

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY  
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<b>Data Acquisition Daemon (DAQD) Program Design</b>
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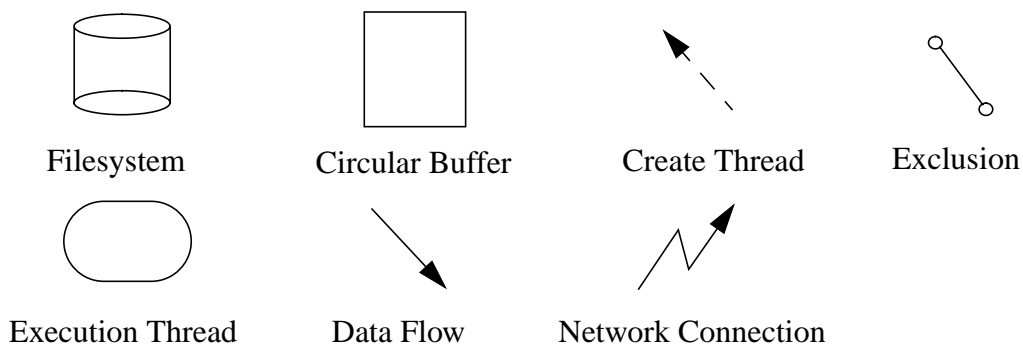
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# 1 THREADS

## 1.1. Symbols

Following symbols are used in the diagrams:

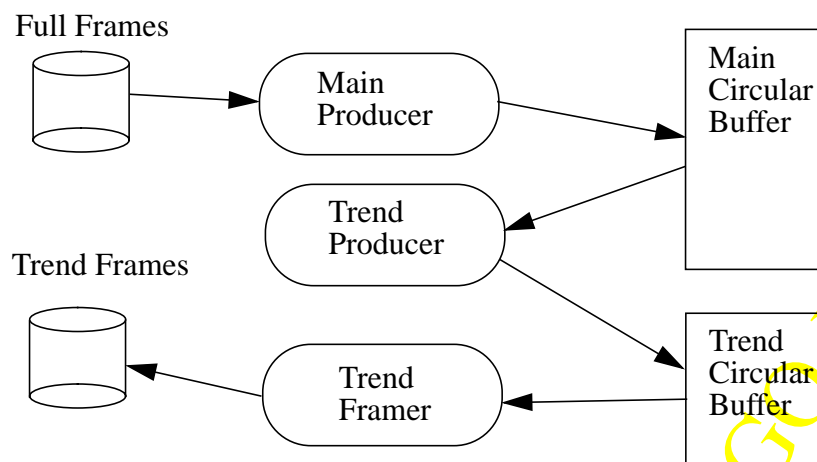


**Figure 1: Program Structure Symbols**

## 1.2. Basic Operation

Server basic operation is implemented with three threads:

- Main producer thread reads full frame files and puts channel data into the main circular buffer. It is implemented in `producer::frame_writer()`. Main producer receives filename update from the frame builder via Epics channel 'fb\_file\_string' access.
- Trend producer thread calculates channel trend (min, max, RMS over one second period) and puts trend data into the trend circular buffer, where it stays for a configurable time period, usually set to 10 minutes. Implemented in `trender_c::trend()`.
- Trend framer takes trend data out of the trend circular buffer, and saves it into the trend frame files. Code is in `trender_c::framer()`.



### 1.3. On-line Network Writer

On-line network writer consists of two threads, network producer and network writer, connected by the network circular buffer.

Network producer takes data either out of the main circular buffer or from the trend circular buffer, depending on the client request type ('start net-writer' or 'start trend net-writer'), and puts selected data channels into the network circular buffer. Network producer thread code is in `net_writer::producer()` function.

Out of the network circular buffer data goes into the network writer, which send data blocks out to the client program through TCP/IP network connection. Network writer code is in `net_writer_c::consumer()`.

