Neural Network Modeler using Watson Studio

Created By:

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Outline

- Watson Studio
- Use of IBM Cloud Object Store (COS)
- Python Notebook in Watson Studio
- Neural Network Modeler (NNM)
- Design your deep learning model in NNM – Sentiment Classification
- Train your deep learning model
- Download the trained model
- Design your deep learning model in NNM – Image Object Classification

Requirement

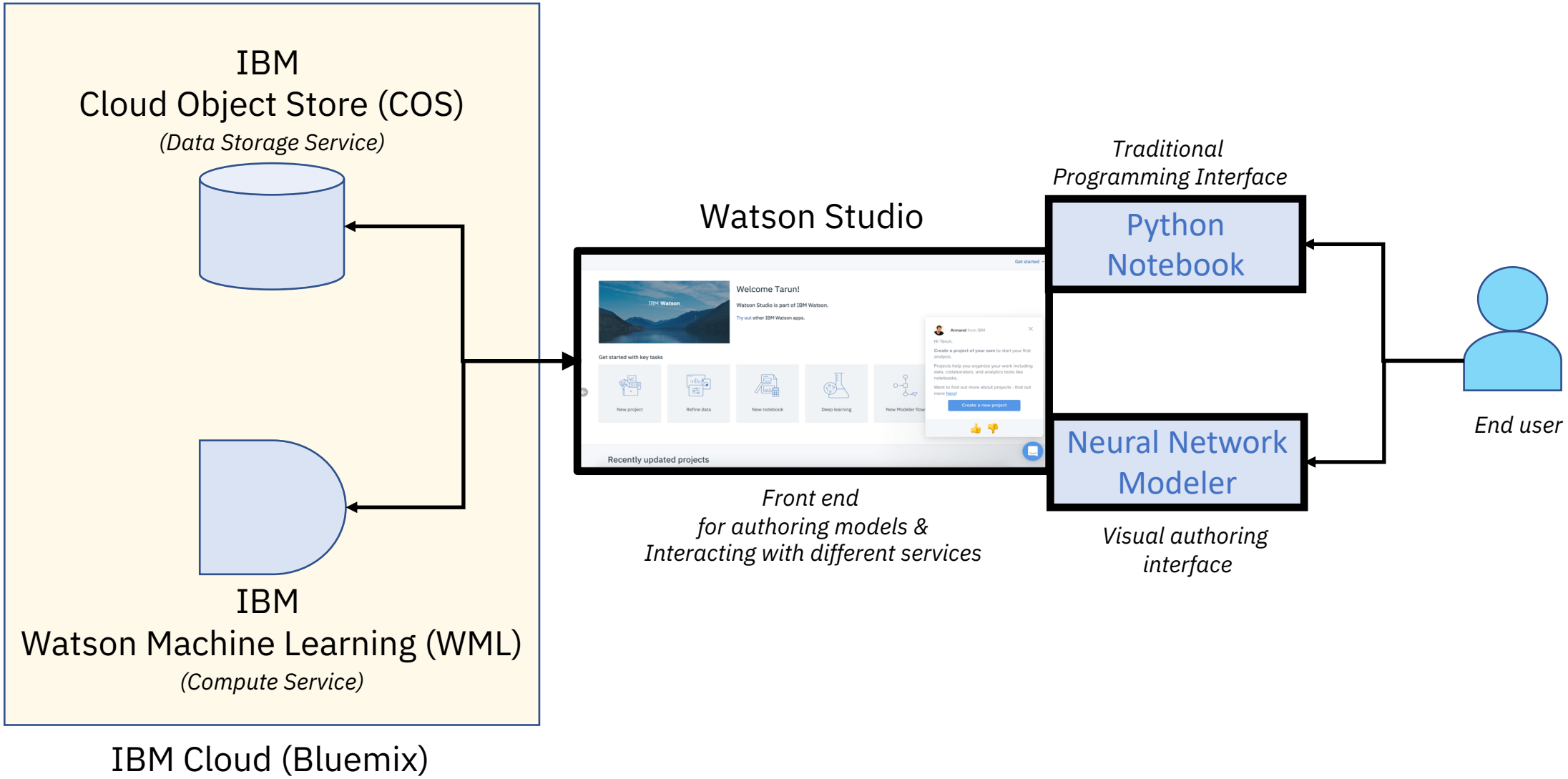
- IBM Cloud Account
  - http://console.bluemix.com/

- IBM Watson Studio / Data Science Experience Account
  - http://datascience.ibm.com/

- Tutorial Dataset
  - https://ibm.box.com/v/nnm-technopulse

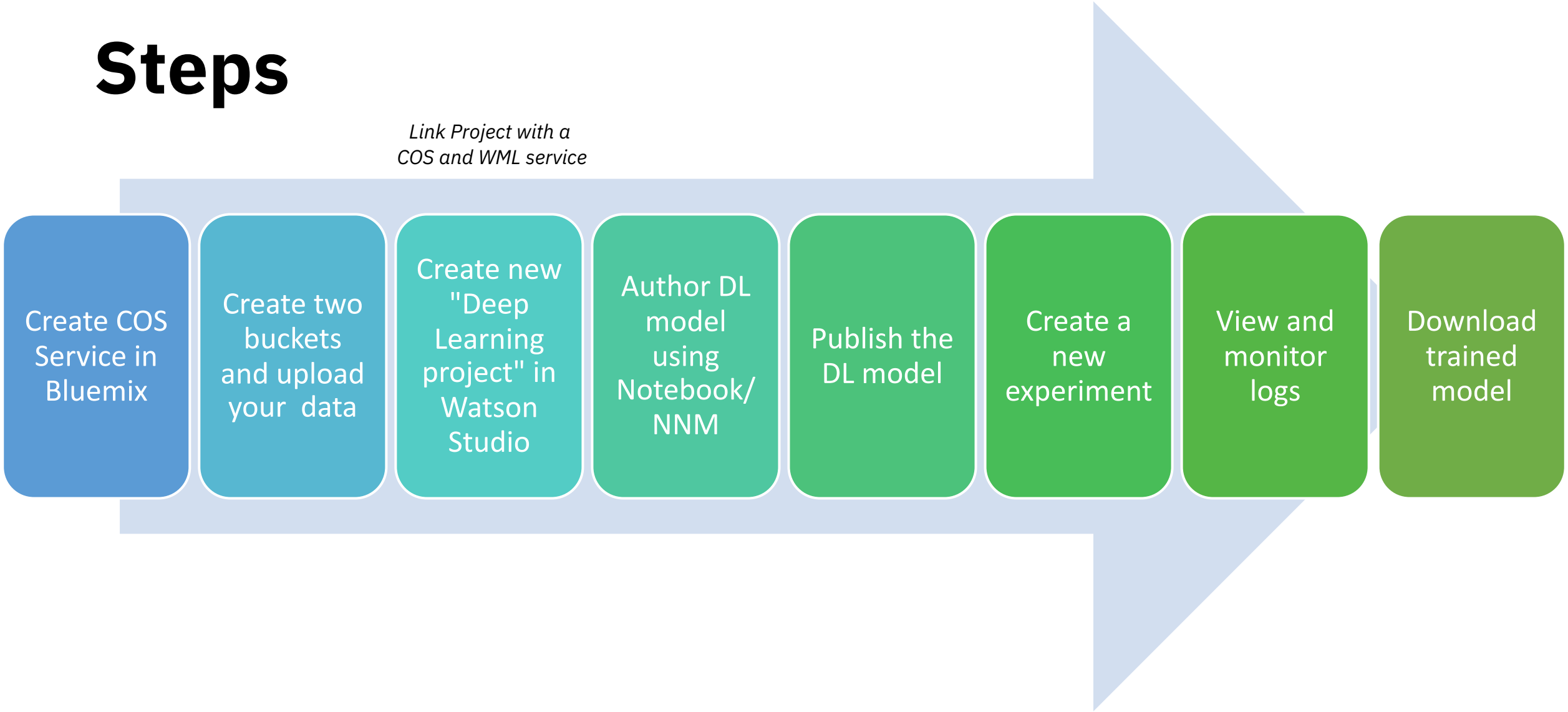
*** **Note**: Watson Studio offers additional features and ML services that are not covered as a part of this tutorial*

Overview



Steps

Link Project with a COS and WML service



Let’s see it in action …

Layers Implemented in NNM

- **Input**
  - Image Data
  - Text Data
- **Core**
  - Dense
  - Concat
  - Dropout
  - Eltwise
  - Flatten
  - Reshape
- **Text**
  - Embedding
  - Simple RNN
  - LSTM
  - GRU
- **Convolution**
  - Conv2D
  - Pool2D
- **Activation**
  - ReLU
  - Sigmoid
  - Softmax
  - TanH
  - BNLL
  - AbsVal
  - Power
- **Loss**
  - Sigmoid Cross Entropy
  - Euclidean
  - Hinge
  - InfoGain
- **Normalization**
  - BatchNorm
  - LRN
- **Metric**
  - Accuracy
  - Argmax

