

Weekly Report 05

Practical Information Course

23.06.2023

NiFi

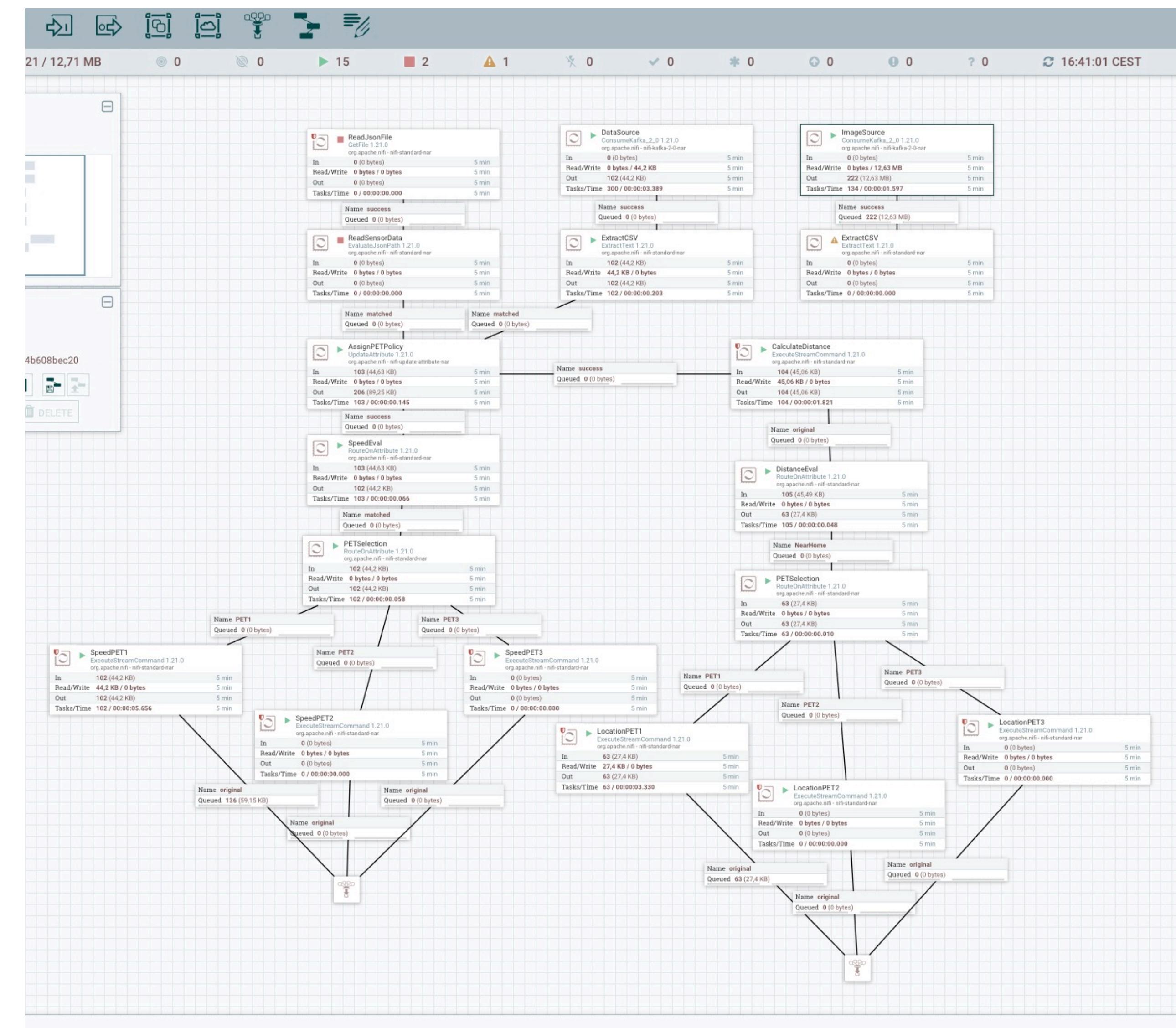
Implementation

• Advantage

- Built-in buffer and speed management mechanism
- Easy to learn and implement
- Fully supported dynamic structure change in runtime
- Advanced template management, easy to modified and share to build large project

