

Minutes of LHC-CP Link Meeting 30

- Subject** : LHC Controls Project
- Date** : 19th November, 2002
- Place** : Pavilion Conference Room, Bld 936-R-030
- Participating Groups**
- | | |
|---------|---|
| LHC-ACR | no representative, |
| LHC-ECR | no representative, |
| LHC-IAS | apologies, |
| LHC-ICP | A. Hilaire, |
| LHC-MMS | no representative, |
| LHC-MTA | no representative, |
| LHC-VAC | R. Gavaggio, I. Laugier, |
| PS-CO | B. Frammery, W. Heinze, F. Di Maio, |
| SL-AP | no representative, |
| SL-BI | L. Jensen, |
| SL-BT | E. Carlier, B. Goddard, |
| SL-CO | A. Bland, E. Hatziangeli, M. Jonker, P. Charrue, M. Albert, |
| SL-HRF | E. Ciapala, L. Arnaudon, |
| SL-MR | R. Billen, |
| SL-MS | no representative, |
| SL-OP | G. Crockford, M. Lamont, |
| SL-PO | no representative, |
| ST-MA | apologies. |
- Others** : A. Daneels (Planning),
R. Lauckner (Chair),
M.E. Angoletta (Scientific Secretary),
B. Puccio (Machine Protection),
M. Tyrrell (Alarm Sub-Project),
M. Vanden Eynden (Core Team).
- Distribution** : Via LHC-CP website: <http://cern.ch/lhc-cp>
Notification via: lhc-cp-info@cern.ch
- Agenda** :
1. Matters arising from Previous Meetings.
 2. LTI Project Status and Major Milestones - B. Goddard
 3. LTI Controls in AB-CO
 - Summary of PCR Workpackages - E. Hatziangeli
 - Data Management - R. Billen
 - Hardware and Timing - W. Heinze
 - Fronds Ends and Communication - F. di Maio
 - Infrastructure - P. Charrue
 4. LTI Controls Technical Coordination - A. Daneels
 5. AOB.

1. Matters arising from Previous Meeting

Robin made some comments to LHC-CP Minutes #28, mentioning some corrections he has received and pointing out that the modifications to the long-term actions have been added as requested by Kris. There were no comments to the LHC-CP Minutes #29.

Robin also mentioned that the aim now is to summarise the most important points at the end of the minutes, rather than including them as ACTIONS after each topic.

2. LTI Project Status and Major Milestones.

[Brennan Goddard](#) talked about the most immediate topics in the LTI project, namely the SPS fast extraction and the TT40 and TI8 transfer lines.

He started by giving a snapshot of the current situation. The h/w for the new fast-extraction system in the straight section LSS4 of SPS has been installed, while the h/w installation for the TT40 transfer line will begin in February 2003. Concerning TI8, the civil engineering part will be completed by December 2002 and a survey is being carried out.

Two days are foreseen in 2003 for extraction tests. However, recently ST announced a 4 months delay on cable installation and this means that several activities will have to be re-scheduled accordingly. For instance, the TI8 line mounting was originally foreseen for January 2004 and will be instead delayed to May 2004. As a consequence, the TI8 cold check falls during the SPS run, therefore new problems (such as what to do with power supplies etc.) will have to be considered. The TI8 commissioning will be carried out towards the end of 2004. Brennan underlined that both extraction tests and line commissioning will be carried out using low-intensity beams.

Brennan concluded his talk by listing the objectives for the testing and commissioning phases. The aim of the Cold Check phase is to carry out all h/w and s/w tests/debugging not requiring the beam. Examples of such items are tests on crates/equipment communication, on motor movements, s/w debugging, data transmission to PCR etc. On the other hand, the commissioning with beam will be devoted to ensuring that the expected performance with beam is reached.

3. LTI Controls in AB-CO.

Summary of PCR Workpackages (E. Hatziangeli)

[Eugenia](#) covered several topics (alarms & surveillance, logging, fixed display, statistics, post-mortem, application software) mentioning also the foreseen timescale for their availability. She underlined that the talk contents result from several discussions carried out both inside the CO group and with other groups.

Alarms will be taken care of by the present SPS Alarm group. Concerning the surveillance processes, some still need clarification. However, the surveillance should be in place by the time a system can be accessed. Both Alarms and Surveillance will be available by the 2003 start-up.

A data logging on a shot-by-shot basis was requested, to which the data that will be acquired by the SPS2001 control system will be fed. A discussion started concerning the data-logging format. One possibility is a fixed display in the control room, for operation, but there are also other possibilities. Several topics, such as what data should be logged and the type of data tagging, should be decided by start 2003. Data-logging and fixed displays should be available by September 2003.

The application s/w for Beam Transfer will be controlled either by SPS ring / TZ software or by SPS2001. Concerning the application s/w for Beam instrumentation: a) TT40 transfer lines will be controlled by SPS2001; b) BLM will be controlled by an updated version of the current SPS LabView applications.

Eugenia concluded the presentation by mentioning the NAOS and the Timing systems. In particular, the SPS Timing system will not be changed until the end of 2003.

In reply to I. Laugier's question about the absence of vacuum data in the logging, Eugenia pointed out that so far nobody requested them; that they will be included now following Isabelle's request.

Mark Tyrrell suggested logging also alarm information, so to have it available also for post-mortem. He then asked whom he has to contact for PO surveillance. The answer was Q. King.

Franck di Maio then underlined the need to clarify the communication architecture for data logging.

