

IBM Cloud and Watson: **quick start intro**

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IBM Developer

What we'll cover

IBM Cloud

Cloud Compute, Services, IoT Platform, and DevOps

Node-RED

Rapid development environment for IoT and other apps

Watson APIs

API Services that apply AI to language, speech, and vision

Watson Studio

Workspace for data science, machine learning and models

IBM Cloud and Node-RED





Catalog

label:lite

Filter

Cloud Foundry

All Categories (52)

Compute (10) >

Containers (1)

Networking

Storage (1)

AI (14)

Analytics (4)

Databases (3)

Developer Tools (7)

Integration (2)

Internet of Things (1)

Security and Identity (3)

Starter Kits (2)

Web and Mobile (2)

Web and Application (2)



Liberty for Java™

Lite • IBM

Develop, deploy, and scale Java web apps with ease. IBM WebSphere Liberty Profile is a highly composable, ultra-fast, ultra-light profile of IBM



SDK for Node.js™

Lite • IBM

Develop, deploy, and scale server-side JavaScript® apps with ease. The IBM SDK for Node.js™ provides enhanced performance,



ASP.NET Core

Lite • IBM

Develop, deploy, and scale ASP.NET Core web apps with ease.



Runtime for Swift

Lite • IBM

A Kitura based server application that you can use as a starting point to get your own Kitura application up and running quickly on Bluemix.



XPages

Lite • IBM

Develop, deploy and scale IBM XPages applications with ease. The IBM XPages runtime provides you with a cloud-ready XPages web



Go

Lite • Community

Develop, deploy, and scale Go web apps with ease.



PHP

Lite • Community

Develop, deploy, and scale PHP web apps with ease.



Python

Lite • Community

Develop, deploy, and scale Python web apps with ease.



Ruby

Lite • Community

Develop, deploy, and scale Ruby web apps with ease.

FEEDBACK

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All Categories (52)

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Starter Kits (2) >

Web and Mobile (2)

Web and Application (2)

Starter Kits



Internet of Things Platform Starter

Lite • IBM

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With the Starter, you can quickly simulate an Internet



Node-RED Starter

Lite • Community

This application demonstrates how to run the Node-RED open-source project within IBM Cloud.

FEEDBACK

[View all](#)

Create a Cloud Foundry App

Lite • IBM

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With the Starter, you can quickly simulate an Internet of Things device, create cards, generate data, and begin analyzing and displaying data in the Watson IoT Platform dashboard.

[View Docs](#)

VERSION 0.7.0

TYPE Boilerplate

LOCATION Germany, United Kingdom,
US South**App name:**

myIoT-demo-application

Host name:

uniqueusername-TOR

Domain:

mybluemix.net

Choose a region/location to deploy in:

US South

Choose an organization:

timrosy

Choose a space:

dev

Selected Plan:**SDK for Node.js™**

Lite

Cloudant

Lite

Internet of Things Platform

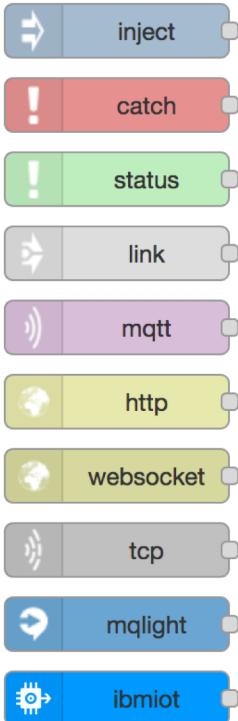
Need Help?

[Contact IBM Cloud Support](#)[Estimate Monthly Cost](#)[Cost Calculator](#)[Create](#)

