

# Status UDPS

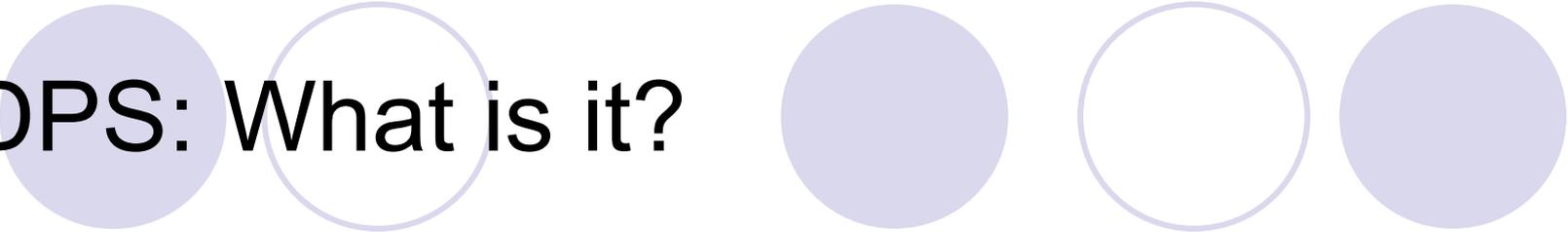
What is it?

How do we get it?

How do we use it?

When do we get it?

# UDPS: What is it?



- Ultra Dynamic PreScale
- David Saltzberg's suggestion
- Use status of L2 Buffers in trigger decision
- Otherwise prescaled triggers get a chance provided there are  $>2$  free L2 buffers
- Provides a way to have effective prescale factors of less than two and do so in real time without pausing the run

# UDPS: How do we get it?

- FRED (aka Global Level 1) does not know about the L2 buffer status
- Trigger Supervisor (TS) keeps track of L2 buffer status and rejects FRED triggers if there is not at least one empty L2 buffer
  - CDF livetime requires  $\geq 1$  empty L2 buffer
- UDPS achieved by feeding knowledge from TS back into FRED

# UDPS: How do we get it?

- Needed information can be derived by logic in the TS crate
- FPGA logic on GL2 transition card in TS crate already used to derive the L2 buffer occupancy status (how many L2 buffers EMPTY, FULL, etc.)
- Checked against information directly supplied by TS (>1 EMPTY, FULL, etc.)

# UDPS: How do we get it?

- Modification to GL2T firmware to send needed information off the board to the Global Level 1 Decision crate
- Additional modifications required on GL2T and TS (firmware, blue wires on GL2T and jumpers on TS) to maintain accurate accounting in both 1 and 2 SRC operation
- More details in TSI e-log

# UDPS: How do we use it?

- (Only) two signals are sent from GL2T
  - $\geq 1$  L2 Buffer Empty
  - $\geq 3$  L2 Buffers Empty
- Differential ECL signals requiring proper termination at the receiving end
- Use as two input trigger bits in FRED
- No special timing required!
  - The signals are simply levels
  - The information is already 'stale' by  $\sim 2 \mu\text{sec}$

# UDPS: How do we use it?

- At FRED `Trigger' level:
  - $\text{UDPS-trig} = \text{Your-trig} \text{ .AND. } \geq 3$
  - $\text{UDPS-trig-norm} = \text{Your-trig} \text{ .AND. } \geq 1$
- At FRED `Prescaled Trigger' Level:
  - Include all UDPS-trig in big .OR. For TS
  - Prescale away all UDPS-trig-norm
- Use SL1D scaler counts from FRED `trigger' level to get effective prescale

# UDPS: When do we get it?

- The modified GL2T card will arrive today
- The firmware and modifications have been thoroughly tested at Yale
- Interested parties can begin immediately on the next steps using a version of the firmware which assumes 2<sup>nd</sup> SRC is not in use
- Automagic switching version of the GL2T firmware requires modifications to all TS modules in the crate (2 SRC firmware, jumpers)