



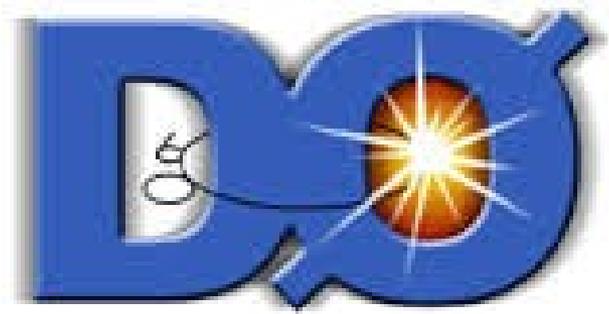
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ITIL Service Models in DAQ Computing

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HEPiX Fall 2015
15 October 2015

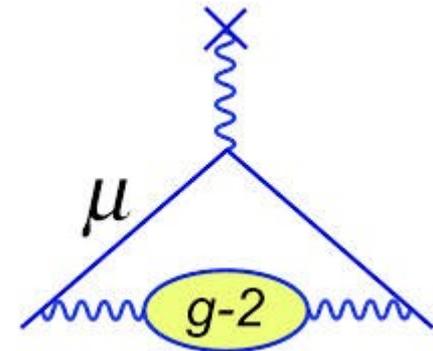
Recent History of DAQ Computing at Fermilab



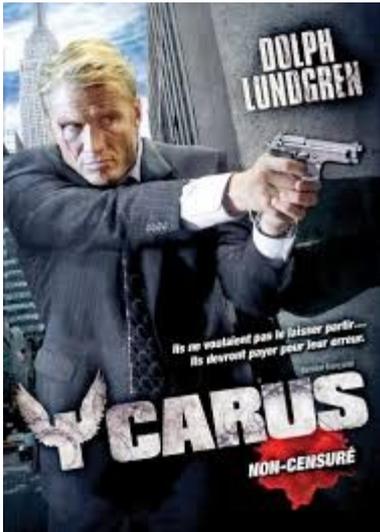
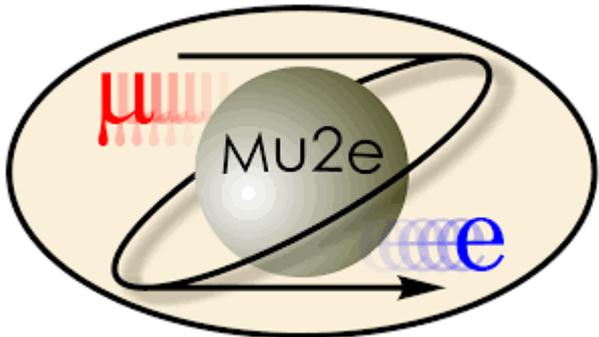
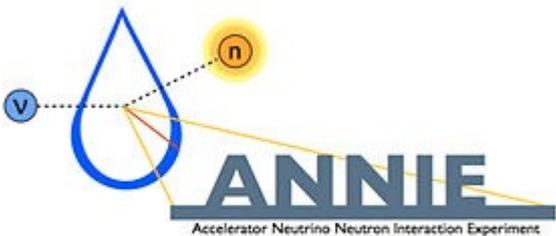
Recent History of DAQ Computing at Fermilab

- Two large experiments, each with its own staff
 - Computing Division eventually took over some DAQ computer system administration for CDF and D0

Now



Soon



More Recently

- Online system administration often first handled by DAQ groups/postdocs/grad students
 - They move away or get jobs
 - Less familiar with some best practices
 - Don't always know all lab computing rules
 - “Protoduction”
 - Duplication of effort
 - Not always clear who's in charge
 - Dependent on dedicated experts

ECF/SLA

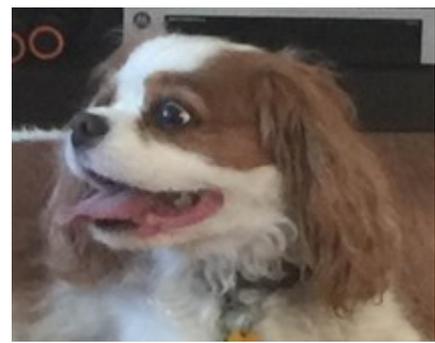
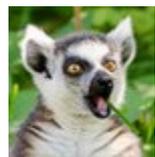
- Experiment Computing Facilities/Scientific Linux Architecture Management
- Originally supported scientific workstations for CDF and others
 - Took over system administration of control room computers
 - On-boarded to ITIL practices and ISO 20k certified in 2014