FEEDBACK

filter nodes

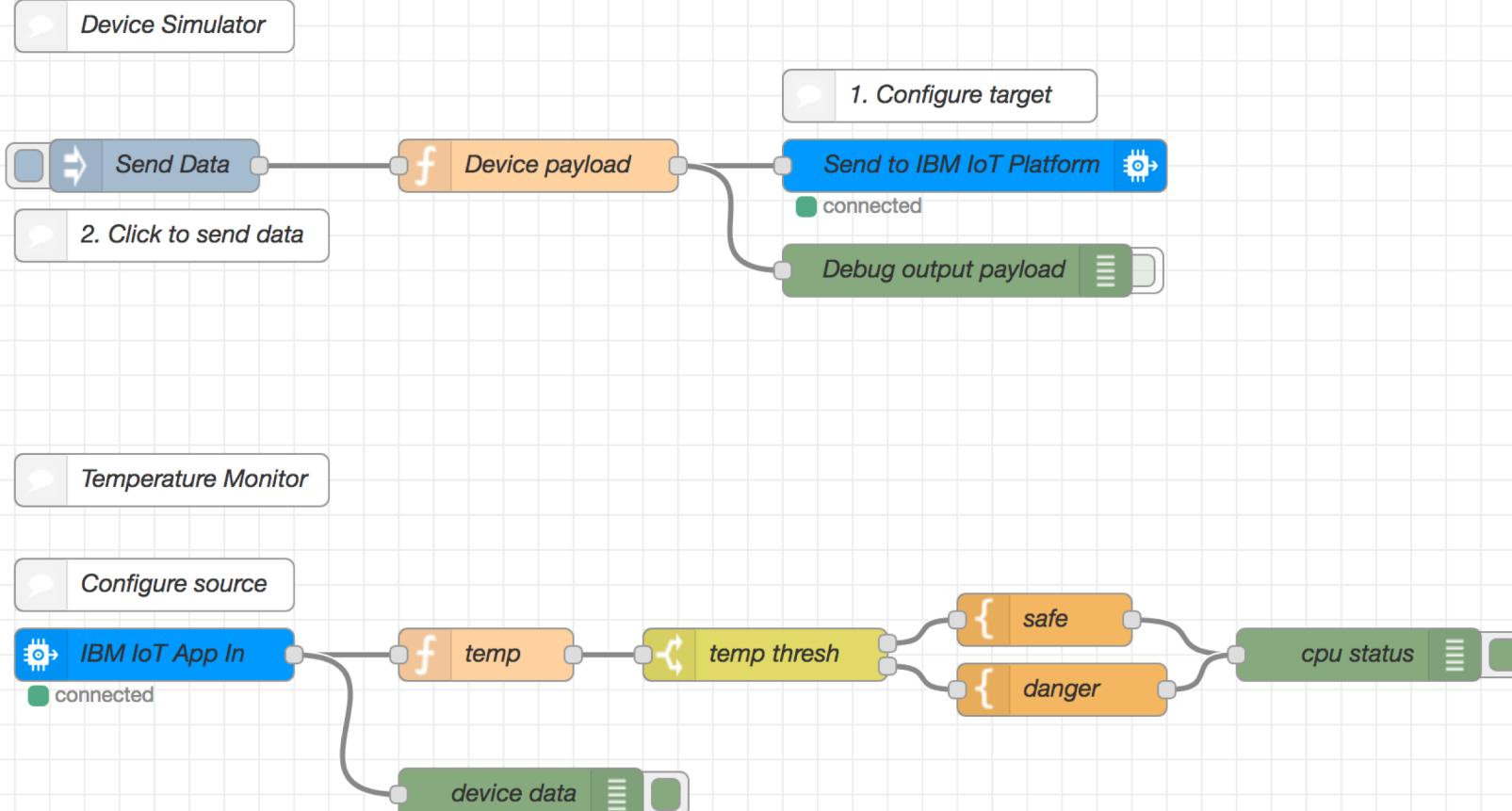
input



output



Flow 1



info

Information

Flow	"deb0d57.1c46528"
Name	Flow 1
Status	Enabled

Flow Description

None

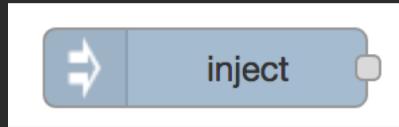


Show the Info tab with or the

Debug tab with

Inject Node

Input node



Edit inject node

[Delete](#)[Cancel](#)[Done](#)

node properties

Payload

true

true

false

Topic

Inject once after seconds, then

Repeat

none

Name

Send Data

Note: "interval between times" and "at a specific time" will use cron.
"interval" should be less than 596 hours.
See info box for details.

