Portable Gathering System for Online

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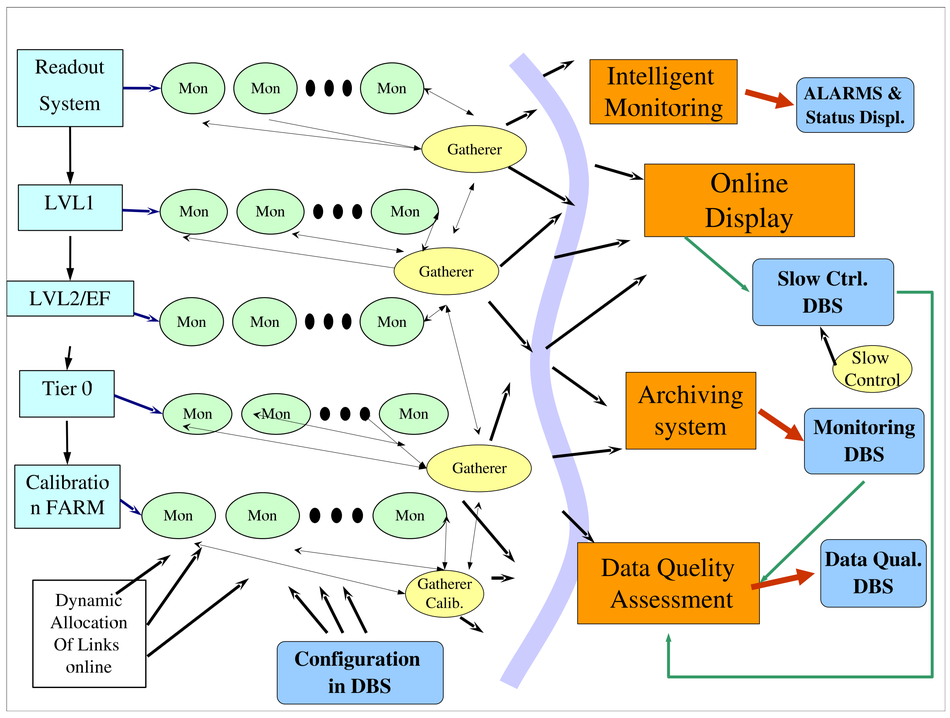
1. Objective



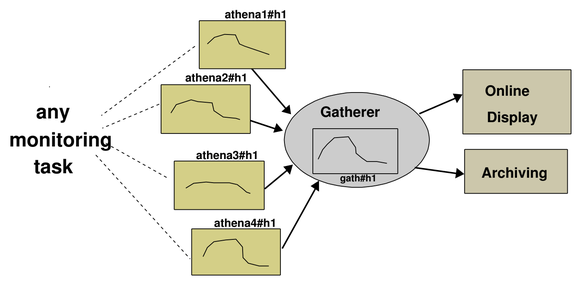
During data tacking many monitoring information is produced:

- Hardware performance.
- Trigger performance.
- Calibration & alignment.
- Reconstruction & analysis.

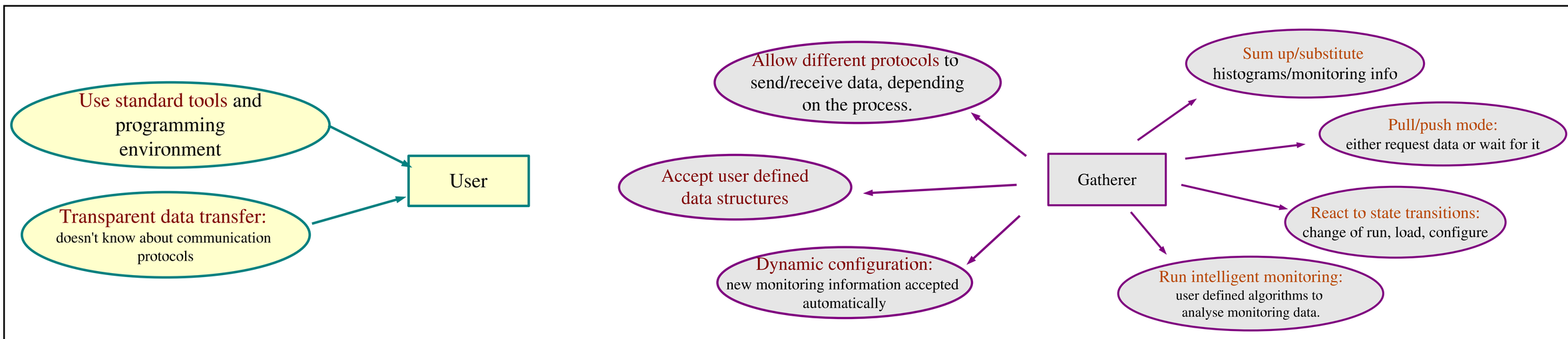
A central process to collect & display monitoring data is needed.