Supporting DAQ Computers

DAQ computers can be more like pets than cattle

Supporting DAQ Computers

And everyone has their own special pet



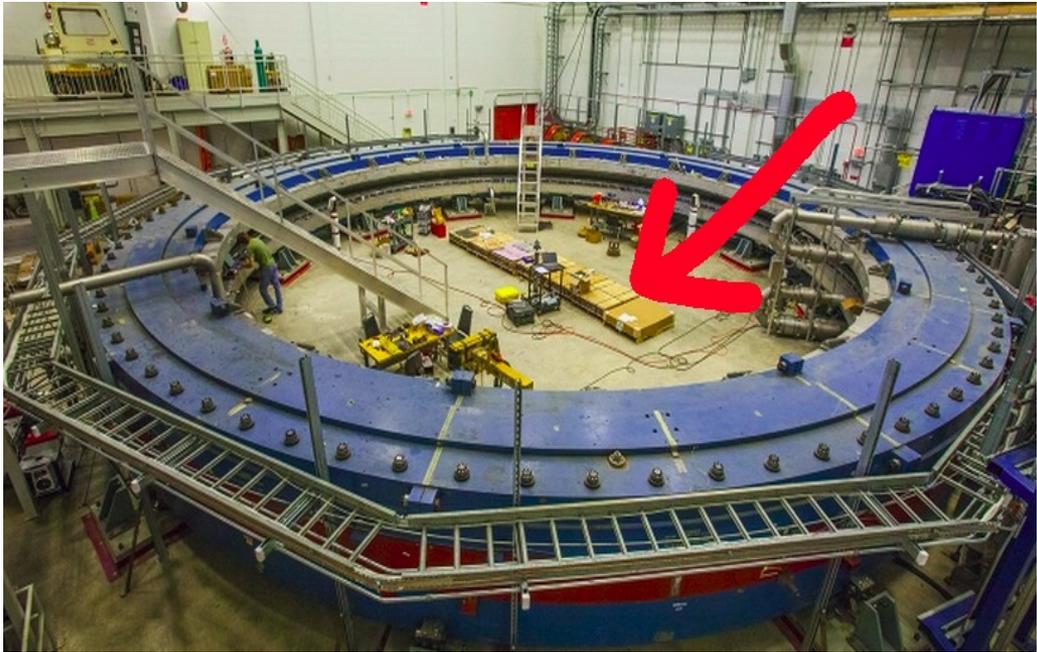
Supporting DAQ Computers

Physical environments may differ from datacenter

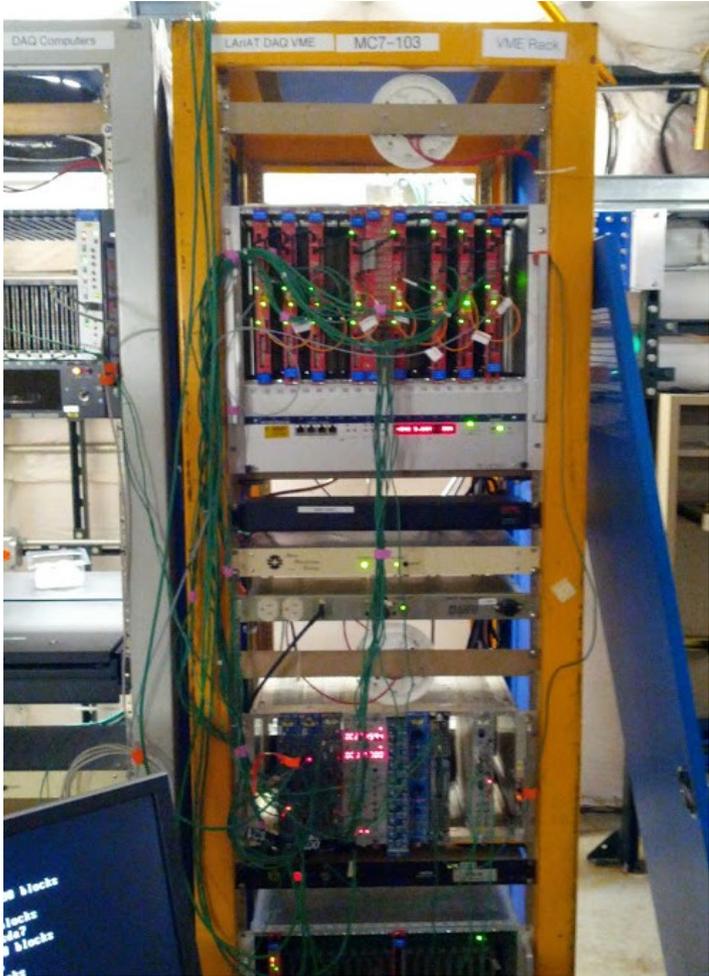
Supporting DAQ Computers



Supporting DAQ Computers

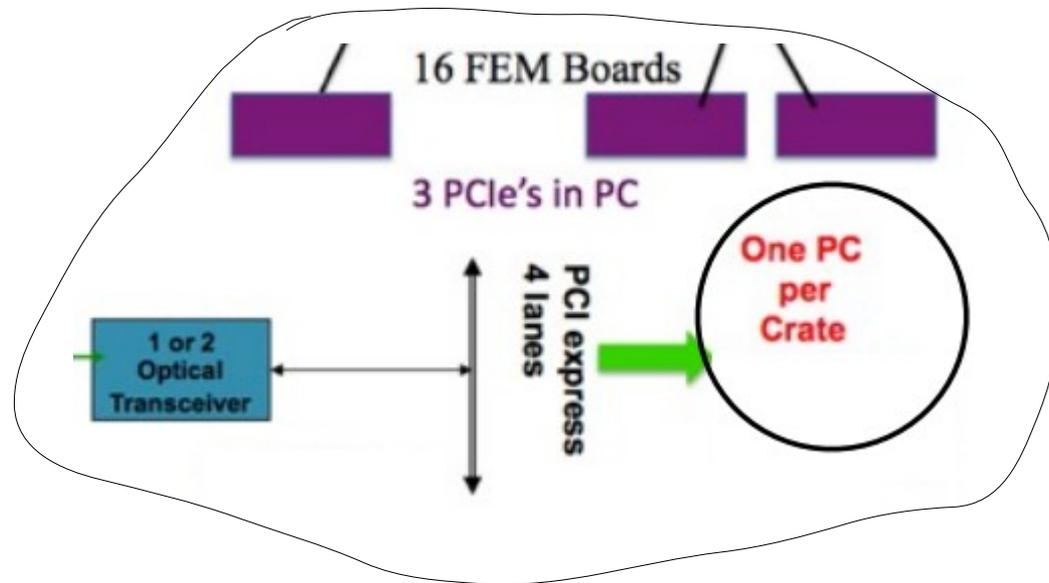


Supporting DAQ Computers



Supporting DAQ Computers

Redundancy can be less meaningful when downstream from experiment electronics



Supporting DAQ Computers

- Sensitive to kernel and software upgrades so must be placed on a hardened network
- UPS/generators may not exist
- Out of Band management may be limited or nonexistent
- Expert shifters may need elevated privileges

ITIL

- Collection of IT Service Management practices
- Standard mechanism to think about best practices

ITIL

- Change Control
- Configuration Management
- Problem Management
- Service Level Management
- Request and Incident Management
- Event Management
- Project Management

Service Level Management

- Formalized discussion to identify requirements and agree on service commitments in **Service Level Agreement** (SLA)
- Negotiate admin access, software update schedules, monitoring
- Services offered are explicitly defined
- Response and Resolution time commitments are made
- Experiment points of contact are established

Service Offerings for Online

- Experiment Online System Management
 - 24/7
- Control Room System Management
 - 12/7
- Limited SLF Workstation and Scientific Test Stand
 - 8/5, reduced priority, users can have root
 - Re-install only if you bork it
- Scientific Linux Engineering
 - “consulting”, best-effort

