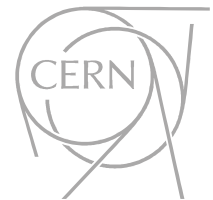David Cobas
Simone Nellaga
Alessandro Rubini
Federico Vaga
Tomasz Włostowski

ZIO: The Ultimate Linux Kernel I/O Framework

CERN BE-CO-HT
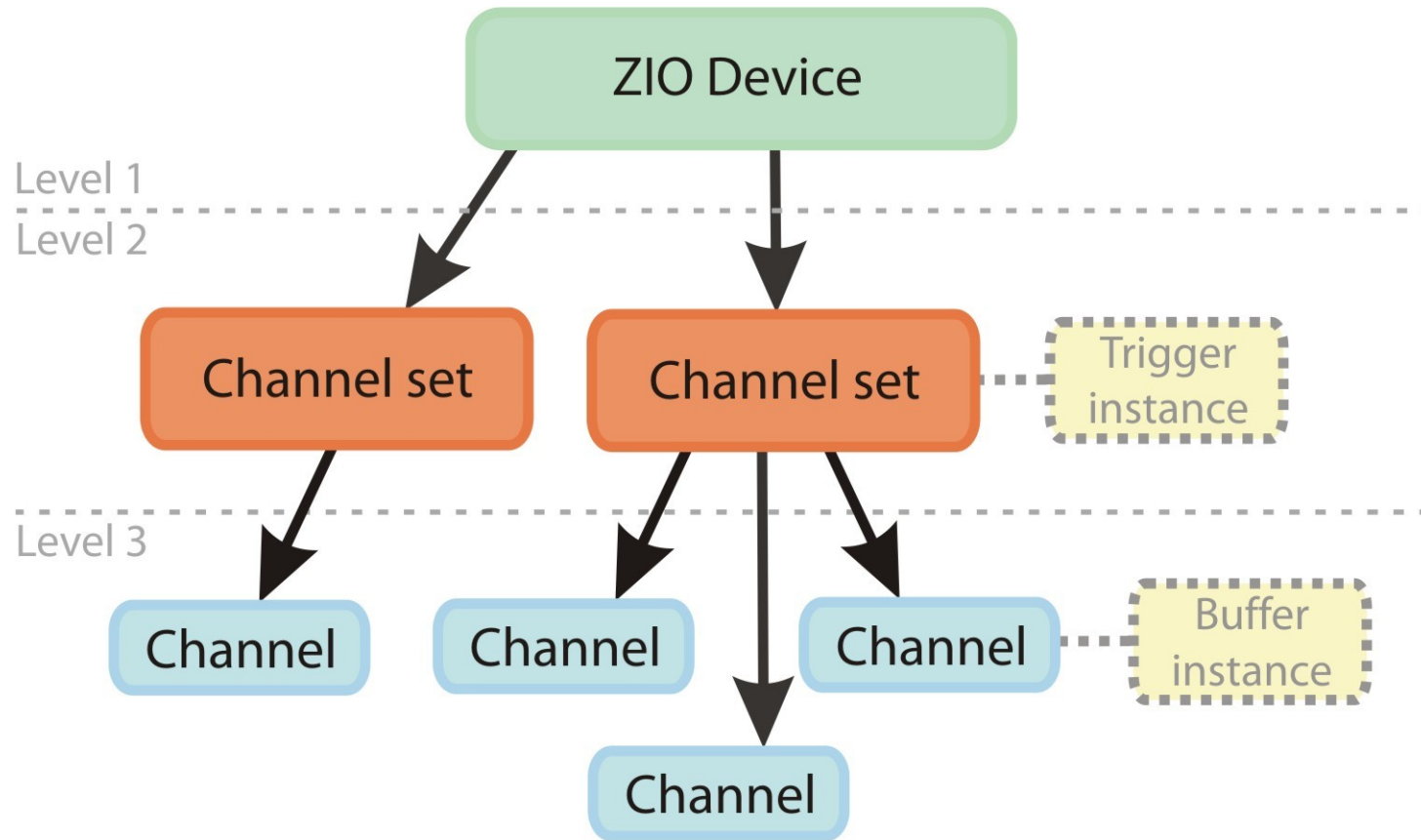San Francisco, October 7th 2013

CERN

What is ZIO?