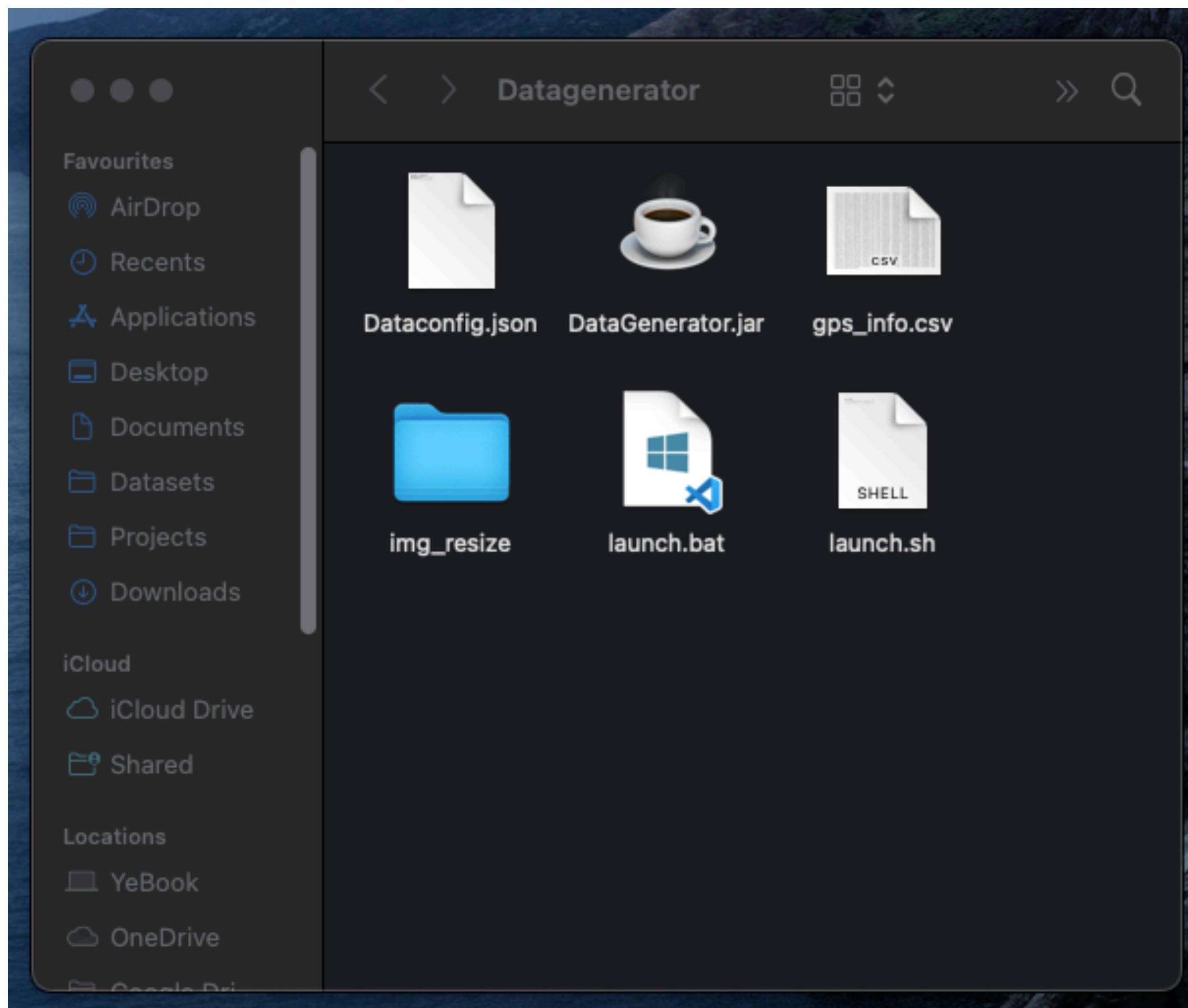
• Disadvantage

- No state Management, can't handle complex event. (Or possible but with significantly more effort)
- Not well documented, lack of resources
- Not fully supported Java implementation (more suitable for javascript or python etc.)
- As far as I know, not suitable for Image processing.



Data Generator

Improvement and UI



The screenshot shows a "Control Panel" window titled "Run/ DelayRun". The interface includes a top bar with "Control Panel" and "Run/ DelayRun" buttons, and a toolbar with numerical inputs (1, 0), "Reset", and "Run" buttons, all enclosed in a red box.

General Information:
Execute: run 1
run True
Execute: write change,1,1,1
New usr msg published
Execute: run 1
run True
Execute: reset
Pointer reset

