ESRFUP-WP10 Workshop on Beamline Instrumentation Software and possible Collaborations amongst European Synchrotrons

Milestone10.1: "Report on collaboration possibilities on advanced beamline instrumentation software"

by L.Claustre, V.Rey, A.Gotz

Programme

Day one- 13th January

1. **9:00 Introduction + Goal of Workshop** (A.Gotz) (**2**0')

2. **9:10 Detector Control**

   1. LIMA 2D Framework (L.Claurent) (20')

   2. AreaDetector 2D Framework (N.Rees) (20')

      Discussion : A 2d detector API for suppliers of detectors for synchrotrons. Can the same API be used for 1d detectors ? (20')

      COFFEE

3. **10:40 High Data Throughput**

   1. ESRF (A.Homs) (20')

   2. DIAMOND - Networks/computing (N.Rees) (20')

   3. *SLS beamline infrastructure (H.Billich) (20')*

      *"D*ata acquisition at high data rates with 2d-Detectors: Storage, network, compute nodes - What did work for Pilatus? What will future detectors need? " (H.Billich, SLS)*

   4. *Dectris - Pilatus and future (M.Kobas) (20')*

      Discussion : What is the ideal infrastructure solution for high data throughput ? Will this satisfy future needs ? (20')

      LUNCH

4. **14:00 Hardware Synchronisation**

   1. Introduction (G.Berruyer) (20')

   2. DANCE hardware platform (M.Perez.) (20')

   3. SOLEIL hardware synchronisation (P.Betinelli) (20')

4. DIAMOND hardware synchronisation (N.Rees) (10')

 COFFEE

Discussion : *How to synchronize experiments (20')*

5. 15:30 Middleware

1. TANGO for non dancers (A.Gotz) (20')
2. Asyn drivers for EPICS *(N.Rees) (20')*

Discussion : How to share TANGO servers and EPICS drivers (20')

6. 16:30 Beamline Graphical Layer
1. TAURUS (T.Couthino) (20')
2. Data Analysis Workbench (M.Gerring) (20')
3. BLISSFramework 4 (M.Guijarro) (20')

Discussion : what is the future of graphical user layers ? (20')

Day two - 14th January

7. 9:00 Beamline Control Sequencer

1. *"GDA - Creating, as a community, a customisable Java software framework to operate experiments on synchrotron facilities"* (P.Gibbons, DLS) (20')
2. *"NOMAD: the interactive way to control experiments" (P.Mutti) (20')*
3. *"Feedback on using on a large scale basis a workflow editor (Passerelle) for automation of beamline alignment, experimental setup and data collections" (M. Ounsy) (20')*

COFFEE

4. SARDANA (J.Klora) (20')

Discussion : What are the requirements of a good sequencer. Are the different sequencers addressing different problems ? Can we share anything if we use different sequencers(20')

8. 11:10 Data management

1. HDF5 / Nexus (A.Sole) (20')
2. CDM (A.Buteau) (20')

Discussion : Is HDF5 sufficient as the only answer for the whole synchrotron community ?

Do we need another layer to integrate other synchrotron data formats e.g. CDM ? (20')

LUNCH

3. Data Manager (C.Guilloud) (20')
4. Data Analysis Sequencing - EDNA (O.Svensson) (20')
5. MacroServer data management (T.Couthino) (20')

   Discussion : How to manage and integrate data analysis sequences for a variety of experiments ? (20')

14:50 Conclusion - A.Gotz + L.Claustre + V.Rey (10')

Summary

The workshop is part of the ESRFUP WP10 work package milestones. The goal of the workshop was to exchange information on Beamline Instrumentation Software between the European Synchrotrons and explore possible collaborations. The following topics were discussed :

