Timing System / Data Selection Integration

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DS/PP Meeting, March 23 2021

Integration

- Define data product for timing message
- Replace Trigger Primitives
- Latency measurements

Timing message on FW

Field label	Field Size [bits]	Field description
Signal type	32	Contains identifier of the timestamped external signal
Timestamp	64	Timestamp of signal arrival time
Counter	32	Counter of how many external signals have been received so far
Checksum	32	Checksum of message

(J. Brooke, Bristol)

Trigger Primitive (overkill)

```
namespace triggeralgs {
  struct TriggerPrimitive {
    int64_t  time_start          = {0};
    int64_t  time_peak           = {0};
    int32_t  time_over_threshold = {0};
    uint16_t channel             = {0};
    uint32_t adc_integral        = {0};
    uint16_t adc_peak            = {0};
    uint16_t detid               = {0};
    uint16_t type                = {0};
    uint16_t algorithm           = {0};
    uint16_t version             = {0};
    uint32_t flag                = {0};
  };
}
```

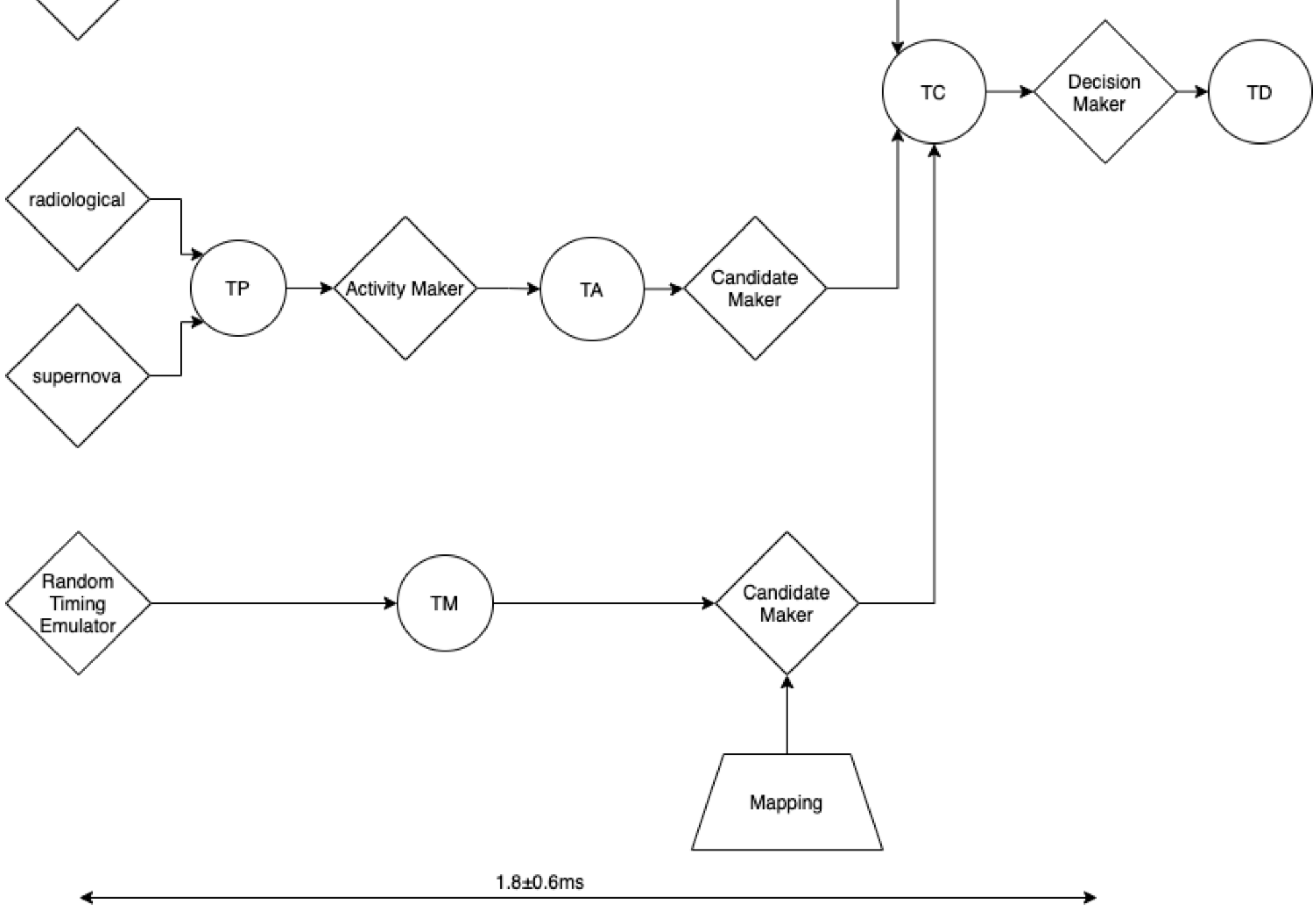
Timing Message

```
namespace triggeralgs {
  struct TimingMessage {
    uint32_t  signal_type    = {0};
    uint64_t  time_stamp     = {0};
    uint32_t  counter       = {0};
  };
}
```

Read-out map (same as before)

Signal type	pre_time	Post_time
1	-2000	+2000
2	-50	+8000
…	…	…

Trigger Candidate	Value
time_start	Timestamp – pre_time
time_end	Timestamp + post_time
type	


TC
Decision Maker
TD
radiological
supernova
TP
Activity Maker
TA
Candidate Maker
Random Timing Emulator
TM
Candidate Maker
Mapping
1.8±0.6ms