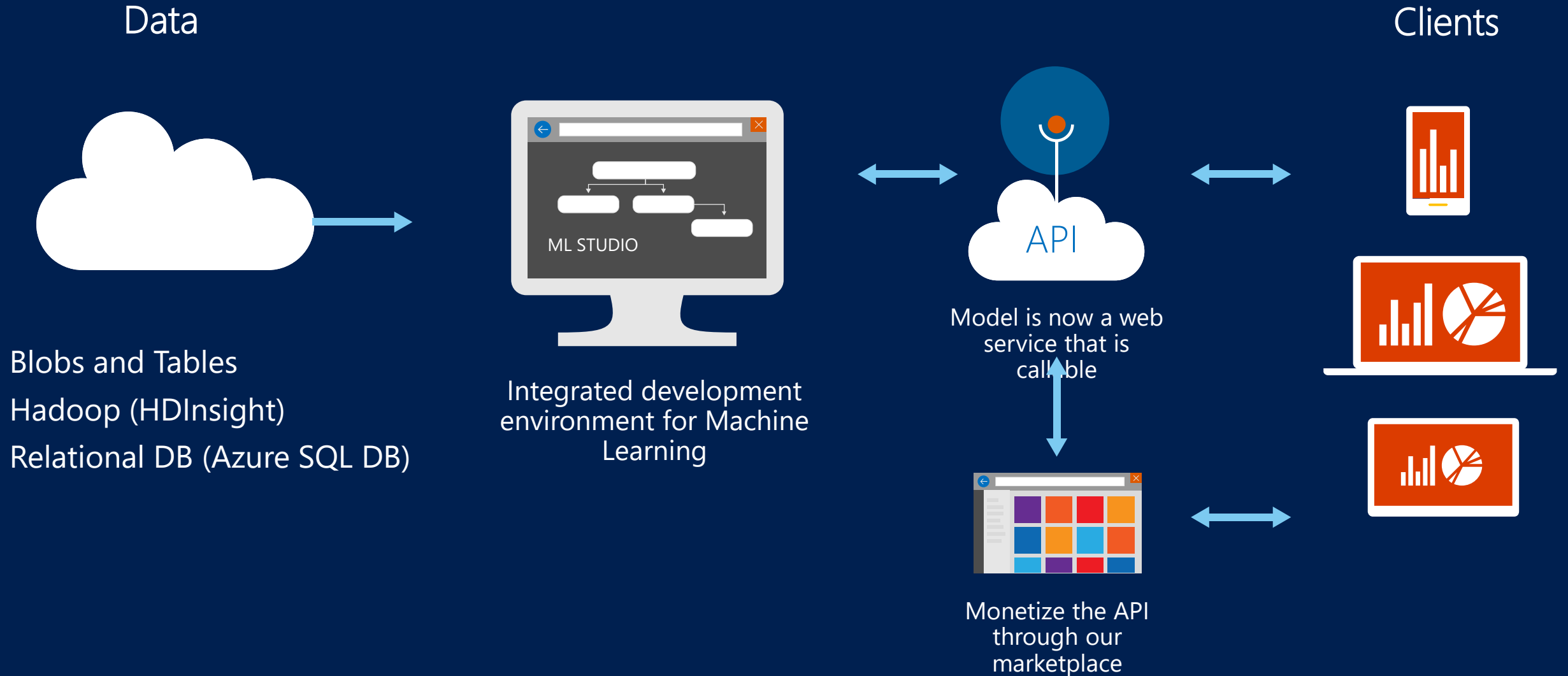
Build & Train



Deploy

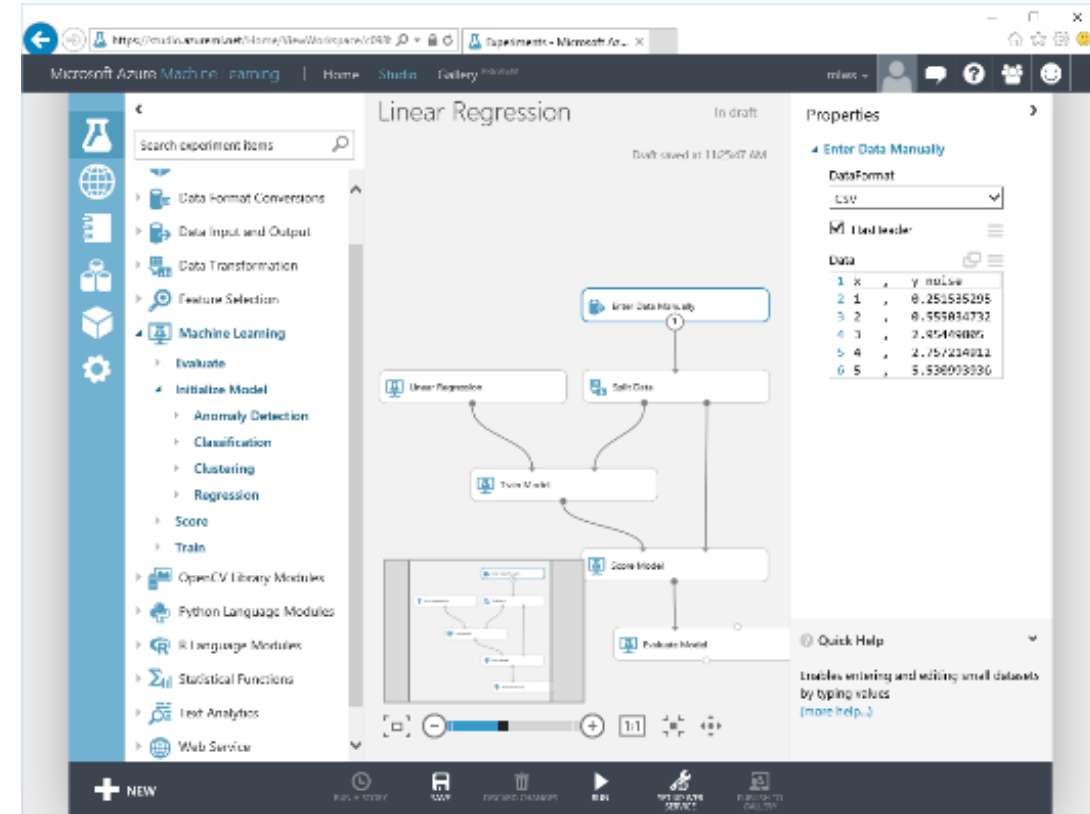
Azure Machine Learning Studio

Azure Machine Learning Studio



Microsoft Azure Machine Learning Studio

- Web based UI accessible from different browsers
- Share|collaborate to any other ML workspace
- Drag & Drop visual design|development
- Wide range of ML Algorithms catalog
- Extend with OSS R|Python scripts
- Share|Document with IPython|Jupyter
- Deploy|Publish|Scale rapidly (APIs)





Azure Machine Learning Services

Orchestrate Your Custom Model

ML Modeling Life Cycle

Prepare



Prepare
Data



Experiment



Build model
(your favorite
IDE)



