ZIO: The Ultimate Linux Kernel I/O Framework
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

ZIO Device

Channel set

Channel

Channel

Channel

Channel

Trigger instance

Buffer instance
Transferring data in ZIO

- 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
  - VME64x
  - PCI-Express

- More details on the poster: MOPPC141