Data Formats for NNM

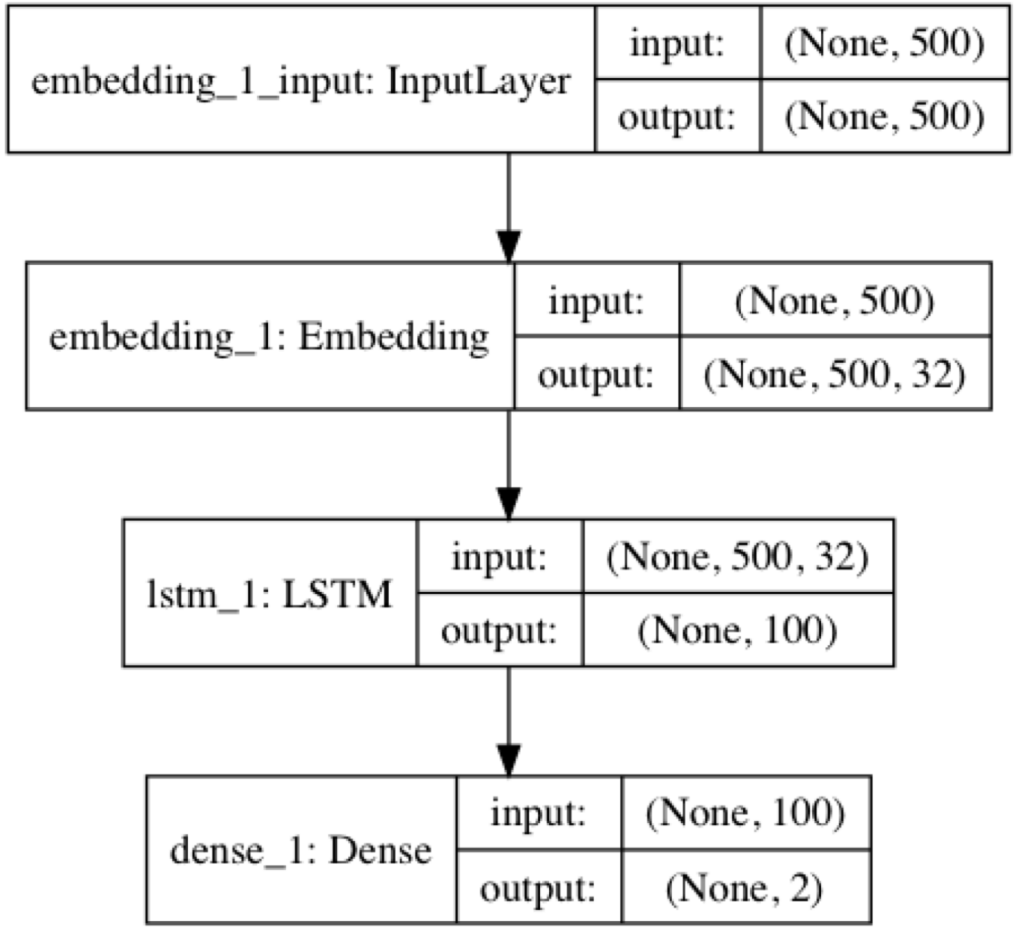
Image Data

- Supported formats:
  - Python Pickle
  - Zip/ archive
  - LMDB/ LevelDB
- Structure:
  - numImage x imgH x imgW x channles

Text Data

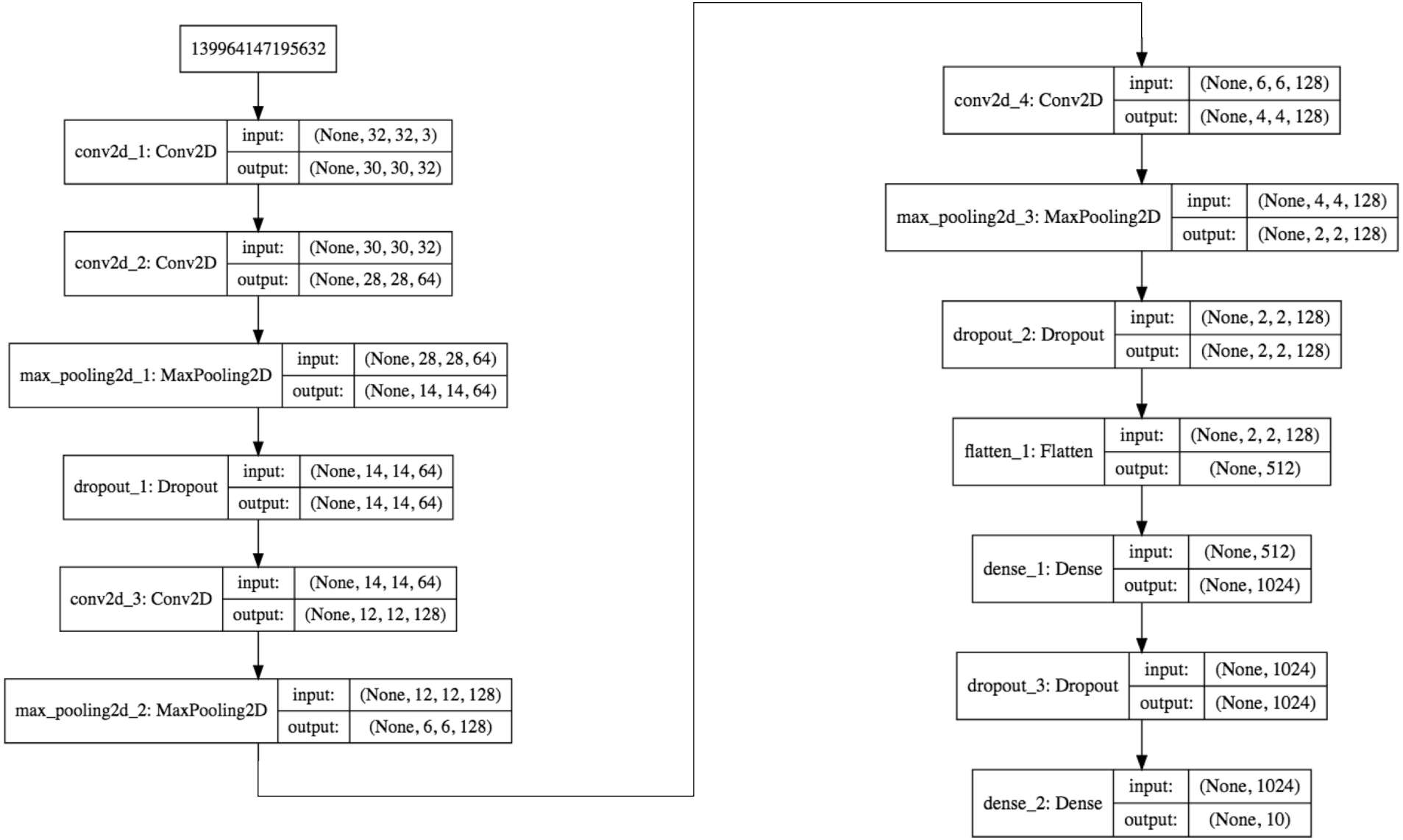
- Supported formats:
  - Txt
  - CSV
- Structure for lang modelling:
  - Each sentence containing a list of words
- Structure for classification:
  - Each sentence containing a list of words followed by a class label

Sentiment Classification in Text



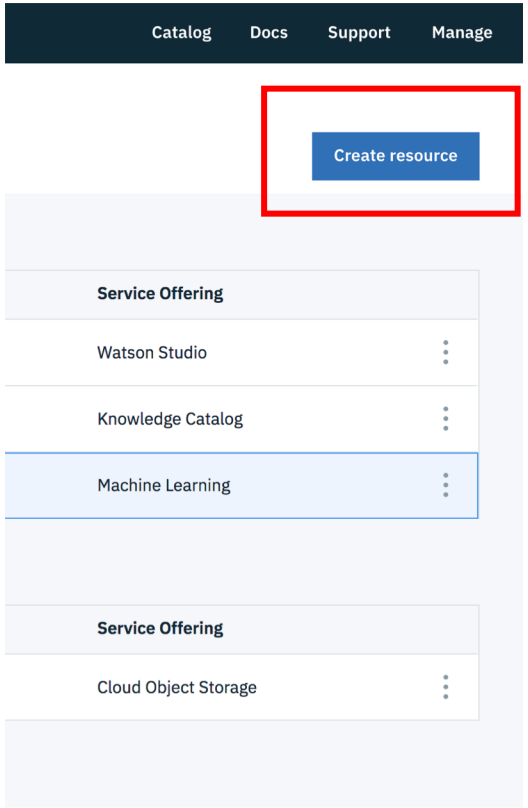
Kaggle Competition: https://www.kaggle.com/ngyptr/lstm-sentiment-analysis-keras