Data Management (R. Billen)

Ronny started by defining the mandate and the scope of the future Data Management (DM) section, of which he will be the leader. The section will be composed by members of LHC/IAS, PS/CO and SL/CO groups, and will provide support for all data management activities in the A&B division, ranging from data modelling to design/implementation of database and data interfacing tools.

He started by listing the shot-by-shot logging requirements requested by BT. One should also include the vacuum data logging required during Eugenia's talk.

The logging options for LTI are the currently deployed SPS Measurement & Statistics System and the LHC Logging System. The former system became operational in 1995 and is based on old technology (black boxes). It will soon be made obsolete by SPS2001. The LHC Logging System is under development and the first version will be available in mid-2003. It is composed of two phases: the first phase includes logging facilities for the Cryogenic Distribution Line (QRL), which has just been approved. The second phase is relative to LHC. The LHC Logging System is based on a single generic data structure and detailed meta-data, and on HTTP-based XML data file transfer; as a consequence, it is completely different from the LEP logging system.

After listing some LTI-specific logging requirements, Ronny pointed out that calling “monitoring system” the system they define corresponds to using a wrong terminology, and that really one should instead talk of “measuring system”.

Ronny ended the talk by saying that the a replacement for the soon-to-be obsolete SPS Measuring system should be put in place, and that the LHC Logging System cannot satisfy BT’s requests.

R. Lauckner recalled that the LHC logging project had looked for an SPS system as an early client. B. Goddard then underlined that SPS will need a logging system with long term storage of data, the problem being that the SPS time-base is basically different from that of LHC since it is linked to SPS cycles. M. Tyrrell comment on the importance of the latency of such a service.

Hardware and timing (W. Heinze)

In the first part of his talk [Wolfgang](#) described the new hardware equipment that will be bought next year. All installations from the end of 2003 and afterwards will be based on it.

Concerning the crates, both VME and cPCI backplanes will be available. The new standard crate (from Wiener) will be based on VME64 and will replace the previous standard. The VME64x crate will provide an Ethernet CPU for transferring data and a RS232 interface for system startup, error surveillance and telnet.

As far as CPUs are concerned, a contract with CES has just been signed. This will allow buying the new RIO3 PowerPC CPUs, to take the place of the RIO2 ones that are out of production. The RIO3 CPUs run at 400 MH, support 256 MB of memory and will come with 3-row or 5-row connectors.

The compatibility between the two crates types and the three CPU types is quite high, since the only non-working combination is RIO3+ 5 rows option CPU with the old WES crate. A. Bland suggested that SL/CO might need to buy a few VME64 crates.

In the second part of his talk [Wolfgang](#) addressed the timing. No changes will be implemented in PS and SPS during 2003. However, several activities are currently going on and will continue in 2003, such as the development of new timing receiver modules (CTX1, TTCbi, CTX8). All tests will have to be done in 2004, with the new infrastructure in place that will allow both new and legacy working modes.

In addition, a new and very complex MTG/BST generator will be installed in the PCR as preparation for SPS multi-cycling.

CO will deliver a considerable amount of software, including drivers, test programs and libraries. All h/w modules will be considered as prototypes, because by 2007 the actual PCB layout might need changes owing to the short life cycle of some used components.

Front Ends and Communication (F. di Maio)

Frank spoke on behalf on the A&B FC (Front-end and communication) section. The equipments covered by his section include vacuum, septa, kickers, magnets and several BI instruments such as BPM, BLM, BCT and profile monitor. He asked to be contacted in case other equipment needing coverage was not in his list. The services provided by his section include: a) equipment access for applications & equipment servers; b) analogue signal observation; c) data logging & alarms connection.

Concerning a), the new applications will use either BISCOto or SPS2001 servers. The magnets and septa controls will be implemented by using the ROCS MUGEF. M. Jonker has modified the software for the new equipment server. M. Jonker intervened mentioning that an extension of a surveillance system is being implemented. It still has to be decided whether SL-EQUIP+SPS2001 server will use the CMW or the DIM. Finally a 18-bit DAQ is going to be supported by the TZ software. M. Jonker pointed out that this will be useful for interlock systems.

Concerning b), the section's aim is to replace by next year the VXI/VxWorks (old) and VXI/Lynx (more recent) configurations with a CompactPCI/Linux one. The CompactPCI/Linux configuration has already been prototyped and uses Concurrent Technologies CPU and Acqiris scopes. Enough spare parts will be kept, anyhow, allowing re-building VXI/Lynx systems if needed.

Concerning c), Frank mentioned that several things have to be discussed. In particular, it should be decided if it is necessary to have services on front-end computers to connect to data logging and alarms. If so, it should also be decided which services and who should provide them.

M. Tyrrell asked for support of alarm logging at front-end level.

Infrastructure (P. Charrue)

Pierre talked about the AB/CO infrastructure that will be provided to support TT40/TI8 extraction tests. It is foreseen that such tests are carried out in September 2003 while the line commissioning is foreseen in 2004. The Infrastructure section will provide support to execute both "old" s/w (C/Motiv) and "new" s/w (JAVA-GUI, JAVA Business layer).

Pierre proposed to use W2K consoles to run old and new s/w, adding that additional study is needed to develop the console manager. PCRSRV9 will be kept as it is today to execute the old s/w. A new service will take care of the Java Business Layer.

Concerning the timetable for the new developments mentioned, a new file storage service to replace PCRSRV1 is under study. Its deployment is foreseen for early 2003. In addition, support for the JAVA Business Layer is under study and might be prototyped in 2003.

