DAQ Monitor

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01/25/2002
Introduction

• Purposes
  – Performance monitoring during a run.
  – Performance tuning tool during commissioning.
  – Diagnostic tool in case of problems.

• Program
  – Server (DM_Server) and Client (DAQ_Monitor.py) system.
  – Communicates with DAQ system elements using itc.
  – Client displays information using Python/Tkinter + Pmw (Python mega widgets) modules.
How it works

• **DM_Server:**
  – an itc server with an itc processor to handle messages.
  – Contains a DM_Task class object.
  – DM_Task class object contains separate monitoring class objects for DAQ sub–processes, e.g. TCC, Distributor, etc.
  – Requests data to the DAQ sub–processes by sending an itc message at fixed intervals, except L3 filter monitor that pushes data to DM_Server.
How it works

– DAQ sub-processes sends monitoring info in the form of an itc message.
  • L1 TCC sends an Opaque message with a c-struct.
  • L2 TCC sends an Opaque message with a l2monitor class.
  • CR, DL, DSM, SDAQ, and L3 filter send a string message.
  • distributor sends its own message class (xdr encoded).

– Messages received from the DAQ sub-processes are handled by callback methods.
How it works

- Opaque messages sent to receiver clients are xdr encoded.

**DAQ_Monitor display**
- Receiver (Display) clients send a string message to request data from the DM_Server at fixed intervals.
- Display clients receive data from the DM_Server and in the case of Opaque message, the message is xdr decoded.
  - Currently all opaque messages are xdr encoded on the server and decoded on the client. Do we need this?
  - xdr decoding in python is very slow.

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Software

- A cvs package: daq_monitor
- Written in C++ (server) and python (display client).
- Uses itc for communication.
- Different message types for individual sub-processes that run C++ server/client.
- String and opaque messages only for python (display) clients.
- Messages are encoded/decoded in XDR in some cases.
- Compiles on SGI, Digital Unix and Linux.
What’s next?

- Switch to a new version of L1 Tcc monitor info
- Include L2 monitor
  - DM_Server can accept l2monitor message from TCC and send it to display client.
  - l2monitor package has been SWIGed so that info can be interpreted using python.
    - SWIGed code has memory leak!!
  - Oklahoma student Isaac Hall working on display.
- Include strip charts and other gooddies
  - MSU student Joe Kozminski started to work on this.
Instructions

• **To start the DAQ Monitor server (on d0olc)**
  - setup d0online
  - start_daq_monitor_server
  - or start_daq daq_monitor

• **To start a DAQ monitor display client (from any online node)**
  - setup d0online
  - start_daq_monitor_display
**Input Specific Triggers:** 0–2

**Specific Trigger Details**

<table>
<thead>
<tr>
<th>Spec Trig #</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trig Name</td>
<td>zero_bias_1_3</td>
<td>cft_pulser</td>
<td>l1bit</td>
</tr>
<tr>
<td>Allocated</td>
<td>True</td>
<td>True</td>
<td>True</td>
</tr>
<tr>
<td>Exp Group Num</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Obey Disable Mask</td>
<td>0x8812</td>
<td>0x8803</td>
<td>0x8802</td>
</tr>
<tr>
<td>Spec Trig Fired (Hz)</td>
<td>4.299</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>And/Or Fired (Hz)</td>
<td>1717629.309</td>
<td>477117.333</td>
<td>477117.333</td>
</tr>
<tr>
<td>Spec Trig Exposed (Hz)</td>
<td>4.299</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>DAQ Enable (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>DeCorr DAQ Enable (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.05</td>
</tr>
<tr>
<td>Corr DAQ Enable (%)</td>
<td>98.096</td>
<td>99.702</td>
<td>0.0</td>
</tr>
<tr>
<td>L3 Indiv Disable (%)</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Unused</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
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DataLogger Monitor


Display Mode

DataLogger Messages

DataLogger Summary 01/23/2002 16:20:58

Events received = 2030792
Average rate = 2.83738
Current rate = 1.95181
Last event = 01/23/2002 16:20:17

ITC buffer - memory used 40207616
ITC buffer - memory free 39682816

-------------------------- RUN 144141 --------------------------

Run 144141

events = 12424
size = 6166168
streams = 1
recording OFF
Started = 01/23/2002 15:13:42
last event = 01/23/2002 16:20:17
Finished (running)

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### Distributor Statistics

<table>
<thead>
<tr>
<th></th>
<th>Trigger 0</th>
<th>Trigger 1</th>
<th>Trigger 2</th>
<th>Trigger 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>stream id</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>trigger id</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>prescale all</td>
<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>prescale bfull</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>event count</td>
<td>112716</td>
<td>0</td>
<td>5430</td>
<td></td>
</tr>
<tr>
<td>kb count</td>
<td>30560247549.0</td>
<td>0.0</td>
<td>1263096440.0</td>
<td>2</td>
</tr>
<tr>
<td>event del bfull</td>
<td>19170</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kb del bfull</td>
<td>1321125291.0</td>
<td>0.0</td>
<td>122618032.0</td>
<td></td>
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<tr>
<td>event del prescale</td>
<td>37573</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>kb del prescale</td>
<td>10115209179.0</td>
<td>0.0</td>
<td>421020964.0</td>
<td></td>
</tr>
<tr>
<td>event ovrt bfull</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>kb ovrt bfull</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td></td>
</tr>
<tr>
<td>event depth</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Data Distributor Monitor**  
Wed Jan 23 16:22:02 2002  
Data Distributor Queue: 0

**Maximum Queue Depth**: 10

**Send Event Requested**: 2

**Overwrite Flag**: 0

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### DSM Messages

**Status of required slaves:**

<table>
<thead>
<tr>
<th>Slave type</th>
<th>iface to DSM</th>
<th>weight</th>
<th>event iface</th>
<th>port</th>
<th>found</th>
<th>marked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>localhost</td>
<td>1.000</td>
<td>doeolc-gb-2</td>
<td>52210</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Distributor</td>
<td>localhost</td>
<td>1.000</td>
<td>localhost</td>
<td>52100</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Datalogger</td>
<td>localhost</td>
<td>1.000</td>
<td>localhost</td>
<td>52218</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

**Connected slaves:**

<table>
<thead>
<tr>
<th>Name</th>
<th>remote host</th>
<th>required</th>
<th>established</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>localhost</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Distributor</td>
<td>localhost</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Datalogger</td>
<td>localhost</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

**Status of dataloggers:**

* localhost (52218) : avg/max/load: 100.000/100.000/1.000

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<table>
<thead>
<tr>
<th>Run</th>
<th>L2 bit</th>
<th>L2 Name</th>
<th>L1 bit</th>
<th>L3 bit</th>
<th>L3 Script Name</th>
<th># called</th>
<th># passed</th>
</tr>
</thead>
</table>
| 144141 | 0      | TRIG_zero_bias_1_3 | 0      | 0      | zero_bias_1_3     | 2189     | 2189    

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