Supporting DAQ Computing under ITIL

- On-boarding has been a multi-year process in some cases
 - Experiments sensitive to downtimes during data taking
 - Some reverse engineering of one-off systems required, result must be validated by experiment
- MINOS and MINERvA fully under management as of 2015 Beam shutdown (ended October 5)
 - Refreshed hardware with on-site warranty
 - Improved redundancy
 - OS updates
 - All puppetized

Challenges

- Service Desk software (Service Now) and work flow perceived as more cumbersome than traditional point to point communication
- Working with Service Now developers to improve user experience

Scientific Computing Systems

-  Control Room Computer Incident (Something is Broken)
-  DAQ Computer Incident (Something is Broken)
-  Test-stand Computer Incident (Something is Broken)
-  Scientific Linux Workstations Incident (Something is Broken)
-  Control Room Computer Request
-  DAQ Computer Request
-  Test-Stand Computer Request
-  Scientific Linux Workstation request

Ticket Templates

Service Catalog > Scientific Computing Systems > DAQ Computer Incident (Something is Broken)

Open on behalf of this user

* Requested For	* Preferred Contact Phone #
<input type="text" value="Bonnie King"/> <input type="button" value="🔍"/> <input type="button" value="🕒"/>	<input type="text" value="8761"/>

Select an Experiment

* Experiment

* System Name

* Short Description

* Please describe the request

Urgency	Impact
<input type="text" value="3 - Medium"/>	<input type="text" value="3 - Moderate/Limited"/>

Watch List

Challenges

- Getting involved early enough in experiment lifecycle
 - Ideally at the test stand stage
 - This is getting better with each new experiment we on-board
- Support “grey areas”
 - Legacy systems that can't be re-installed yet but experiments request help with them
- Customers still like to email directly
 - Service Now has an email consumer
 - Just keep telling them...

