

SNEWS UPDATE

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NO ν A Collaboration Meeting, October 24, 2014

- The setup
- DAQ Resource Manager integration
- Monitoring of processes
- Some Event Displays
- Implimented scripts and where to find them
- A word on DAQ read out tests

- Quick reminder of XMLRPC message chain to NO ν A data
 - Sender on bnlboom1 sends messages to forwarder on novatest01 (nova-supernova-gateway)
 - Forwards messages to receiver on novadaq-near-trigger and forwarder on novadaq-far-trigger
 - Forwards messages to receiver on novadaq-far-trigger
 - Receiver translate XMLRPC into DDS messages and pipe them to Global Trigger
 - Global Trigger issues trigger to Buffer Node Farm and Data Logger
 - Buffer nodes send data to Data Logger
 - Data Logger writes them to disk
 - Everybody is happy!

- Forwarder backbone start and stop scripts with logging
- Forwarder monitoring via SpillServer Monitor
- Receivers start and stop scripts with logging
- Receivers implemented as a Manager process under control of the Resource Manager and monitored by the DAQApplications Manager
- Full chain successful on NDOS (four weeks ago)

SNEWS RESOURCE

The screenshot shows the 'FarDet Detector Resource Manager' application window. The title bar indicates it is running on 'novadaq-far-runcontrol.fnal.gov'. The interface includes a menu bar (File, Edit, Connection, Configuration) and a toolbar with 'Null Particles' and 'Part 1 to 2' buttons. The main content area displays a tree view of resources, organized into 'Managers' and 'BNEVB Lists'. The 'Managers' section is expanded, showing a list of services with their respective hosts and ports. The 'BNEVB Lists' section is also expanded, showing a list of identifiers.

Id	Host	Commissioned	Port
- Managers			
ConfigurationManager	novadaq-far-master		
SimulationManager	novadaq-far-master		
GlobalTrigger	novadaq-far-trigger		
TDUManager	novadaq-far-runcontrol		
MessageFacilityServer	novadaq-far-msglogger		
MessageViewer	novadaq-far-msglogger		
ResourceManagerServer	novadaq-far-runcontrol		
RunControlServer	novadaq-far-runcontrol		
EventDisplay	novadaq-far-datamon		
SpillServer	novadaq-far-trigger		
EventDispatcher1	novadaq-far-datadisk-01		
TriggerScalars1	novadaq-far-datadisk-01		
EventDispatcher2	novadaq-far-datadisk-02		
TriggerScalars2	novadaq-far-datadisk-02		
EventDispatcher3	novadaq-far-datadisk-03		
TriggerScalars3	novadaq-far-datadisk-03		
DataLogger	novadaq-far-datadisk-01		7755
DataLogger2	novadaq-far-datadisk-02		7755
DataLogger3	novadaq-far-datadisk-03		7755
DDTManager	novadaq-far-master		
MessageAnalyzer	novadaq-far-msglogger		
DaqMonitor	novadaq-far-daqmon		
SNEWSMessageReceiver	novadaq-far-trigger		
- BNEVB Lists			
+ bng21			
+ bng10			
+ bng09			
+ bng16			
+ bng17			
+ bng18			
+ bng19			
+ bng20			
+ bng14			
+ bng15			

SNEWS RESOURCE NEARDET

NearDet Detector Resource Manager <@novadaq-near-runcontrol.fnal.gov>

File Edit Connection Configuration

Null Partition

Id	Host	Commissioned	Port
Managers			
SimulationManager	novadaq-near-runcontrol		
GlobalTrigger	novadaq-near-trigger		
MessageFacilityServer	novadaq-near-msglogger		
MessageViewer	novadaq-near-msglogger		
SpillServer	novadaq-near-trigger		
MessageAnalyzer	novadaq-near-msglogger		
ConfigurationManager	novadaq-near-runcontrol		
ResourceManagerServer	novadaq-near-runcontrol		
RunControlServer	novadaq-near-runcontrol		
TDUManager	novadaq-near-runcontrol		
DDTManager	novadaq-near-runcontrol		
DataLogger	novadaq-near-datadisk-02		7755
TriggerScalars	novadaq-near-datadisk-02		
EventDispatcher	novadaq-near-datadisk-02		
DaqMonitor	novadaq-near-datamon		
SNEWSMessageReceiver	novadaq-near-trigger		
BNEVB Lists			
Timing Chains			