- *2d detector integration* – the two main libraries are Lima (ESRF) and areaDetector (EPICS), during the discussion it was decided that we would look into sharing device drivers for detectors, Lima is becoming the standard for the TANGO community
- *high speed detectors* – Dectris presented the next two generations of Pilatus which will be available in 2011 and 2012 respectively, the maximum data rate will go from 75 MB/s to 525 MB/s and 8.5 GB/s respectively when running the 6M at 350 Hz, these data rates will put more load on the storage and network infrastructure, ESRF presented their developments for high speed detectors of up to 1GB/s with the new generation ESPIA card
- *storage and network infrastructure* – two institutes (SLS and DIAMOND) presented their storage and network infrastructure for high performance computing beamlines, they both use parallel filesystems (GPFS and LUSTRE) and high performance storage solutions which scale linearly (3+ GB/s in write and read mode), DIAMOND has a cluster with more than 300 cores dedicated to MX, the ESRF presented their high performance solution for saving data locally on beamlines (< 1 GB /s) and on the central storage (300+ MB/s write and 30 MB/s read)
- *experiment synchronisation* – the main solutions are SPIETBOX (SOLEIL) and DANCE (ESRF) and using motor controllers, the SPIETBOX is the most advanced solution today but the DANCE project will offer more features and performance once it is ready in the future
- *data format* – HDF5 with Nexus conventions is the new *de facto* standard, however it is not without issues, SOLEIL proposed to solve these problems with a new layer called CDM
- *beamline control systems* : the main control systems used at sychrotrons, TANGO and EPICS, were represented, the sharing between the two control systems was discussed, DIAMOND plans to use the TANGO device server for the Maxipix detector
- *beamline sequencers* : the main new candidates are GDA (DIAMOND) and SARDANA (ALBA) , ILL has developed NOMAD, SOLEIL has their own solution, and ESRF uses SPEC,

new institutes (including ESRF) are evaluating the 2 main solutions, so far only PETRAIII has made a decision to adopt SARDANA, SOLEIL uses a graphical sequencer, Passerelle

- *graphical user interfaces* – the main technologies used are JAVA (GDA + NOMAD + DAWB) and Python/QT (TAURUS + Bliss FWK), the goal is to share graphical visualisation and some modules,
- *online data analysis* – the main solution is EDNA (ESRF+DIAMOND) based on wrapping data analysis programs with Python, with a graphical workbench (DAWB)

Conclusion

The BIS FP7 workshop has shown that collaboration between beamline controls groups across synchrotrons is active. All the institutes make their code available and in many cases this has profited partners. The collaboration has been made formal in some cases, like TANGO or EPICS and less formal in many other cases: SARDANA, TAURUS, EDNA ,HDF5 ,GDA, SPEC macro code, LIMA library, plot and data visualization programs, etc. However the main tendency is still for each institute is to write its own code as a way to keep full control of their systems.

TANGO and EPICS are the two main distributed control systems used in synchrotrons. Around these systems two groups of synchrotrons have emerged in respect to control of beamlines and accelerators. The organization of a workshop like this has allowed both TANGO and EPICS users in Europe to share beamline control issues for the first time. It was interesting to note the participation of the ILL that is not present in either the TANGO or EPICS forums. The participants from our neighbouring institute found that many aspects of their beamline control needs are similar to synchrotron beamline control.

SLS and DIAMOND are the leaders in high performance storage systems.

As result of this and future meetings we can expect collaboration to increase with the other synchrotrons, this means increased sharing of developments. This includes the ILL where a meeting on possible collaborations in controls software has been triggered by the workshop. It will depend on the commitment of everybody to make this collaboration even wider and/or to get formal engagement in specific projects.

The workshop was considered very useful by all participants especially the mix of EPICS and TANGO communities. It was decided it would be a good idea to repeat the workshop in a years time and in the meantime to explore the ideas for collaboration from the workshop.

The main action of the workshop was to form a users group for integrating detectors in order to increase the sharing of detector integration software.

Annexes

List of participants

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Discussion

Day one, 13th January

9:00 Introduction and goal of workshop – Andy Gotz – ESRF

Session 1. Detector Control

9:20   LIMA library for detectors – Laurent Claustre – ESRF

Q: Do you see any performance problem when using fast acq?
A: No, we don' t see it today
Even with 6M detector that gives high throughput, no performance issue

Q: (A.Gotz) Any way to give priority to acquisition on processing?
A: (A. Homs) It can be done, as we are using several threads. By keeping for example a lot of frames in memory.   It is possible to

Q: About Pilatus
A: Analysis we do straight out of disks asynchronously
We make an effort to follow

Q: Which frame can run lima at which 6M? Can you run at full rate
A: 12 Hz, that is the maximum. Everything is saved on local disk
But , it is still on the computer, we need to get it to an external server
Ok. Then we need help for that

9:40   AreaDetector 2D Framework – Nick Rees – Diamond

Q: (Gotz). Is it EPICS independent?
A: (Nick):   No one has run it out of EPICS. It is independent of IOC code, though.   But it does use EPICS libraries, helper libraries
But, would it be possible to interface LIMA in our library to run Maxipix, for example?