R. Gavaggio asked who is the responsible for W2K servers. B. Frammery answered that the IT division maintains them through SL/CO.

4. LTI Controls Technical Coordination.

Axel Daneels defined the scope of the LTI Controls Technical Coordination as limited to the installation of controls h/w infrastructure and to the tests to carry out in 2003/2004. Neither the s/w infrastructure nor s/w facilities are included.

Axel then illustrated the general planning for 2003 to 2007 (see slides for more details). In particular, there might be the possibility of a test on TI2 during 2003 but beams would not be involved.

Two groups are defined within the Technical Coordination framework: Clients and Suppliers. The Clients are systems that rely on one or more services for their activity. The Suppliers are the supplier of such services. Examples of Clients are several BI instruments (BPM, BCT, BLM etc), Vacuum, Fire Protection, Magnet surveillance. Examples of the Suppliers category include Control Cables, Network, Optical Fibres. Axel underlined that the Timing System is not only a Supplier, but also a Client since it needs cables and optical fibres.

There are two sets of Excel spreadsheets for each project, the first pertinent to Clients and the second to Suppliers. In each spreadsheet, columns represent the different installation phases, such as specification, order, installation, test, system available. Rows represent the supplies needed (for a Client spreadsheet) and the client systems (for a Supplier spreadsheet). A Summary Chart is also available for each project, to summarise the system situation as seen from the Clients' viewpoint (listed in columns) and from the Suppliers' viewpoint (listed in rows). Each cell in the Summary Chart represents the intersection between the Client and the Supplier viewpoints. A colour coded cell indicates if everything seems OK (green cells) or if there is disagreement between Client and Supplier on the current state of the installation (red cells).

B. Frammery asked how one could solve the problems highlighted by a red cell. Robin remarked that a plenary meeting is scheduled early in December to review these issues. Axel added that in such cases (red cells), usually people come to his office and go out with a list of points to check.

E. Carlier asked whom one should contact for s/w support, which was not part of Axel's talk. Robin answered that Eugenia is trying to set up a timescale on when the CR s/w will be provided. Concerning the s/w support, it's up to Bertrand and the CO group to discuss the best way to provide it.

Outstanding Points

1. As C. Niquille and G. Arduini are leaving OP new people are needed to maintain the TZ database.
2. Vacuum group request data logging
3. Clarification of the responsibility for PO software is required. In particular alarm surveillance for mugef and ROCS.
4. BT has requested shot-by-shot logging for the extraction. Applications are post mortem and LHC performance analysis. No solution is proposed.
5. CMW team want to receive specification of services for data logging and alarms
6. The interface between controls teams and the networking services of IT/CS is not well defined. Technical coordination in the area is difficult.
7. Who has the overall responsibility for coordinating controls above the level that is covered by Axel Daneels? What are the respective roles of the CP and future AB-CO technical committee?

Long-Term Actions	People
Common power circuit database requirements	R. Schmidt
Underground Control Rooms requested	R. Lauckner
Establish Post-mortem sub-project	R. Lauckner
Clarify Middleware Services to be used by LHC-CP	Future AB-CO TC

Reported by M. E. Angoletta



LTI Project Status and Plans

- Overall scope
- Present status and activities
- Planned milestones and deadlines
- Tests and commissioning

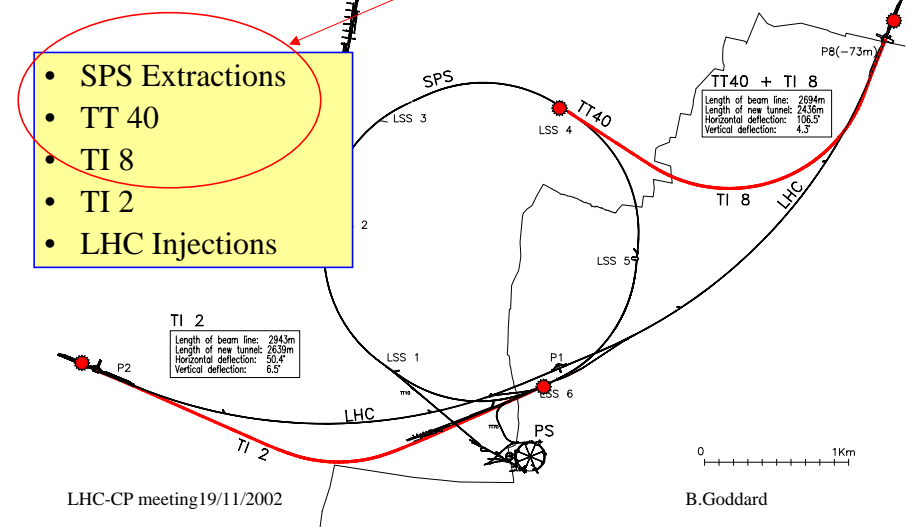
LHC-CP meeting 19/11/2002

B.Goddard



Overall Scope

Focus here on most immediate items...



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B.Goddard



Present Status and Activity

- LSS4
 - H/W installation now in progress
- TT40
 - Services installation about to start (for TI 8),
 - H/W installation to start Feb. '03
- TI 8
 - civil engineering finishing (December)
 - survey in progress.