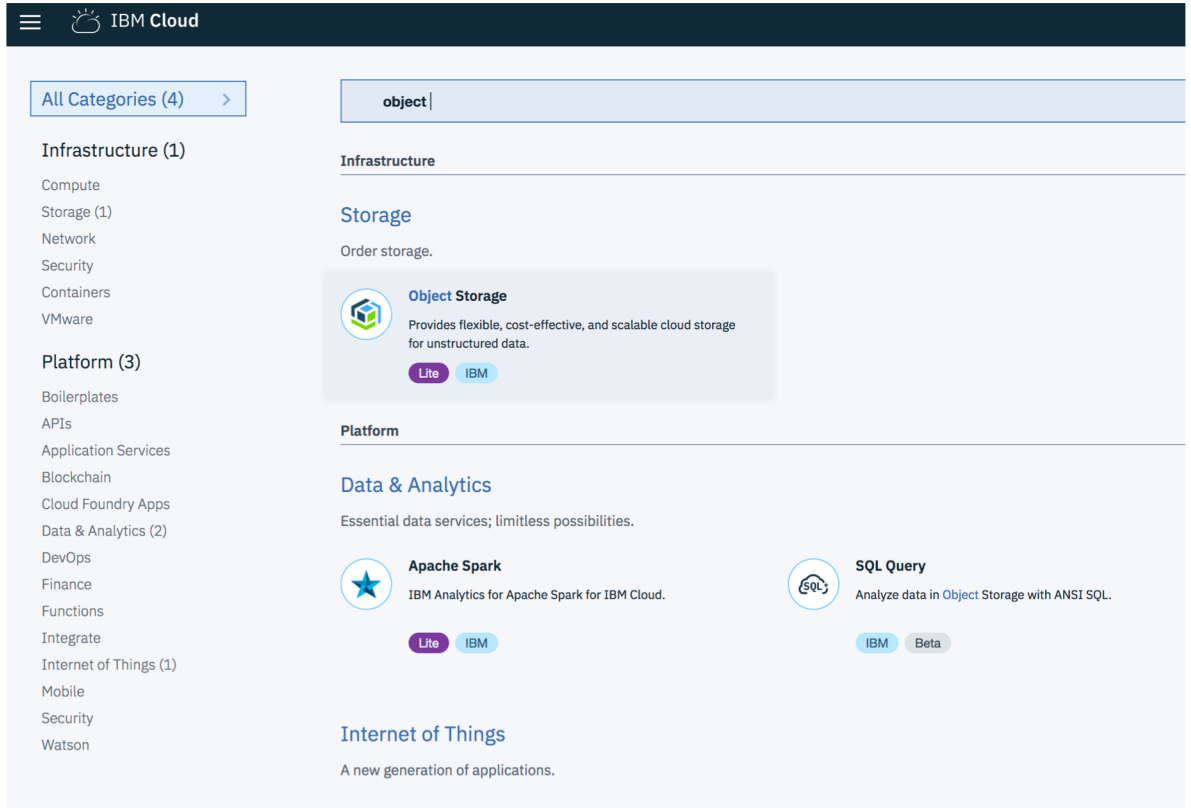
Object Classification in Images



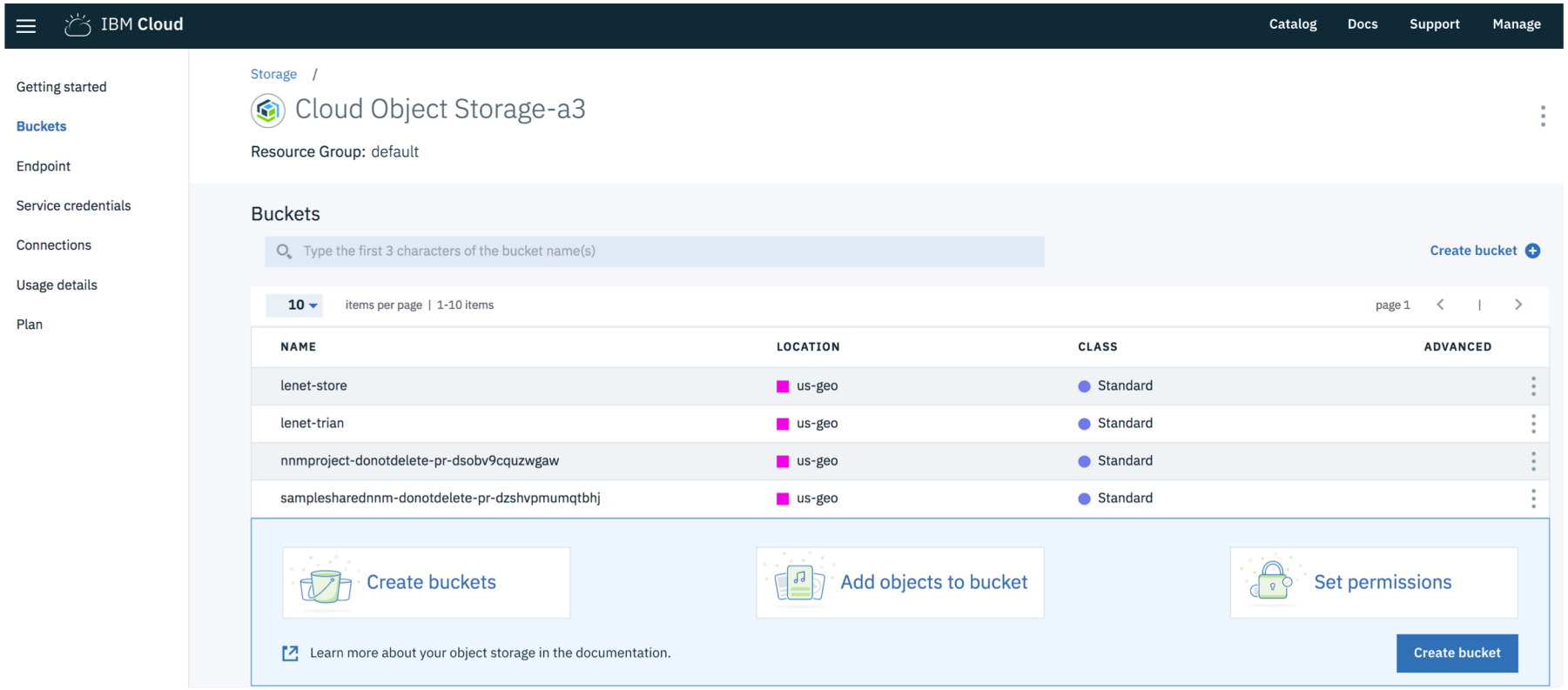
Screenshots

Cloud Object Storage

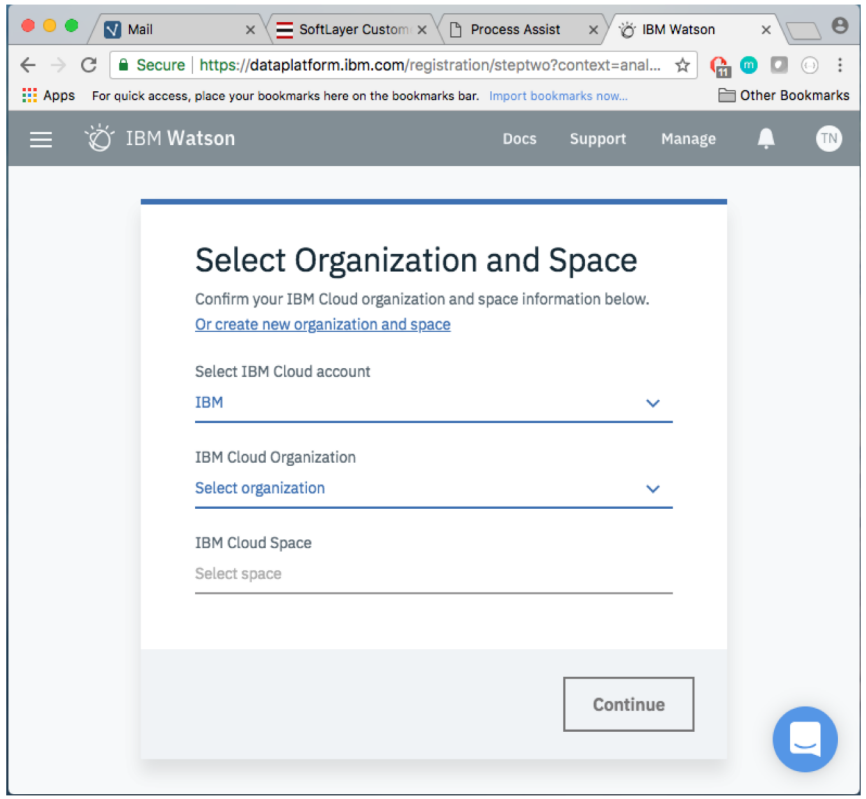


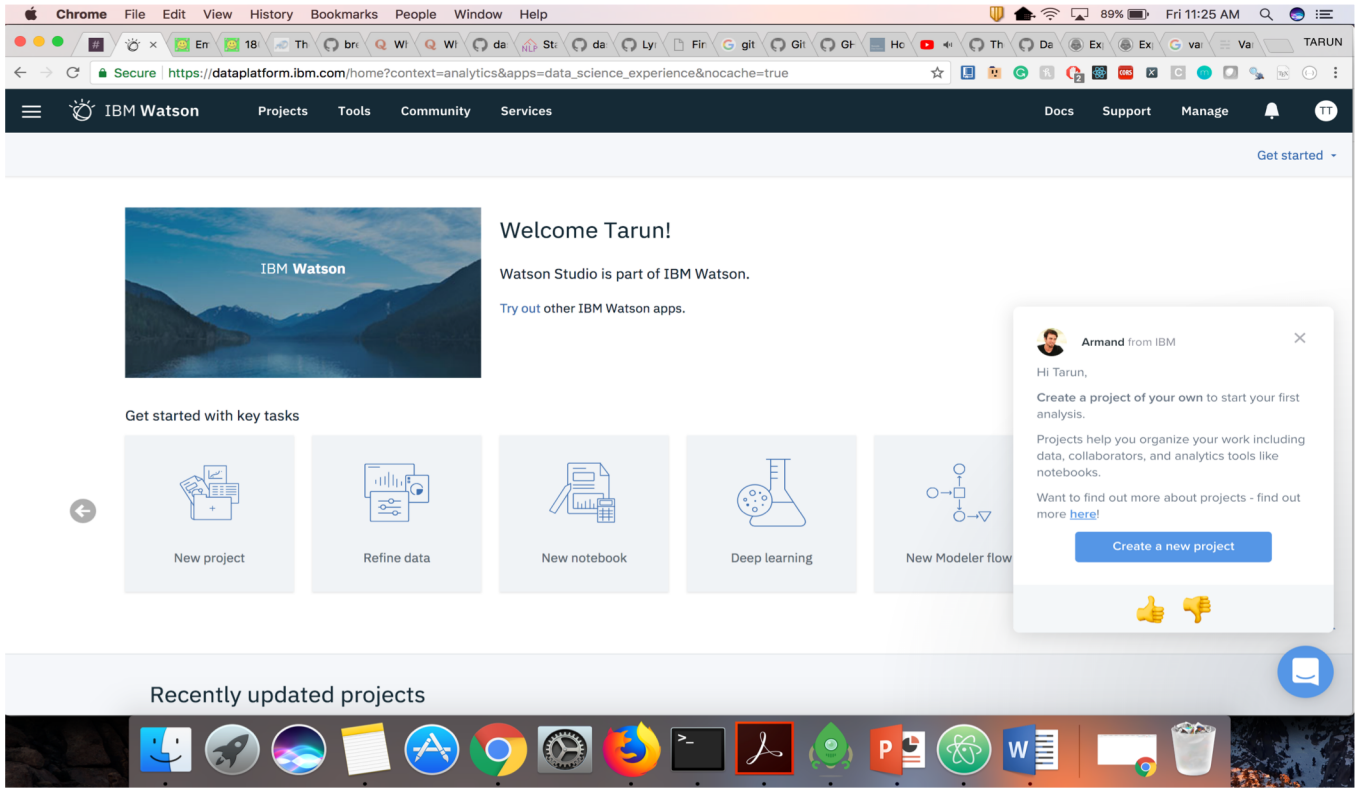


Upload Data to Bucket

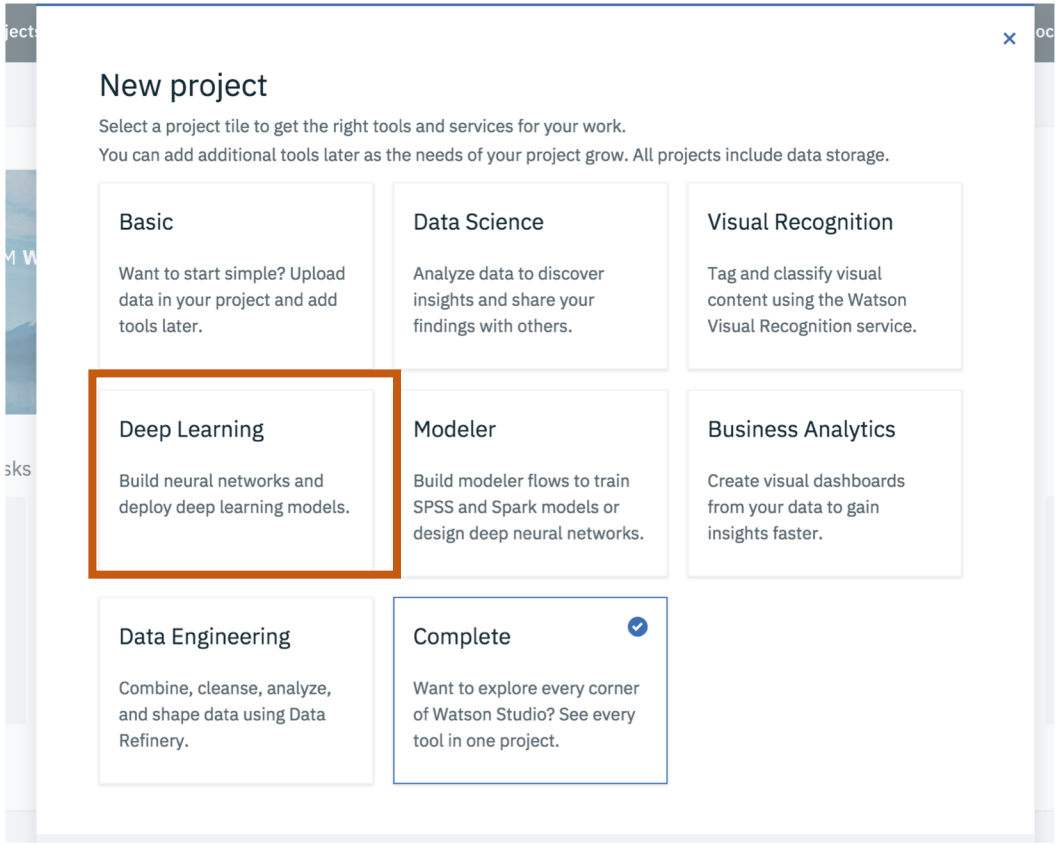


Watson Studio

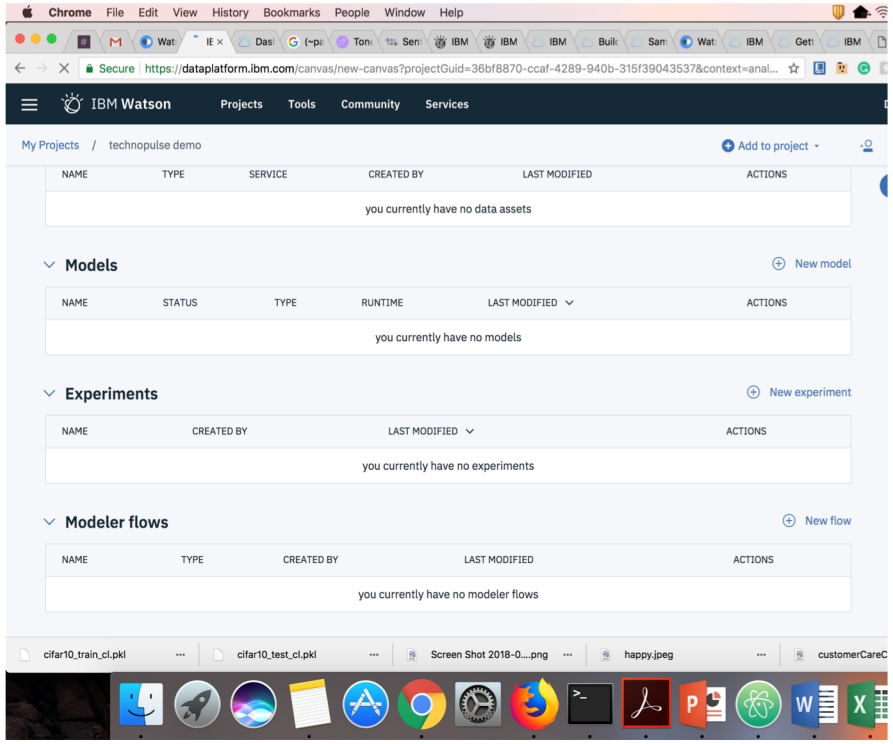


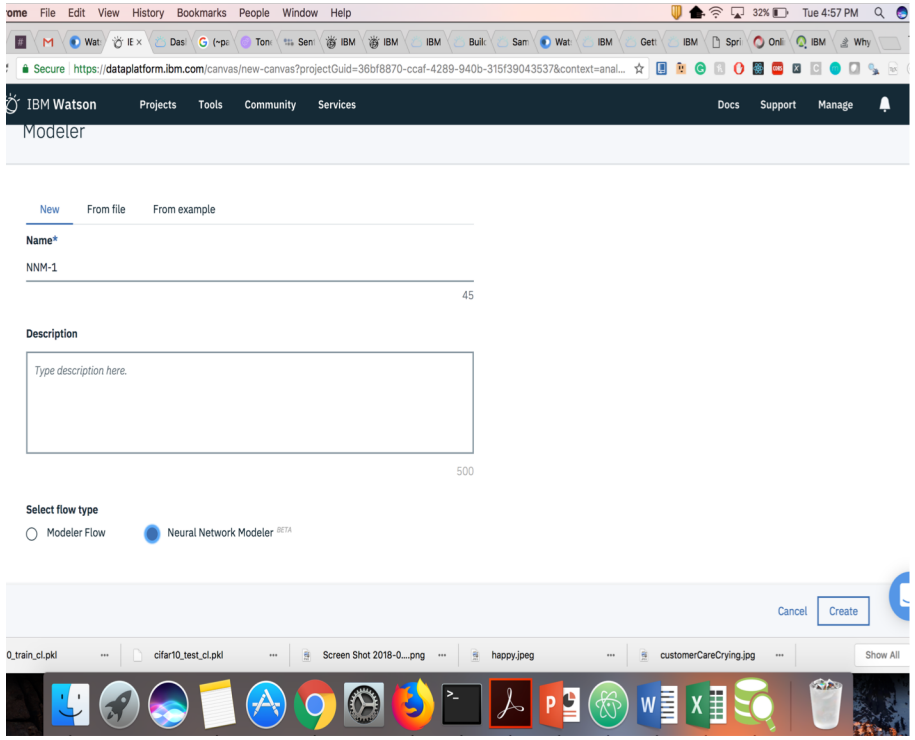


