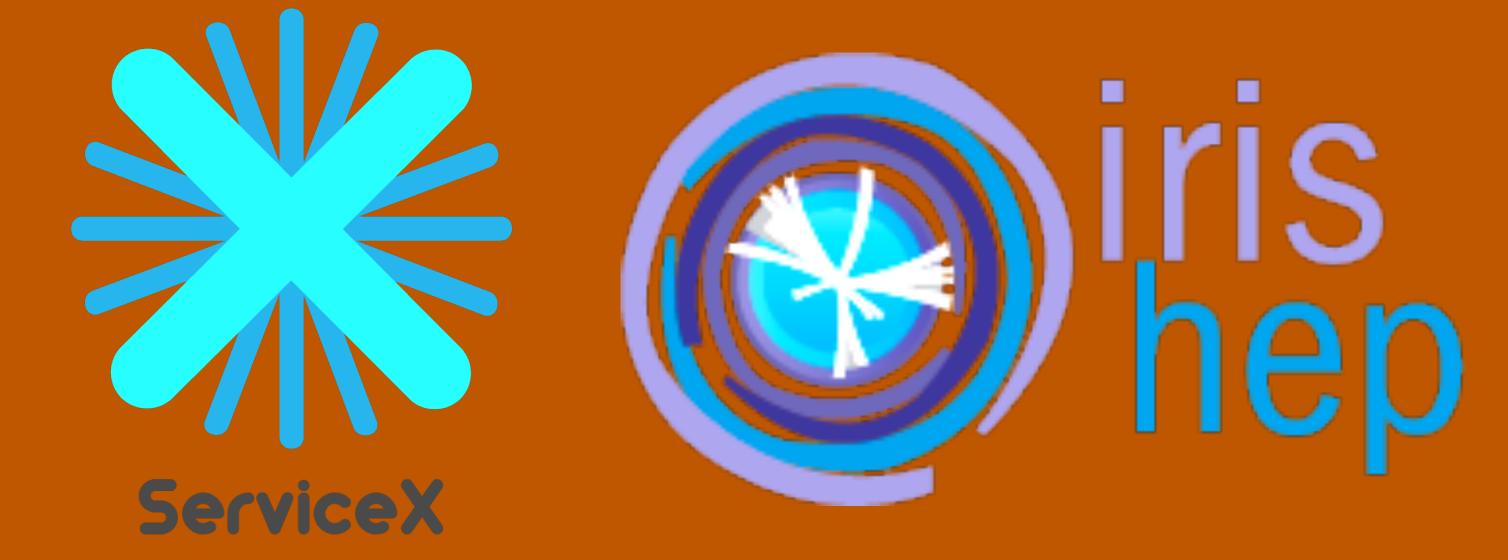


ServiceX: Novel Data Access and Delivery System for Physics Analysis

KyungEon Choi for the IRIS-HEP ServiceX Team



Jupyter notebook at TACC (Texas Advanced Computing Center)

RucioDID="user.kchoi:user.kchoi.fcnc_tHq_ML.ttH.v11",

query_signal = servicex.FuncADLQuery().Where(lambda e: e.met_met>50e3).Select(lambda e: {'el_pt': e['el_pt'], 'el_

