Long Time Logging

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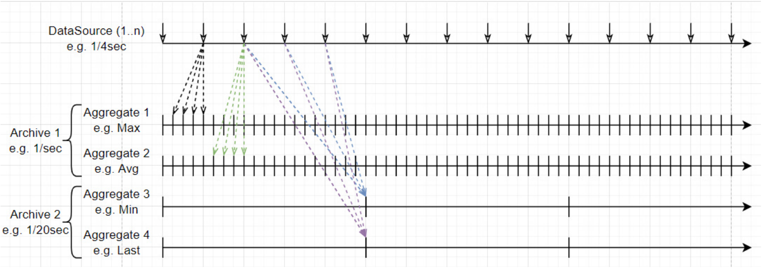
Outline

Round Robin Database

Data Collection and Storage

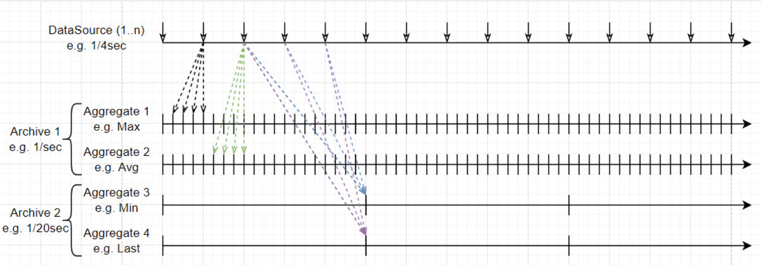
- Collects data from multiple data sources
  - each data source has a name and defines a specific data sample frequency (rate) e.g. RPM value once per second, temperature once every 5 seconds
- Stores collected data in multiple archives
  - archives are defined at database level
  - each archive defines a data sample frequency (rate) e.g. one value every second, every minute, every hour
  - also, the last value[1] of each data source is available



[1] not same as last stored value

Round Robin Database

Aggregation/Resampling



- Mismatch between the sampling frequencies of each data source and of each archive
- Resampling needed before storing: aggregation
- Each data source defines 0 or more aggregations (one of: Min, Max, Average, Last)

Round Robin Database
Trivia

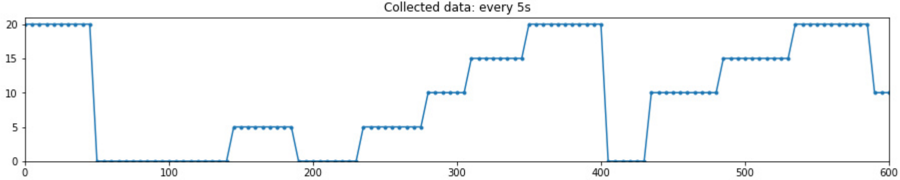
The current database is setup with 3 archives containing data samples for

- every second for 72 hours
- every minute for 60 days
- every hour for about 9.75 years[2]

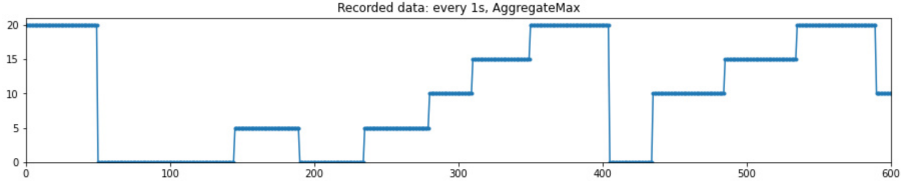
[1]probably a mistake; likely intended to be 10 years

Data Aggregation

Supersamp



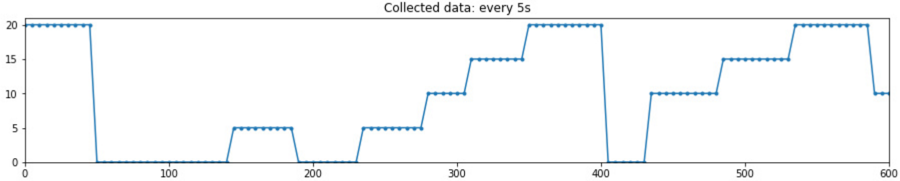

```
Total time @ 0kV: 650 s
Total time @ 5kV: 805 s
Total time @ 10kV: 680 s
Total time @ 15kV: 805 s
Total time @ 20kV: 660 s
```



