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# Online monitoring for LArIAT

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# Outline

- What do we want to monitor?
- ACNET and Synoptic vs. current situation
- To do

# What do we want to monitor?

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- **"Basic" items (i.e. get them done asap):**
  - **Beam:** beam triggers, power
  - **Cryo:** temperature, pressure, levels
  - **Wire planes:** voltages, currents
  - **PMTs:** voltages, currents

- *A bit more sophisticated (a.k.a. mid-long term ideas):*
  - ***Beam:*** *particle type (?)*
  - ***Cryo:*** *purity, filters*
  - ***Wire planes:*** *pedestals, hit occupancy, pulse shape (?)*
  - ***PMTs:*** *noise level / pedestals*
  - ***Electronics:*** *nb. of crates / cards / channels*

# What OM framework?

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- ArgoNeut did not really have an OM framework.
- MicroBoone OM seems to sophiscated for what we want to do.
- Do not want to start from scratch...

  → Accelerator control based framework i.e. ACNET + user friendly GUI Synoptic.

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# ACNET

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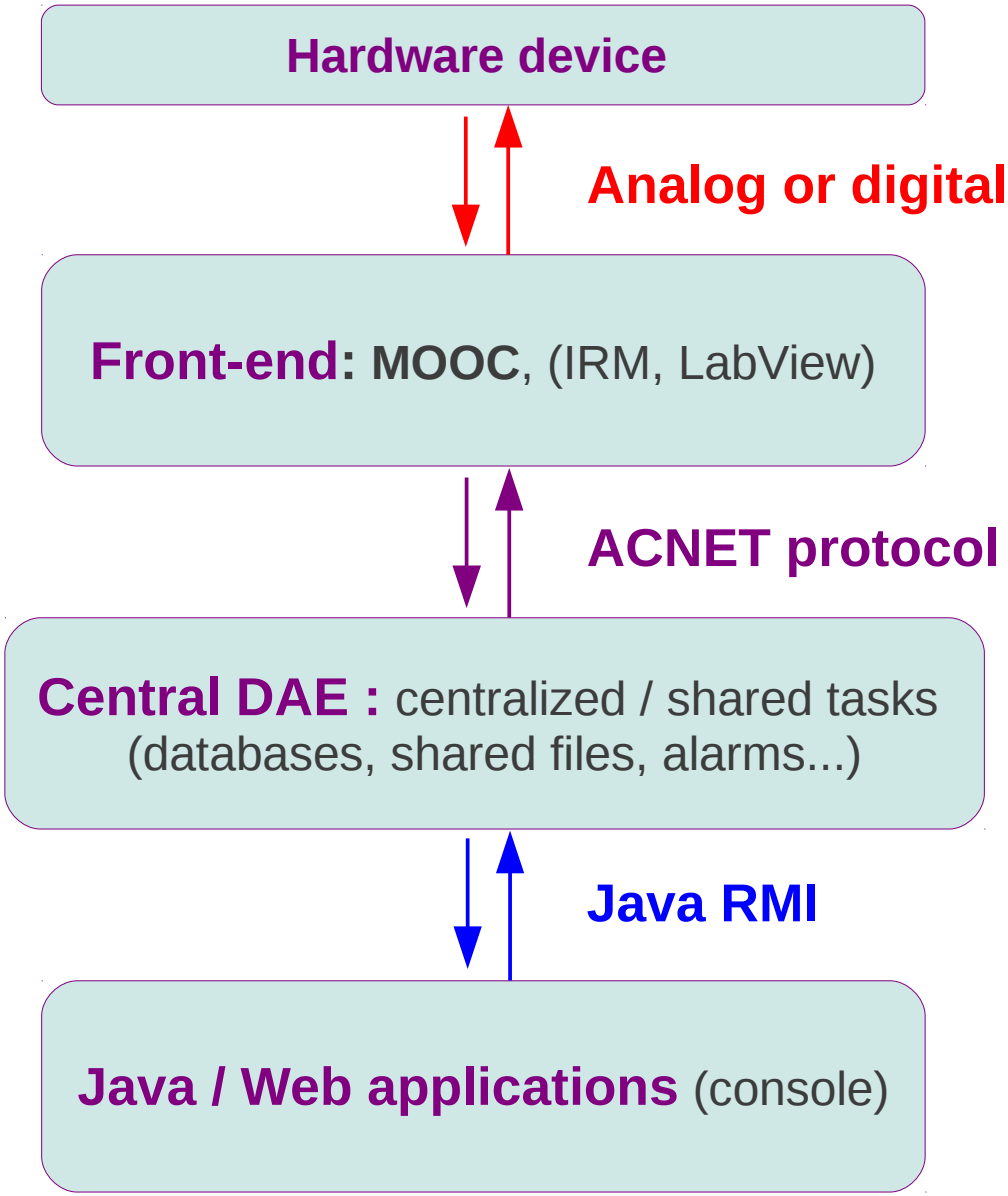
- ACNET (Accelerator Control NETwork) is a series of applications and transport protocols used by the accelerator control system.
- Advantages: Well-known (has been used for a long time), robust, efficient, & long term support exists (currently used by the accelerator division).
- Each device model has a unique name (restricted to 8 characters.)
- Each device has a a set of up to 6 proprieties:

  → reading, setting, digital status & control, analog & digital alarms
- Existing central database of 200 000 devices descriptions and 350 000 proprieties.