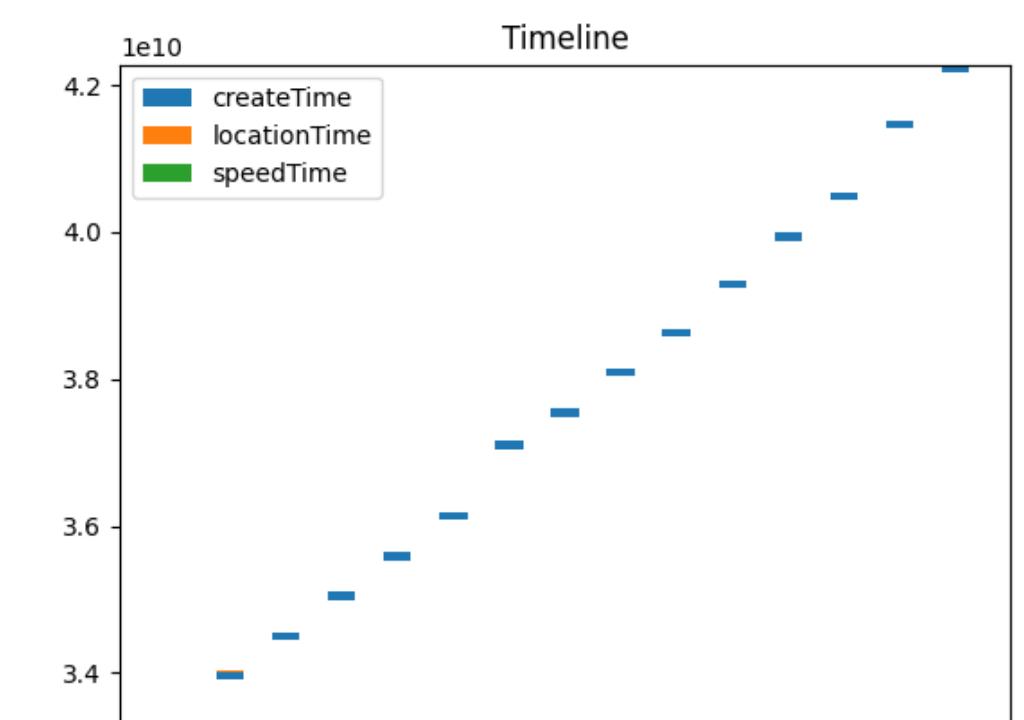
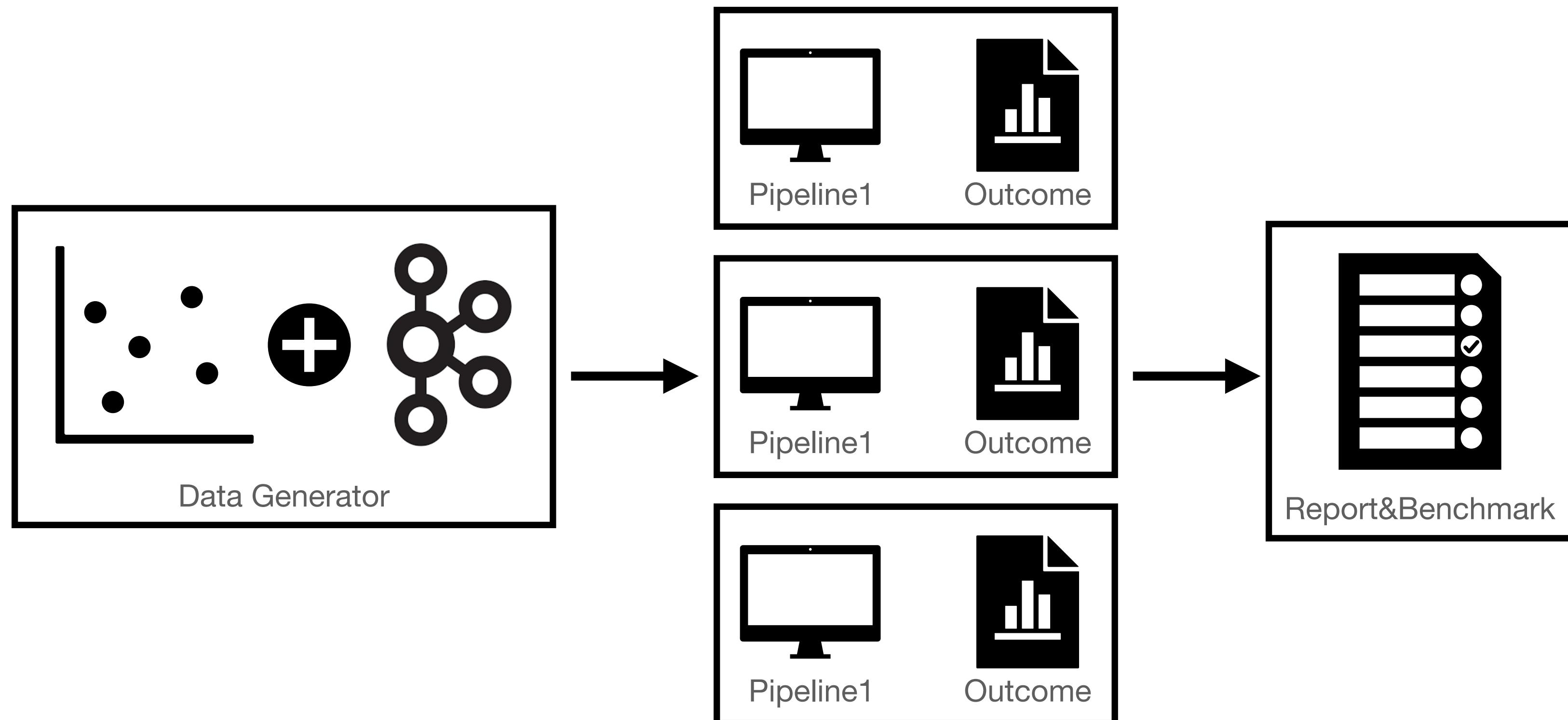
Script Editor:
run 1
run 1
write change,1,1,1
run 1

Activate Situation:
 Location Speed Camera Write

Execute Script:

DataGenerator

In evaluation



	Creation Time	LocationPET	SpeedPET	ImagePET	Policy
1	1687856049581	1687856049710	1687856049715	1687856049720	0 0 0
2	1687856065714	1687856065808	1687856065808	1687856065808	0 0 0
3	1687856067459	1687856067552	1687856067552	1687856067552	0 0 0
4	1687856068221	1687856068315	1687856068315	1687856068315	0 0 0
5	1687856068985	1687856069076	1687856069076	1687856069076	0 0 0
6	1687856069639	1687856069732	1687856069732	1687856069732	0 0 0
7	1687856138162	1687856138178	1687856138184	1687856138189	0 0 1
8	1687856138826	1687856138970	1687856138970	1687856138970	0 0 1
9	0 0 0