It provides:

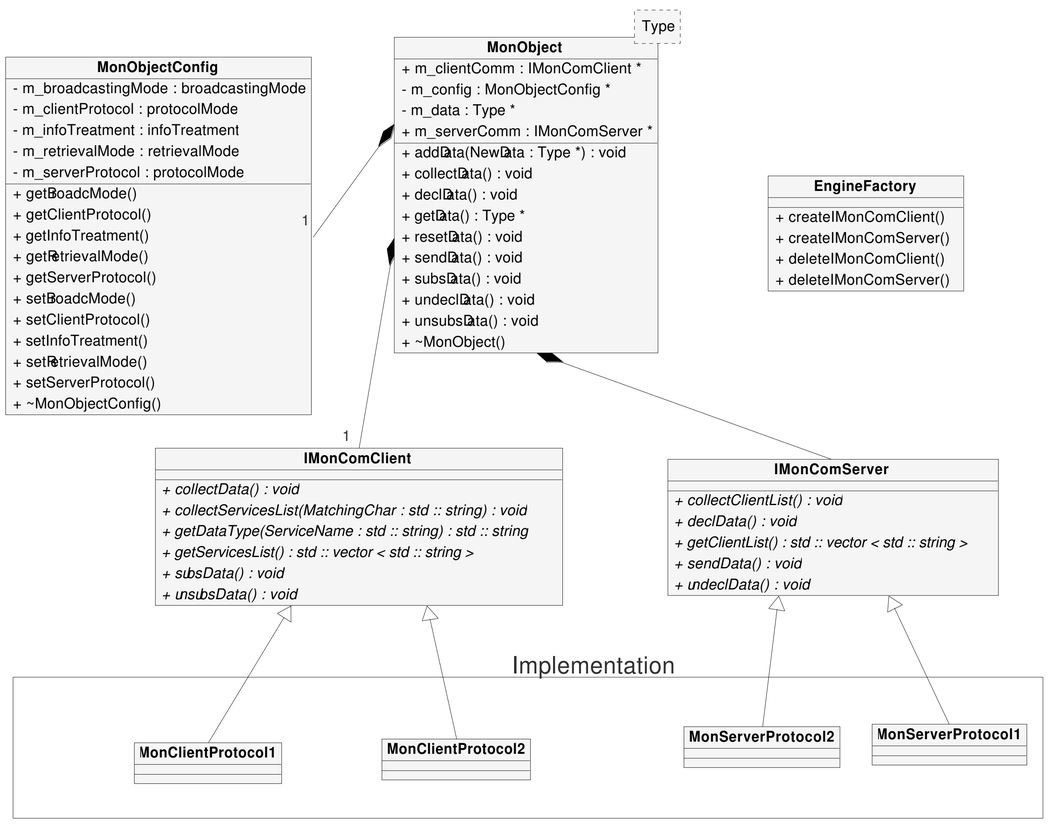
- Common tools for all processes to collect, add up statistics and publish monitoring information.
- Environment for intelligent monitoring.