# Control system structure




MOOC = minimally object oriented communication, runs on VME / VXI PowerPC

IRM = internet rack monitor

DAE = data acquisition engine, typically a custom java application server

RMI = Remote Method Invocation API

# Synoptic

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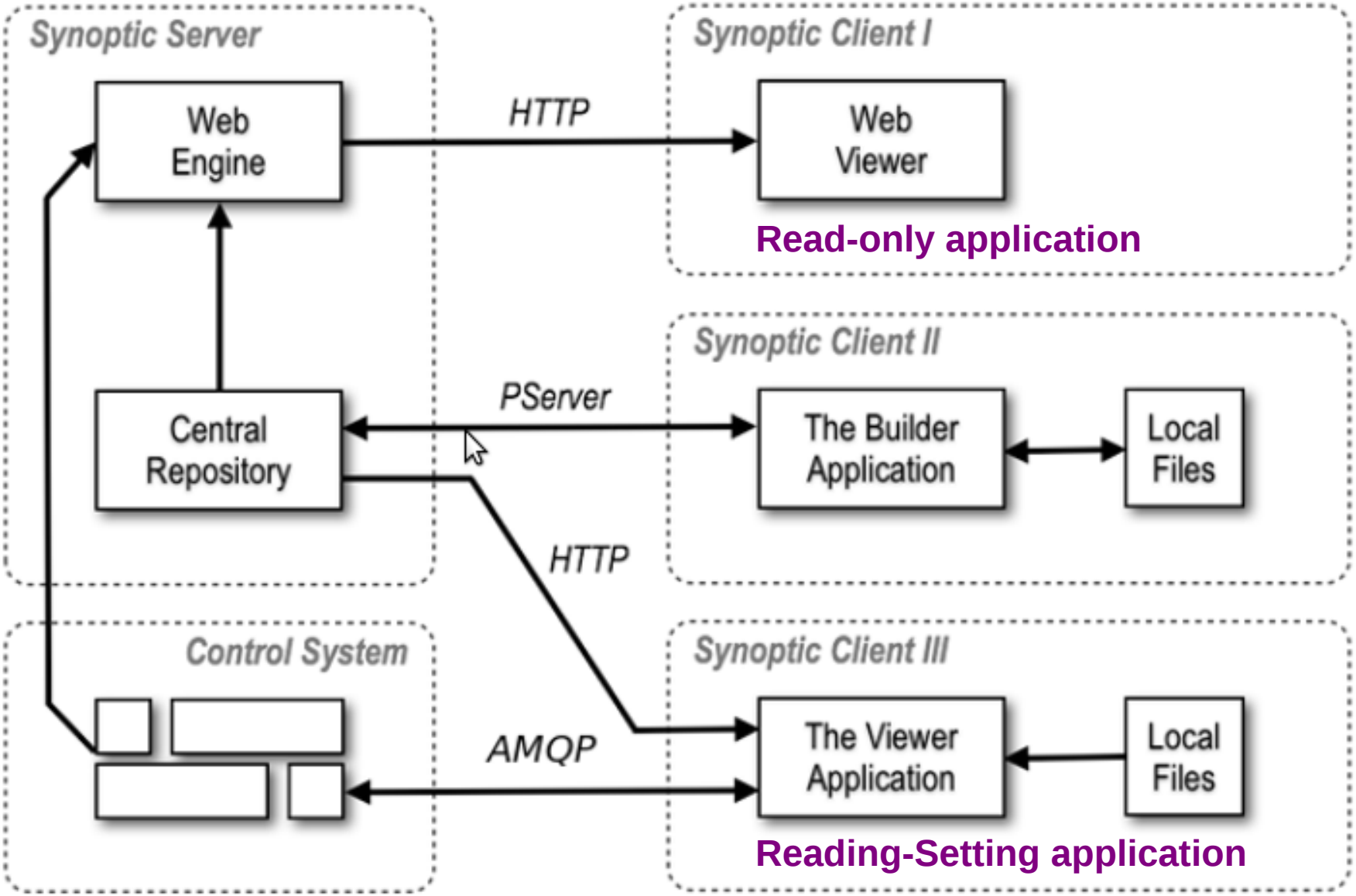
- GUI for representation of real-time data, similar to EPICS EDM, and LabVIEW (drag-and-drop interface).
- Allows to create plots in a simple way, and eventually set data to control system, displayed on a web browser.
- 5 main components:
  - **Central repository:** stores all displays versions (Java CVS).
  - **Web engine & viewer:** launches displays at user's request, read-only application, no authentication needed, available anywhere (useful for not-on-site experts).
  - **Viewer application:** runs on local computer, can set data back into the system, require Kerberos ticket and works only within the Fermilab network.
  - **Builder application:** standalone program to modify displays.