Switch Node

Function node



Edit switch node

Delete

Cancel

Done

node properties

Name

temp thresh

Property

msg. payload

\leq	a_z	40	$\rightarrow 1$
$>$	a_z	40	$\rightarrow 2$

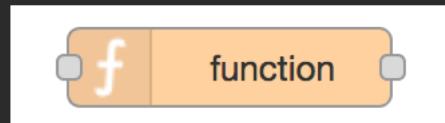
+ add

checking all rules

recreate message sequences

Function Node

Function node



Edit function node

Delete

Cancel

Done

node properties

Name

Device payload



Function

```
1 // Thermostat's location:  
2 var longitude1 = -98.49;  
3 var latitude1 = 29.42;  
4  
5 // Array of pseudo random temperatures  
6 var temp1 = [15,17,18.5,20,21.5,23,24,22.2,19,18  
7  
8 // Array of pseudo random relative humidities  
9 var humidity1 = [50,55,61,68,65,60,53,49,45,47];  
10  
11 // Counter to select from array.  
12 var counter1 = context.get('counter1')||0;  
13 counter1 = counter1+1;  
14 if(counter1 > 9) counter1 = 0;  
15 context.set('counter1',counter1);  
16  
17 // Create MQTT message in JSON
```

Outputs

1

See the Info tab for help writing functions.

Debug Node

Output node



Edit debug node

Delete

Cancel

Done

node properties

Output

msg. payload

To

debug window

system console

node status (32 characters)

Name

Debug output payload

Watson API

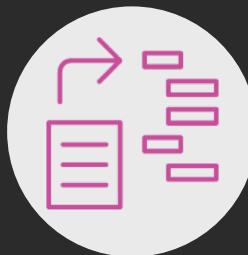


Watson Developer APIs

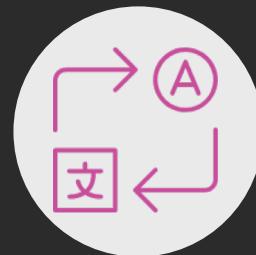
Language



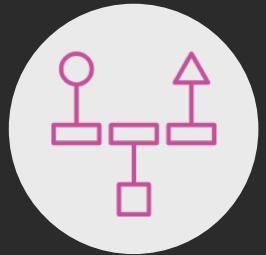
Assistant



Natural Language
Understanding



Language Translator



Natural Language
Classifier



Personality Insights



Tone Analyzer

Speech

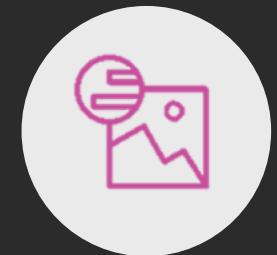


Speech to Text



Text to Speech

Vision



Visual Recognition

Data Insights



Discovery

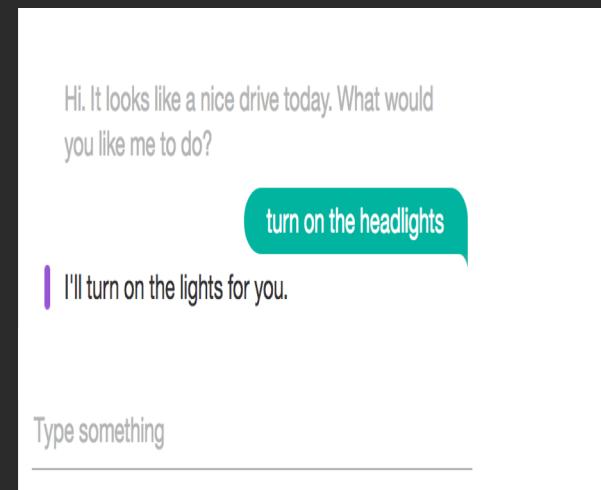
SDKs: <https://github.com/watson-developer-cloud>

Watson Assistant

Quickly build and deploy chatbots and virtual agents across a variety of channels, including mobile devices, messaging platforms, and even robots.

Sample Use Cases

- FAQ Chatbot
- Customer call center
- Conversational commerce



ibm.biz/demo-assistant

Watson understands

```
1 {
2   "intents": [
3     {
4       "intent": "turn_on",
5       "confidence": 0.9951137542724611
6     }
7   ],
8   "entities": [
9     {
10      "entity": "appliance",
11      "location": [
12        12,
13        22
14      ],
15      "value": "lights",
16      "confidence": 1
17    }
18 ],
19   "input": {
20     "text": "turn on the headlights"
21 },
22   "output": {
23     "text": [
24       "I'll turn on the lights for you."
25     ],
26     "nodes_visited": [
27       "Entry Point For On Off Commands",
28       "node_2_1467232480480",
29       "Appliance On Off Check"
30     ],
31     "action": {
32       "lights_on": ""
33     },
34     "log_messages": []
35   },
36   "context": {
37     "conversation_id": "bd7963ba-b395-4f1e-b37f-31af3dbe42ce",
38     "custom": {
39       "location": [
40         12,
41         22
42       ]
43     }
44   }
45 }
```

Natural Language Understanding

Text analysis through natural language processing. Analyze text to identify concepts, entities, keywords, sentiment, and more.

