

# DUNE Timing System

DAQ expert training: Troubleshooting the Timing System

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Thanks to Diana Antic for slides

# Content

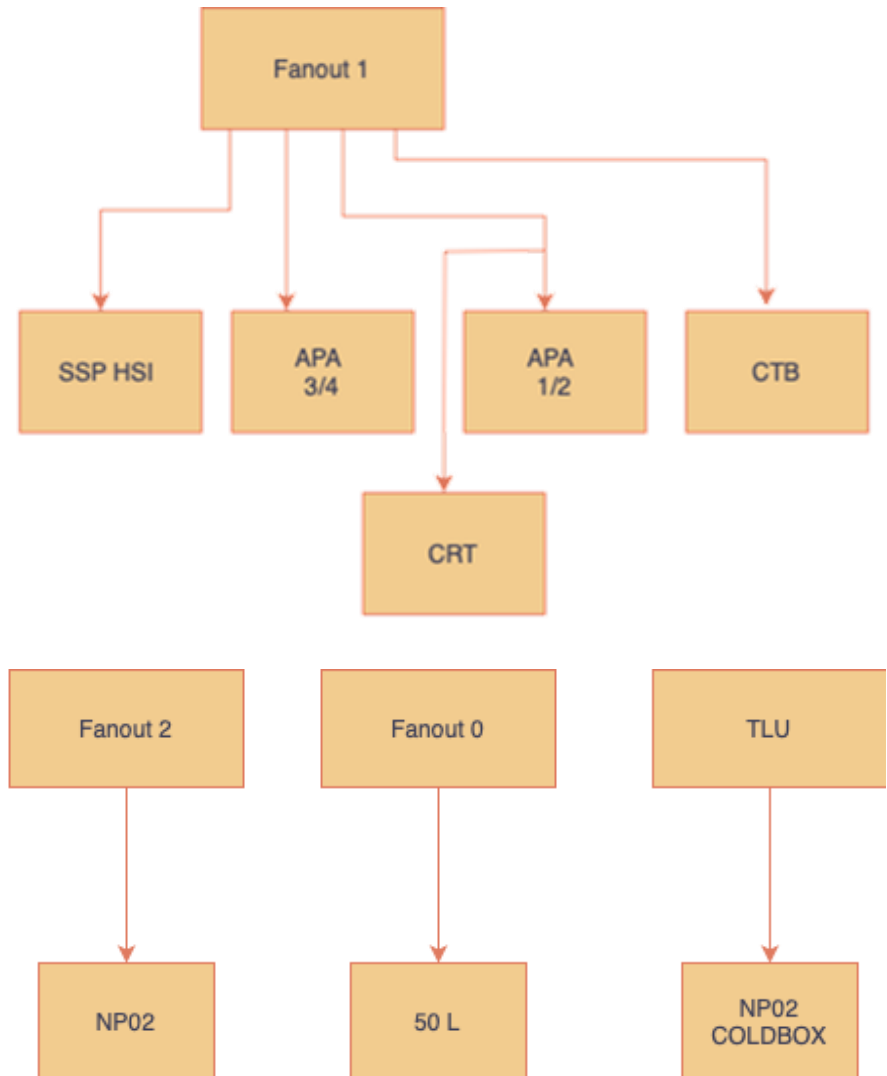
- **Dune Timing System (DTS) outline**
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# DUNE Timing System outline

- The DUNE Timing System (DTS) provides timing information across the NP04 experiment (and separately to i.e. NP02 coldbox).
- Bad timing means bad timestamps.
- Tends to go wrong during DAQ configuration.
  - Endpoints (i.e. WIBs) have a timing status.
  - Will raise problems if not in a good state (i.e. they don't have a timing signal).

# DTS hardware outline

- Fanout 1 for NP04 (with 10MHz clock coming from the WR-LEN driven by the beam-instrumentation WR network).
  - WIBs, DAPHNEs, CalCI
- TLU for coldbox.
- Fanout 2 for NP02.
- Full list of EHN1 timing endpoints:
  - <https://cernbox.cern.ch/s/OOIoDZuX3FvdiXA>