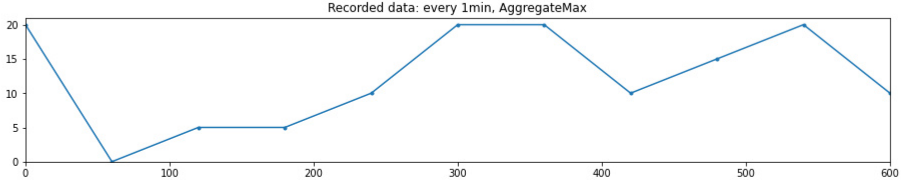

```
Total time @ 0kV: 650 s
Total time @ 5kV: 805 s
Total time @ 10kV: 680 s
Total time @ 15kV: 805 s
Total time @ 20kV: 660 s
```

Data Aggregation

Subsamplir

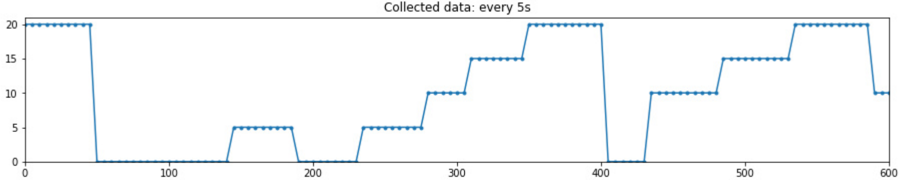



```
Total time @ 0kV: 650 s
Total time @ 5kV: 805 s
Total time @ 10kV: 680 s
Total time @ 15kV: 805 s
Total time @ 20kV: 660 s
```

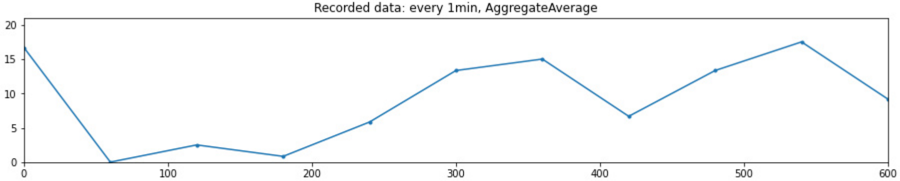



```
Total time @ 0kV: 180 s
Total time @ 5kV: 600 s
Total time @ 10kV: 420 s
Total time @ 15kV: 1140 s
Total time @ 20kV: 1260 s
```

Data Aggregation
Subsamplir




```
Total time @ 0kV: 650 s
Total time @ 5kV: 805 s
Total time @ 10kV: 680 s
Total time @ 15kV: 805 s
Total time @ 20kV: 660 s
```




```
Total time @ 0±2kV: 360 s
Total time @ 5±2kV: 780 s
Total time @ 10±2kV: 780 s
Total time @ 15±2kV: 960 s
Total time @ 20±2kV: 60 s
```

Data Aggregation

Limitations

- Fixed size database[3], long term history of value evolution
- Total size (hence number of data sources and aggregates) to be kept in check
- Re-(sub-)sampling (i.e. low resolution of sampling) makes extracting totals difficult or unfeasible
- Totals and counters may but don't need to be part of the long term logging; they could be recorded in other forms of persistent storage

[3] for one aggregation of one data source

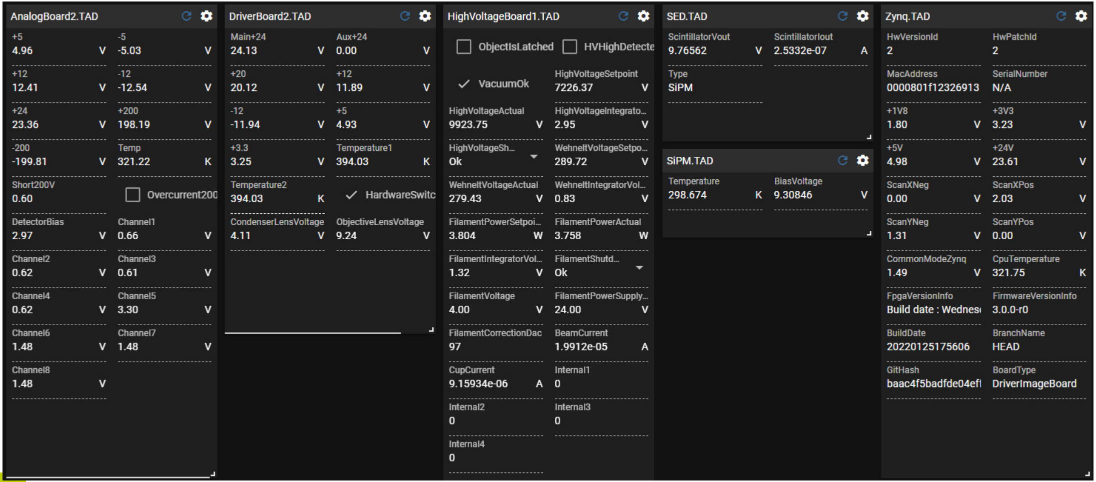
Operational Values

Which Values to Log?