- Supports domain-specific models trained with Watson Knowledge Studio for entity and relationship extraction.

Sample Use Cases

- Content Recommendation
- Advertising Selection
- Data Mining

The screenshot shows a user interface for analyzing text. At the top, there's a purple 'Analyze' button. Below it is a row of buttons: Sentiment, Emotion, Keywords, Entities (which is highlighted in purple), Categories, Concept, and Semantic Roles. A text input field contains the instruction: 'Extract people, companies, organizations, cities, geographic features, and other information from the content.' To the right of this input is a 'JSON' dropdown menu. The main area displays a table of entities found in the text. The columns are 'Name', 'Type', and 'Score'. The entities listed are:

Name	Type	Score
Anza-Borrego Desert	GeographicFeature	0.84
Myrtle Botts	Person	0.83
Colorado Desert	GeographicFeature	0.58
Albert S. Evans	Person	0.51
Canebrake Canyon	GeographicFeature	0.46
Desert Dunes	GeographicFeature	0.44
Southern California	Location	0.41

<https://natural-language-understanding-demo.ng.bluemix.net/>

Tone Analyzer

Use linguistic analysis to detect joy, fear, sadness, anger, analytical, confident and tentative tones found in text.

Sample Use Cases

- Monitor Call Center Engagement
- Social Listening
- Conversation escalation

The screenshot displays the Tone Analyzer interface. At the top, under 'Document-level', several tone categories are listed: Anger (selected), Fear (selected), Joy (unchecked), Sadness (unchecked), Analytical (unchecked), Confident (unchecked), and Tentative (unchecked). Below this, under 'Sentence-level', a descriptive text explains how to identify sentences with stronger tones in context or sorted by score. It highlights that if more than one tone is present, the stronger one is shown. A 'Tones' sidebar lists Analytical, Anger (selected), Confident, Fear, and Tentative. To the right, an 'In context' section shows a list of sentences related to a product named '#ThisPhone'. The sentences are color-coded based on their tone strength: light gray for 'None', orange for '.5 - .75', and red for '>.75'. The red sentences include: 'I hate these new features On #ThisPhone after the update.', 'I hate #ThisPhoneCompany products, you'd have to torture me to get me to use #ThisPhone.', 'The emojis in #ThisPhone are stupid.', '#ThisPhone is a useless, stupid waste of money.', '#ThisPhone is the worst phone I've ever had - ever 😞.', and '#ThisPhone another ripoff, lost all respect SHAME.'.

ibm.biz/demo-tone-analyzer

Text to Speech

Understand text and natural language to generate synthesized audio output complete with appropriate cadence and intonation. It is available in 13 voices across 7 languages.

- Supports custom voice model to define pronunciations.

Sample Use Cases

- Home Automation
- Content Narration
- Speech enabled chat-bots

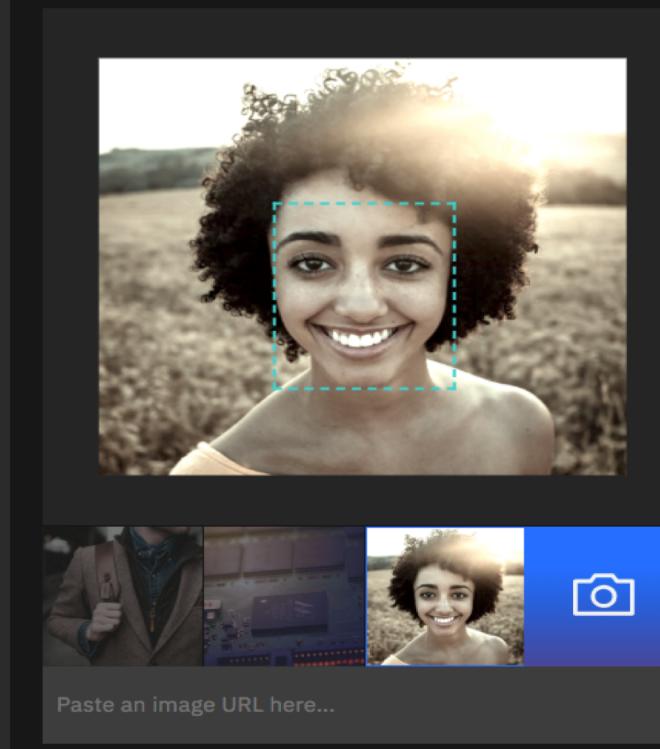
American English (en-US): Allison (female, expressive, transformable) ▾