SNEWS RUNNING

Resource Selection Window (on novadaq-far-runcontrol.fnal.gov) x

id	Disabled
<input type="checkbox"/> Managers	<input type="checkbox"/>
<input checked="" type="checkbox"/> ConfigurationManager	<input type="checkbox"/>
<input checked="" type="checkbox"/> DDTManager	<input type="checkbox"/>
<input type="checkbox"/> DaqMonitor	<input type="checkbox"/>
<input checked="" type="checkbox"/> DataLogger	<input type="checkbox"/>
<input type="checkbox"/> DataLogger2	<input type="checkbox"/>
<input type="checkbox"/> DataLogger3	<input type="checkbox"/>
<input checked="" type="checkbox"/> EventDispatcher1	<input type="checkbox"/>
<input type="checkbox"/> EventDispatcher2	<input type="checkbox"/>
<input type="checkbox"/> EventDispatcher3	<input type="checkbox"/>
<input type="checkbox"/> EventDisplay	<input type="checkbox"/>
<input checked="" type="checkbox"/> GlobalTrigger	<input type="checkbox"/>
<input checked="" type="checkbox"/> MessageAnalyzer	<input type="checkbox"/>
<input checked="" type="checkbox"/> MessageFacilityServer	<input type="checkbox"/>
<input checked="" type="checkbox"/> MessageViewer	<input type="checkbox"/>
<input type="checkbox"/> ResourceManagerS...	<input type="checkbox"/>
<input checked="" type="checkbox"/> RunControlServer	<input type="checkbox"/>
<input type="checkbox"/> SNEWSMessageRe...	<input type="checkbox"/>
<input type="checkbox"/> SimulationManager	<input type="checkbox"/>
<input checked="" type="checkbox"/> SpillServer	<input type="checkbox"/>
<input checked="" type="checkbox"/> TDUManager	<input type="checkbox"/>
<input checked="" type="checkbox"/> TriggerScalars1	<input type="checkbox"/>
<input type="checkbox"/> TriggerScalars2	<input type="checkbox"/>
<input type="checkbox"/> TriggerScalars3	<input type="checkbox"/>
<input checked="" type="checkbox"/> Timing Chains	<input type="checkbox"/>
<input checked="" type="checkbox"/> Buffer Nodes	<input checked="" type="checkbox"/>