- 47/47 00:20

- 47/47 00:20

About Dashboard Monitor Logs Kyungeon Choi ▼

Status Files completed Workers Actions

Running 237 of 692

Sort: Finish (desc) 🔻



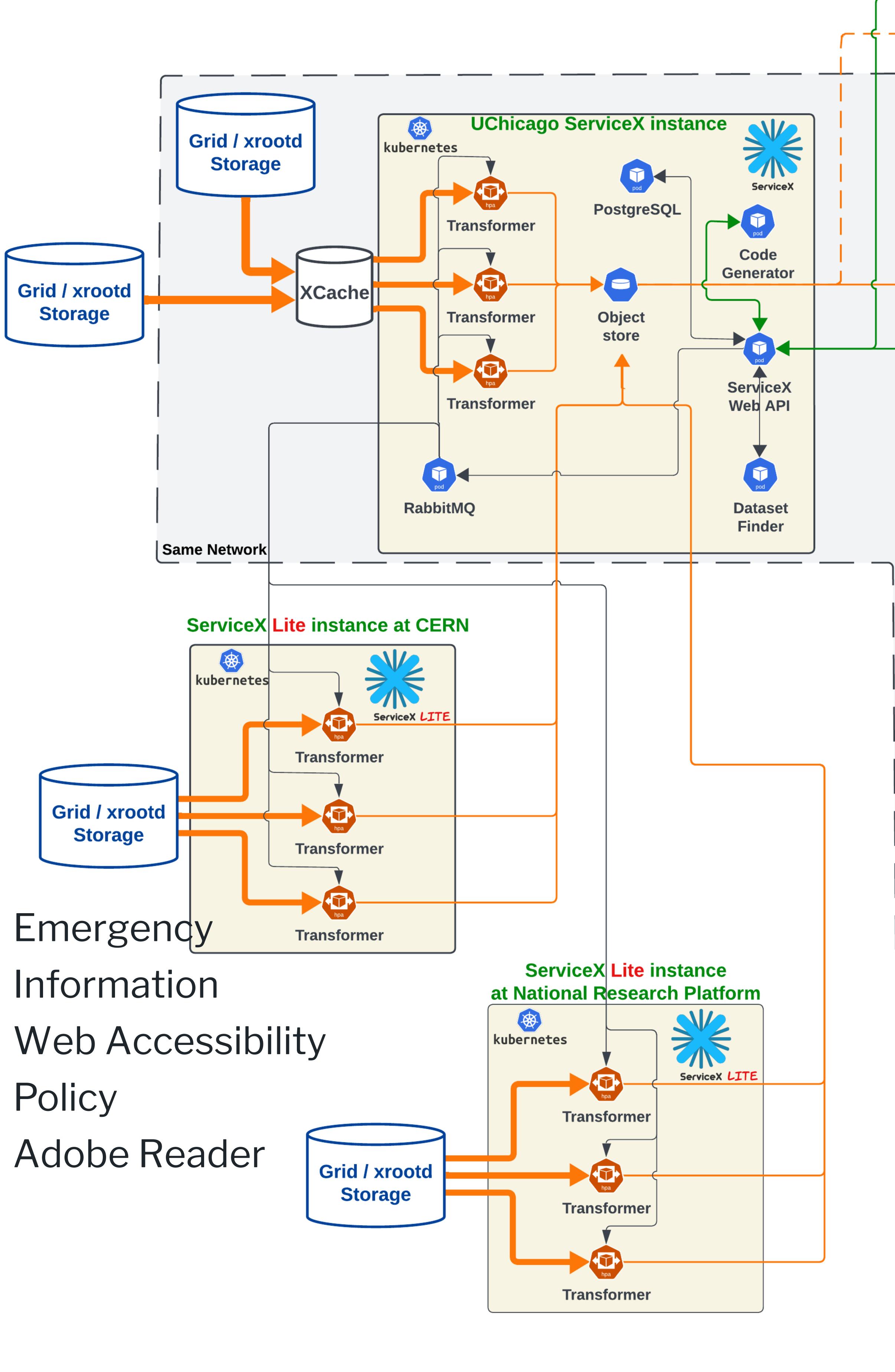


UX

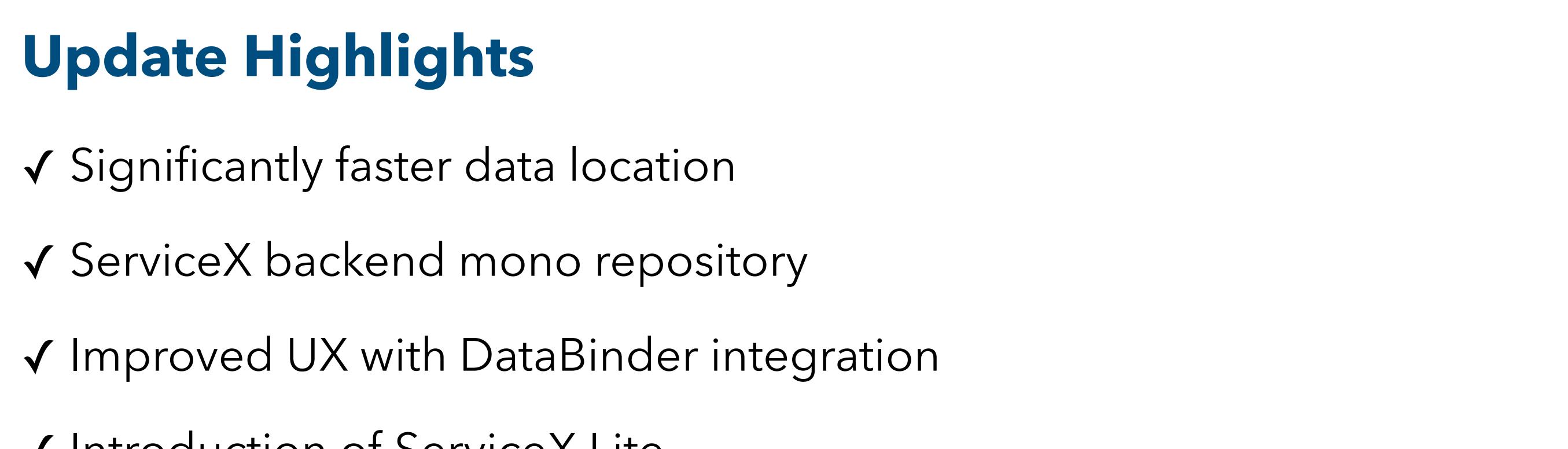