Text	Expressive SSML	Voice Transformation SSML
		Hello! I'm Allison, but you can change my voice however you wish. <voice-transformation type="Custom" glottal_tension="-80%"> For example, you can make my voice a bit softer, </voice-transformation> <voice-transformation type="Custom" glottal_tension="40%" breathiness="40%"> or a bit strained. </voice-transformation><voice-transformation type="Custom" timbre="Breeze" timbre_extent="60%"> You can alter my voice timbre making me sound like this person, </voice-transformation> <voice-transformation type="Custom" timbre="Sunrise"> or like another person in your different applications. </voice-transformation> <voice-transformation type="Custom" breathiness="90%"> You can make my voice more breathy than it is normally. </voice-transformation><voice-transformation type="Young" strength="80%"> I can speak like a young girl. </voice-transformation><voice-transformation type="Custom" pitch="-30%" pitch_range="80%" rate="60%" glottal_tension="-80%" timbre="Sunrise"> And you can combine all this with modifications of my speech rate and my tone. </voice-transformation>

ibm.biz/demo-text-to-speech

Visual Recognition

Uses deep learning algorithms to analyze images that can give you insights into your visual content. You can organize image libraries, understand an individual image, recognize food, detect faces, and create custom classifiers for specific results that are tailored to your needs.



The screenshot shows the Watson Visual Recognition interface. At the top, there is a large image of a woman with curly hair smiling. A blue dashed rectangular box highlights her face. Below the main image, there are three smaller thumbnail images: a person in a jacket, a computer screen with a dashboard, and the same woman's face again. To the right of these thumbnails is a blue camera icon. At the bottom of the interface, there is a text input field with the placeholder "Paste an image URL here..." and a "Get Started" button.

General Model

Quickly understand objects, actions, scenes, and colors within an image.

gray color	0.75
person	0.75
coal black color	0.74
afro hair style	0.70
spit curl hairstyle	0.56
pompadour hairstyle	0.50

Face Model

Locate faces within an image and assess gender and age.