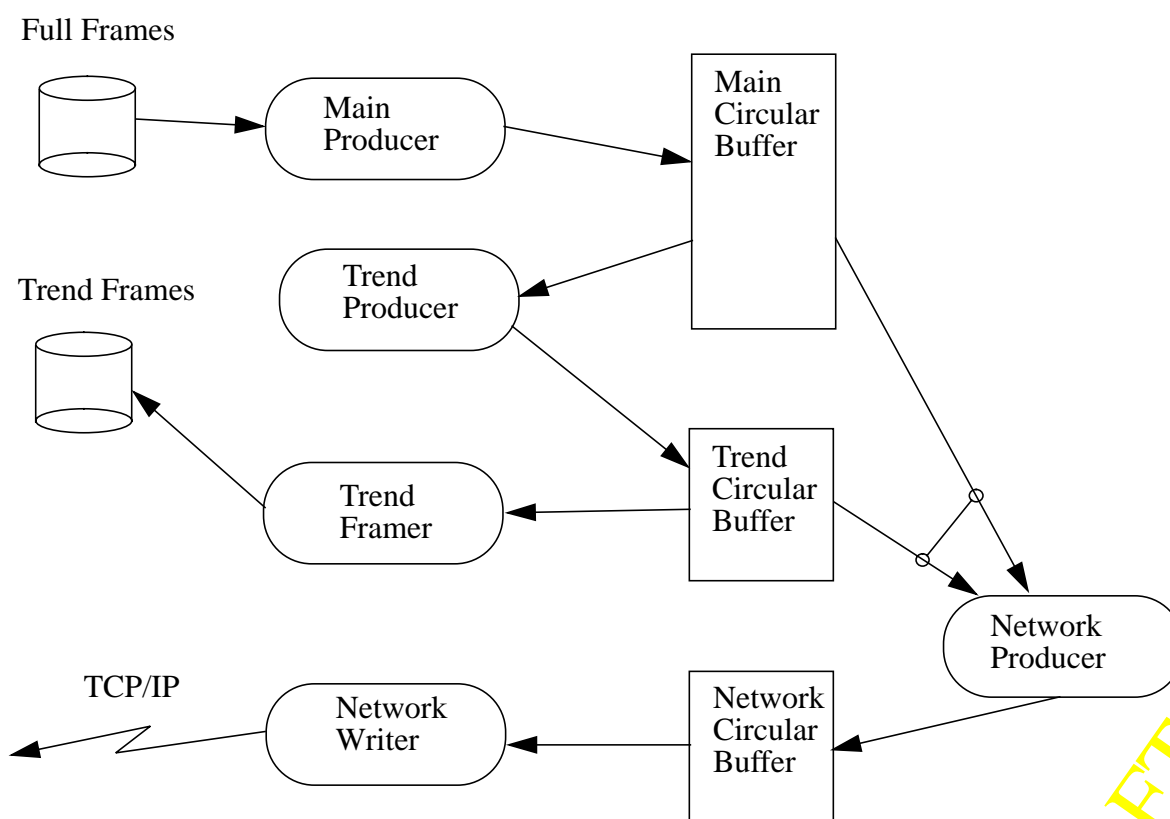


Figure 2: On-line Network Writer

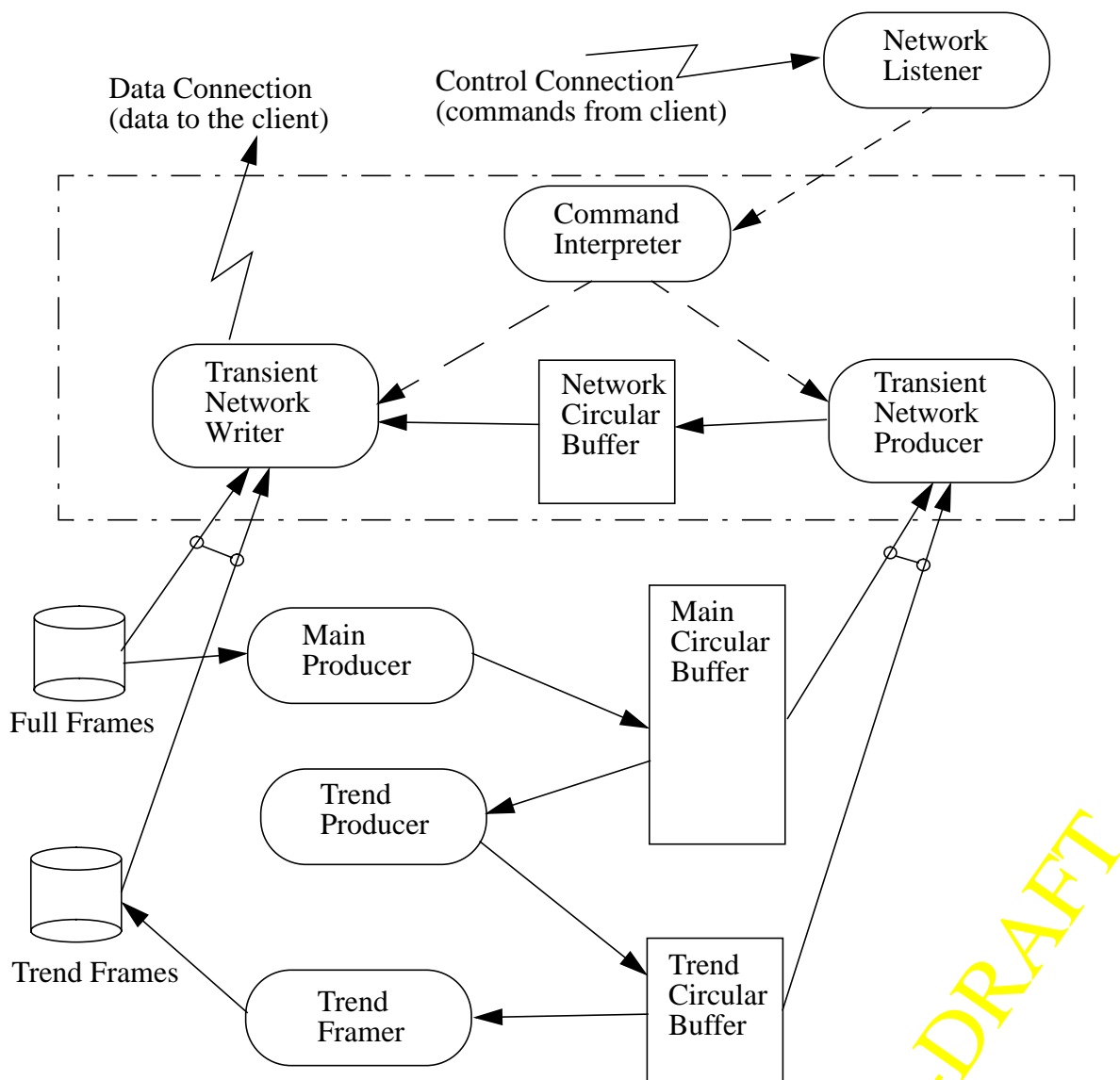
### 1.4. Off-line Data Network Writer

Off-line data is requested by the client for the specified period of time. The data could be either in a circular buffer in memory or in a frame file or in both place. Figure 3: 'Off-line Network Writer' shows off-line network writer threads arrangement along with the listener and command interpreter threads.

Transient network writer purpose is to get data from the main or trend circular buffers for some period of time and save this data into the network writer circular buffer.

Transient network writer thread reads data out of the main frame files or trend frame files and sends the data to the client. It could also access network circular buffer to get any data that goes from main or trend circular buffers.

Dash-dot rectangle in Figure 3: 'Off-line Network Writer' shows program elements that are created for every client requesting off-line data.



**Figure 3: Off-line Network Writer**

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