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B.Goddard



Major milestones – TI 8

- TI 8 / TJ 8 CE finished by 20 December
 - TT40 installed during 02/03 shutdown.
 - 2003 SPS cold check out including LSS4 extraction channel + TT40
 - Extraction tests 8 Sep & 1 Oct '03 (LSS4 + TT40)
 - TI 8 line mounted May/June 04 (TI 8 GS rescheduled by 4 months!).
 - TI 8 Cold check out July/August 04 (2 months) during SPS run
 - TI 8 Commissioning with beam August/September/October 04 (?)
- Still to optimise?

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B.Goddard



Tests and Commissioning

- Cold check-out periods
 - verification of all hardware AND software systems that can be done without beam.
 - establishing communication with crates and equipment, checking responses, motor movements, settings, readouts, **final** software debugging, data transmission to PCR, applications software, databases, functions, polarities, coarse timing etc etc etc.
- Commissioning periods with beam
 - Ensuring that the performance with the beam is as expected - **NOT FOR DEBUGGING OF BASICS**
 - Magnets, Instrumentation (resolution, linearity, gain, polarity, ...), optics, steering, aperture, interlocks and controls tests, etc etc etc.

Summary of PCR Work Packages

Input from: R. Lauckner, M. Lamont, E. Carlier, J-J Gras, L. Jensen, K. Sigerud, V. Paris, M. Tyrrell

19th Nov 2002

E. Hatziangeli SL/CO

Categories

- Alarms & Surveillance
- Logging, Fixed Displays, Statistics, Post-mortem
- Application software
- Other Systems

19th Nov 2002

E. Hatziangeli SL/CO

Alarms & Surveillance

- Alarms will be taken care by the SPS Alarm system – Alarm team
- Surveillance processes – Equip. groups
 - Extraction Kickers - BT
 - Extraction Septa - BT
 - Power Supplies - PO
 - Vacuum pressure, valves, interlocks (PVSS Alarms to CAS) – LHC/VAC
 - Beam Losses - TBC
- Availability by the start-up 2003
- Follow up by the Alarm team
 - Interface SPS2001 device servers (MKE, MSE) and CAS

19th Nov 2002

E. Hatziangeli SL/CO

Logging, Post-Mortem, Statistics & Fixed Displays

- Shot-by-shot logging needed PM, FDs, statistics, INB records.
 - By SPS2001 measurement system
 - Beam position monitors (BPM)
 - Beam sizes from BTV screens
 - SEM grids before 1st TED
 - BCT intensity on dump (INB req.)
 - MKE kick strength
 - MSE girder positions, coil & yoke temperatures
 - TT40 magnets – TZ software
 - Beam losses – 40 monitors (SL/BI)
 - Vacuum – (LHC/VAC)
 - Bumper magnets – TBC

19th Nov 2002

E. Hatziangeli SL/CO

Logging, Post-Mortem, Statistics & Fixed Displays

- Post-Mortem
 - Triggered by the machine protection system (if ready)
 - All relevant data will be available in the logging DB
- Fixed Displays
 - New FD provided by SPS FD software (M Albert OP)
 - All data in the logging DB will be available
- Statistics
 - Must define what is needed - OP
 - Statistics applications could be done later (as long as we have all data necessary available) – E. Hatziangeli

19th Nov 2002

E. Hatziangeli SL/CO

Logging, Post-Mortem, Statistics & Fixed Displays

- Must define soon (by start 2003):
 - What data should be logged must be clarified
 - Database tables design – AB/CO/DM
 - Interfaces for data producers and consumers
 - Unique data tagging (timestamp, cycle id extraction id, ..)
- Concerned
 - SPS2001 (M. Lamont)
 - AB/CO/DM (R. Billen)
 - AB/CO/AP (E. Hatziangeli)
 - TZ software (V. Paris)
 - SL/BI (L. Jensen)
- Logging & Fixed Displays available by Sep 2003

19th Nov 2002

E. Hatziangeli SL/CO

Application Software Beam Transfer

- Controlled by SPS ring or TZ software
 - New ROCS Mugefs Bumper magnets
 - MSE ROCS Mugef
- Controlled by SPS2001
 - Extraction kickers MKE
 - SPS2001 compliant device server provided by BT
 - Extraction septa MSE.
 - SPS2001 compliant device server will be provided by BT
 - Some facilities (device explorer, contracts) are needed for hardware commissioning early 2003

19th Nov 2002

E. Hatziangeli SL/CO

Application Software Beam Instrumentation

- All BI TT40 on LHCDAB are controlled by SPS2001
 - Beam Position Monitors
 - Screen Profile Monitors (BTVP)
 - Fast BCT (capable of measuring individual bunches)
 - SEM BBS monitors (TBC)
 - Specification of contracts required for the SPS2001 software is needed by SL/BI by the end of Nov 2002
- Beam Loss Monitors will be controlled by present SPS LabView based application (N. Ferrari OP)
 - LSS4 7 BLMs & TT40 6 BLMs
- For all BI, OP should specify all properties needed for the PCR – G. Crockford OP

19th Nov 2002

E. Hatziangeli SL/CO

Application Software

Transfer Line steering

Settings generation, measurements and drive by TZ software

- New hw addresses in TZ database (G. Arduini, C. Niquille OP)
- Ready before start-up 2003

SSIS

Upgrade of existing system - Ready before start-up

- New MACHST modes (LSS4, CNGS) - R. Lauckner
- New BEAST modes - (J. Carron OP)
- New elementary tests - (C. Despas)
- Update existing SSIS black boxes with new members (K. Sigerud)