Face 1

age 19-22	0.93
FEMALE	1.00

ibm.biz/demo-visual-recognition

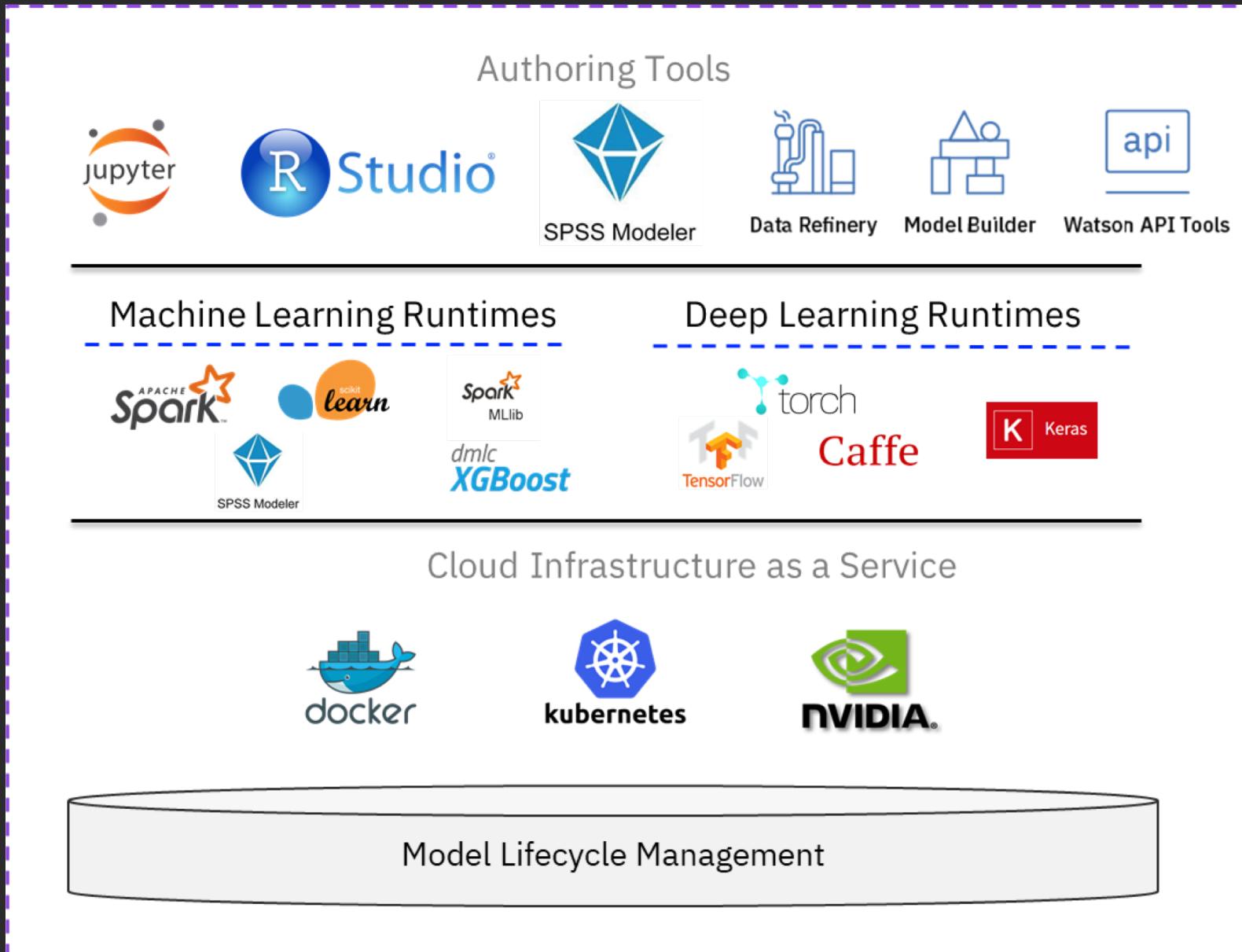
Sample Use Cases

- Visual Inspection
- Social Media Listening
- Resource Identification

Watson Studio



Tools for supporting the end-to-end AI workflow



Start using Watson Studio

Sign up for IBM Cloud:

<https://www.ibm.com/cloud/>

and Watson Studio:

<https://dataplatform.cloud.ibm.com/>

Create a new Project

Create services in Settings tab

Machine Learning service is needed for deployment

The screenshot shows the 'Associated services' section with a table header: NAME, SERVICE TYPE, PLAN, and ACTION. A message below the table says 'you currently have no associated services'. In the ACTION column, there is a dropdown menu with the option '+ Add service' highlighted. Below this is the 'Access tokens' section with a similar table structure and a message 'you currently have no access tokens'.

The screenshot shows the 'New project' dialog box. At the top, it says 'Select a project tile to get the right tools and services for your work. You can add additional tools later as the needs of your project grow. All projects include data storage.' Below this are nine project tiles arranged in a grid:

- Basic**: Want to start simple? Upload data in your project and add tools later.
- Data Science** (selected): Analyze data to discover insights and share your findings with others.
- Visual Recognition**: Tag and classify visual content using the Watson Visual Recognition service.
- Deep Learning**: Build neural networks and deploy deep learning models.
- Modeler**: Build modeler flows to train SPSS and Spark models or design deep neural networks.
- Business Analytics**: Create visual dashboards from your data to gain insights faster.
- Streams Designer**: Ingest, analyze, monitor, and correlate data as it arrives from real-time data sources.
- Data Engineering**: Combine, cleanse, analyze, and shape data using Data Refinery.
- Complete**: Want to explore every corner of Watson Studio? See every tool in one project.

At the bottom right of the dialog are 'Cancel' and 'OK' buttons.