Flink Redis

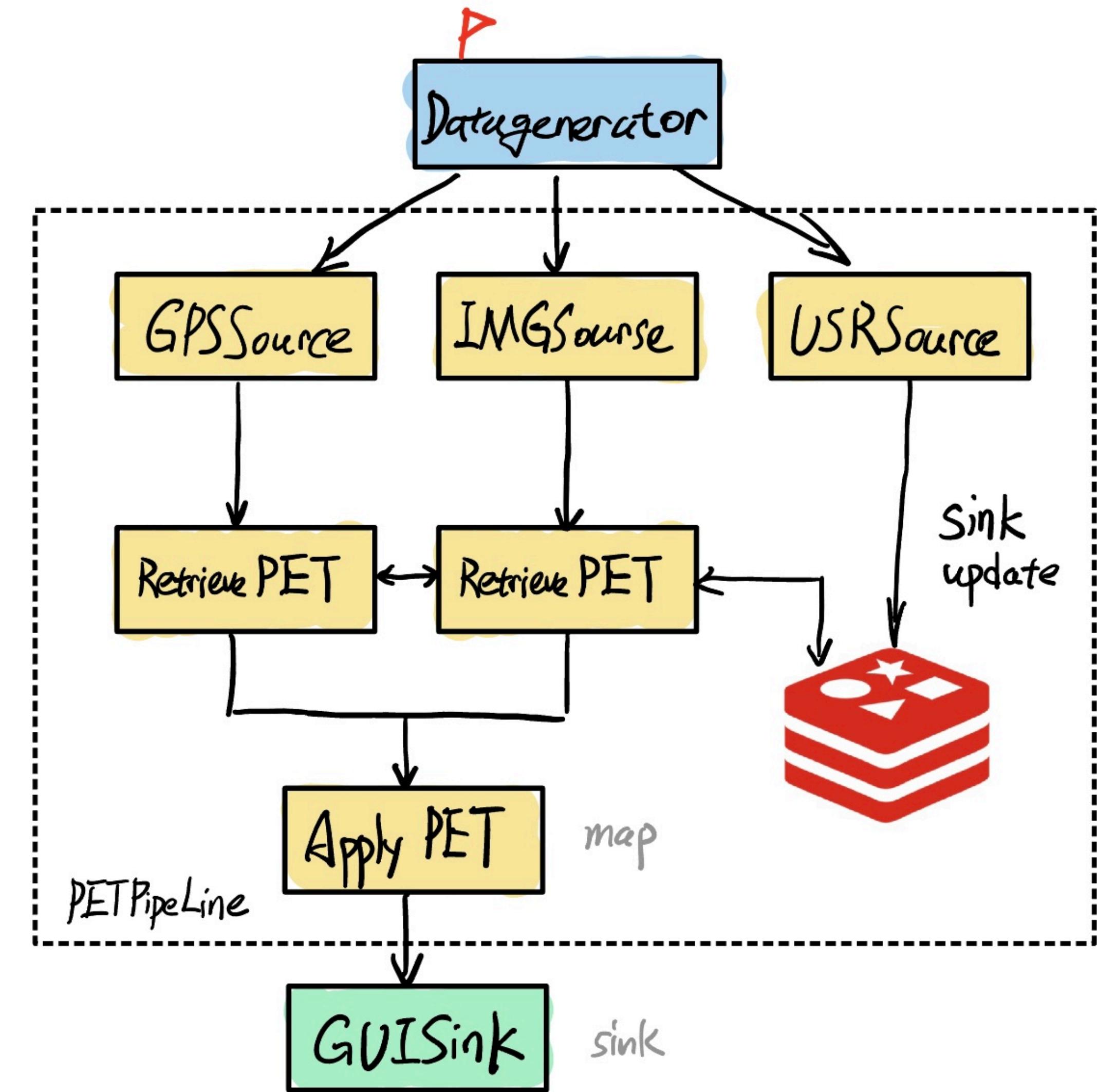
Attribute	Default Value
LocationPET	0
SpeedPET	0
CameraPET	0
LocationSituation	0
SpeedSituation	0
CameraSituation	0
Dirty	0

The image shows two screenshots of Redis management interfaces. The top screenshot is a terminal window titled 'redis-cli -u' showing the command 'redis-cli -u redis://default:123456@redis-17361.c81.us-east-1-2.ec2.cloud.redislabs.com:17361'. It includes a warning about using a password with '-a' or '-u' options. The bottom screenshot is a Redis Labs Management UI for a database named 'PETConfig'. The UI shows general information like 'Database name: PETConfig', 'Type: Redis Stack', 'Redis version: 6.2.6', and creation/last change times. It also shows a public endpoint and a 'Connect' button.