Deep Learning Project

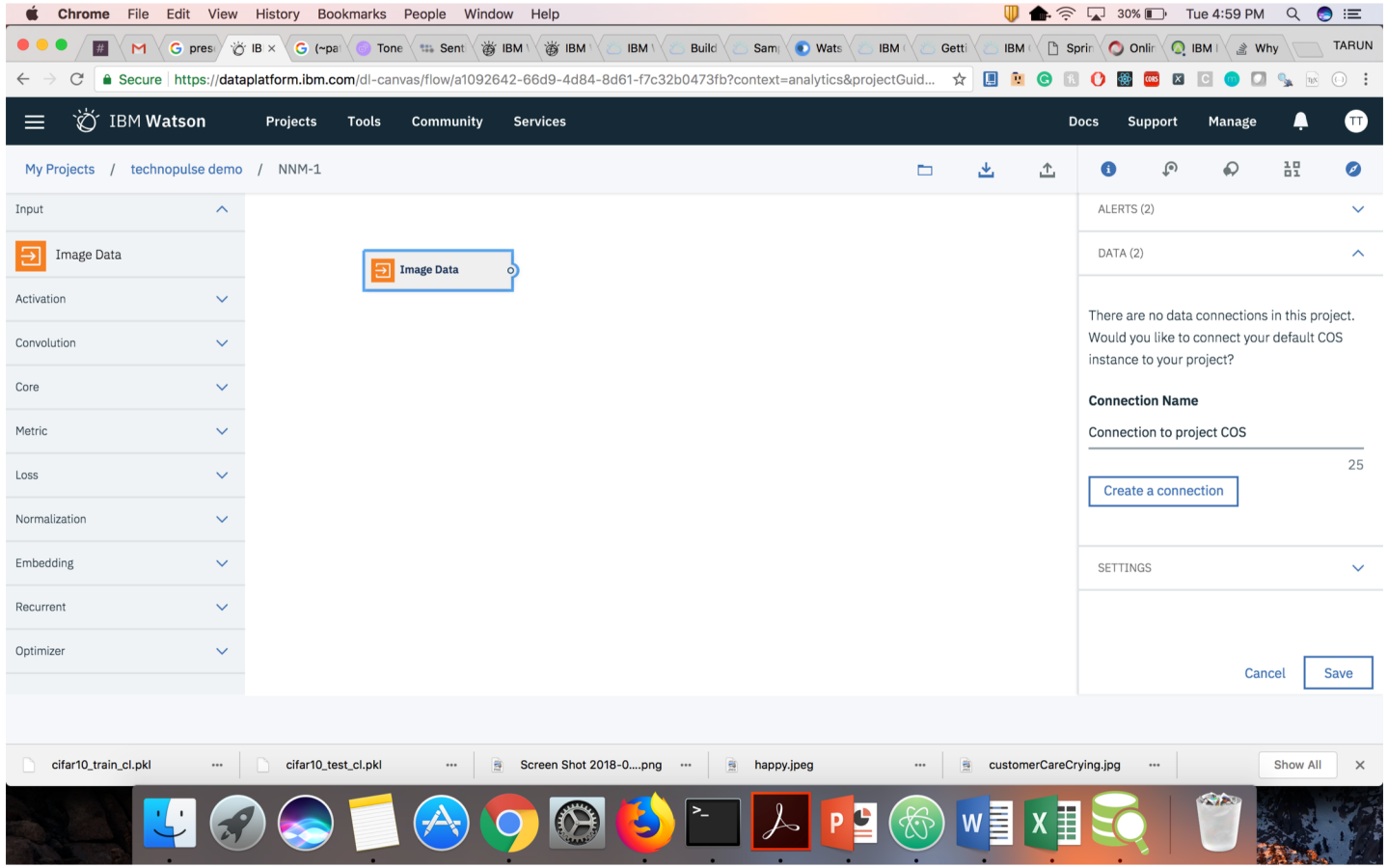


Modeler Flow





NNM Canvas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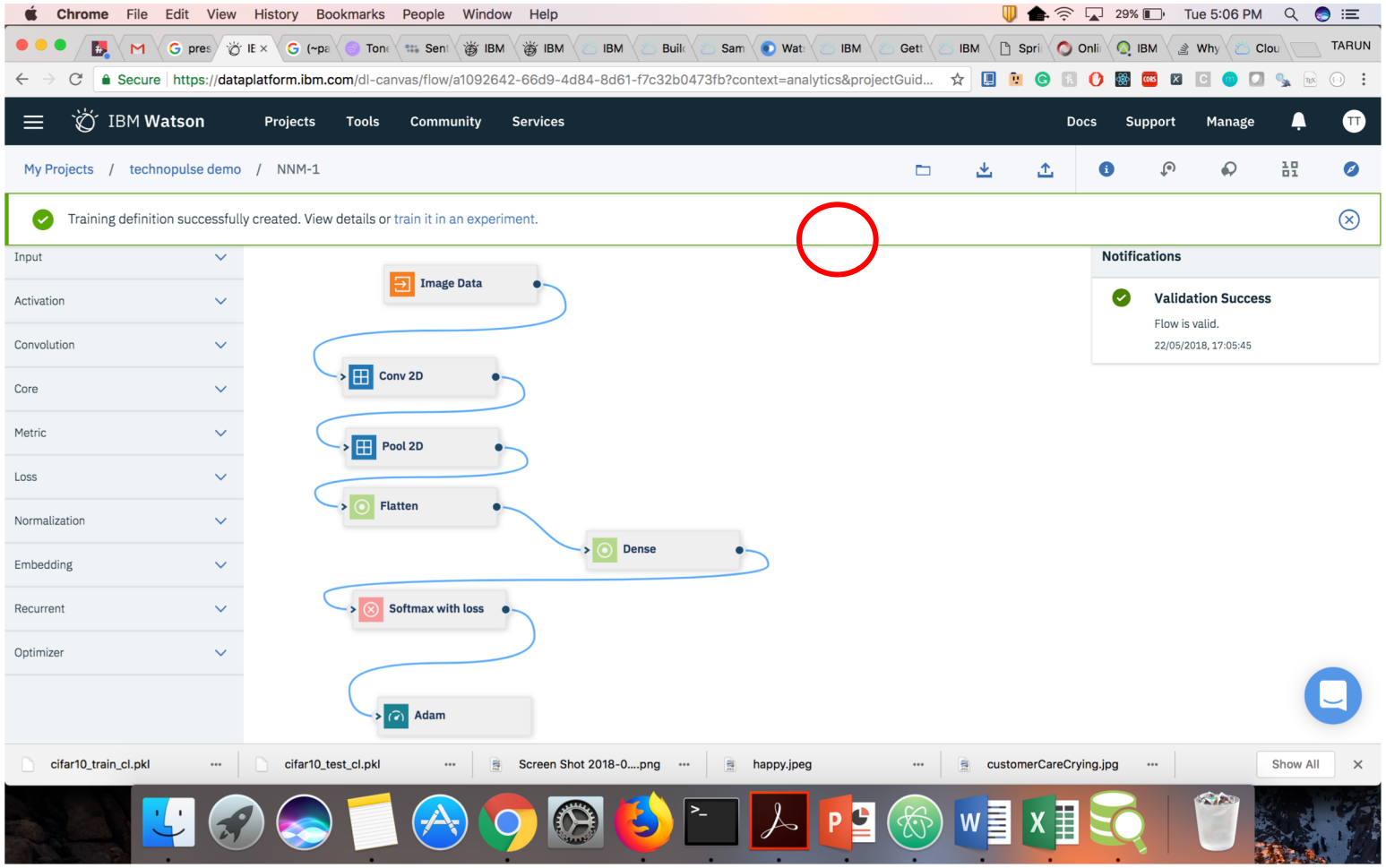
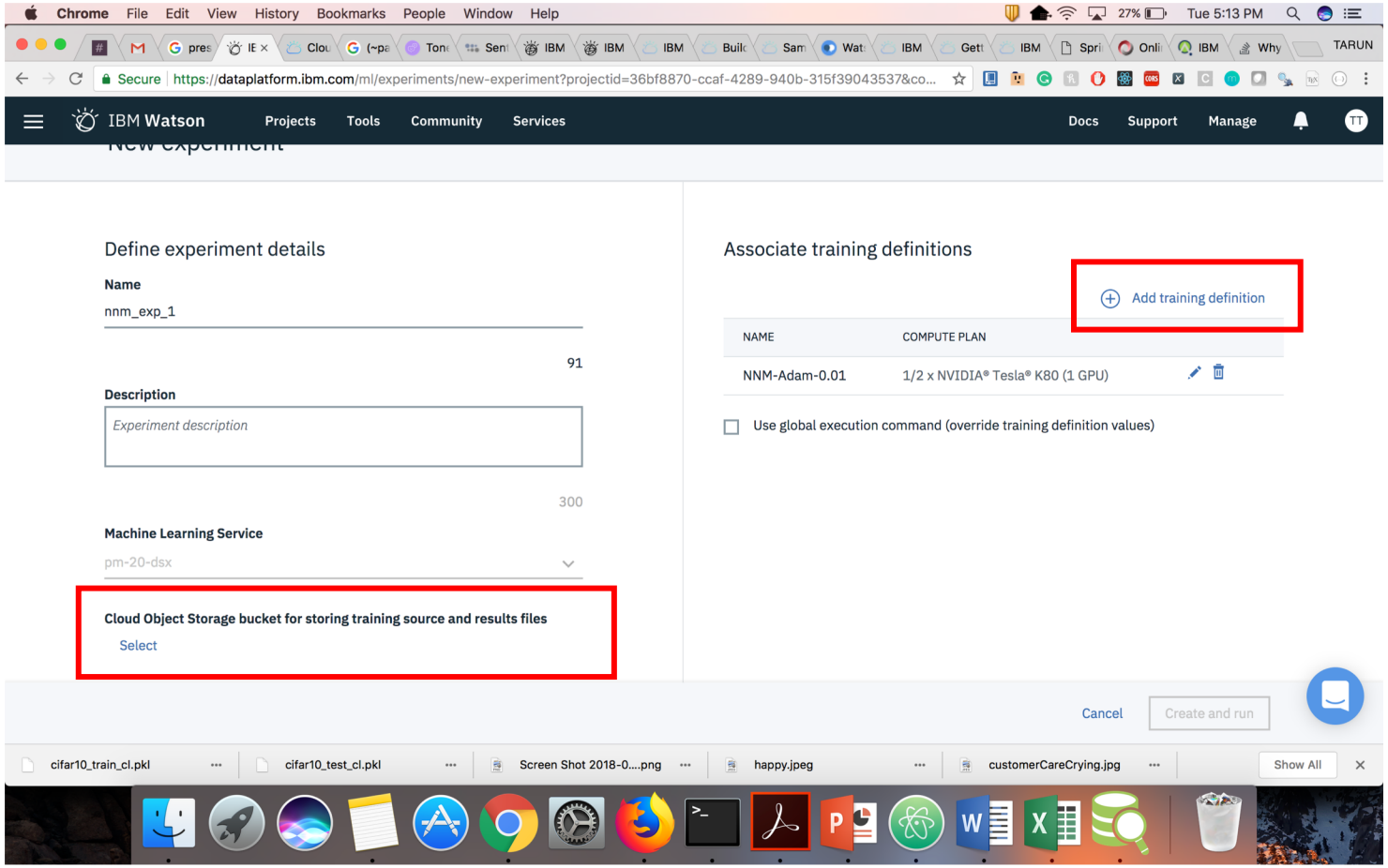
IBM Watson
Projects
Tools
Community
Services
Docs
Support
Manage
My Projects / technopulse demo / NNM-1
Input
Image Data
Activation
Convolution
Core
Metric
Loss
Normalization
Embedding
Recurrent
Optimizer
Image Data
ALERTS (2)
DATA (2)
There are no data connections in this project. Would you like to connect your default COS instance to your project?
Connection Name
Connection to project COS
25
Create a connection
SETTINGS
Cancel
Save
cifar10_train_cl.pkl
cifar10_test_cl.pkl
Screen Shot 2018-0....png
happy.jpeg
customerCareCrying.jpg
Show All