- A Linux kernel framework for laboratory I/O

- Designed with Big Physics needs in mind

- … that are not met by the existing solutions (Comedi and IIO)

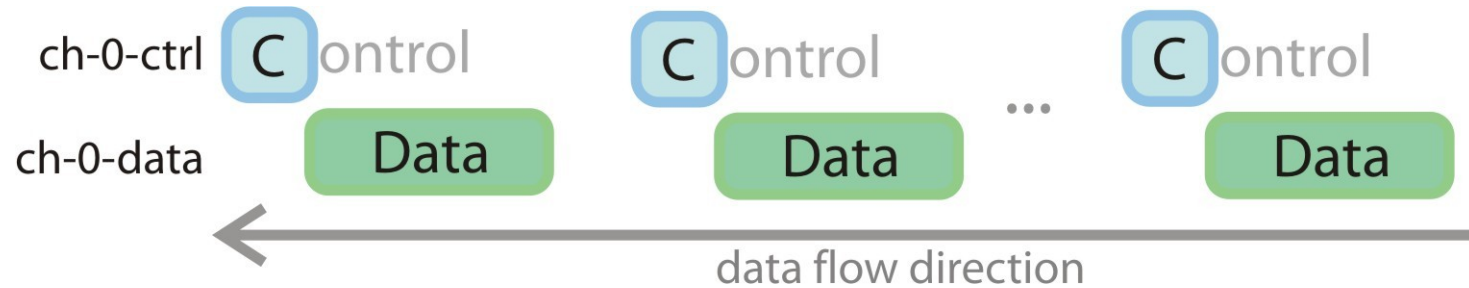- Goals: Performance, scalability and modularity

ZIO features

- Large data blocks

- Large number of devices

- High data rate

- Hardware timestamps (better than 1 ns precision)

- Flexible triggering

- Off-line creation/gathering of data blocks

- Easy monitoring of a diverse I/O environment
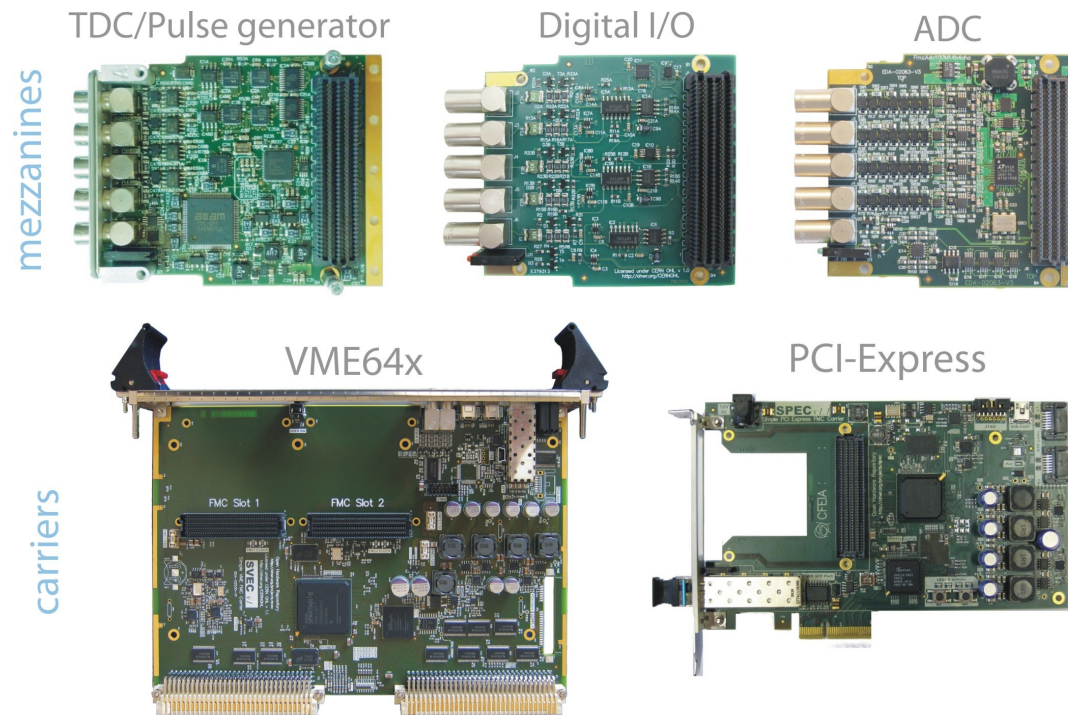
ZIO Device Model

Transferring data in ZIO

ch-0-ctrl Control   Control   ...   Control

ch-0-data Data   Data   Data

← data flow direction

- **Transfers done in blocks associated with metadata**

- **Metadata contains:**
  - timestamps
  - sample & trigger IDs
  - channel features (sample rate, etc)

Summary

- Stable version released

- Reference hardware drivers available:

TDC/Pulse generator   Digital I/O   ADC

mezzanines

VME64x   PCI-Express

carriers

- More details on the poster: **MOPPC141**