Apply All Remove All

Do Pedestal Run OK Cancel

Manager Processes::Managers

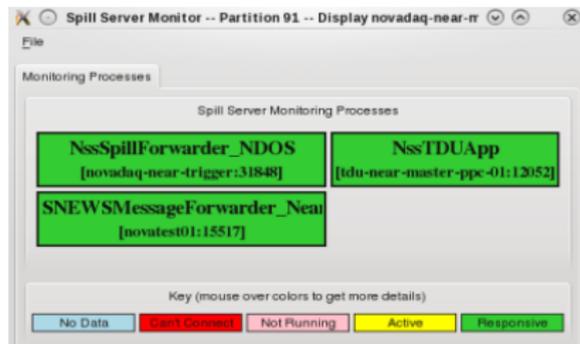
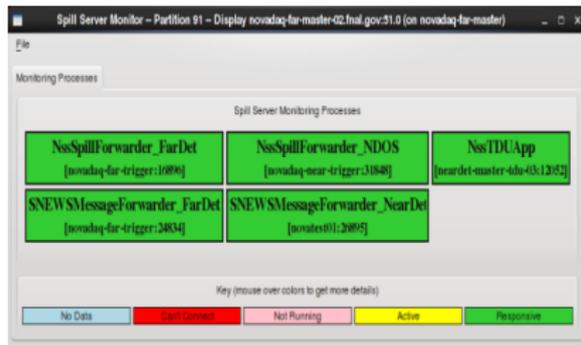
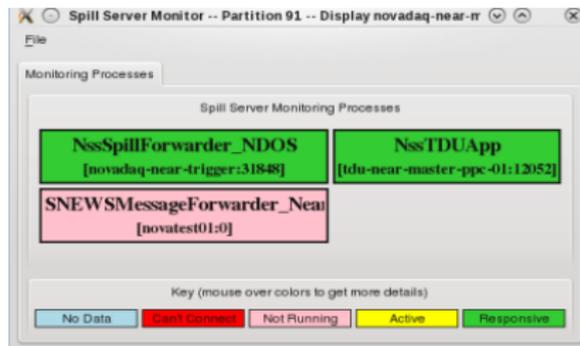
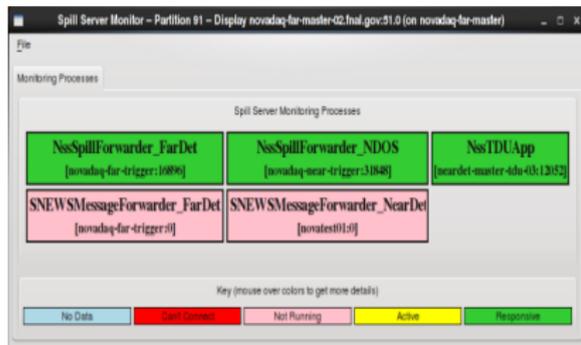
ConfigurationManager [novadaq-far-master:26055]	DDTManager [novadaq-far-master:26047]
DataLogger [novadaq-far-datadisk-01:16389]	EventDispatcher1 [novadaq-far-datadisk-01:16399]
GlobalTrigger [novadaq-far-trigger:18826]	MessageAnalyzer [novadaq-far-msglogger:20149]
MessageFacilityServer [novadaq-far-msglogger:23656]	MessageViewer [novadaq-far-msglogger:23654]
RunControlServer [novadaq-far-runcontrol:3079]	SNEWSMessageReceiver [novadaq-far-trigger:22623]
SpillServer [novadaq-far-trigger:22616]	TDUManager [novadaq-far-runcontrol:17260]
TriggerScalars1 [novadaq-far-datadisk-01:18196]	