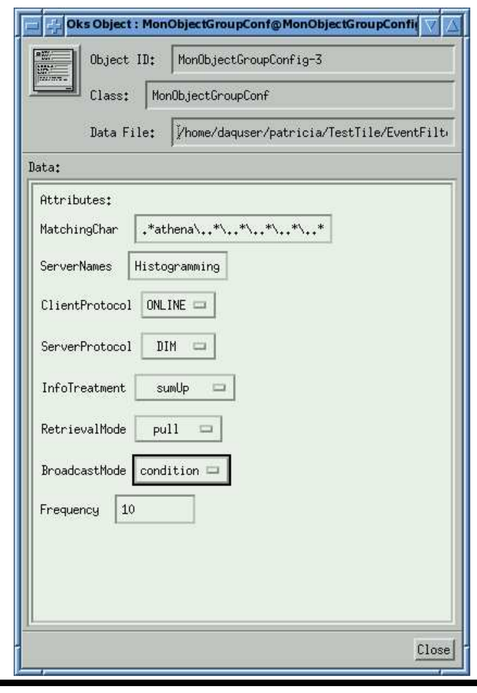
2. Requirements



3. Design: Data transfer and communications.



- One MonObject per monitoring variable:
  allows treating monitoring variables independently.
- The server/client communications are defined through an abstract interface.
  Could be implemented using any communications protocol.
- Communication objects created throw a factory.
- Each MonObject configures itself.
  Needs access to the configuration database.



Calibration and Monitoring at ATLAS

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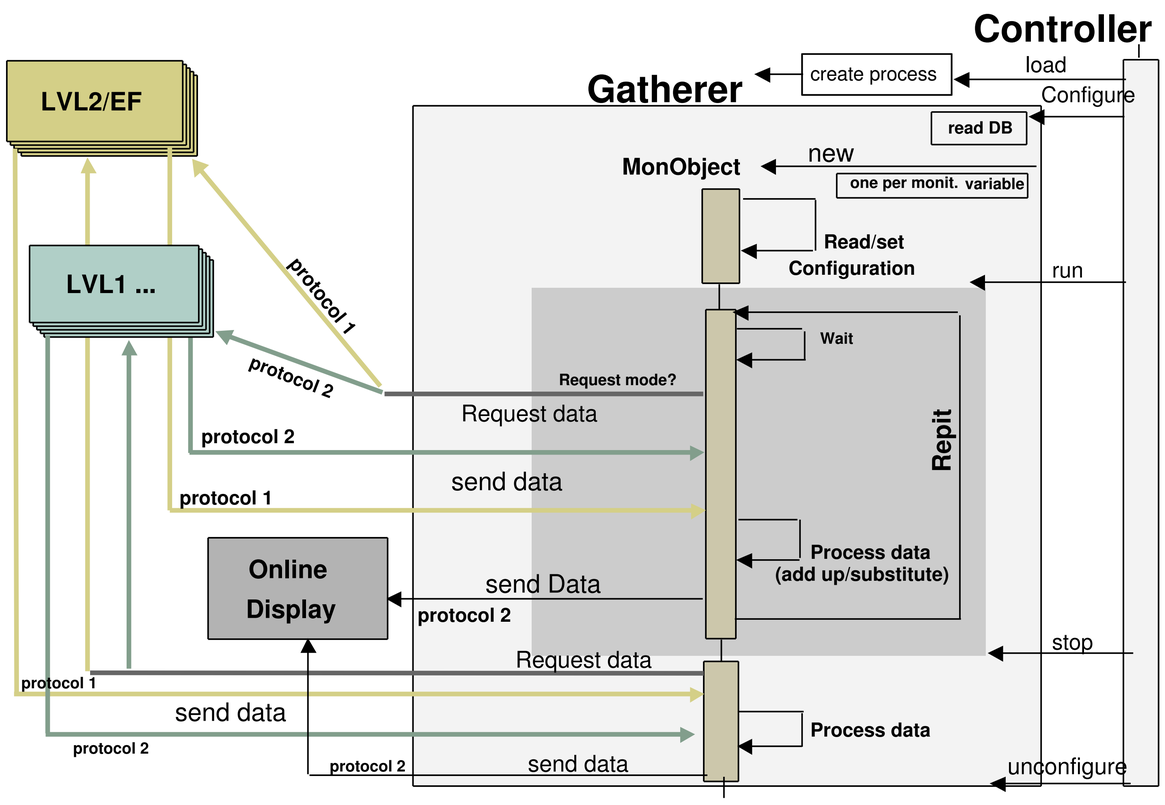
4. Design: Infrastructure.



- The *Gatherer* is an application running on the online system.
- Reads its configuration from a data base.
  Allows to have more than one gatherer collecting different monitoring variables.
- The Gatherer finds out what monitoring variables to collect, creates the MonObjects and performs operations on them (ex. sendData).
- It acts as a server for the online display and data quality display.
- It provides the infrastructure for intelligent monitoring.
- It reacts to state transitions.

