Web Technology Usage at ISIS

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ISIS Facility

- Pulsed neutron and muon source
- ~30 experiment beamlines
- World leading materials research facility

Every year over:
- 1000 proposals
- 700 experiments
- 400 publications
Instrument Control

• EPICS base 3.15.5
• Eclipse GUI based on C S Studio
• Python scripting
• Running on Microsoft Windows x64
Web Technology Usage

• Only use web for display of data
• Main application is “web dashboard”
  – a summary of the instrument state for user
• Separately also use WebAgg matplotlib backend
  – For plotting in IBEX client GUI
  – Allows locating plot next to PyDev console
POLARIS is RUNNING

Title: shutter closed - internal test (HT card replaced) (beam to target)
Users: Smith

Good / Raw Frames: 5430723/5430723
Current / Total: 0.000 μA/3870.960 μA hour
Monitor Counts: 12 count
Start Time: Fri 31-May-2019 17:39:50
Run Time: 30 hr 10 min 13 s
Period: 1/1

Configuration: Polaris_base_sample_changer

Run Information
- Run Status: RUNNING
- Run Number: 00118851
- RB Number: 0
- User(s): Smith
- Title: shutter closed - internal test (HT card replaced) (beam to target)
- Start Time: Fri 31-May-2019 17:39:50
- Total Run Time: 30 hr 10 min 13 s
- Period Run Time: 30 hr 10 min 13 s
- Good Frames (Total): 5430723
- Good Frames (Period): 5430606
- Raw Frames (Total): 5430723
- Raw Frames (Period): 5430606
- Current Period: 1
- Number of Periods: 1
- Period Sequence: 1
- Beam Current: 0.000 μA
- Total Uamps: 3870.960 μA hour
- Count Rate: 0.000
- DAE Memory Used: 91609 byte
- Total DAE Counts: 2147483647 count
- DAE Timing Source: Internal Test Clock
- Monitor Counts: 12 count
- Monitor Spectrum: 11
- Monitor From: 2500.000 us
- Monitor To: 3500.000 us
- Number of Time Channels: 7793
- Number of Spectra: 3008
- Shutter Status: CLOSED
- DAE Simulation mode: No

Blocks
- Jaw_set
  - h_gap1: 55.667
  - h_gap2: 39.732
  - h_gap3: 30.820
  - h_gap4: 27.285
  - h_gap5: 17.500
  - v_gap1: 63.843
  - v_gap2: 54.501
  - v_gap3: 49.265
  - v_gap4: 47.206
  - v_gap5: 42.260

Sample_changer
- Sample: 11
- Target: 0 (INVALID/UDF_ALARM)
- Move_finished: 1

Beam
- TS1_beam_current: 0.000 μA
- Shutter_status: CLOSED
- Actual_beam_current: 0.000 μA (MINOR/LOW_ALARM)
- ISIS_beam_energy: 800 MeV

Vacuum
- Tank: 0.056 mbar
- Pump: 0.025 mbar
Web Dashboard Architecture

Instrument
- Archive Engine
  - INST
  - BLOCKS
  - DATAWEB
- Blockserver
  - WebServer

Dataweb Server (NDAEXTWEB1)

JSON Bourne

Webpage (HTML & Javascript)

http://NDXDEMO:4812/

http://NDXDEMO:4813/

http://NDXDEMO:8008/
Web Dashboard Operation

• CSS Archive engine provides data as JSON
  – Several engines per instrument
• JSON Bourne process amalgamates data
  – Acts as a cache
  – Also groups it using blockserver configurations
• Client JavaScript (bootstrap) page reads data
  – Currently refreshed by polling
Easy to reformat data
Future

• Enable web dashboard to show graphs of historical data

• Starting to think about tablet computers on beamlines:
  – Smaller screen, less powerful
  – Potential application as a motion “jog box”
  – Looking at CS Studio Phoebus, but web an option?