Application Software

• Application Server

- For SPS2001 software

• Fileserver

• New/updated software that needs time reserved to be tested will be specified in time

- Update commissioning schedule (A. Daneels)

Other Systems

naOs

Needed for the verification of the pre-pulse for the MKEs

- New Linux based cPCI hardware - AB/CO/HT
- New FE software and application (TBC) - AB/CO/FE

Timing Events

The timing system will remain the same as the one in SPS until end 2003

- If any updates necessary will be done in collaboration with (M. Jonker, L. Norman OP)



Data Management Services for LTI

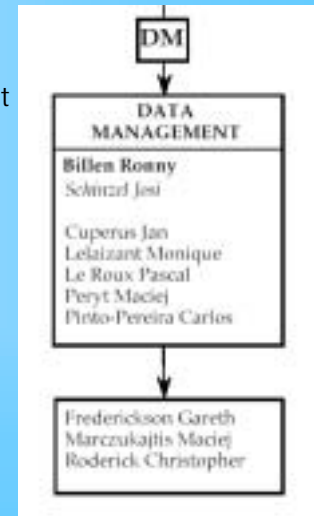
Ronny BILLEN

~~SL/MR/DBS~~ – AB/CO/DM

AB/CO Data Management Section



- 🔥 Officially announced on 11-Oct-2002
- ✓ The A&B-CO-DM section is mandated to provide support for all data management activities in the A&B Division, necessary for the control, exploitation and maintenance of the accelerator chain.
- ✓ This support covers requirement analysis, data modeling, database design and implementation, development of generic data interfacing tools, participation in collaborations for larger application development.
- ✓ The support may also translate in guidance and assistance towards existing CERN-wide data management infrastructures.



Logging Requirements



- Shot-by-shot logging requested by BT
 - Beam losses
 - Beam positions
 - Beam sizes from screens
 - SEM grids before 1st TED
 - BCT intensities on dump and in ring
 - Power converters – current waveform
 - Bumper magnets – current waveform
 - MKE kickers – voltage, timing, fault states
 - MSE septum – current waveform, girder positions, coil + yoke temperatures, fault states
 - Machine protection
- ☺ This looks like data management...

Logging options



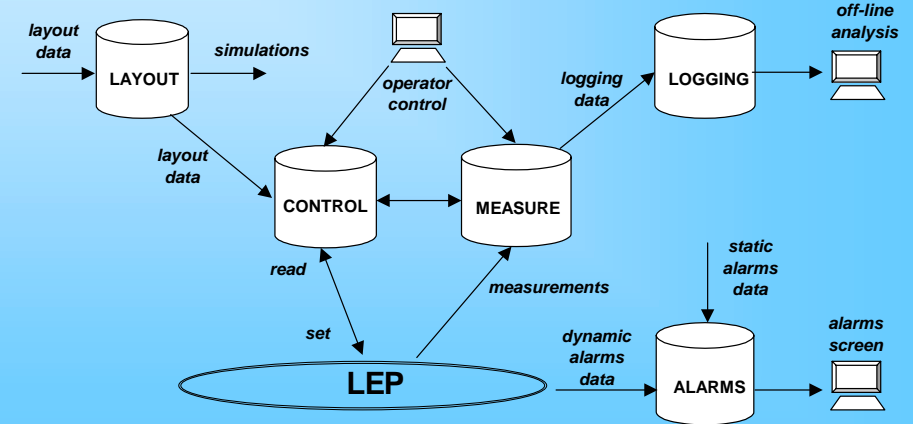
- SPS Measurement & Statistics System
 - Existing, operational since 1995
 - Scope: SPS cycle based information
 - Dedicated data structures per system
 - Dedicated Pro*C interfacing “black boxes”
 - Intended to become obsolete with SPS2001 in place
- LHC Logging System
 - Under development, Version 1.0 mid-2003
 - Scope: QRL (1st phase); LHC (2nd phase)
 - Single Generic data structure + detailed meta-data
 - XML data file transfer based on HTTP

LTI Logging Requirements Specifics



- Purpose : capture extraction data; analysis in case of extraction mishap
- Time base ≠ Timestamp
 - Timestamp = { date + time [+ fractional seconds] }
- Time base = Unique Cycle identifier + Time-in-Cycle
 - CycleID = {MTG cycle number + SC start} (i.e. bricolage)
 - Time-in-Cycle = extraction number (present requirements)
- Latency : within next cycle! (i.e. monitoring)
- Persistence : forever? Not for BT, extra requirements might come from OP
- ↻ These are requirements for a **measurement** or **monitoring** system