10:20   Distributed Fast Acquisitions systems for Multi Detectors experiments – Alain Buteau – Soleil

Q: What is Nexus 4 Tango
A: We needed file streaming mechanism with enough metadata so that reconstruction can be done

Q: How do you mix all the data?
A: Through data merger

General Discussion

Nick: How do I get maxipix running with EPICS?

Nick: If LIMA had a hardware library or ours has a system… then we could interface Lima hardware in our EPICS system

Laurent: Also processing library could be shared

Nick: but then we should be using the same data structure

Andy: If we want to use any of the EPICS integrated cameras in LIMA, which one we could try? Maybe the GigE is the best candidate

Laurent: A lot of the hardware layer is in Python

Andy: can areaDetector call python

Nick: Yes, we can maybe embed it in a C program

Break

Session 2 - High Data Throughput

10:50 High Data Throughput detectors (A.Homs) – ESRF

Q: (Heiner) A lot of effort to store locally before central storage is not fast enough? Did you try to solve that?
A: (Didier) To accelerate we are adding cache to accelerate the reading process.

(Jorg) 500 or 800 MB/sec served through 10Gb link… parallel read and write (BluArc from Hitachi) NFS head is pure FPGA.   4 clients at the same time.

11:20 Networks/computing at DIAMOND – Nick Rees – Diamond

Q: When data rate will grow x 10? Makes any sense to keep a central storage, isn't it better to have local storage
A: Storage needs management also down the beamline. If we focus on one beamline you would also get funds for one beamline one year, an another one another year

Q: Storage also advances commercially... why not having this locally?
A: You want whatever the number to manage them efficiently.
Comment (Jorg) : I agree, a lot issues that need management and staff. You have the biggest cluser for accelerator physics?

(Andy) How many people maintain the beamline storage: (Nick) Three
(Olof) What is the division between MX and the other beamlines?
(Nick) Cluster is used all the time and there is a queue. 100% used. [...]

11:45 SLS Beamline Infrastructure (Heiner Billich) – SLS

Eiger detector? For FEL... deliver parallel 1/10 GbE links
Compression of mostly 0-counts images

Q: (Andy) – If you use very big files what happens with multiclient access? Read and write at the same time
A: You do not read from disk during collection.

(Nick) – Analysis software has to be adapted for it.
Computer cluster... you have to stick to the rules otherwise you don' t get the performance
GPFS much better than NFS.
Infiniband (in computer room) seems to be a good idea to solve Ethernet problems.

(Nick) Files have to be big but not too big. If you change a byte... you have to backup the whole file.
(Armando) HDF gives tools to split large files into individual files

12:15 PILATUS – Past, present and future (Miroslav Kobas) – Dectris

Q: Full dataset stored in RAM disk of processing server. How big?
A: 1TB

Q: (Olof) Current detectors? Are possible to upgrade?
A: Upgrade to Fast is possible

Q: (Olof) Processing unit? Would it be possible to add to existing detectors?
A: Yes

Q: (Rudolf D.) Processing unit presented seems to be adapted to the old generation, but not to the new one?

A: Yes.   For example changing the processing server by a cluster machine. And hopefully 40Gb/sec Ethernet will be available

Q: (Sebastien)   Are you planning to provide a library instead of a server?
A: Nothing yet. We are thinking about how to integrate server. Library is one of the ideas.

Q: XDS, why not other software?
A: The only reason for XDS is because is the only software that can provide the speed to follow the acquisition.

Q: Looks like a full control for beamline experiment? Are you planning to control the energy for MAD?
A: No, we do not want to control anything at the beamline

Q: (Alain)   Regarding API for control? Is there any reflection on that? Specially considering the price
A: We are collecting ideas about in which direction we want to go. We will come up with a new concept.

Q: (Nick) The architecture you propose is maybe a bit naïf, considering that there are 25 FTE working on the processing ? A user group would tell you what is actually needed.
A: The concept does not pretend to change anything of the beamline. It will be a system that would provide enough information for collection strategy and easier to get data from processing storage to outside.

Q: (Andy) Is the software going to be open source ?
A: Current idea is that anybody can have the software, the single-threaded version. For the multi-threaded version there will be a license.