 User's query to select columns (or branches) and filter rows (or events) on input experimental data

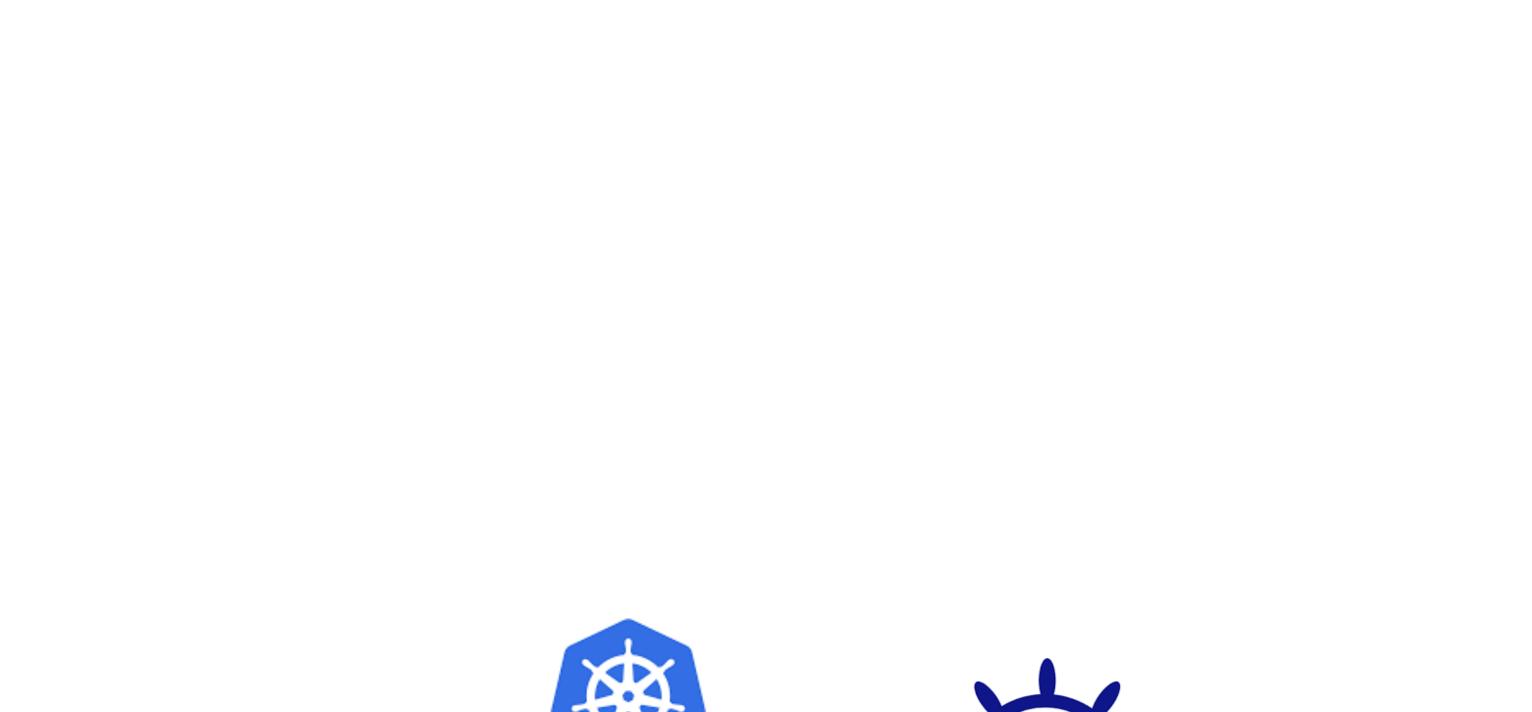
Input Data Format	Query Language
Flat ROOT ntuple	FuncADL [1]
	Python Function
	Awkward
ATLAS xAOD	FuncADL