<< Back Start Group Stop Group Restart Group

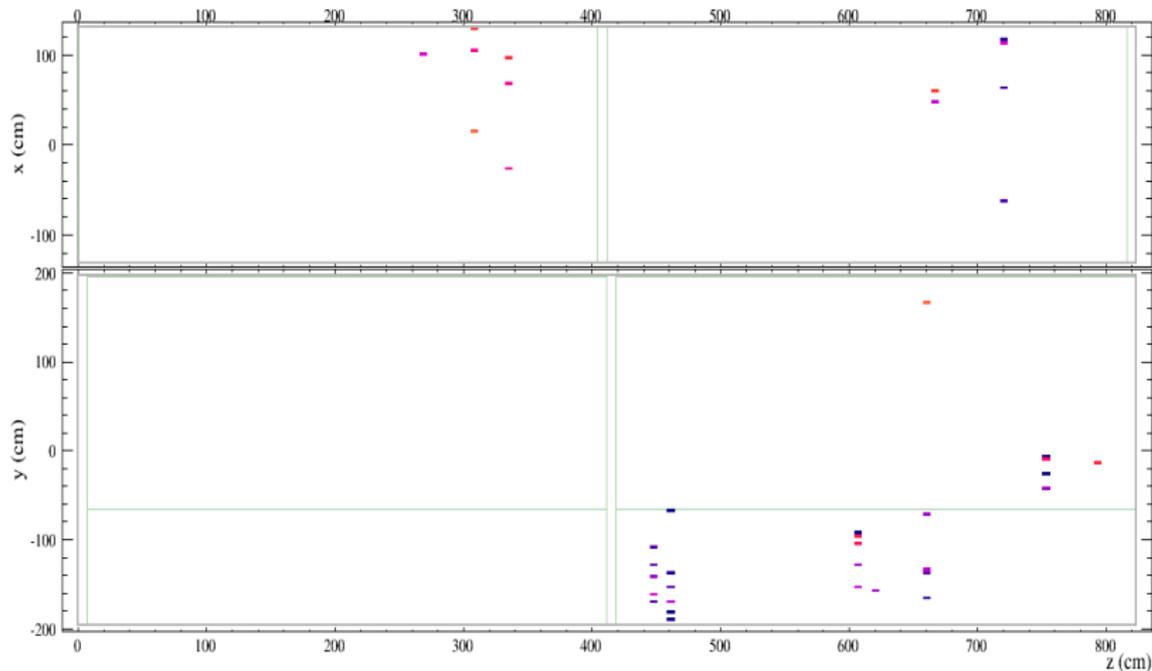
System-Wide Control

Start System Stop System Restart System

SNEWS MONITORING



SNEWS NDOS TRIGGER



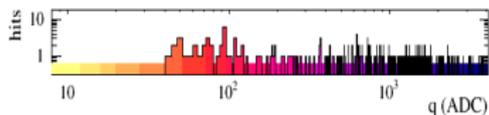
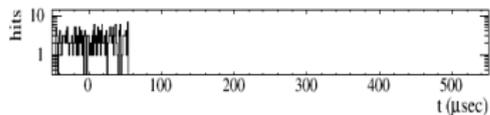
NOvA - FNAL E929

Run: 16829 / 2

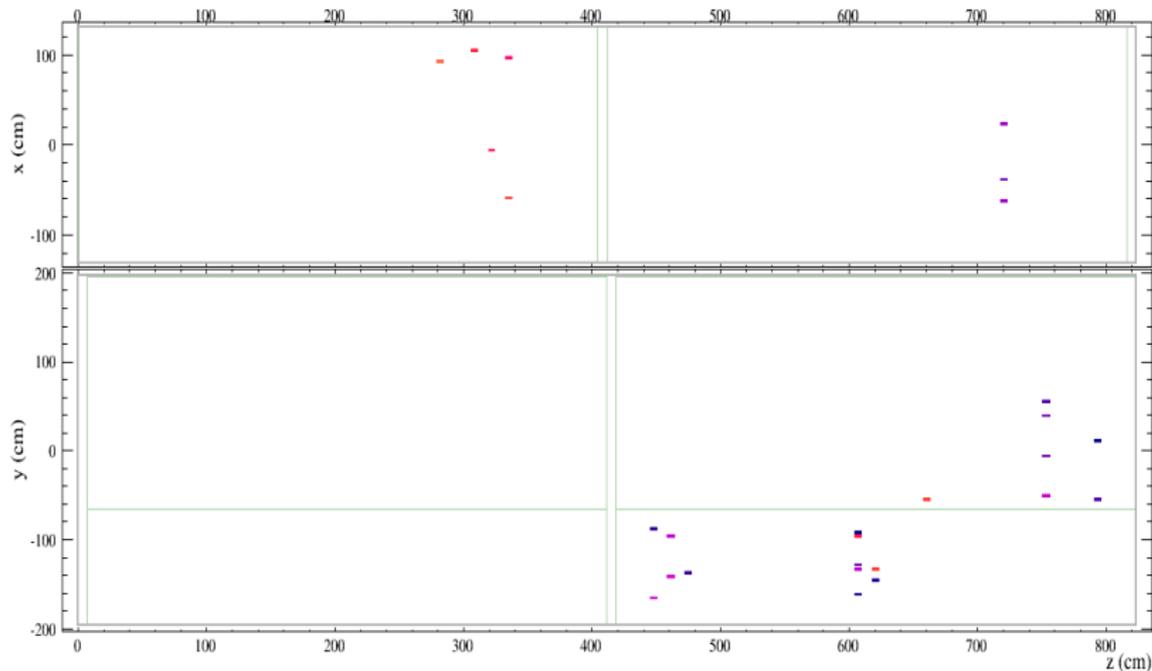
Event: 5057 / SNEWSTrig

UTC Tue Sep 23, 2014

17:42:58.864995968



SNEWS FAST BEAT



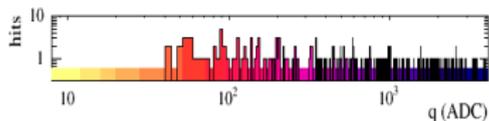
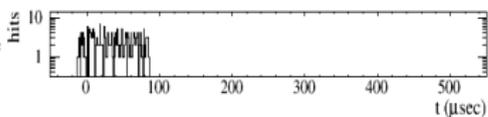
NOvA - FNAL E929

