

HDF5-HL Packet Tables



The Situation: A Stream of Data

- An instrument takes measurements at regular intervals
 - Data arrives in "**packets**"--one value at a time
 - Data is arriving in **real-time**
- Or multiple instruments are being used
 - Packets consist of one or more measurements
 - Packets **vary in size**

The Solution: Packet Tables

- A high-level API for HDF5
 - Designed to support **streams of data**
 - **High-performance** for real-time data
 - Supports both **fixed-length** packets and **variable-length** packets
- Available in C and C++

Packet Tables vs. H5TB Tables

- The "Packet Table" and "Table" interfaces both create tables in HDF5.
- H5TB Tables are **flexible**.
- H5TB Tables support **insertions**.
- Packet Tables are **high-performance** and support **variable-length** entries.
- A table is **one or the other**, but not both!

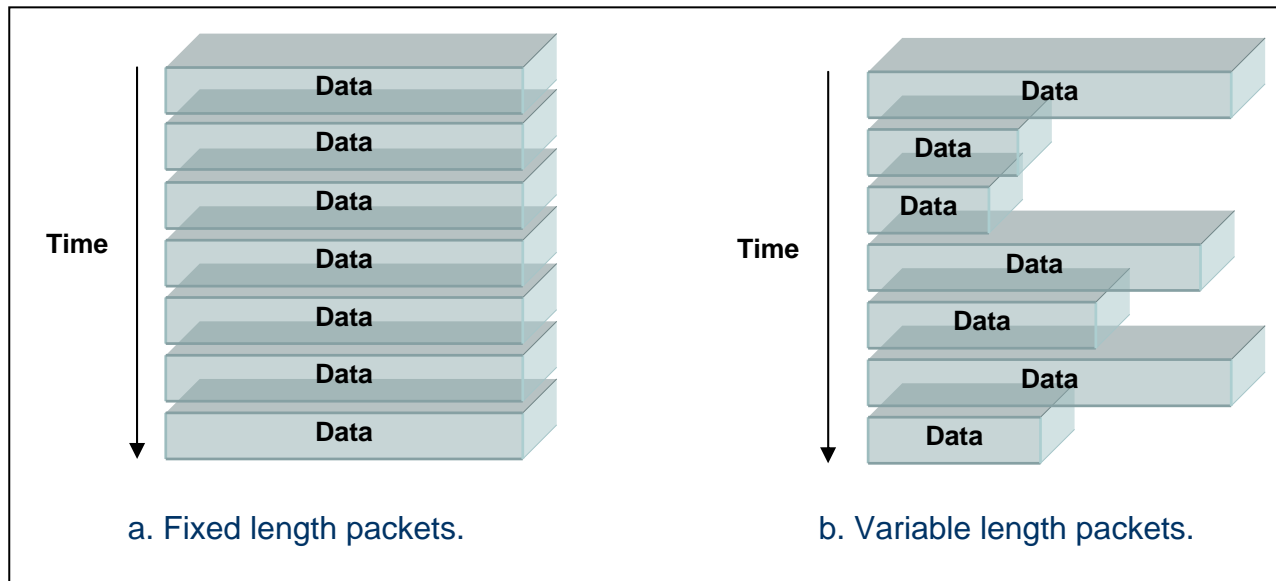
Using Packet Tables

- A Packet Table contains either fixed-length or variable-length packets.
 - Use `H5PTcreate_fl` or `H5PTcreate_vl`
 - Once set, a Packet Table's type never changes
- Packet Tables need to be opened and closed like HDF5 datasets.
 - Use `H5PTopen` and `H5PTclose`

Using Packet Tables

- Write packets from the data stream
 - Use H5PTappend
- Read packets back in order
 - Set the starting point with H5PTset_index
 - Use H5PTget_next to move through the data
- ...Or, out of order
 - Use H5PTread_packets

Fixed-length vs. Variable-length



Fixed-Length vs. Variable Length

- Both types of Packet Table use the same API calls
 - Fixed-length tables use HDF5 datatypes
- Variable-Length Packet Tables use **hvl_t** structs
 - HDF5's natural support for variable-size data
 - During reads, a buffer is allocated and must be freed -- use `H5PTfree_vlen_readbuff`

Packet Tables in Action

- An overview of Packet Tables

http://hdf.ncsa.uiuc.edu/HDF5/hdf5_hl/doc/RM_hdf5pt_intro.html

- See the Packet Table use cases:

http://hdf.ncsa.uiuc.edu/HDF5/hdf5_hl/doc/RM_hdf5pt_usecases.html

- Simple examples of Packet Tables in use