Zarr vs. HDF5

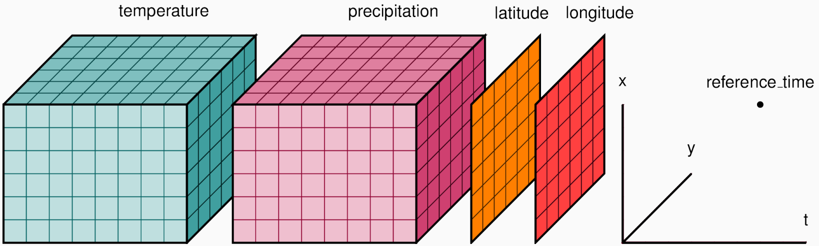
Joe Jevnik

November 4th, 2019

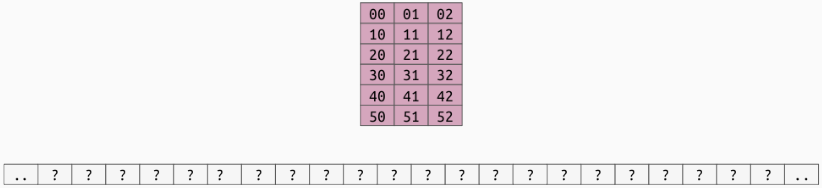
Boston Python

Core Concepts

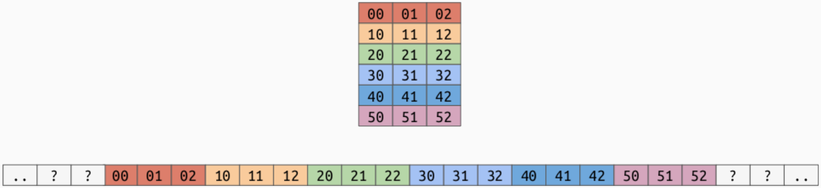
Multidimensional Data



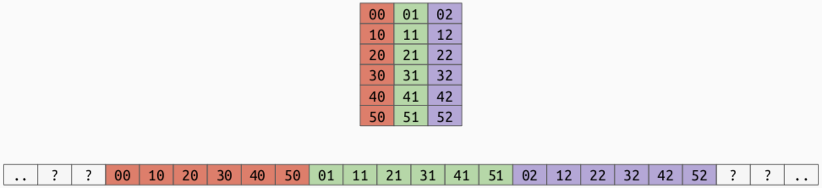
Multidimensional Data



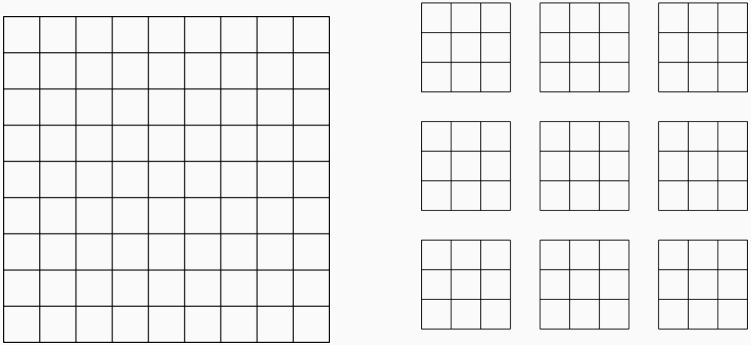
Row Order


00 01 02
10 11 12
20 21 22
30 31 32
40 41 42
50 51 52
.. ? ? 00 01 02 10 11 12 20 21 22 30 31 32 40 41 42 50 51 52 ? ? ..

Column Order



Chunks



Chunks

reduce io

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facilitate caching

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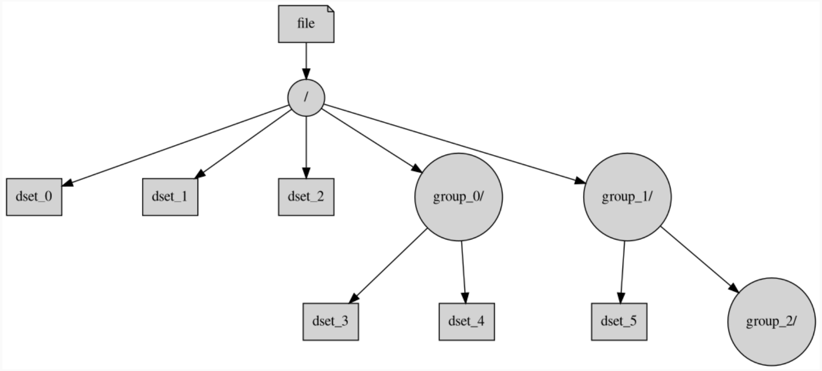
reduce io

facilitate caching

allow extending the shape of the dataset

Hierarchy


file
/
dset_0
dset_1
dset_2
group_0/
group_1/
dset_3
dset_4
dset_5
group_2/

Nodes

Definition (Dataset)

a multidimensional array

leaves of a Zarr or HDF5 tree

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either a **dataset** or **group**

Attributes

Definition (Attributes)

key-value data

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key-value data

property of each **node**

Python Interface

General

nested dictionaries

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leaves are *array-like*

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NOTE: describes `h5py`, not `pytables`

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>>> f['dset'][10, 3]
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>>> f['dset'][:]
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`Dataset.read_direct` to read into existing buffers

Making a Decision

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Extensions

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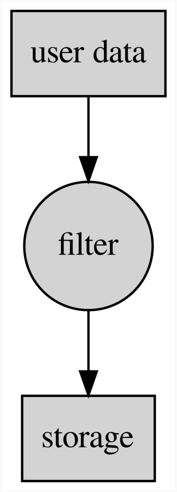
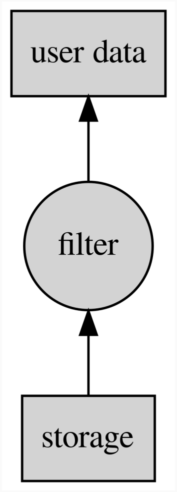
checksumming

Filters

write

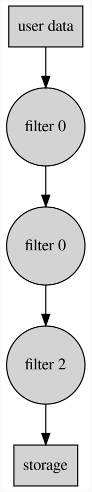


read

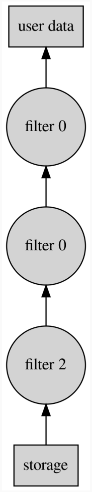


Filter Pipelines

write



read



Writing an HDF5 Filter

```
size_t dod_filter(unsigned int flags,
                  size_t cd_nelmts,
                  const unsigned int cd_values[],
                  size_t nbytes,
                  size_t *buf_size,
                  void **buf);
```