Run: 16829 / 2

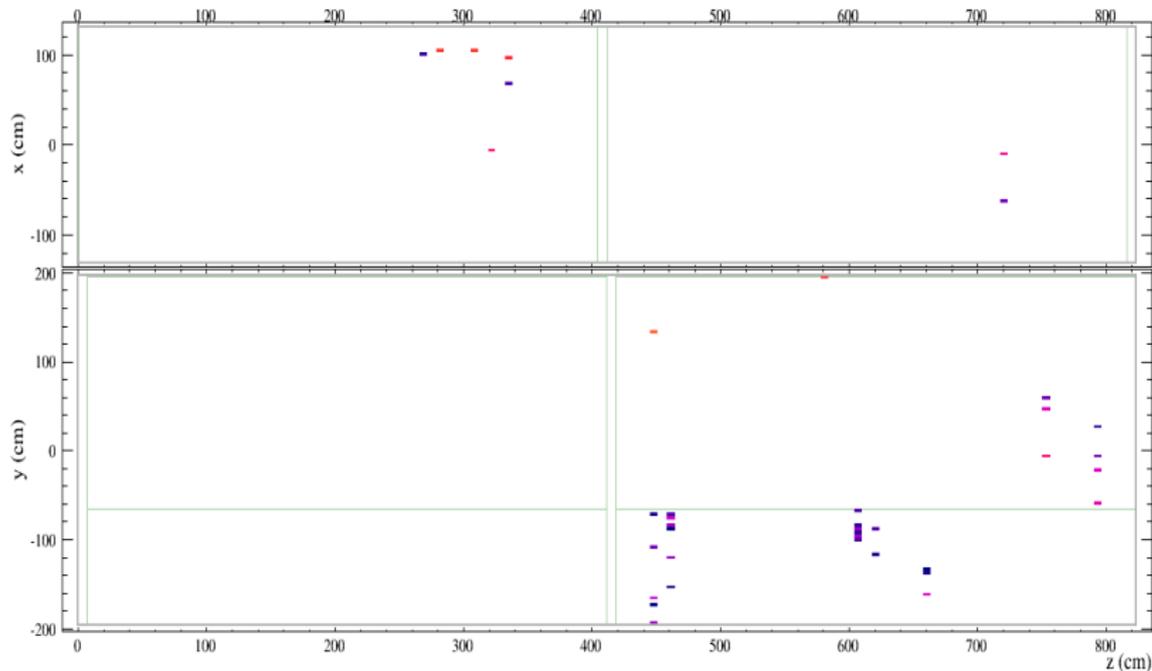
Event: 5043 / SNEWSBeatF

UTC Tue Sep 23, 2014

17:42:52.690913024



SNEWS SLOW BEAT



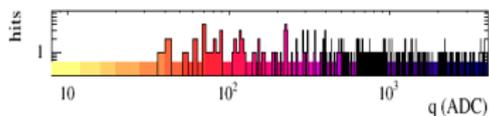
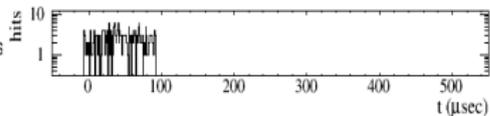
NOvA - FNAL E929