Remember the LEP environment



Conclusions

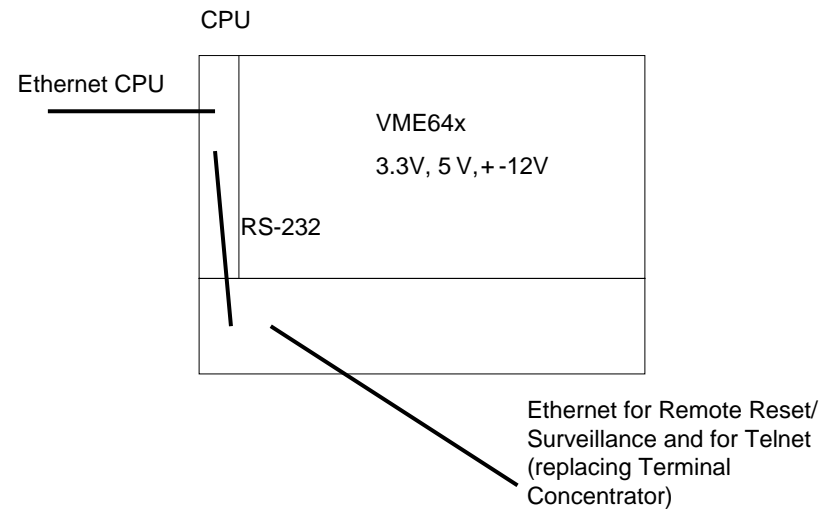


- The requirements for LTI from BT are not "Logging" requirements (in LEP or LHC terminology)
- If the present **SPS Measurement system** is considered to be obsolete, a replacing system should be put in place
- According to the revised scope of the **SPS2001** project, this is still a deliverable of the project
- As promised, AB/CO/DM is available for support for this data management
- As usual, the "instantiation" of this support depends on resources, priorities, requirements and expectations

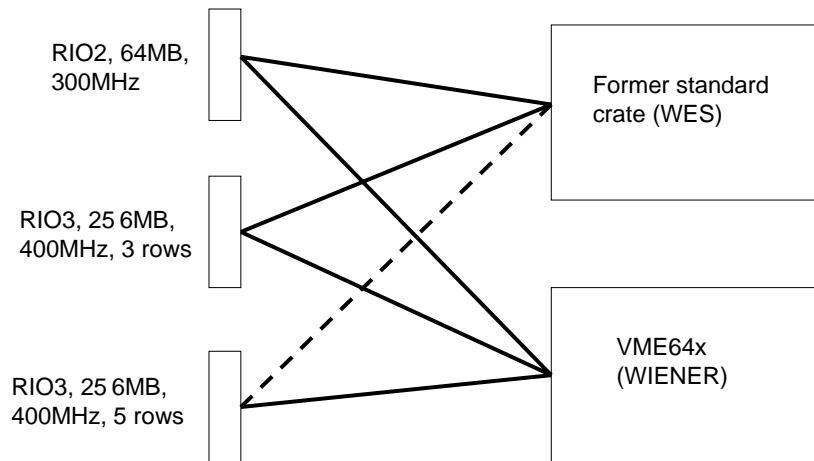
Hardware (VME + cPCI)

- Call for tender together with physics experiments, conducted by the EP pool, offer from WIENER retained
- One standard VME crate for machine control, with one variant for the BI applications (additional power supplies and bus lines on P0)
- Price of standard crate ca. 4200 Euro
- Offer is modular and allows to order the same crate with cPCI backplane, 2 crates with 3x6 slots cPCI ordered
- For the CPU, a contract with CES is just being signed, will allow to buy RIO3 CPU's (PowerPC)
- 2 versions will exist: with 3-row connector (VME 32 bit) and with 5 - row connector (VME 64bit)

Standard VME Crate 6 U



Compatibility between Crates and CPU's



Timing - 2003

- No change in the PS and SPS
- Timing for TT40/TI8 based on actual GMT generator (PC in PCR)
- Receiving modules are SPS TG8's and TX3's (for G6 4crates)
- Protocol on Timing network: framed bi-phase/mark, 5 12Kb/s,RS-422

- Prototype of BST generator installed, based on the CTG module
- Runs with test program (delivered by CO/HT) permitting generation of telegrams and events; does not contain beam intensity
- Transmission of BST timing over TTC to BI applications
- Receiver TTCbi (VME module by JJ. Savioz)ready for start-up

- CTX1 for LHC power converter testing nearly ready, including driver
- Will be driven by a test program on an (old) MTG card (VME); timing events and telegrams can be programmed
- Other potential clients can test it (E. Carlier)

Preparation for SPS Multi-Cycling

- For start-up 2004, a complete MTG/BST generator will be installed in the PCR, based on the new CTG card
- Generates Supercycles based on the Central Beam and Cycle Manager
- Generates timing for LINAC/PSB, CPS, ADE, SPS, SPS legacy, LHC and the BST for LHC ring 1, 2, experiments, and SPS
- MTG/BST consists of 2 independently working generators, the actual master selectable by a switch
- Many problems to solve: building the switch, transmission of external conditions from PS to PCR, transmission of beam intensities to PCR, generating precise clocks (HP 5 85 03-Driven from GPS)

- Development of a CTX8 module as PMC and VME version
- Contains counters and PPM support (replacement of TG8)
- Should be ready end of 2003
- Input compatible with the old TG8's

Transmission and General Remarks

- Selecting optical transmission hardware (transmitters, receivers): Industrial equipment (ppm) – TTC hardware
- Transmission of timing pulses and –trains (generated by the RF in SR4 and BA3) to the PCR: ready for start-up 2004

- Lots of software delivered by CO/HT: drivers, test programs, CBCM, Tgm/DTM library for the SPS

- All modules are prototypes. PCB's can change because of short life cycle of components

- Protocol on GMT network (5 12Kb/s,framed bi-phase/mark, RS-422) could change but this would be transparent to the user

LTI Controls Front-end & Communication

Franck Di Maio
19 Novembre 2002

Equipment

- Beam Instrumentation: BPM, BLM, BCT, Profile monitor
- Magnets
- Kickers
- Septa
- Vacuum (separate system)

Services

- Equipment access for applications & equipment servers
- Analog signals observation (NAOS)
- Data-logging & Alarms connection

Equipment Access

- Old applications (C/Motif) use SL-EQUIP API and communicate with SL-EQUIP servers on front-end via SL-NC.
- New applications (Java) use either BISCOto or SPS2001 servers.
- Move to CMW for API & communications
- Means new servers (BISCOto or SPS2001)
 - An integration effort for each category of server
 - Synchroniz edwith the applications' development.