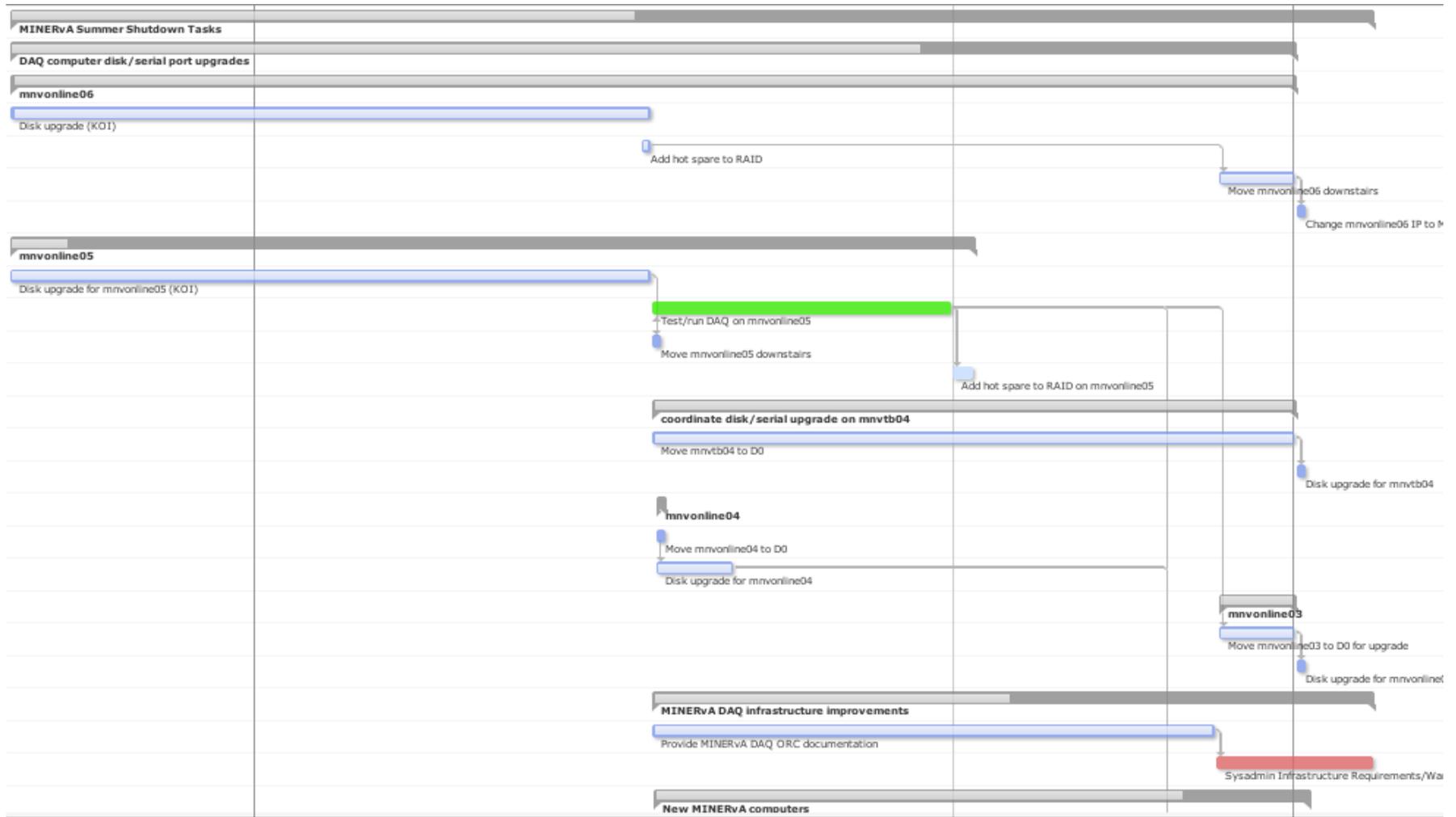
Successes

- Introduced some measure of redundancy
 - **SLAs** require it
- Helped with procurement and purchase recommendations
 - Can specify what is supported including warranty
- Standardized operating environments
 - Decreased rework and redundant work
- Systems under configuration management (Puppet)
 - Systems can be reloaded very quickly