Web Privacy Policy



- √ Introduction of ServiceX Lite







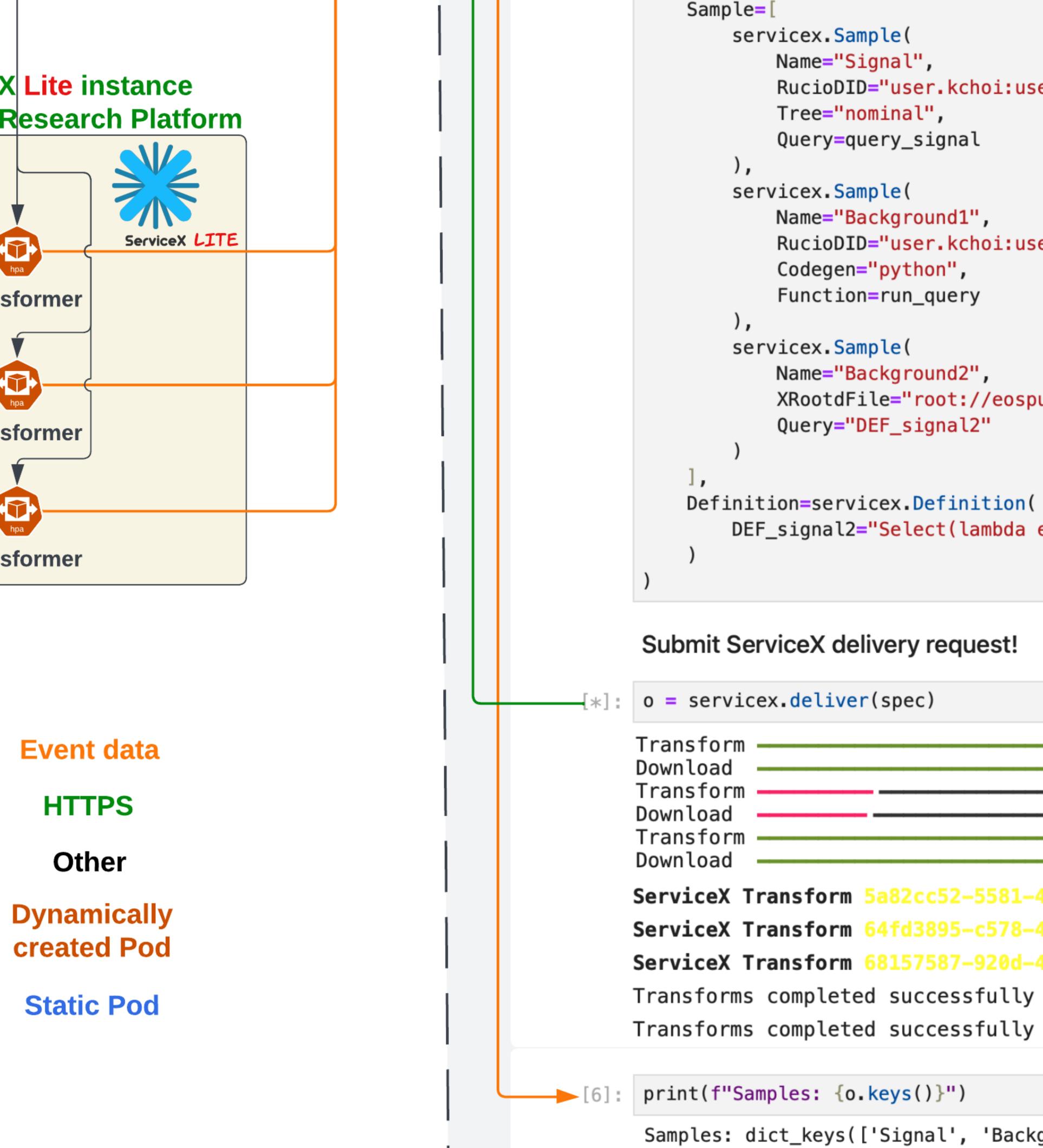


MINIO









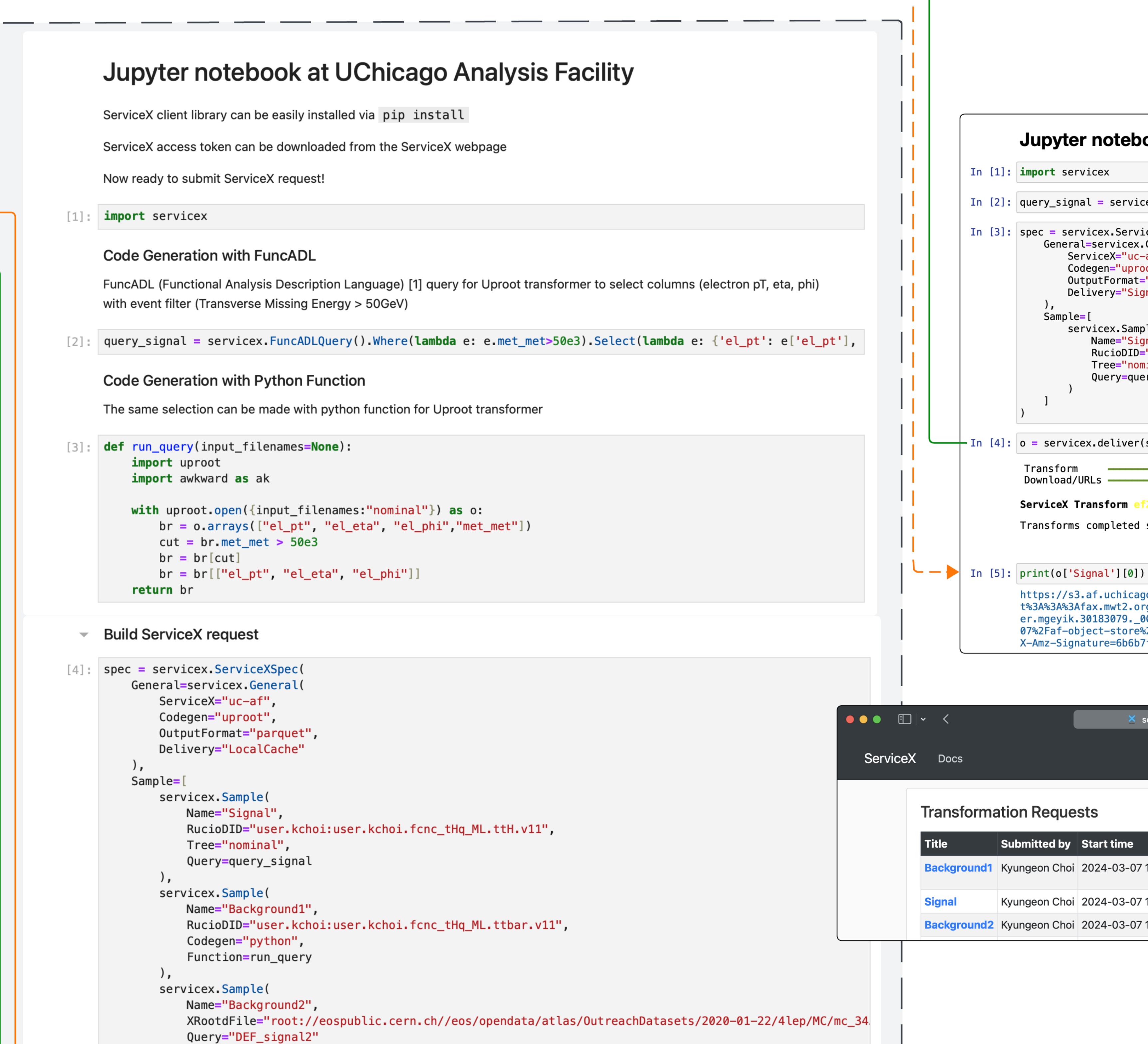
Event data

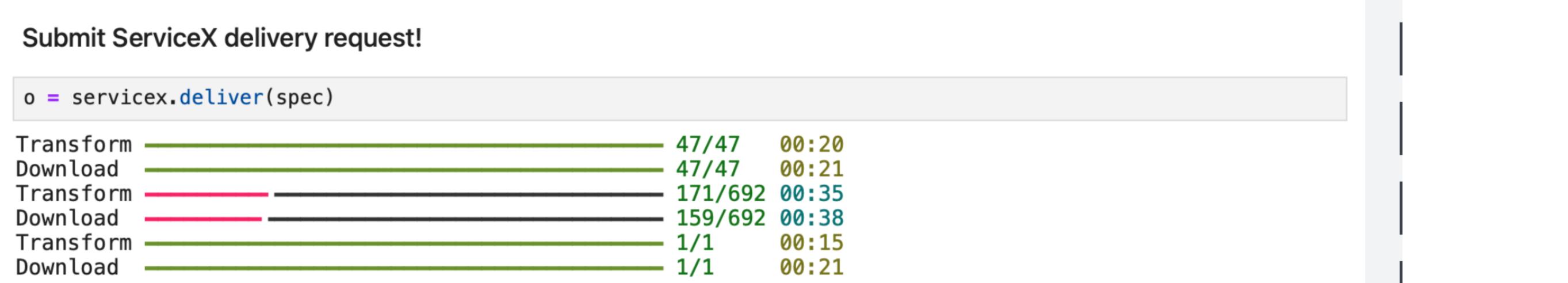
Dynamically created Pod

HTTPS

Other

Static Pod





DEF_signal2="Select(lambda e: {'lep_pt': e['lep_pt'], 'lep_eta': e['lep_eta'], 'lep_phi': e['lep_phi']

ServiceX Transform ServiceX Transform 64 ServiceX Transform 68157587-920d-4e18-a970-c82bcc60b888 Transforms completed successfully