Train & Test
Model



Register and
Manage Model



Build
Image



Deploy
Service
Monitor
Model

The team workspace - logical



Workspace



Experiment



Model



Compute



Image



Data Source



Deployment

1. Snapshot folder and
send to experiment



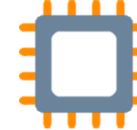
2. create docker image



Docker Image

3. Deploy docker
and snapshot to
compute

5. Launch script



Compute Target

4. Mount datastore
to compute

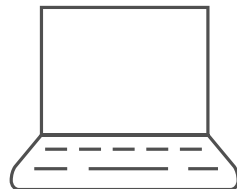


Data Store

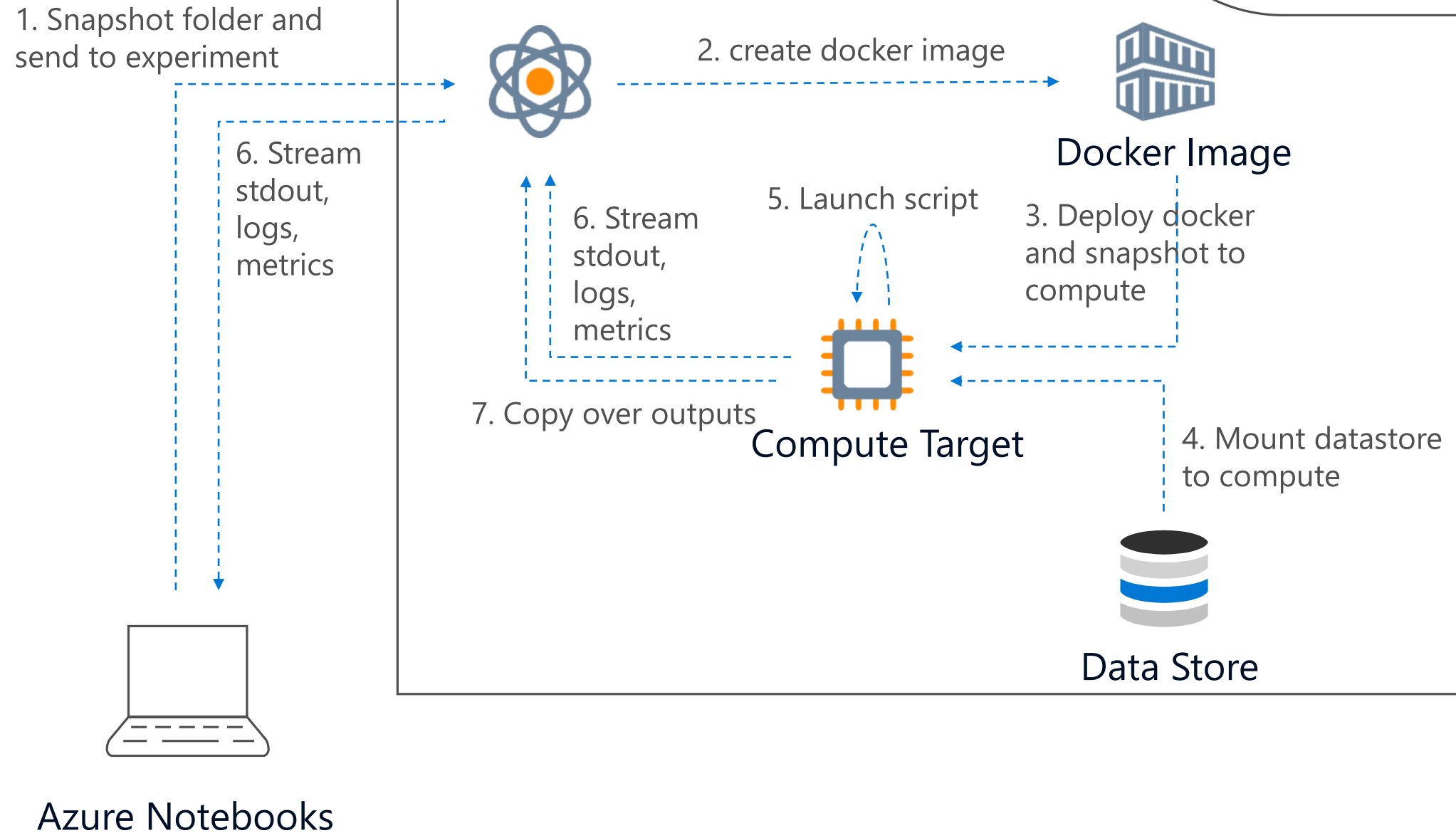
6. Stream
stdout,
logs,
metrics

7. Copy over outputs

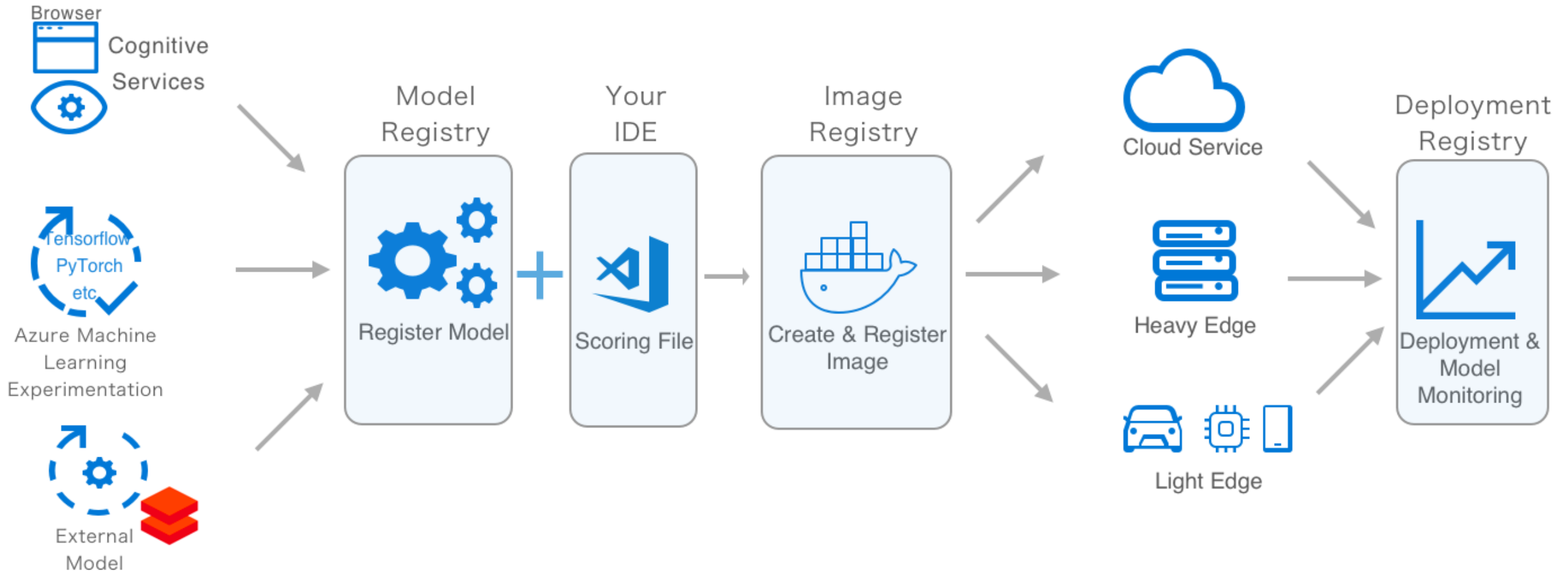
6. Stream
stdout,
logs,
metrics



Azure Notebooks



Full ML Pipeline with Focus on Deployment



Bing/Google for Azure Machine Learning Notebooks

Azure / MachineLearningNotebooks

Watch

94

Star

423

Fork

332

Code

Issues 91

Pull requests 17

Projects 0

Wiki

Insights

Use the example notebooks in this repo to explore the Azure Machine Learning service. <https://docs.microsoft.com/azure/mach...>

machine-learning

notebook

azure

deep-learning

data-science

342 commits

10 branches

11 releases

19 contributors

MIT

Branch: master

New pull request

Create new file

Upload files

Find File

Clone or download



rastala Merge pull request #287 from jeff-shepherd/master

Latest commit 4244a24 2 hours ago



Dockerfiles

1.0.21 dockerfile

9 days ago



contrib/RAPIDS

update RAPIDS 2

16 days ago



how-to-use-azureml

Added back automl_setup_linux.sh with correct line termination

16 hours ago



images

YT cover

6 months ago



sdk-license

license updates

4 months ago



sdk-preview-license

license updates

4 months ago



tutorials

version 1.0.21

9 days ago

Branch: master ▾



rastala Merge pull request #290 from rastala/master ...

Latest commit a956162 2 minutes ago

..

📁 automated-machine-learning	Added back automl_setup_linux.sh with correct line termination	16 hours ago
📁 azure-databricks	version 1.0.21	9 days ago
📁 deployment	update production deploy to aks	4 minutes ago
📁 explain-model	version 1.0.21	9 days ago
📁 machine-learning-pipelines	version 1.0.21	9 days ago
📁 manage-azureml-service/authentication...		
📁 training-with-deep-learning	version 1.0.17	a month ago
📁 training		
📄 README.md	version 1.0.17	a month ago

Thanks