Successes

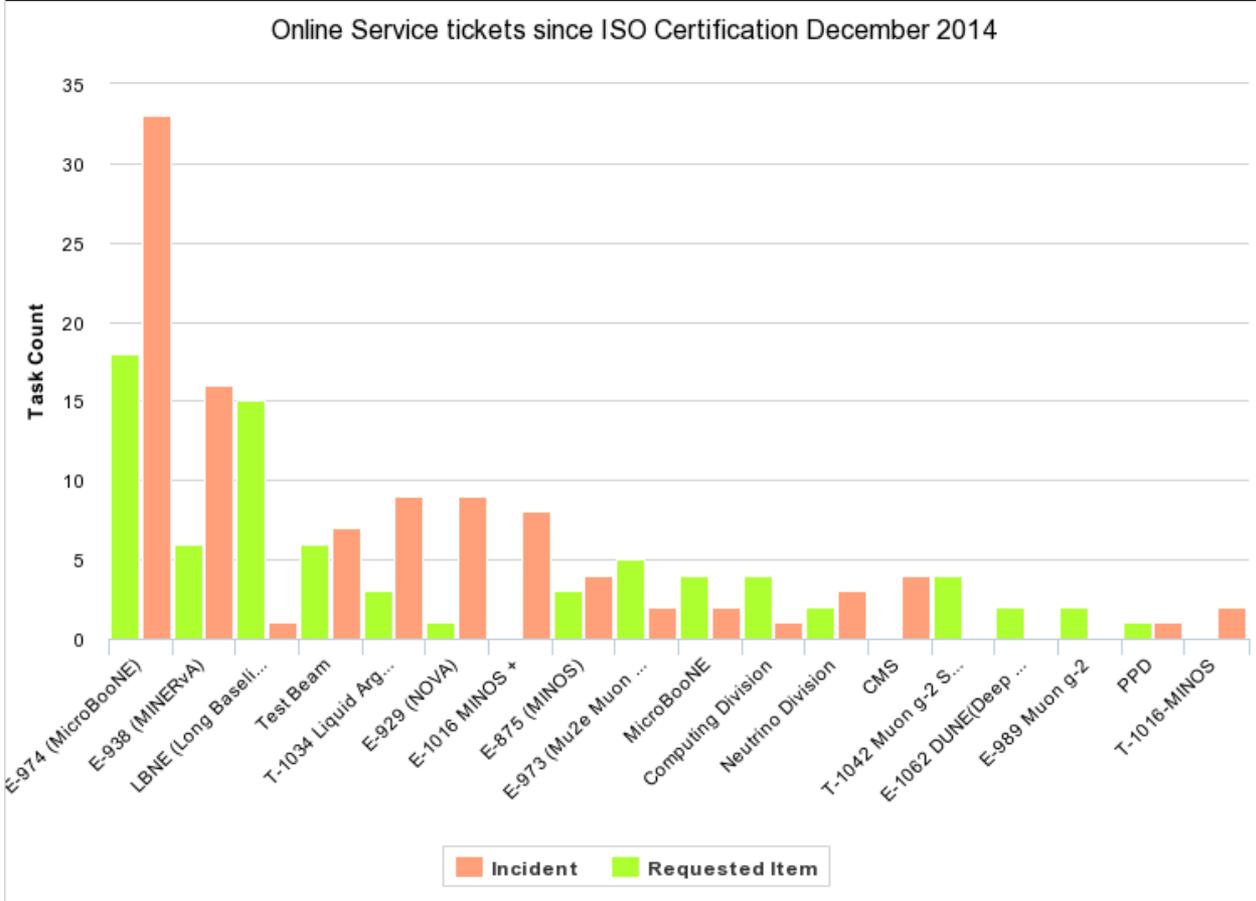
- Able to maintain quality of service during understaffed/busy periods
- Provide Services, not people
- Lots of concurrent maintenance projects over Summer 2015 (beam downtime)
- **Service** and **Project** management in Service Now enabled team leaders to delegate team resources and track work efficiently