Q: (Franc) Are you planning to move to higher energies ?
A: Many plans here: thicker sensors.

Q: (Jorg) plans for the processing server ?
A: for the middle of the year. It's done, we need just to test it.

Andy: Maybe to get the user group of the ground should be the next step

Session 3 - Hardware Synchronization

14:05 Introduction – Gilles Berruyer – ESRF

Q: (Thorsten) Energy movements together with undulators movements? Are you planning to do it?
A: We already do. Trajectory movement.

Q. Yes… but do you speak with your undulator?

Q: (Nick) Are there mechanical issues. Minimum displacement?
A: Picking the undulator encoder is okay

Q: Is there any reason to move away from VME?
A: It is an internal policy. We have not updated VME cards for a long, long time. We want to have network devices everywhere.

Q: Do you actually use motor controllers to do coordinated movements?
A: This is what we plan to do? Not in use at the beamlines yet.

14:20 DAnCE – M. Perez (on behalf of J.Clement) – ESRF

Q: No question(s)

14:35 SOLEIL Hardware Synchronization (Pascale Betinelli)

Q: (Andy) It looks very similar to DAnCE. How do you think they compare?
A: Our solution is simpler. Maybe less powerful than the DAnCE framework.

Q: (Andy) Knowing that they are based on the same FPGA could both solution share hardware?
A: The main problem is the availability of human resources. That's why we have to stick with simple solutions. We cannot afford to put more effort.

Q: (J.Clement) Are the components of the SPI system based on standards? Or Soleil standards?
A: No. We did not want to be based on any board

Q: (J.Clement) What is the speed?
A: A few kilohertz. It would be very interesting if you have a SPI interface in your developments.

Q: (L.Claustre) One of the advantages of the DAnCE is to be close to the equipment. No need for long cables.
A: Well, you can have small SPI modules and then set them also close to the equipment

Q: (Nick Rees) I like that it is connected through Ethernet… but what is the set of commands that you use?
A: We use the same command mapping.

Comm. – Andy – it sounds like modbus.
Comm – Nick -- Would it be profinet? We use simple, no profibus or other, pure tcp/ip no other fieldbus.
Comm – Nick – It is binary or ascii protocol? –

Resp – Alain Buteau – We want to set a library with its API around this interface. The interface we want it is based in read-memory-address or write-memory-address.
So, new information only need for the developer to know where it is located. It means you can integrate in your system at Diamond.
Comm – Nick – Great

15:00 DIAMOND Hardware Synchronization – Nick Rees – Diamond

Q: (Andy) I understand you don't have a framework. Just put together things without generalization.
A: Yes. Right

Q: (Andy) But GDA will put everything together
A: Yes. GDA will give a common interface for everybody, it will look the same at all beamlines

Comment: (Trieste) Best solution for me it's using the Galil products. They have digital I/O and analog I/O, they read encoders and are programmable, with 8 threads in parallel.it has scripting capabilities and also simple Ethernet protocol. We did the Pilatus collection with Galil.   It's cheap and it works.

Comment: Andy – But we cannot combine other ADC in the acquisition, temperature and other
Comment – Trieste – You can always translate the signal.
Comment – L.Claustre – Galil board is not fast enough for some applications but for other okay, it is a cheap solution.

Open discussion

Andy: what kind of common things we find between DAnCE, Spietbox…etc… It does not look we can get common if we don' t have the same higher level control system.
Jorg: The MUSST is anyway a solution that anybody can use, even if it has not an Ethernet interface, but GPIB is fine
Ricardo Hino: The MUSST is very flexible and can do everything for the user. What we want to do is something that is simpler for the user in the future.
Andy: What we need is a language that allows the user to program the sequence easily.
Nick: National Instruments uses labview "fpgl??"
Andy: not really simple and you are completely blocked inside the labview interface
Nick: Tim Mooney has done record support for an FPGA, you can do that as well. The problem is that this is far for the user even if, in theory, you can do everything. In reality we do not want to give this level of detail to the user.

Session 4 - Middleware

16:07 Tango for non dancers – A.Gotz – ESRF

Bridges between Tango and EPICS exist.

Q: (Speaker) Who wants to use them?

A: It seems how much support you get in case of problems.
A: Actually not many people in Diamond understand EPICS core but we just use it.