- Define a list or a method to identify the values (and aggregations) to be recorded in the long term database
  - There seems to be some consensus that all "sensible" TAD values should be logged
    - not: strings, versions, video ADCs etc.
    - boolean or enum-like values might or might not be useful when aggregated
  - There is a proposal of adding other parameters but they are mostly just overall totals or counters (like total distance travelled by stage axes or number of valve actions)
  - Stigmation and source tilt (X and Y) history could qualify, but not sure how the loss of resolution would impact them

Operational Values

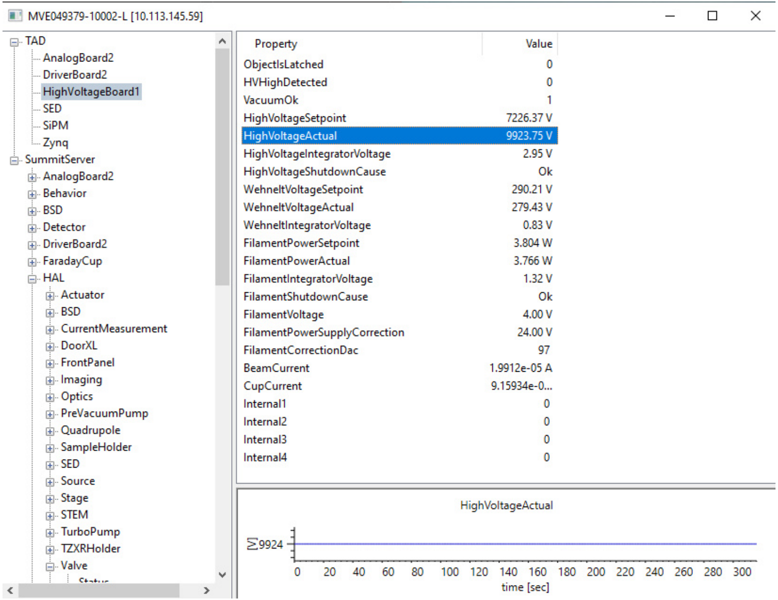
In TestUI



Not all values can or should be logged.

Operational Values

In PhenomServiceTool



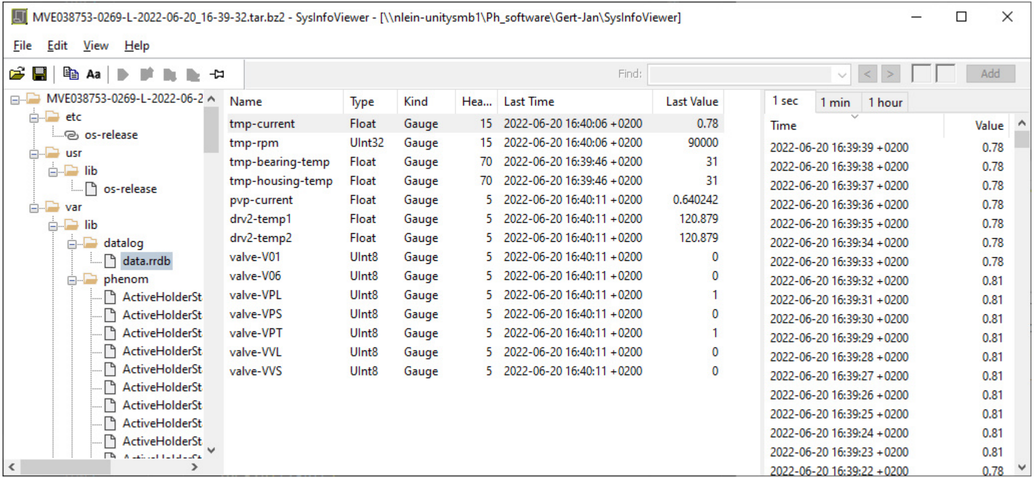
Operational Values

Plan

- Add all "sensible" TAD values and the two already requested (Stigmation and SourceTilt)
- Decide on how to handle totals and counters
- Collect input from R&D, Service, Apps over which other values to add
- Critically select which to add and which not, based on maximizing the "usefulness"

Operational Values

In SysInfoViewer



Questions and Discussions