Successes



Successes

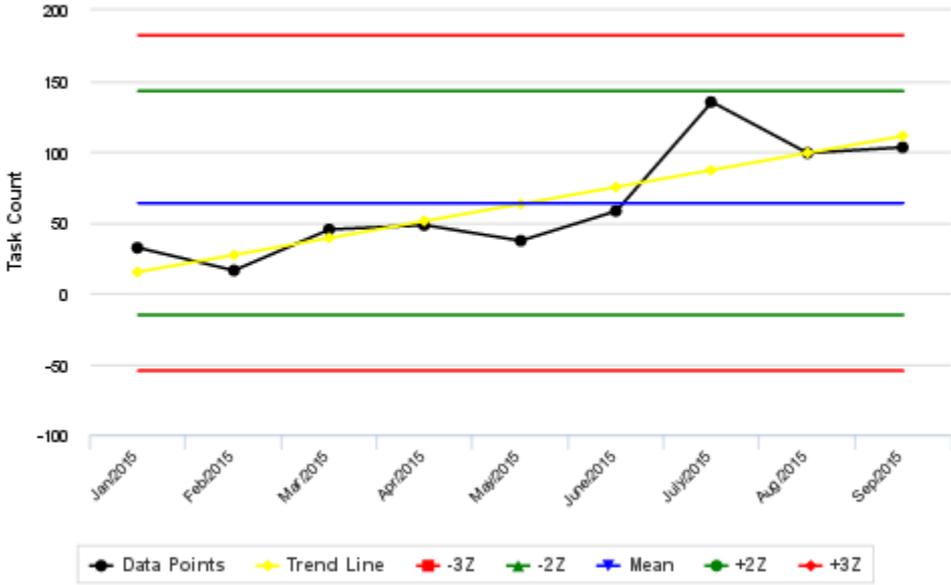
- Usable metrics



Successes

- Usable metrics

Service Area - Scientific Computing Systems - Workload Trend



Successes

- Improved engagement with experiments
- Consistently positive feedback



Future

- For continued adoption across upcoming experiments, we must demonstrate repeated success
 - “taking over your computers” requires trust
- General Purpose computers getting smaller, faster, cheaper
 - Many expose GPIO
 - Already being used in some places
- Work more closely with DAQ software developers (artDAQ) to improve deployment
 - True turnkey DAQ computer setups

Photo Credits

- Lab photos Bonnie King or Patrick Riehecky
- DAQ diagram apologies to Eric Church
- Animal photos CC0 or Public Domain
 - Except the black kitty, Novell (RIP) (Mattias Wadenstein)
 - And the spaniel, Murphy (Mallory Ortberg)
 - And the human child (Jim Simonson)



Questions?