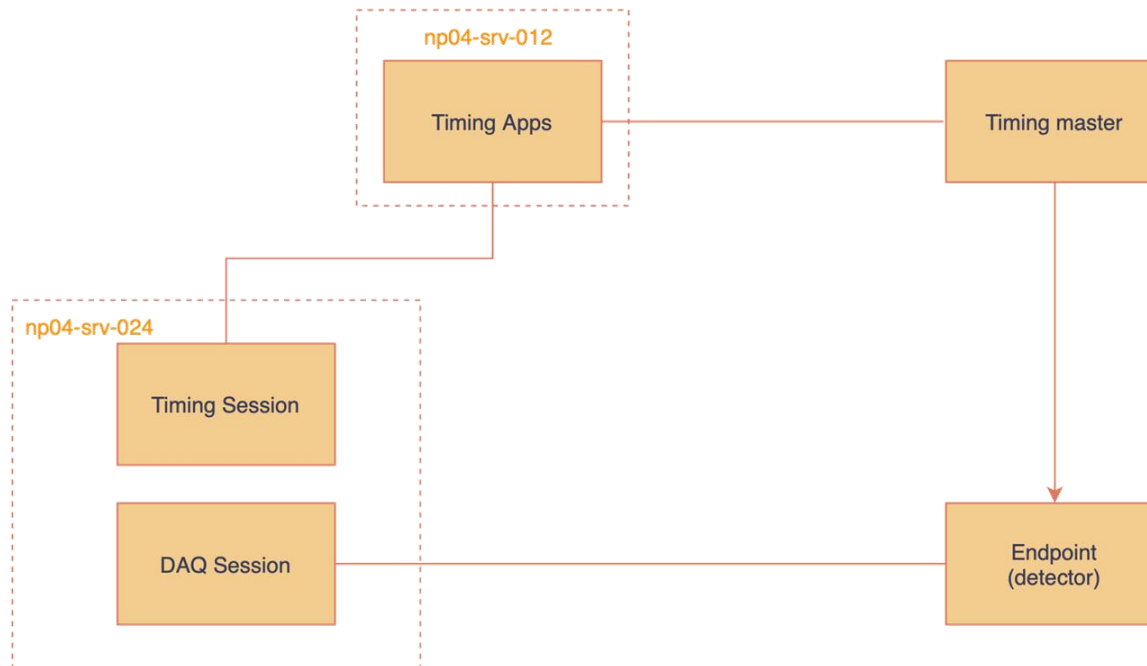


# DTS expert advice

- Follow the official documentation twiki:  
<https://twiki.cern.ch/twiki/bin/view/CENF/TimingUserGuide>
- Please post your questions to #timing-integration slack channel.
  - Individuals may not be able to help as quickly as the group!
- In the twiki:
  - Reconfiguring the timing system using the timing sessions (these slides).
  - Starting devices from cold (in particular, the CRT rack has a device which must be manually restarted, and may be over-looked).
  - Contact experts via #timing-integration !

# Reconfiguring the timing

- Timing sessions live on np04-srv-024.
  - Standard log in with np04daq.
- Timing sessions have tmux windows with “\_timing\_”.
  - NP04 tmux window: np04\_timing\_fanout\_1



# Reconfiguring the timing

- Non-timing experts can attempt to reconfigure the timing system.
- Attach to the relevant tmux window, should have the timing session running.
- Run the following commands:
  - stop
  - scrap
  - conf
  - start
- Can fix common errors, and won't interrupt the system if timing isn't the problem.
- Further details in the twiki.

# Reconfiguring the timing

## 1. stop

```
user@timingrc> stop
# acks received ██████████ 100%
# responses received ██████████ 100% 0:00:00 0:00:00
thi ██████████ 100% 0:00:00 0:00:00
tnc ██████████ 100% 0:00:00 0:00:00
```

```
Run #1 ongoing
```

Type	TEST
Start time	06/06/2024 13:34:58
Duration	1 day, 4:08:50.384476
Data storage enabled	False
Trigger rate	default from config (1Hz?)

np02\_coldbox\_timing\_tlu\_conf applications in partition np02-coldbox-timing-tlu

name	state	host	pings	last cmd	last succ. cmd
np02_coldbox_timing_tlu_conf	configured				
└ np02_coldbox_timing_tlu_conf	configured				
└─ thi	configured - alive	np04-srv-012	True	stop	stop
└─ tnc	configured - alive	np04-srv-012	True	stop	stop

## 3. conf

```
user@timingrc> conf
# acks received ██████████ 100%
# responses received ██████████ 100% 0:00:00 0:00:14
thi ██████████ 100% 0:00:00 0:00:00
tnc ██████████ 100% 0:00:00 0:00:14
```

```
Run #1 ongoing
```

Type	TEST
Start time	06/06/2024 13:34:58
Duration	1 day, 4:11:29.491681
Data storage enabled	False
Trigger rate	default from config (1Hz?)

np02\_coldbox\_timing\_tlu\_conf applications in partition np02-coldbox-timing-tlu

name	state	host	pings	last cmd	last succ. cmd
np02_coldbox_timing_tlu_conf	configured				
└ np02_coldbox_timing_tlu_conf	configured				
└─ thi	configured - alive	np04-srv-012	True	conf	conf
└─ tnc	configured - alive	np04-srv-012	True	conf	conf

## 2. scrap

```
user@timingrc> scrap
# acks received ██████████ 100%
# responses received ██████████ 100% 0:00:00 0:00:00
thi ██████████ 100% 0:00:00 0:00:00
tnc ██████████ 100% 0:00:00 0:00:00
```

```
Run #1 ongoing
```

Type	TEST
Start time	06/06/2024 13:34:58
Duration	1 day, 4:08:56.131118
Data storage enabled	False
Trigger rate	default from config (1Hz?)

np02\_coldbox\_timing\_tlu\_conf applications in partition np02-coldbox-timing-tlu

name	state	host	pings	last cmd	last succ. cmd
np02_coldbox_timing_tlu_conf	initial				
└ np02_coldbox_timing_tlu_conf	initial				
└─ thi	initial - alive	np04-srv-012	True	scrap	scrap
└─ tnc	initial - alive	np04-srv-012	True	scrap	scrap

## 4. start

```
user@timingrc> start
# acks received ██████████ 100%
# responses received ██████████ 100% 0:00:00 0:00:00
thi ██████████ 100% 0:00:00 0:00:00
tnc ██████████ 100% 0:00:00 0:00:00
```

```
Started running
```

```
Run #1 ongoing
```

Type	TEST
Start time	07/06/2024 17:47:02
Duration	0:00:00.003447
Data storage enabled	False
Trigger rate	default from config (1Hz?)

np02\_coldbox\_timing\_tlu\_conf applications in partition np02-coldbox-timing-tlu

name	state	host	pings	last cmd	last succ. cmd
np02_coldbox_timing_tlu_conf	running				
└ np02_coldbox_timing_tlu_conf	running				
└─ thi	running - alive	np04-srv-012	True	start	start
└─ tnc	running - alive	np04-srv-012	True	start	start



# Summary

- Bookmark the twiki!  
<https://twiki.cern.ch/twiki/bin/view/CENF/TimingUserGuide>

**Thank you!**