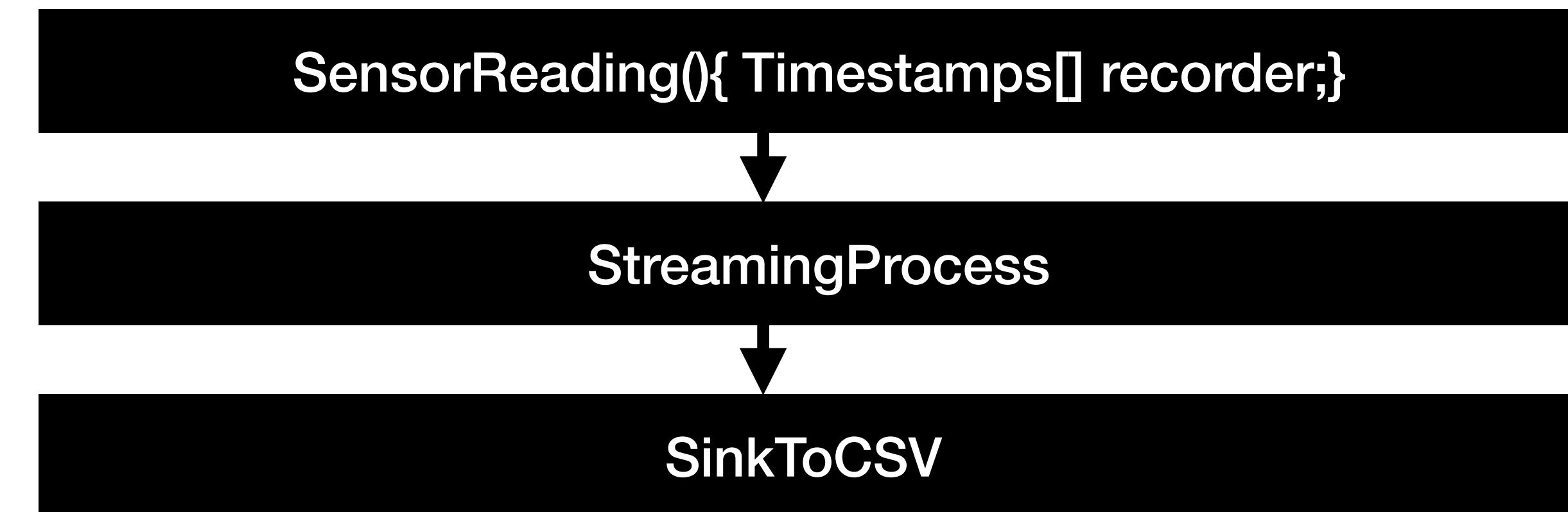
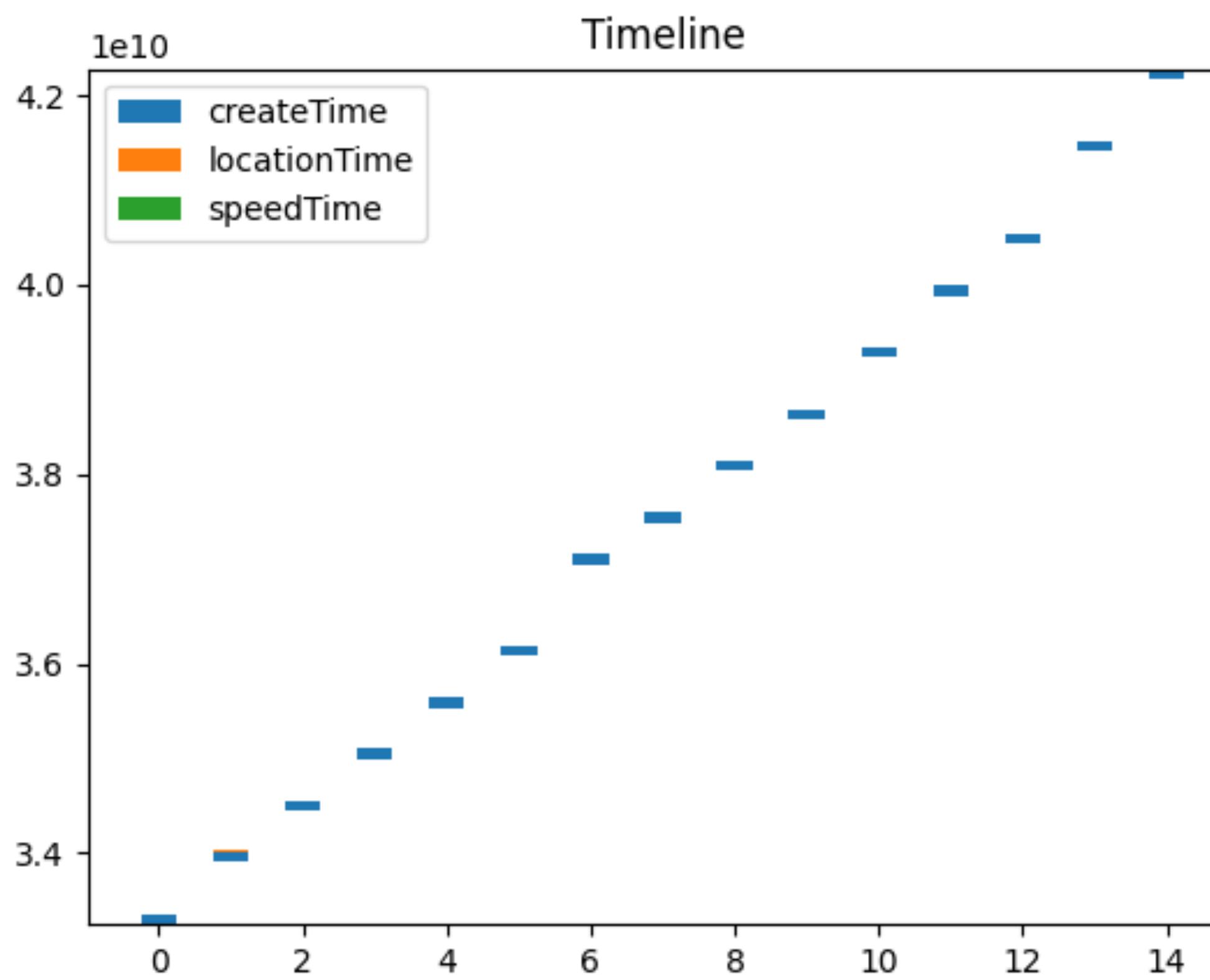
Flink

Variation 2

- Redis as global parameter manager
- Separate pipeline for image and gps data
- No GUI Implementation