Create a Jupyter notebook in Watson Studio

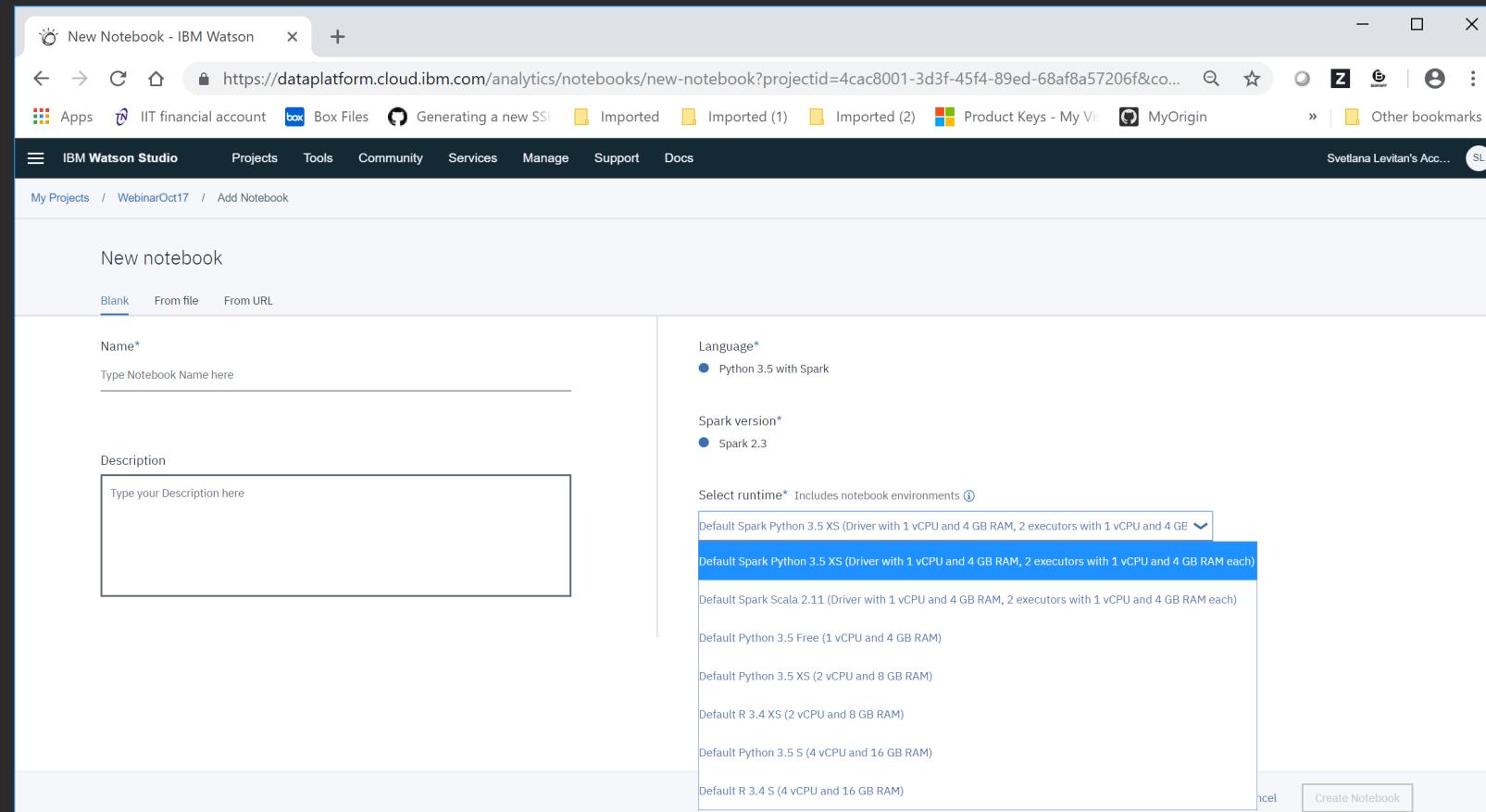
Create a notebook in Assets tab:

Scroll down to Notebooks, click
“+ New notebook” on the right side

Give a name, select
Spark Python runtime,
then click “Create”

Load data for analysis into the
project, then into the notebook:
creditcard.csv

Example from:
<https://github.com/IBM/xgboost-smote-detect-fraud>



Analyze Credit Card Fraud Data with Traditional ML

```
print(df.groupby('Class').size())
Class
0  56772
1   102

#Random under-sampling of cases with 0 target:
sample = df[df['Class']==0]
fraud = df[df['Class'] == 1]
ignore_me, sample = train_test_split(sample, test_size = 0.1)
sample = pd.concat([sample, fraud])

# Split into train and test units.
xtrain, xtest = train_test_split(sample, test_size = 0.3)
ytrain = xtrain['Class']
ytest = xtest['Class']
xtrain.drop('Class', 1, inplace = True)
xtest.drop('Class', 1, inplace = True)
```

Analyze Credit Card Fraud Data with Traditional ML (cont.)