Run: 16829 / 2

Event: 5064 / SNEWSBeatS

UTC Tue Sep 23, 2014

17:43:1.607707008



- SpillMonitor configuration files live in `/nova/config/FarDet/appmgr/Partition91` and `/nova/config/FarDet/appmgr/Partition91` accessible through `novadaq-far-master` and `novadaq-near-master` respectively
 - `HostList.xml` had to be modified to include the gateway machine (`novatest01` at the moment)
 - `ApplicationTypeList_DAQ_Standard_Check.xml` now has an `ApplicationType` for `SNEWSMessageForwarder`
 - `ProcessList.xml` has an `ApplicationInstance` for each `SNEWSMessageForwarder`
- Forwarders to be started via `startSNEWSMessageBackBone.sh` which can be found in `DAQOperationsTools/scripts`
- Log to: `\daqlogs\SNEWSMessageForwarder\(Far) Gateway\snewsForwarder_<timestamp>.log`
- Forwarders to be stopped via `stopSNEWSMessageForwarder_{FNAL,AshRiver}`

- Configured via GUI saved as `/home/novadaq/.NovaDAQResources.xml`
 - Stood up for each DAQ Partition when Manager is selected
 - Calls `startSNEWSMessageReceiver.sh` with proper arguments on Reserve Resources step
 - When a run ends, calls `stopSNEWSMessageReceiver.sh` during Release Resources step
 - Logs to: `/daqlogs/<detector>/<partition>/SNEWSMessageReceiver/<host>/snewsReceiver_<timestamp>.log`
 - e.g. `/daqlogs/FarDet/Partition1/SNEWSMessageReceiver/novadaq-far-trigger/snewsReceiver_20141021_050635.log`

- NovaSNEWSInterface has the Sender, Forwarder, and Receiver binaries (and their configuration)
- DAQMessages has new messages to correctly talk to the Global Trigger
- NovaGlobalTrigger has the actual trigger module
- DAQOperationsTools has the start stop scripts for operations
- Not entirely sure where to commit configuration files of Resource Manager and DAQApplication Managers to

- The goal is to have continuous readout of at least 1 minute of data
- Tests were conducted using 10 to 11 diblocks in Partition 1 of the FarDet
- Turned off all triggers except the manual sender, which we were using to issue triggers, stream t04
- On October 6, just after lunch, the torture began (runs 17955 through 17604)
- Started with 5 ms (milliblock) readback, success!
- Increased trigger lengths and the last success was with 50 ms
- Attacking the problem from a different angle, we issued 200 Hz worth of 5 ms triggers, which the system handled fine
- More details can be found in ECL entry 50775 by Pengfei

- The readout from these runs was processed offline to generate DAQHits, time sort them, and see if there are any holes.
- It's available on `/nova/ana/trigger/data/fd/DAQTortureTests` and is a great min bias sample
- The Global Trigger issues one trigger message for every 5 ms of data requested, so 10 messages worked (foreshadowing)
- The trigger number is incremented, but there is a master trigger number stored in the header to let you know who the individual triggers belong to.
- Accessible via `rawdata::RawTrigger` class in the offline framework
- File sizes became large enough that we incurred the wrath of the Diskwatcher, which helpfully ended the run for us

- The culprit was a global DDS message queue depth of 10
- The fact that we were getting by with just 10 messages in any mailbox shows how fast the system handles all requests
- Increased the queue depth to 15,000 (one minute corresponds to 12,000 trigger messages)
- Resumed tests on October 10 with details in ECL 51034 and 51046
- Summary is we got to readout a full second of data
- At two seconds we started getting DataLogger errors of the type: No TriggerBlock Number of Datablocks

- Turns out we were running into a 20 second timeout value on the DataLogger
- Increased this to 40 seconds with success
- With quite a network storm we were able to readback about 4 seconds of data
- TCP packet resubmissions were quite high, network is the bottle neck
- Trying 10 seconds showed us a readback error from the DCMs to the BNEVBs
- Possibly kernel level interrupts because of the network storm we're creating
- Ron is tweaking the network, has lots of experience with this, and is confident we can squeeze out a few factors of transmission

- With beam returning soon we will have to coordinate stress tests to coincide with beam off times.
- We still have a way to go and the end game will likely be by dumping the data to local disk and transferring a controlled stream to the DataLogger.
- Feel good message: We encounter and solve problems one at a time, nothing looks insurmountable