Andy: for me it would be a sign of maturity if a piece of software could be taken and use it without fear of problems, like with commercial software that you do not need to understand.
Comment: If we mix systems we add a new layer and one more chances for problems.

16:22 Asyn drivers for EPICS – N.Rees – Diamond

Q: (Andy) Do you think anybody use them outside the EPICS world
A: No I don' t think so as you would need a real application

Q: (Andy) Is this the way most EPICS drivers are written
A: Yes

Day two, 14th January

Session 5 – Beamline Control Sequencer

16:40 – GDA – Pierre Gibbons – Diamond

Q: (Wolfgang) How far is the python implementation going? How fast is it?
A: Fast timing you don't do in GDA. You do that in your servers. Provided that you don't need high timing precision you can use GDA.
Comment: Geoff -- We wrote some support for Tango devices.
A: It is quite feasible to extend it further. You can talk both EPICS or Tango from within the GDA namespace.
Comment – Andy – We are evaluating different solutions to move from SPEC: those are GDA, Sardana and inhouse solution.

Q: (Matias) Have you ever considered using Python instead of Jython?
A: No. Because Jython and Java work together. We don' t see any benefit at the data acquisition level, maybe yes at the data analysis level.

Q: (Heiner) Can you explain how do you get the data from the detector?
A: We get data sometimes from the disk. We return the filename from the server. The result of the experiment can be a list of filenames that we can then interrogate

Q: (Majid) You mention the use of Nexus. Do you include any data access in a standardized way?

A: We follow the Nexus definition. We get information about the scan you made and the counters/detectors you measured on from the Nexus file

17:10 NOMAD – Paolo Mutti – ILL

Q: (Laurent) Which language do you use in your command line?
A: Historically… our own definition of commands.

Q: What is Numor ?
A: Numor is a datafile that we identify with a number

Q: Have you thought about using a modern scripting lang. Like python?
A: No

Q: Is your command line a proper language? Flow control structure?
A: We are thinking about implementing "if" or "while" but not yet

Q: Is it worth carrying on adding on your language? That's quite a job
A: Before your talks I thought there was nothing else on the market… but now…. I don't know. Our command line "language" is about 100 commands. We had a request to have a command line, but not a request for a sophisticated language. That's we keep our own language.

Q: What is most often used? The interface or the command line?
A: I don't know but the people that asked for the command line actually don't use it

17:35 Passerelle – Majid Ounsy – Soleil

Q: (Andy) You said.. "used by 60% of the beamlines" but how much of the needs of the beamlines are satisfied?
A: In the graphics you can see that both the beamline staff and the daily operation are done

Q: (P.Gibbons) When "use daily" means that the beamline create their own sequences?
A: Users do not see even that there are sequences. We let that choice to the beamline staff. Normally they don't let users define their own sequences.

Q: How many actors are controlling hardware?
A: More than 100 we have now.

Q: Which disadvantages come from using Paserelle? Like too complex diagrams?
A: Yes, but this is the disadvantage of any system of this kind. We keep refactoring to make the interface readable.

17:55 – Sardana – Jorg Klora – ALBA

Q: (P. Gibbons) How do you write a script that combine a number of devices and check things?

A: This is done in python. A python macro and the macroserver will execute the script and can access all the devices in Sardana. A macro, btw, is a class and there you define a number of things like what do you want to do if stop by control-c. The system automatically generates a macro interface for each macro.

Q: (P.Gibbons) Does the framework know how to manage contributions like eclipse does? To add new items for graphical interface construction?
A: You can make contributions by adding in a file that you want to instatiate a certain class. Qt does it for you

Comment – T.Kracht – We, at DESY, we use Sardana at our beamlines. We have not ruled out Sardana for our beamlines, we are busy with commissioning and we plan to use it. I am sad to say that we can contribute so little to the collaboration. I will be happy to contribute more to the project. I like the basic components of the system. Our plan is to roll out Sardana quite soon, starting with the spock interface, and we will also write python and interfaces. I also would like to acknowledge the work of Alba and their support.

Comment – A.Gotz – Two comments. We haven' t heard about the adoption level of the other systems. We know that Sardana – Desy + ALBA
GDA – BM26, SLS started collaboration, SAXS beamline at APS, Brazilian light source plan to use at one beamline to investigate the system (+Diamond)

APS they are not going to move away from their own system. They are going to test it.