print(f"Samples: {o.keys()}") Samples: dict_keys(['Signal', 'Background1', 'Background2']) Check a delivered parquet file

import awkward **as** ak

import matplotlib.pyplot as plt

Definition=servicex.Definition(



Future plans

spec = servicex.ServiceXSpec(

General=servicex.General

servicex.Sample(

Transforms completed successfully

er.mgeyik.30183079._000008.out.root

X-Amz-Signature=6b6b7f96030daf1926f

07%2Faf-object-store%2Fs3%2Faws4_

In [4]: o = servicex.deliver(spec)

ServiceX Transform

Submitted by Start time

Background1 Kyungeon Choi 2024-03-07 16:48:08

ServiceX="uc-af",

Codegen="uproot", OutputFormat="root-file",

Query=query_signal

- Publish ServiceX Client library 3.0
- Service status dashboard

Kyungeon Choi 2024-03-07 16:48:08 2024-03-07 16:48:33 Complete 47 of 47

Background2 Kyungeon Choi 2024-03-07 16:48:08 2024-03-07 16:48:26 Complete 1 of 1

- Support other transformers
- ServiceX dask integration
- Server-side caching
- Column join functionality
- Intelligent transformer pod creation at main and lite instances
- Tutorial

Useful Links

- [1] FuncADL @ PyHEP 2021 Workshop
- [2] IRIS-HEP Homepage
- [3] ServiceX readthedoc page