Instrumentation

- 4 new VME crates
- BISCO TO systems, except BLM.
- LynxOS 3.1 already
- SL-EQUIP + CMW equipment access.
 - CMW-based servers in development (CO/BI collaboration)
- BPM & BCT need BST

ROCS MUGEF

- Software modified for new equipment server
- Port to LynxOS 3.1 to be done
- Extension of the surveillance system (“ Channel 6 4”)
- SL-EQUIP + SPS2001 server via either CMW or DIM. (To be planned)
- 18 bits DAC to be supported by the TZ software.

Kicker

- Duplication of the injection kicker configuration (except analog signals)
- Already LynxOS 3.1 for the VME part
- PLC connection via Softnet
 - Could be reviewed (AB/CO/IS) but at least the base solution
- SPS2001 device servers for VME and PLC equipment

Septa

- ROCS MUGEF
- Device server SPS2001 (on HP server) for parameters surveillance (water, temperature...)
 - In development (BT)
 - Could include motor control as well.

Analog Signals

- Reminder:
 - Original config.: VXI/VxWorks/N.I.CPU & HP Scopes.
 - Modified: VXI/LynxOS/CES CPU with Hytec VXI/VMEadapter.
 - Prototype: CompactPCI/Linux/Concurrent Tech. CPU & Acquiris scopes.Software ported on the three OS + new development.
- Should use the CompactPCI configuration
- With enough spare to build VXI/LynxOS in a hurry if necessary.

Data Logging / Alarms

- Is it necessary to have some services on front-end computers to connect to data-logging and alarms?
- Which one?
- Who provides them?

Summary

- Align on LynxOS 3.1 : ROCS
- Migrate to CMW but only one operational new server / front-end (in addition to the SL-EQUIP one). To be synchronized with the applications.
- Validate the CompactPCI configuration for Analog signals.
- Some FC work for data-logging & alarms?

AB/CO Infrastructure

TT40/TI8 extraction tests

What?

- Extraction tests in September 2003.
- Line commission in 2004.

- Support to execute old fashion software in C-MOTIF
 - (TZ, Alarms, current SPS SW, ...)
- Support to execute new fashion software in JAVA-GUI + JAVA Business layer
 - (SPS-2001, LASER, BI SW, ...)

What in terms of Infrastructure

- Console to display X-MOTIF and CPU to execute C software
- Console to display JAVA GUI and CPU to execute JAVA business layer
- File storage space to host everything
- Development support

Proposal

- W2K Consoles to run old and new software (need more study for the console mgr).
- PCRSRV9 as it is today to execute C/Motif software.
- New service to host and execute the JAVA business layer.
- Enhance the file storage service offered today in PCRSRV1 and BURSA

Timetable

- W2K exists and is supported.
- PCRSRV9 exists and is supported.
- HPJVM is currently used for JAVA development.
- SLJAS1 is currently used for JAVA operation.
- A new file storage service is under study to be deployed early 2003 (~400 Gbytes) to replace PCRSRV1
- In AB/CO/IN, studies are taking place to offer JAVA application support (business layer). Prototyping could arrive in 2003.



LTI Controls Infrastructure: Technical Coordination

Axel Daneels (SL/DI)

- ◆ Scope of Coordination
 - ◆ LTI Layout
 - ◆ General Planning
- ◆ Major Milestones 2003 - 2004
 - ◆ Systems / Who
 - ◆ Progress Charts
 - ◆ Examples
- ◆ Current Situation (Summary)
 - ◆ Major Concerns

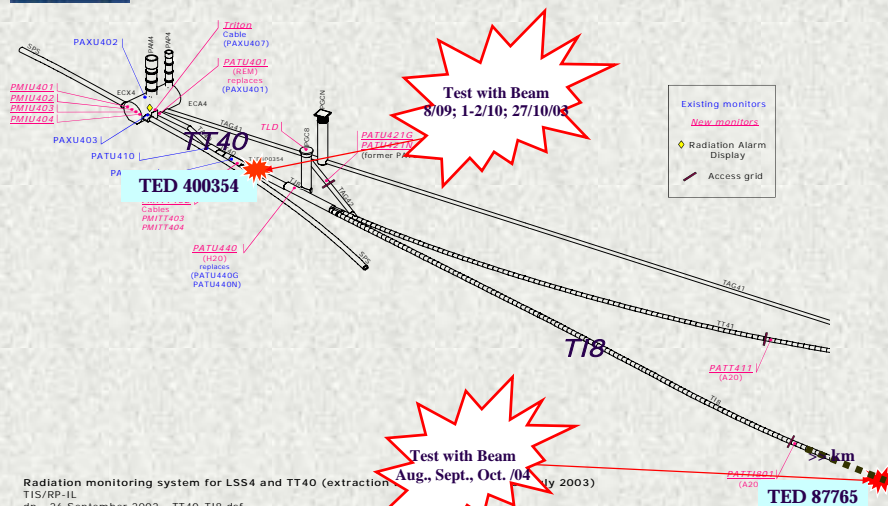


Scope of Coordination

- ◆ Focus on tests in **2003 & 2004**
- ◆ **Only** installation of controls hardware infrastructure for
 - ◆ LSS4, TT40
 - ◆ T18
 - ◆ (CNGS takeover by Konrad Elsener)
 - ◆ T12 (?)
- ◆ **No** software infrastructure
- ◆ **No** software facilities
 - ◆ Logging, Alarms, Middleware, etc. = responsibility of the Groups in charge