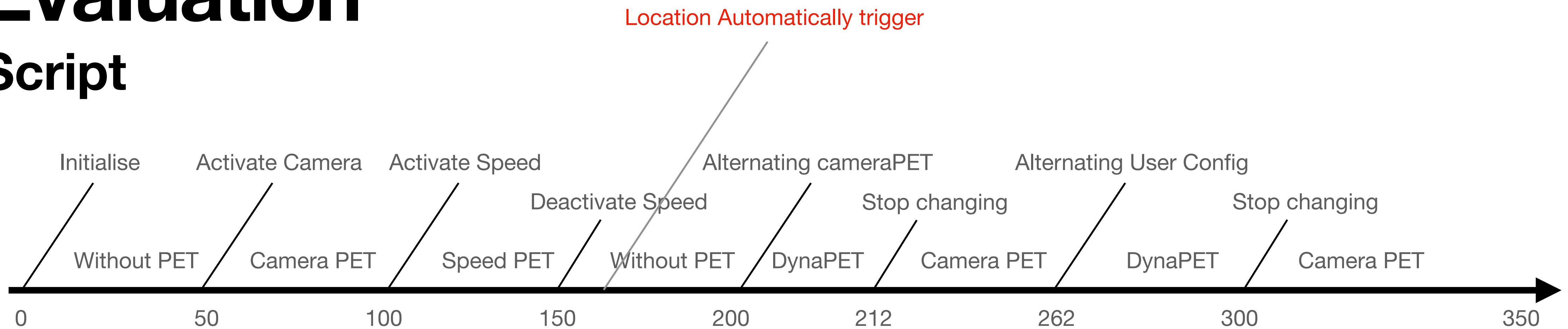
Evaluation Idea



Example Data

	Creation Time	LocationPET	SpeedPET	ImagePET	Policy
1	1687856049581	1687856049710	1687856049715	1687856049720	0 0 0
2	1687856065714	1687856065808	1687856065808	1687856065808	0 0 0
3	1687856067459	1687856067552	1687856067552	1687856067552	0 0 0
4	1687856068221	1687856068315	1687856068315	1687856068315	0 0 0
5	1687856068985	1687856069076	1687856069076	1687856069076	0 0 0
6	1687856069639	1687856069732	1687856069732	1687856069732	0 0 0
7	1687856138162	1687856138178	1687856138184	1687856138189	0 0 1
8	1687856138826	1687856138970	1687856138970	1687856138970	0 0 1
9	0 0 0