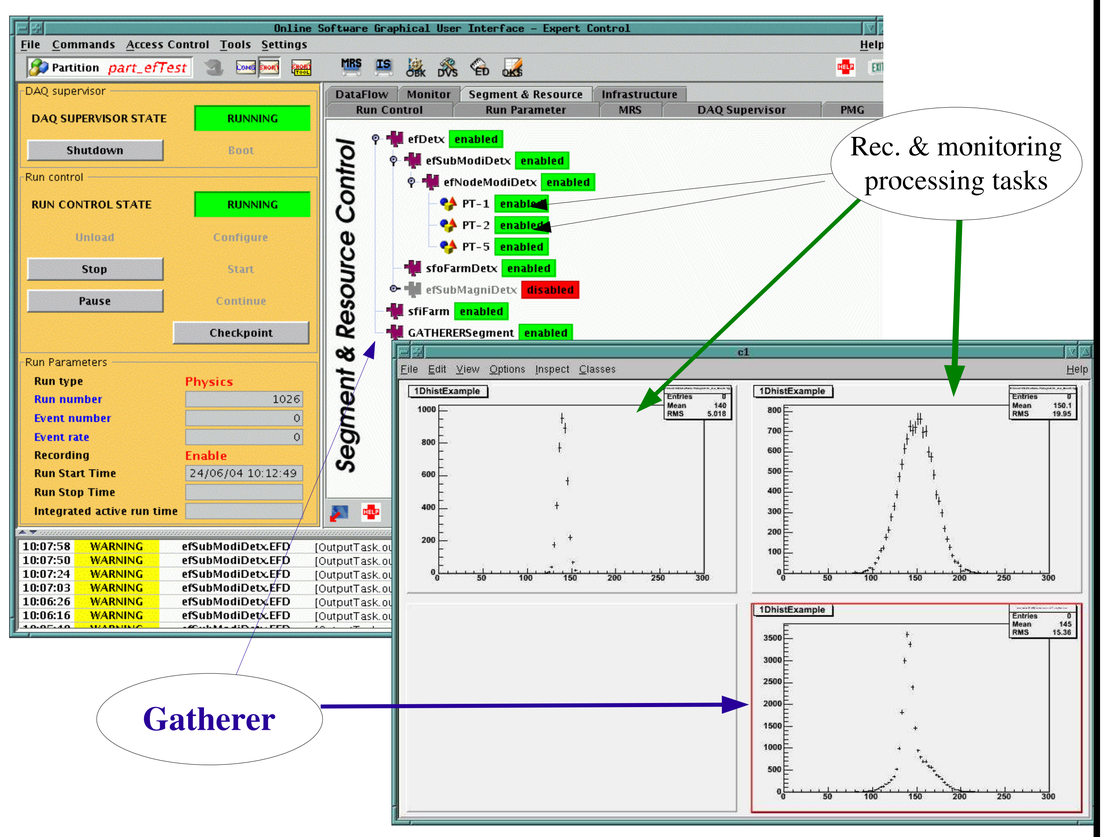
5. Implementation: first prototype.

Used at the ATLAS Test Beam (summer 2004).It had a simplified implementation:

- Main objective: to be robust.
  Configured at start time.
  Minimal interaction with the users once started (no commands).
- Only one protocol implemented (Information Service[a], based on CORBA).
- An algorithm running at the Event Filter[b] publishes all histograms from the reconstruction and monitoring tasks ⇒ the users do not know about data transfer.
- Other processes in the TDAQ publish information in their standard way.

Performance of the Gatherer:

- CPU usage: up to 30 % (3.2 GHz processor) during data transfer.
- Idle more than 30 % of the time.
- Memory usage: ∼ 10 % (1 GB processor) during data transfer.
- Communications may be slow (strong dependence on the protocol used).
  Adding more gatherers and changing the configuration the time of the data transfer can be sensibly reduced.
- Average size of data transfered: ∼ 90 MB. Expected size at Atlas 900-9000 MB.



[a]http://atddoc.cern.ch/Atlas/DaqSoft/components/is/Welcome.html
[b]3rd trigger level

6. Conclusions

- The first prototype of a monitoring system for the ATLAS experiment has been designed and implemented for the 2004 Test Beam.
- The system has been designed to have maximum flexibility, dynamicity and user friendliness.
- It abstracts the communications layer, allowing transparency for the user and the possibility of using different protocols for the data transfer.
- Having dynamic configuration and the possibility to use different communication protocols allow to tune the system in order to optimize the performance.