# Synoptic organization



# What do we have?

- Start with simplest task: monitor high voltages for TPC and PMTs ...
- TPC cathode: Glassman 125 kV model LX125 from the accelerator division, should exist in the catalog.
- Wire planes: LeCroy 1440 mainframes

  → do we want to replace these if the accelerator division has supplies that meet the requirements (~300 V , low current)?

  → If not, the description and set of proprieties exist in the database for this model?
- PMTs: 1 supply from PREP, ES-7109 MWPC → same as LeCroy.
- SiPMs: Still looking for supplies (?) so might be able to get some from the accelerator division.

# To do

- Need to get list of devices already existing in the database. If not, see if they can be replaced?
- Waiting for answer from accelerator division to get a HV supply and ACNET front-end to install in the beam test facility. This will be used with Geoff Savage to run some tests and understand the system.
- For cryostat related monitoring, there is an IFIX slow control bay, uses OPC protocol (same as Minerva) so some framework should exist. Currently finding out more about this.

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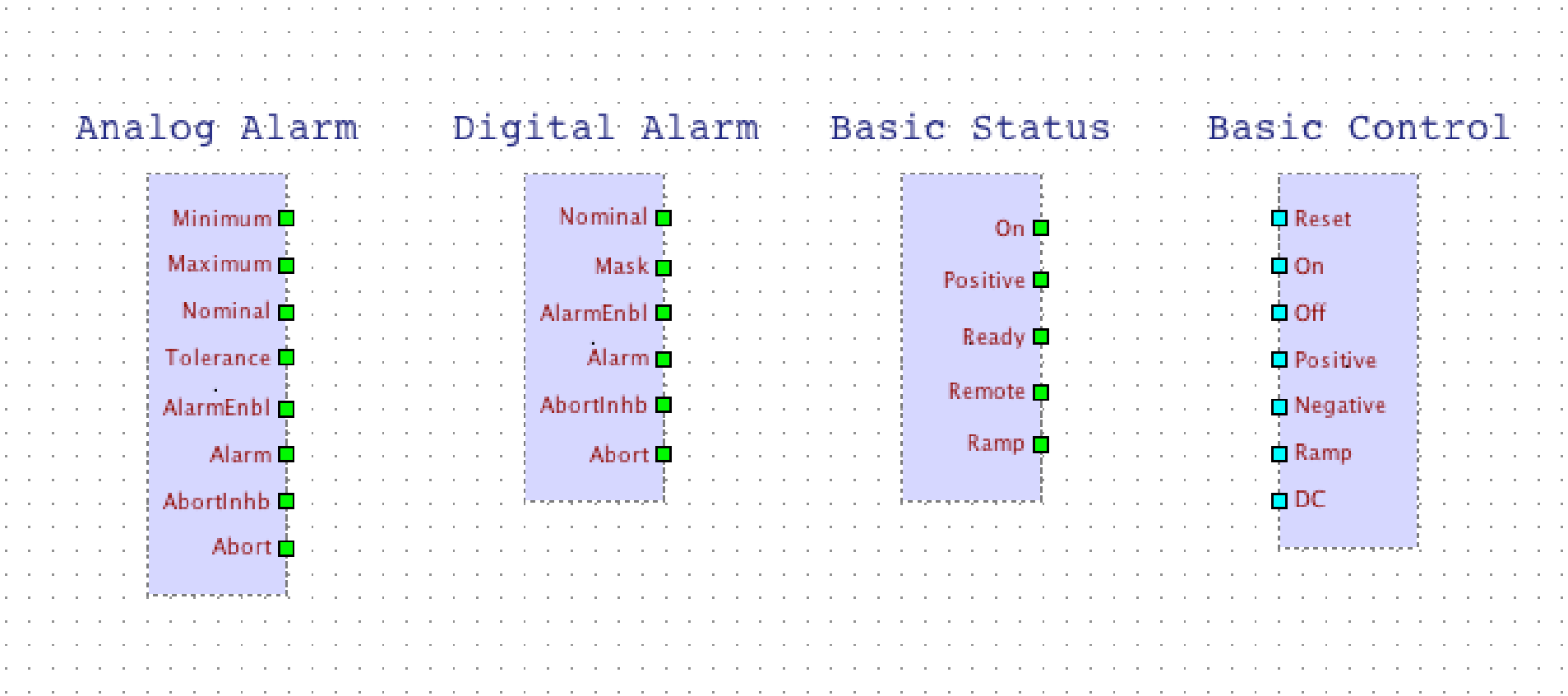
# Back up

# Physical Organization


Analog Alarm
Minimum
Maximum
Nominal
Tolerance
AlarmEnbl
Alarm
AbortInhb
Abort
Digital Alarm
Nominal
Mask
AlarmEnbl
Alarm
AbortInhb
Abort
Basic Status
On
Positive
Ready
Remote
Ramp
Basic Control
Reset
On
Off
Positive
Negative
Ramp
DC