Evaluation Script



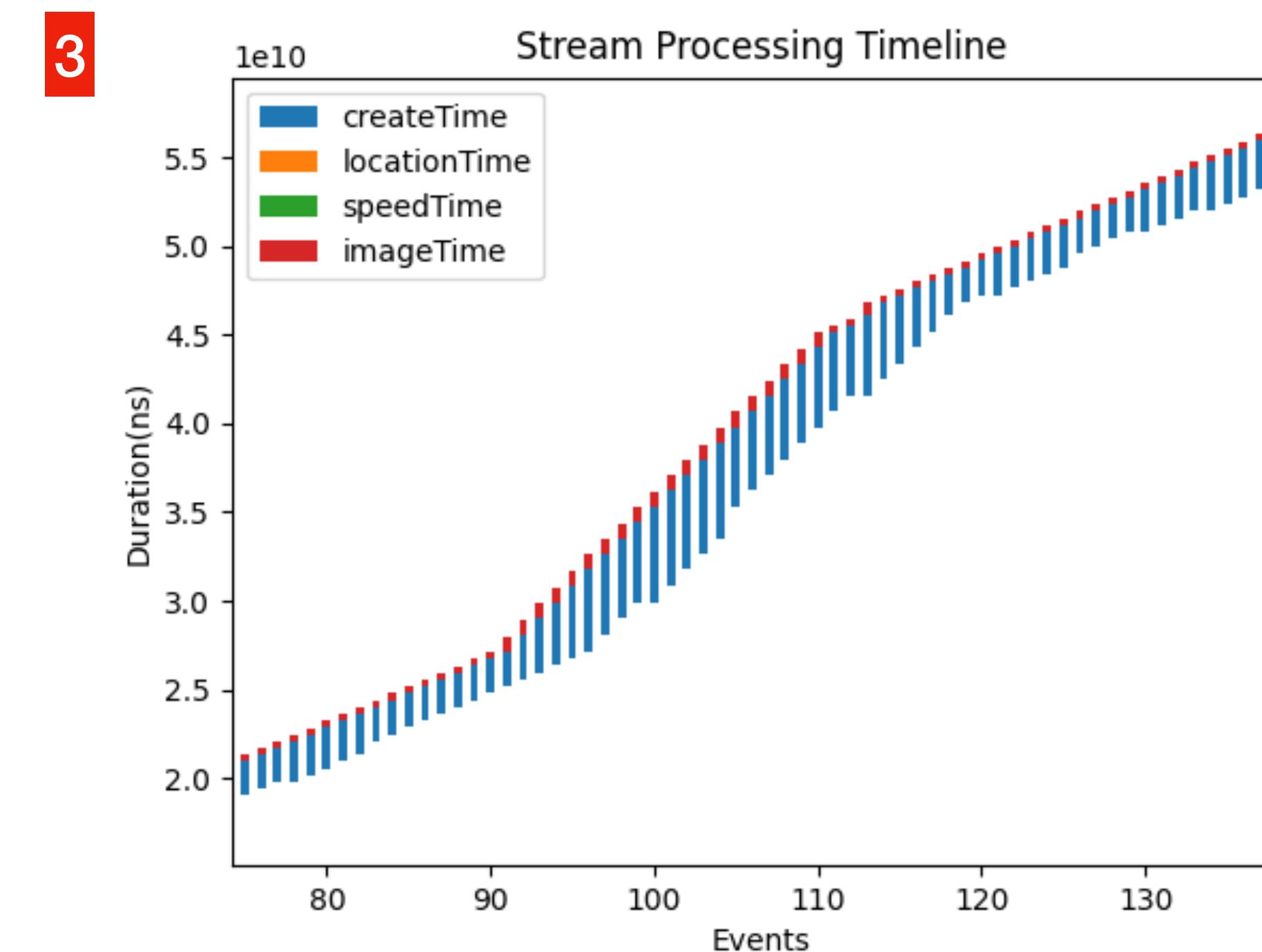
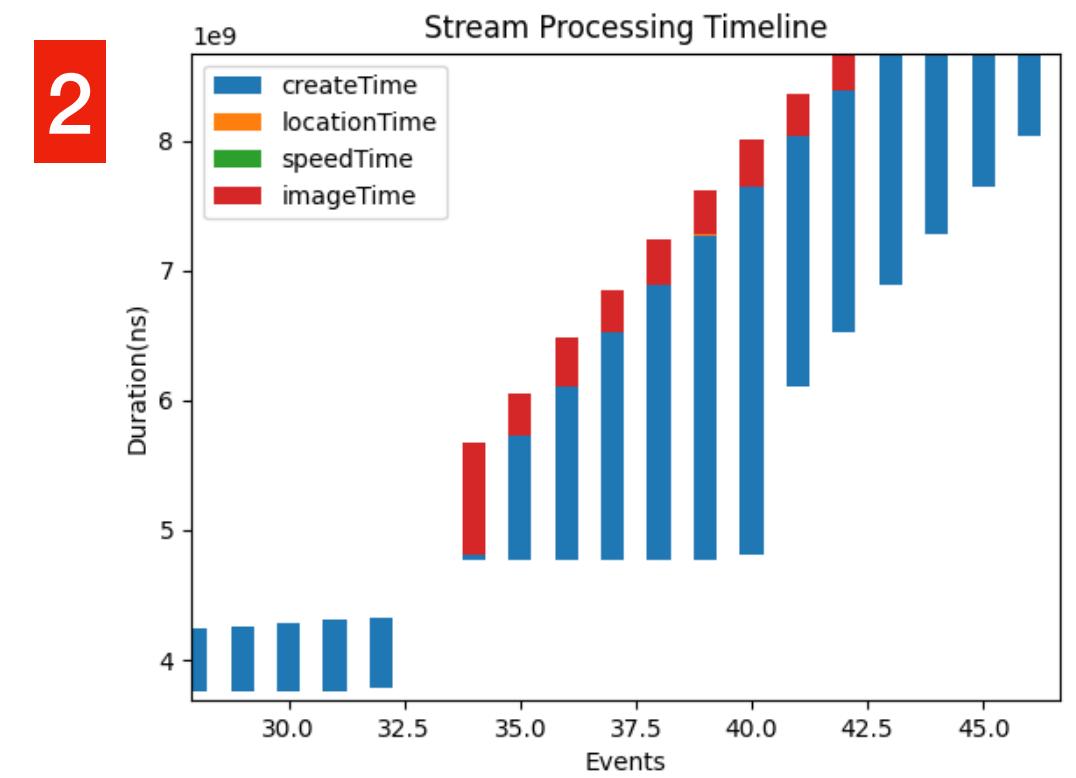
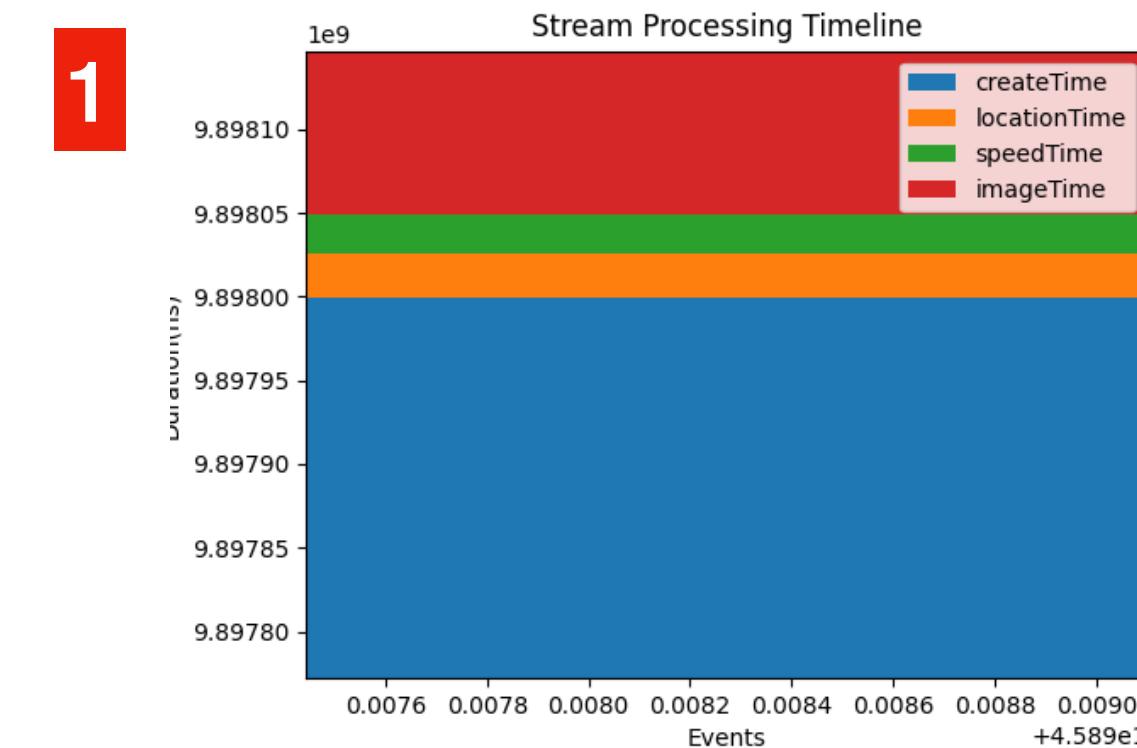
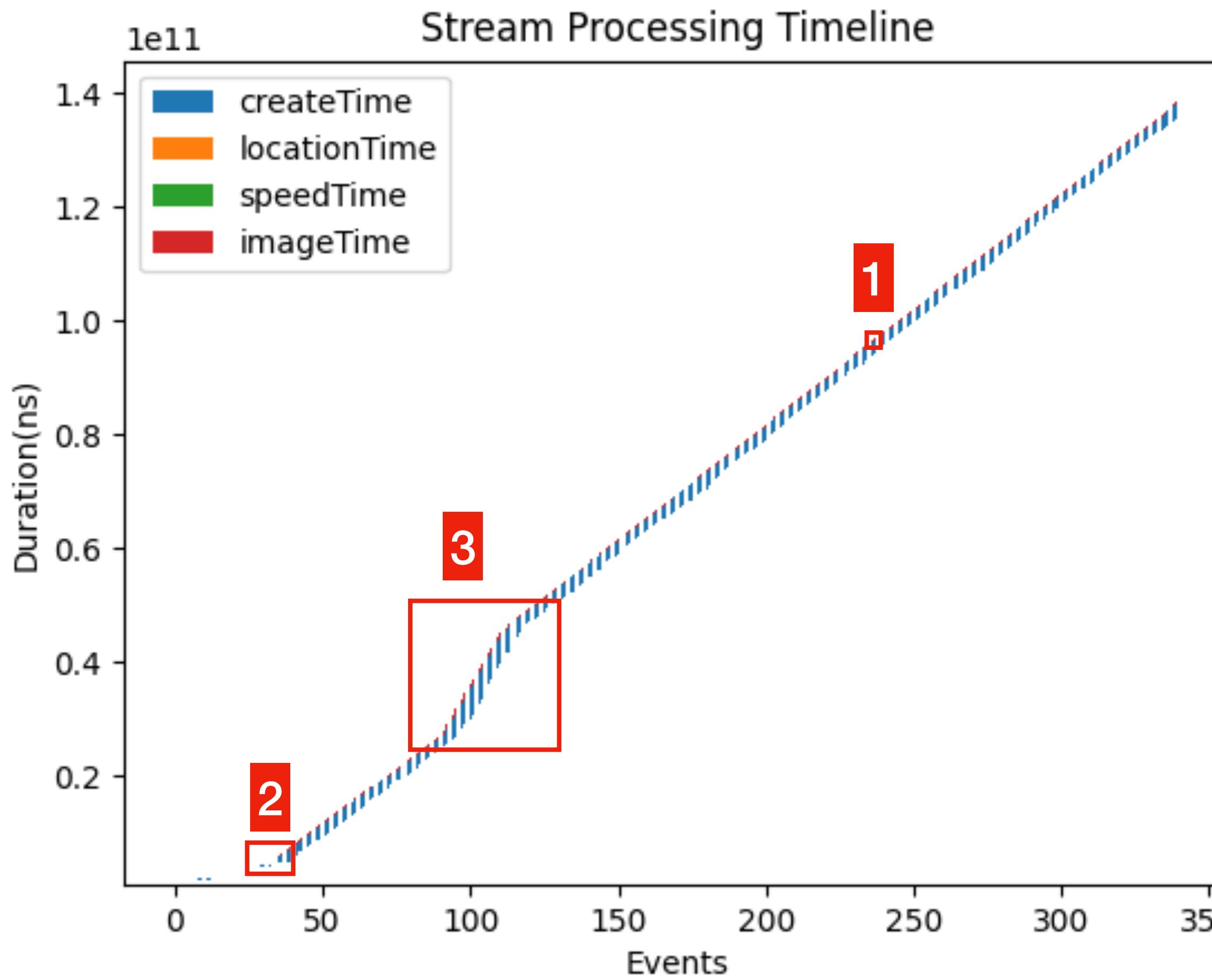
Evaluation

Variation 1 Testing

- Extreme Streaming test: Publish 350 (contains complex policy changes) at the same time and observe the consume behaviour.
 - Observation: Depends on the computational capacity, the message might be loss.
 - Handling: Add back pressure to the data source to balance the input and output speed, ensure the message won't get loss in the case of buffer is full.
- Problem remains: different consume speed between data topic and user config topic

Evaluation

Result Visualisation



Next Phase

- Debug
- Evaluation
- New evaluation strategies
- New pipeline implementations