J.Gabadinho - at SLS decision is not taken. The test concerns MX beamlines. If it works for MX it would work for the others. A visit is foreseen from SLS to Diamond for exploration.

Andy – out of GDA, Sardana, Nomad the three system seem to have the same architecture. There is something magic at it. That must be what it has to be. You don't see the differences.

Jorg – the main difference is the underlying Tango or EPICS. They will not merge.

Andy – It would be good if they all present the same interface for scientists.

Jorg – The commands actually in both GDA or Sardana they all emulate spec at the end. Scientists expect spec commands to work in both interfaces and… they do.

P.Gibbons to Jorg – I would like to see the way you define sequences.

Jorg – You are very welcome

Tiago – For info, MAX_LAB is looking, considering at both GDA and Sardana.

Session 6 – Beamline Graphical Layer

9:10 – Taurus – T.Coutinho – Alba

Q: If I take a macro from existing spec, would it be easy to use? Or, would it be difficult to adapt?
A: No, it would need to adapt

Q: Very nice. Is it possible to lock the position of widgets or avoid users to move around the widgets?
A: Yes, there is lock button

Q: (Franc) Can you do 'cdef' like in spec… but graphical?
A: Yes. Not like in spec but it is possible. There is a more complex widget, that we call sequencer, where you can chain macros. It will detect if a macro supports hooks and let you add pieces of code to that.

Q: If you have a new tango server with new properties. How do you get the new information available?
A: No. You don't need to do anything. It will appear directly in the list of devices to select and the properties/attributes would be available

Q: (A.Gotz) Are there other widgets in Qt that people are doing that are interesting?
A: Yes, for example there is one we found with plot, profile for images… etc.

Q: (Wolfgang) – How much are you depending on the qt version?
A: The minimum required is qt 4.2. The problem is that sometimes with the versions something I developed in 4.6 does not work in the control room with a lower version. But we are committed that everything is compatible from version 4.2

9:40 – Data Analysis Workbench – Matthew Gerring – ESRF

(www.eclipse.org/Xtext --> DSL for SPEC)

Q: (Tiago) You said you wish to integrate CPython as a node? If you have two different CPython nodes, like NumPy, do you plan to have two instances of the interpreter?
A: No. I expect to use shared memory to access data without starting two interpreters.

Q: (Tiago) What tool do you use for shared memory?
A: Jepp

Q: (Tiago) I saw that you use different libraries for different widgets. Did you have a look at Nebula? It is a library for SWT with nice widgets
A: No, I never heard of it. Thank you.
Comment – Andy – I did have a look at it, but you have to be careful as they are not included in the package as standard
Comment – P.Gibbons – ISPyB uses Nebula

Q: (Alejandro) Concerning Passerelle is it possible to encapsulate a block as a higher level scheme so that it is reusable ?

A: (Majid) Yes. There is the concept of actors and of composite actors. You can embed actors in composite actors.

Comment - Alain Buteau - We have the opportunity to exchange actors between Soleil and ESRF. Soleil could profit of data analysis actors

Q: (Vicente) You mention control in your Passerelle scheme, how is that control done?
A: It is encapsulated, the user does not need to know.

Comment – Andy – The difficulty is to find users for this framework
Comment – Alain Buteau – We are ready to be your guinea pig. We can do tests at Soleil

Comment – P.Gibbons – I would think if you are going to do a test it is better to find something more complex than what you showed as people could just write a python script to do it.
Answer – Yes. If it is always the same analysis in a beamline, it is not worth to expose the pipeline.
Comment – Andy – The idea behind is to make easy to launch, integrate packages that need complex preparation, like input data files, etc…

10:20 – BLISS Framework 4 – Matias Guijarro – ESRF

Q: (Tiago) The fact that we use 0MQ is new?
A: Yes before we were using Pyro and we have changed

Q: (Tiago) Local or remote… is this transparent to the user?
A: Yes. It is.

Q: (Tiago) When you save an application it is actually a directory? When you open it back would it open the directory with all the windows?
A:

Q: (Andy) Is there any reason why a control object is not a Tango server?
A: No. It was a decision so that Control Objects can be used without the Tango environment

Q: (Andy) Can you use the designer instead of the application builder?
A: It was a choice not to expose too many options. So that you don't play so much from the layout. You would …

Q: (Jorg) I like the idea that you can move the application from one beamline to another and just change the xml file. Is this being used in other beamlines?
A: No, because it is not happening yet… but that's the idea.