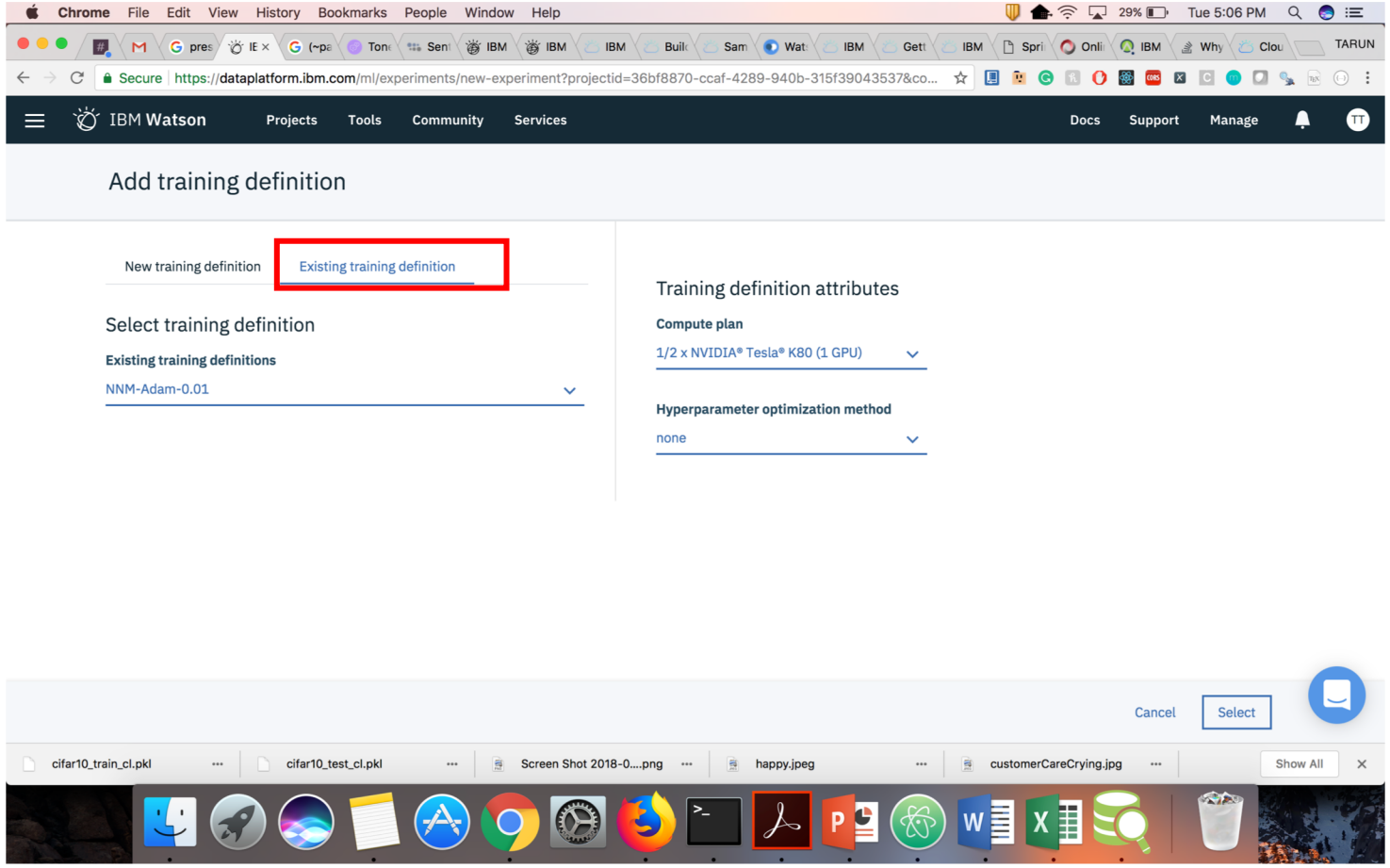
Publish Training



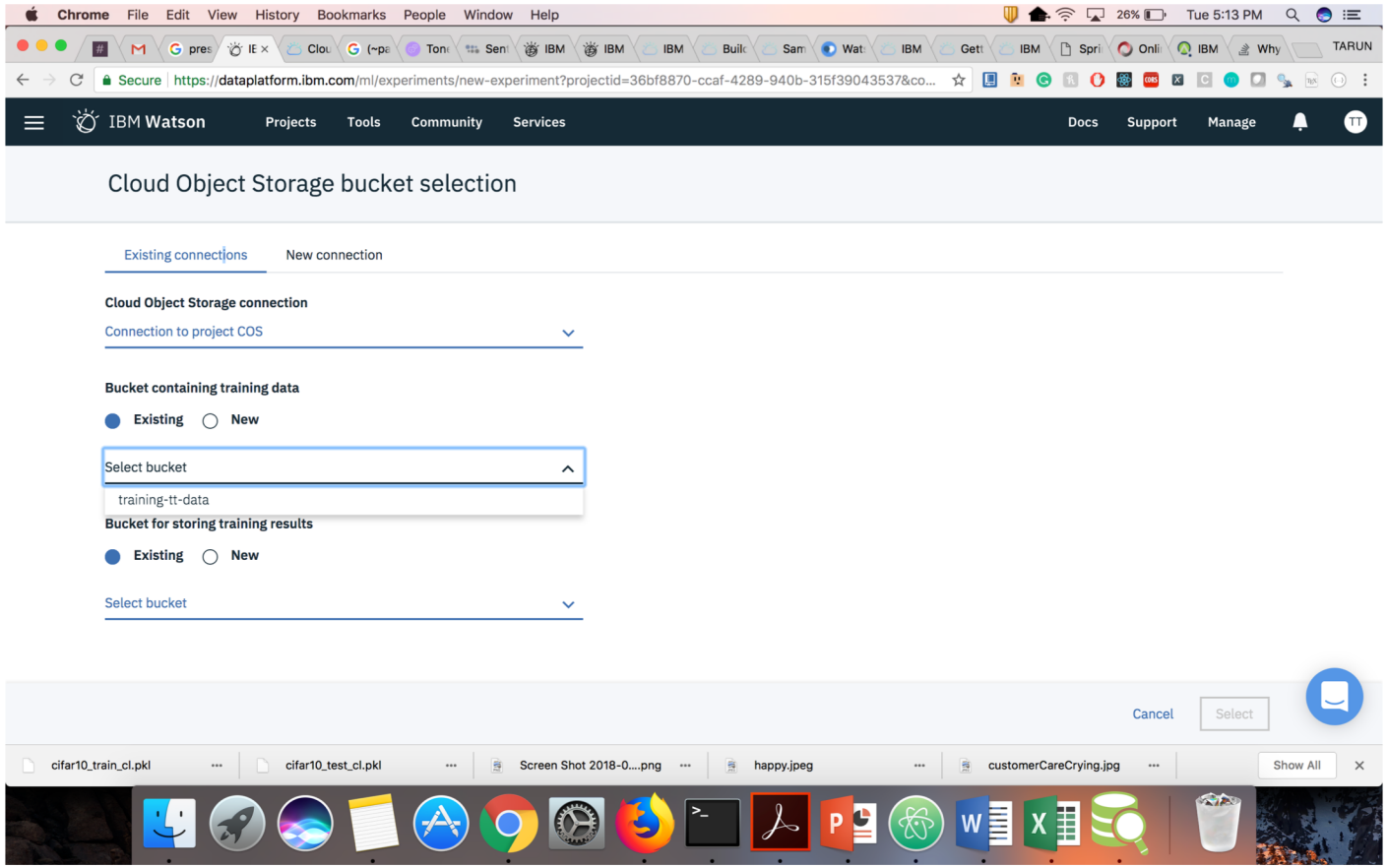
Create Experiment



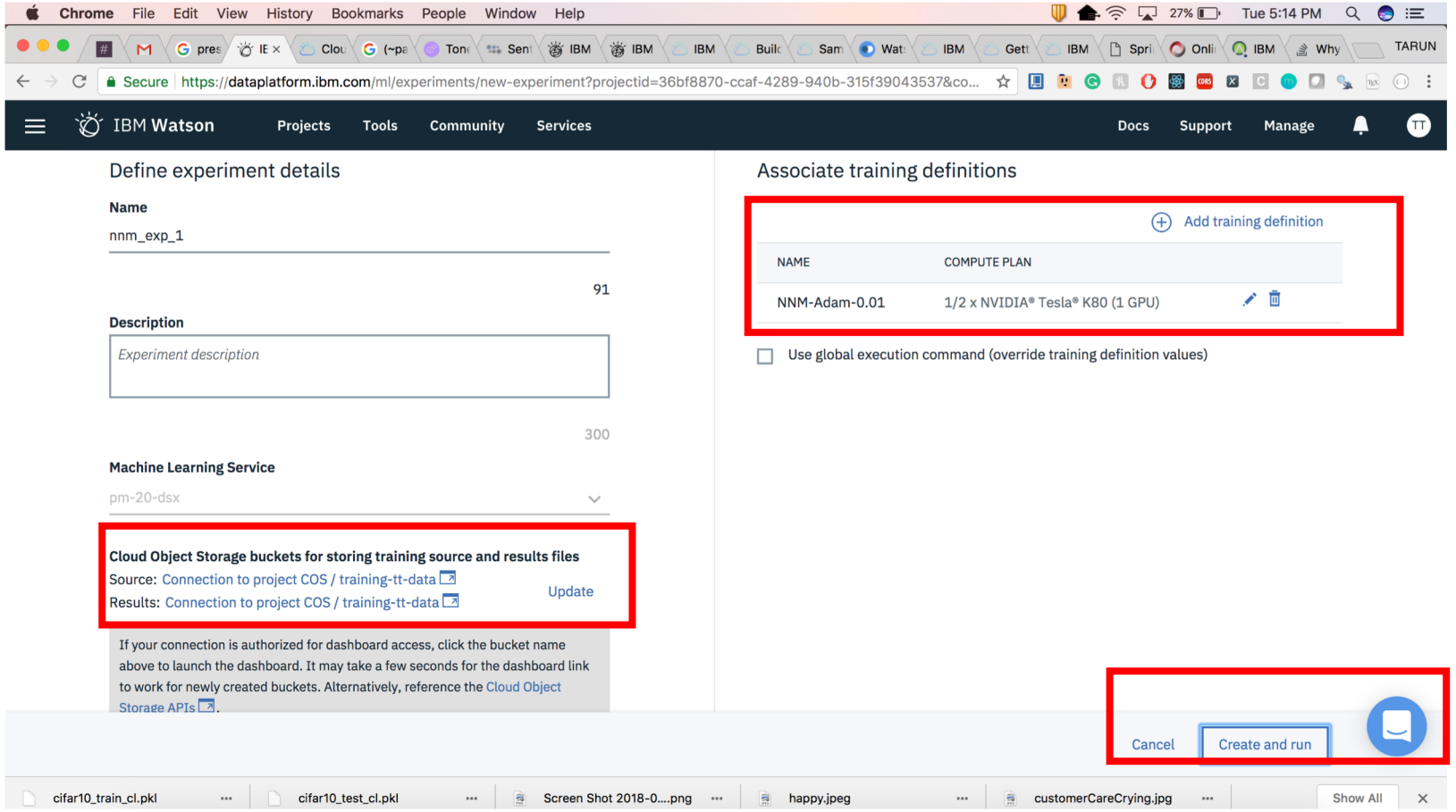
Add Training Definition



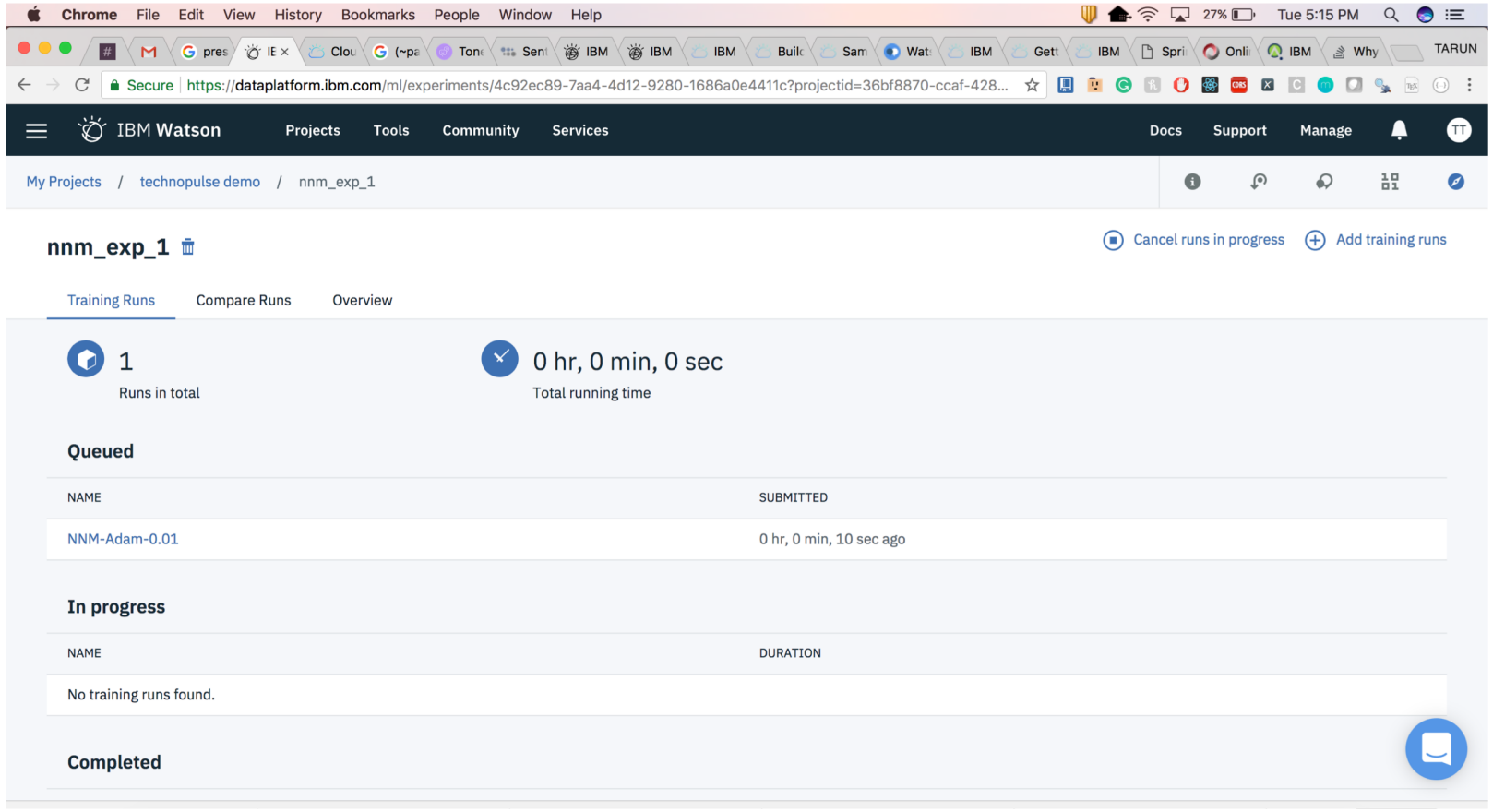
Add COS Details to Experiment



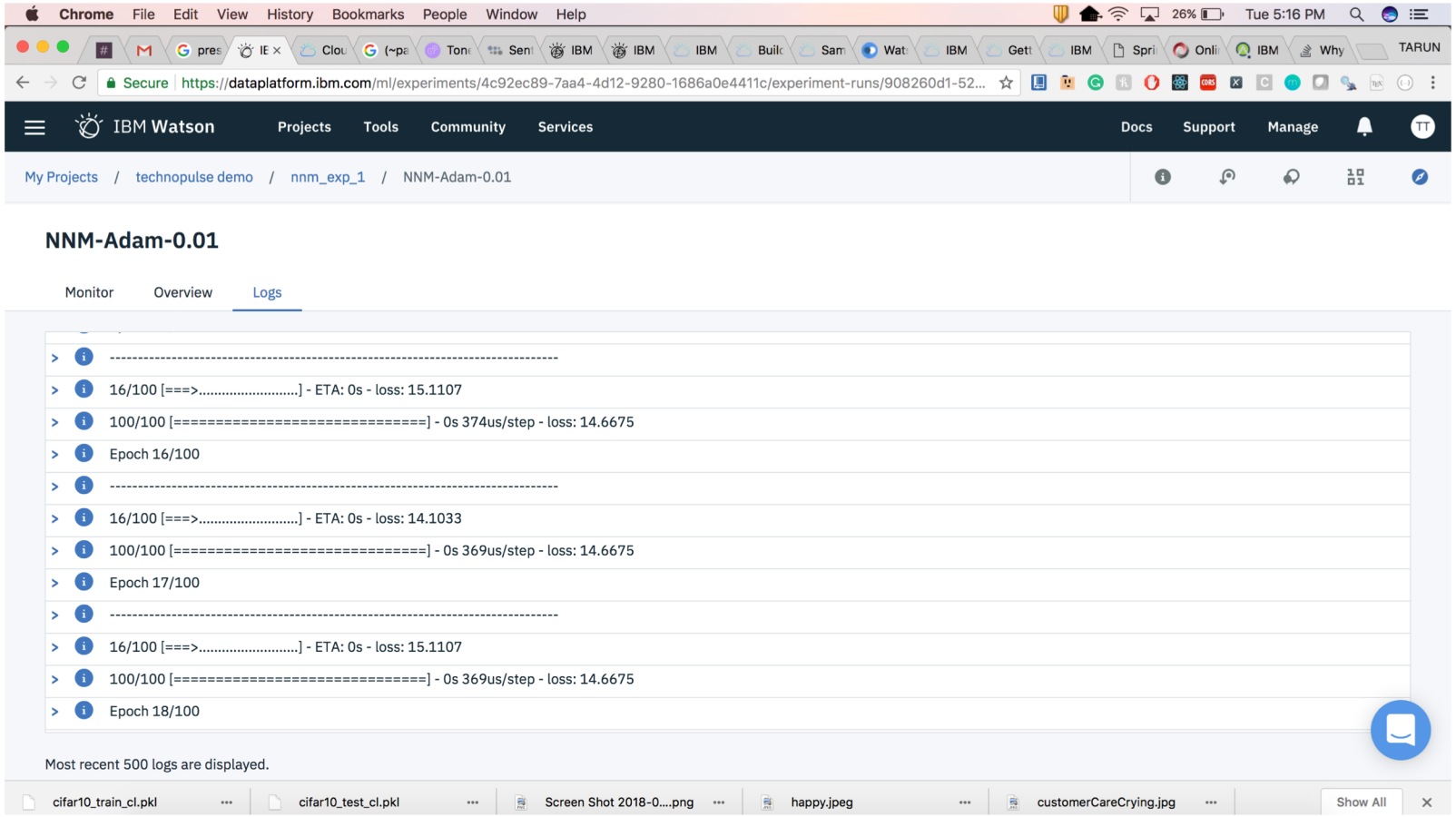
Create and Run



Experiments



Logs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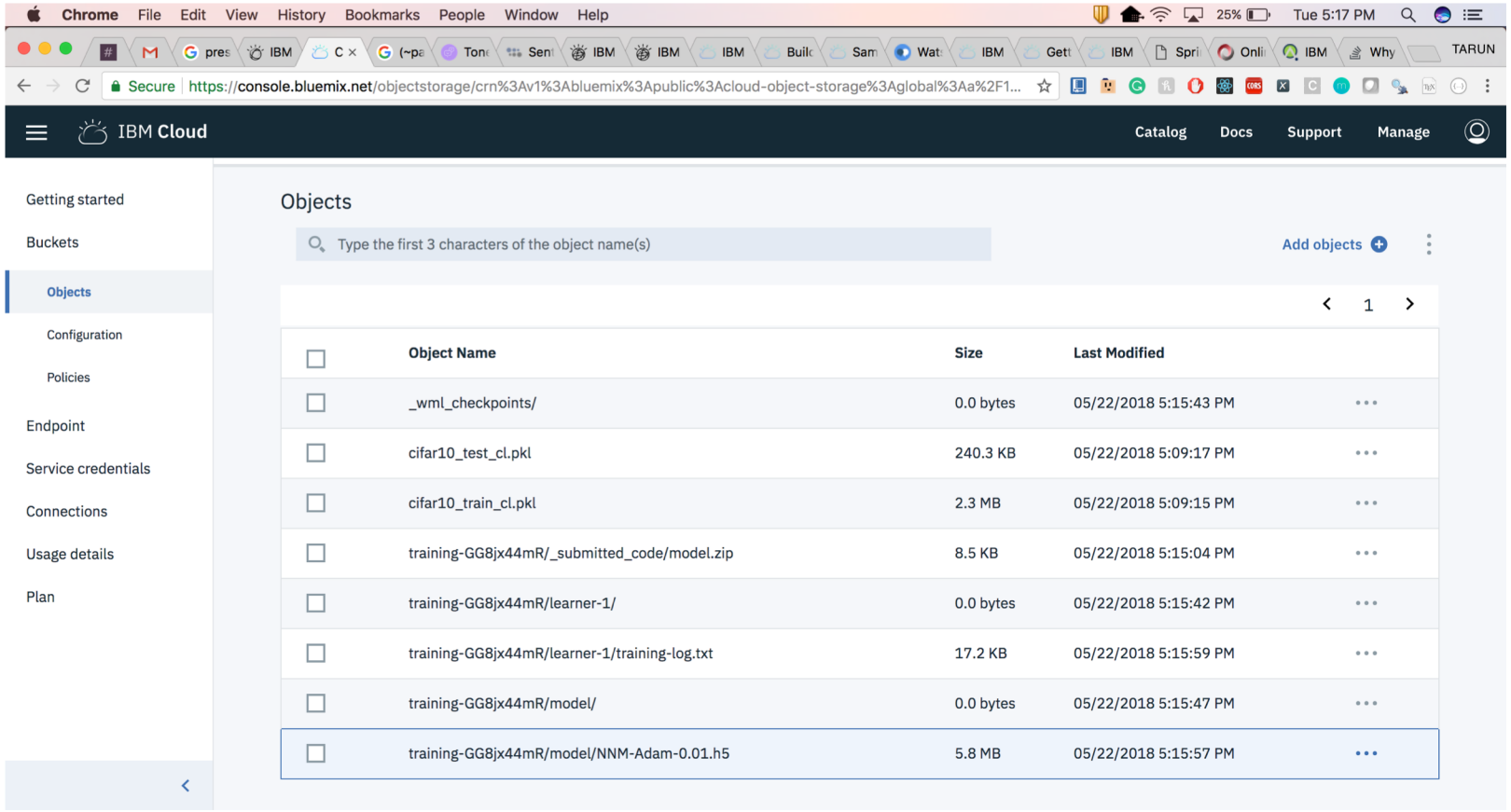
IBM Watson
Projects
Tools
Community
Services
Docs
Support
Manage
My Projects / technopulse demo / nnm_exp_1 / NNM-Adam-0.01