Use XGBoost algorithm:

```
from xgboost.sklearn import XGBClassifier

# Create the XGB classifier, xgb_model.
xgb_model = XGBClassifier()
clf = xgb_model.fit(xtrain, ytrain, eval_metric=['error'], eval_set=[((xtrain,
ytrain)),(xtest, ytest)])  
  
#Export the model in PMML for easier deployment
from sklearn_pandas import DataFrameMapper
default_mapper = DataFrameMapper([(i, None) for i in df.feature_names + ['Class']])  
  
from sklearn2pmml import sklearn2pmml
sklearn2pmml(estimator=clf, mapper=default_mapper, pmml="MyPmml.xml")
```

Deploy the Model or pipeline into Watson Machine Learning

In Project view

“+ New Watson Machine Learning model”,
Give a name, select “From File”

The screenshot shows the 'New model' dialog in IBM Watson Studio. On the left, under 'Define model details', there is a 'Name' field with 'Model name' typed in, and a 'Description' field with 'Model description'. On the right, under 'Select model type', the 'From file' radio button is selected. Below it is a dashed box with the placeholder text 'Drop PMML model file (.xml) here or browse your files to add a new file'. At the bottom right of the dialog are 'Cancel' and 'Create' buttons.

The screenshot shows the 'PMMI Scorer' configuration page in IBM Watson. The top navigation bar includes 'My Projects / New First project / PMMI Scorer'. The main content area has tabs for 'Overview' (which is selected), 'Evaluation', 'Deployments', and 'Lineage'. The 'Overview' tab displays a 'Summary' section with the following details:

Machine learning service	pm-20-dx
Model Type	pmmi-4.3
Runtime environment	java-1.8
Training date	11 Sep 2018, 4:24 PM
Label column	Species
Latest version	fc1f4805-58e0-4130-a91f-8f1cbd3f0e50

Below the summary is an 'Input Schema' table:

COLUMN	TYPE
Sepal.Length	double
Sepal.Width	double
Petal.Length	double
Petal.Width	double

Scoring PMML in Watson Machine Learning

The screenshot shows the 'Implementation' tab of the 'DeployIrisTree' project in the IBM Watson interface. It includes:

- Scoring End-point:** https://us-south.ml.cloud.ibm.com/v3/wml_instances/cc4030b4-b416-4803-8fb5-0da79fc84b14/deployments/4fa4556f-fadb-4e67-a3be-9b237610edef/online
- Authorization:** Bearer <token> (Note: See code snippets below for information on how to retrieve the WML Authorization Token to be passed with scoring requests.)
- Content-type:** application/json (Required if the request body is sent in JSON format.)
- Code Snippets:** A Python code snippet for making a scoring request to the WML instance.

The screenshot shows the 'Test' tab of the 'DeployIrisTree' project in the IBM Watson interface. It includes:

- Enter input data:** Fields for Sepal.Length (4), Sepal.Width (4), Petal.Length (4), and Petal.Width (4). To the right, a JSON representation of the input data is shown:

```
{  
  "fields": [  
    "PredictedValue",  
    "Probability",  
    "Probability",  
    "Probability"  
  ],  
  "values": [  
    {  
      "virginica":  
      0,  
      0.021739130434782608,  
      0.9782608695652174  
    }  
  ]  
}
```

- Predict:** A button to submit the input data for prediction.

Watson Video Recognition example

- + New Visual Recognition model
- Associate a service (Lite is free)
- Upload labeled data, click “Train”

Once training completes,
get instructions for embedding the classifier

The screenshot shows the Watson Studio interface with the following sections:

- My Projects / WebinarOct17**: The current project selected.
- Launch IDE**: A button to start the development environment.
- Add to project**: A button to add files or services to the project.
- Models**:
 - Natural Language Classifier models**: A section with a button to "New Natural Language Classifier model". It displays a message: "You don't have any Natural Language Classifier models yet."
 - Visual Recognition models**: A section with a button to "New Visual Recognition model". It displays a message: "You don't have any Visual Recognition models yet."
 - Watson Machine Learning models**: A section with a button to "New Watson Machine Learning model". It displays a message: "You don't have any Watson Machine Learning models yet."
- Notebooks**:
 - A table showing one notebook entry: "Fraud Detection" (Shared: No, Scheduled: No, Status: Pending, Language: Python 3.5 With Spark, Last Editor: Svetlana Levitan, Last Modified: 16 Oct 2018). Actions column includes edit and more options.
- Streams flows**: A table showing no streams flows.

On the right side, there is a sidebar with tabs: Load, Files, Catalog. A "Drop files here or browse for files to upload" area is also present.

More Information

FirstNet Chicago Slack

#ibm-cloud

IBM Developer

ibm.com/developer

Hack Microsite

ibm.biz/firstnetChicago-hackinfo