Q: (Laurent) Configuration can be done with a tool?
A: Yes.. the idea is to use beacon

Comment – Jose Gabadinho – It was pretty straight forward to use EPICS channels as control objects.

Coffee

11:05 – HDF5 / Nexus – A.Sole – ESRF

Q: (Heiner) HDF5 is a container, when we talk about data format you also need semantics, and HDF5 does not provide semantics
A: Still, you can make your life much easier if you use HDF5

Q: (Alejandro) The problem of concurrent access… you mention it would be solved. Do you mean from the same computer? Or distributed?
A: I mean that if a dataset is changing size.

Q: (Alejandro) I have in mind a very specific situation. The collection is going on and the detector is writing and the beamline control is writing something like collection data
A: I think it is better to let the detector to write data fast and let the collection sequence to write datafiles with links to the detector data.

Comment – Seb – There is a module (fuse) to mount an HDF5 to
Comment – Dectris – I would use fuse as it is pretty bad, it is ok to look a little bit, but that's it
Comment - Alain Buteau - In our case the MX beamline acquisition and analysis go in parallel, concurrent writing+reading

Q: (Nick Rees) I understand that you do not propose to use the Nexus interface but directly the HDF5 as it would be limiting.
A: Yes. We would use the HDF5 and writing as Nexus files without using the Nexus API
The validation tool is more critical than the Nexus API

Q: (Tiago) I understand that you validate the Nexus convention but not the Nexus API.
A: Correct

Comment – M. Gerring – Our experience is the same. Accessing files with HDF5 is fine but the Nexus API fails

Q: (Andy) You do not propose a solution in the proposal for the problem of navigating the data and finding the information needed.
A: At the end the semantics will be imposed by the leading packages.

Q: (Andy) But you will not get it right in the first go. What ILL thinks about it ?
A: ILL – I would like to use Nexus but we need more involvement from the scientists to advance the convention of the semantics.

Q: (Andy) I still think that if you give me the file and I don't know what is in it, it is very difficult to understand what is in it.

A: (P.Gibbons) There is no need for it.

11:35 – CDM -- Alain Buteau – Soleil

Session 8 – Data Management

13:36 – Data Manager – Cyril Guilloud – ESRF

Q: (Nick) Is there any control going through the data analysis?
A: (Gilles) The aim is both things to be separated , control and analysis
A: (Cyril) We would like to have to avoid to end up with a too many pieces structure
A: (Nick) One lessons learnt is that it should be a table driven layer to associate any meaningful value with metadata
A: (Gilles) The parameters of the sequence itself can be set by the analysis needs. When the sequence is running is its responsibility to say that there will be this data available. The control sequence should say to the data manager: 'values are ready, take them If you need them'
A: (Nick) I make sure that everything is available in the file header. The data analysis only needs to read the file
A: (Armando) I hope that the sequencer is doing something else than sending data to the data manager. It is very important, specially if something goes wrong, any other information is also written by the sequencer.
A: (Andy) You need the context of the beamline
A: (Alain Buteau) We have in Soleil something like this system

Comment – A way to force the users to use the new file format is to have a killer application that uses this system.

Q: (Andy) Next step?
A: Good question.

13:58 – Data Analysis Sequencing EDNA – Olof Svensson – ESRF

Q: (Nick) How do you run the tests, do you use Hudson?
A: It is a cron job

Q: When using EDNA on other machines how do you do it?
A: For the moment it is done using ssh calls. It would be good to go for a client/server model

Comment – Andy – I think the scheduler is a priority. It would be a convincing argument for some users

14:16 – MacroServer data management – Tiago Coutinho – ALBA

Q: (Claustre) Are you planning to transfer the data from the macroserver to scheduler, final destination….?
A: It is a very good question. This example is not going through the pool. The macroserver is fetching directing from the CCD. It should not be like that.

Q: (Alain Buteau) We had a similar problem with write permissions for files. We solved it by putting the responsibility of the actual writing in another device server.
A: Yes. But how do you make sure that the user permissions are ok?
A: (Nick) Presumably this server is using root permissions

Presentations

The presentations can be found on line here:
http://www.esrf.eu/events/conferences/ESRFUP-WP10%20beamline-instrumentation-software