NNM-Adam-0.01
Monitor
Overview
Logs

16/100 [===>.....] - ETA: 0s - loss: 15.1107
100/100 [==========] - 0s 374us/step - loss: 14.6675
Epoch 16/100

16/100 [===>.....] - ETA: 0s - loss: 14.1033
100/100 [==========] - 0s 369us/step - loss: 14.6675
Epoch 17/100

16/100 [===>.....] - ETA: 0s - loss: 15.1107
100/100 [==========] - 0s 369us/step - loss: 14.6675
Epoch 18/100
Most recent 500 logs are displayed.
cifar10_train_cl.pkl
cifar10_test_cl.pkl
Screen Shot 2018-0....png
happy.jpeg
customerCareCrying.jpg
Show All

Trained Model



Public Tutorials

- Exploring Deep Learning and Neural Network Modeler with Watson Studio
  https://medium.com/ibm-watson/exploring-deep-learning-and-neural-network-modeler-with-watson-studio-ead35d21a438

- Accelerate Your Deep Learning Experiments with IBM's Neural Network Modeler
  https://medium.com/ibm-watson/accelerate-your-deep-learning-experiments-with-ibms-neural-network-modeler-dd0c92fba814

- Deep Learning as a Service Now in IBM Watson Studio
  https://medium.com/ibm-watson/deep-learning-now-in-ibm-watson-studio-d8ba311e4ff1

- Video Tutorial
  https://www.youtube.com/watch?v=EDQ0AWcUBnE