LTI Layout



General Planning

LHC Section	Major Milestones	Dates	
		Start	Finish
LSS4, TT40	Hardware Commissioning	1-Mar-2003	30-Apr-2003
QRL (7-8)	Installation	16-Jul-2003	7-Nov-2003
	Pre-Commissioning	14-Jul-2003	7-Nov-2003
	Test with Beams up to TED 400354	8-Sep-2003	8-Sep-2003
LSS4, TT40	Test with Beams up to TED 400354	1-Oct-2003	3-Oct-2003
	Test with Beams up to TED 400354 (reserve)	27-Oct-2003	27-Oct-2003
QRL (7-8)	Hardware Commissioning	7-Nov-2003	1-Oct-2004
	Reception	1-Dec-2003	5-Mar-2004
T18	Installation (*)	May-04	June-04
	Hardware Commissioning up to TED 87765 (*)	July-04	August-04
Sector (7-8)	Installation	15-Mar-2004	11-Mar-2005
	Test with Beams up to TED 87765 (*)	August-04	October-04
Sector (8-7)	Installation	1-Mar-2005	22-Oct-2005
	Hardware Commissioning	14-Mar-2005	16-Sep-2005
Sector (9-7)	Hardware Commissioning	24-Oct-2005	7-Apr-2006
	Hardware Commissioning	15-Mar-2006	15-Apr-2006
TT41 & CNGS	Test with Beams	Spring 2006	
LHC	Possible Injection Test: T106, Sect 7-8, Sect 8-7, Dump TD62 (?????)	15-Apr-2006	21-Apr-2006
LHC	LHC Full Machine Hardware Commissioning	15-Feb-2007	31-Mar-2007
LHC	LHC First Beams & First Run	3-Apr-2007	26-Oct-2007

(*) T18 dates to be "optimised"



Major Milestones 2003 & 2004

- ◆ LSS4 ,TT4 0
 - ◆ H/W Commissioning TED- 400354 :
 - ◆ 1 Nov 2002- 30Apr. 2003
 - ◆ Test with beam up to TED- 400354
 - ◆ 8 Sept. 2003
 - ◆ 1 - 2Oct. 2003
 - ◆ 27Oct. 2003 (reserve)
- ◆ TI8 (*date to be " optimised"*)
 - ◆ H/W Commissioning
 - ◆ July- Aug. 2004
 - ◆ Test with beam up to TED- 87765
 - ◆ Aug. Sept. ,Oct. 2004
- ◆ TI2
 - ◆ *upstream commissioning (?)*
 - ◆ *6 Jul. 2004 not well defined; if yes, then probably very limited*



Systems / Who

- ◆ « Clients »
 - ◆ BPM, BCT: L. Jensen, D. Cocq
 - ◆ BLM, BTV, SEM/STEP: L. Jensen, G. Ferioli
 - ◆ ROCS Mugef: J. D. Hundzinger
 - ◆ Détection incendie: D. Raffourt
 - ◆ Vide: J. Ch. Billy
 - ◆ Radiation & protection: N. Aguilar, D. Perrin
 - ◆ BT (Extraction, Transfer Lines) : E. Carlier
 - ◆ Surveillance Aimants: P. Dahlen, G. Mugnai
 - ◆ Timing: J- B. Ribes
 - ◆ Interlocks: B. Puccio (*)

(*) new entry
- ◆ « Suppliers »
 - ◆ Câbles de contrôle (incl. Bus terrain) : P. Woillet
 - ◆ Réseau: M. Da Costa, J- M. Jouanigot
 - ◆ Fibres Optiques: L- Kde Jonge
 - ◆ Rack: M. Condemine, P. Woillet
 - ◆ Distribution électrique (48 V, 20 V) : S. Akhtar
 - ◆ Secteur secours (UPS) S. Akhtar
 - ◆ Timing: J- B. Ribes
 - ◆ " Front- End M. VanderEynden



Progress Charts

- ◆ Excel Work books « Clients » et « Suppliers »
 - ◆ Column: Installation phases
 - ◆ Specification, order, installation, test, available
 - ◆ Rows
 - " Clients " charts = supplies they need
 - " Suppliers " chart = their " clients " systems
- ◆ « Summary » Chart
 - ◆ Simplified overview of the current situation
 - ◆ Intersection « client » / « supplier »: cf. colour code
- ◆ Colour Code
 - ◆ Green = seems O. K.
 - ◆ Red = may be a problem for tests in 2003 or 2004
 - ◆ Black = according to planning / not critical
- ◆ Tables available at
 - ◆ <http://proj-lti.web.cern.ch/proj-lti/ControlsInfrastructure.htm>



Example (1) : "Client's" Chart

Etat d'Avancement le: 23-Oct-02		System		System	System	System	System	System	System
System	System	System	System	System	System	System	System	System	System
Client / Equipment Acquire	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Installation Order	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Installation	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Test	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Available	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Commissioning	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Ready for operation	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / In operation	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Decommissioning	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / End of life	OK	OK	OK	OK	OK	OK	OK	OK	OK
Client / Disposal	OK	OK	OK	OK	OK	OK	OK	OK	OK

