

What you get

Steen Jensen on behalf of BE-CO

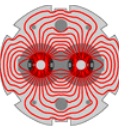
Based on discussions with

OP

Mike, Jorg, Delphine, Laurette, Ghislain, Jan, George-Henri, Giulia, Fabio

CO

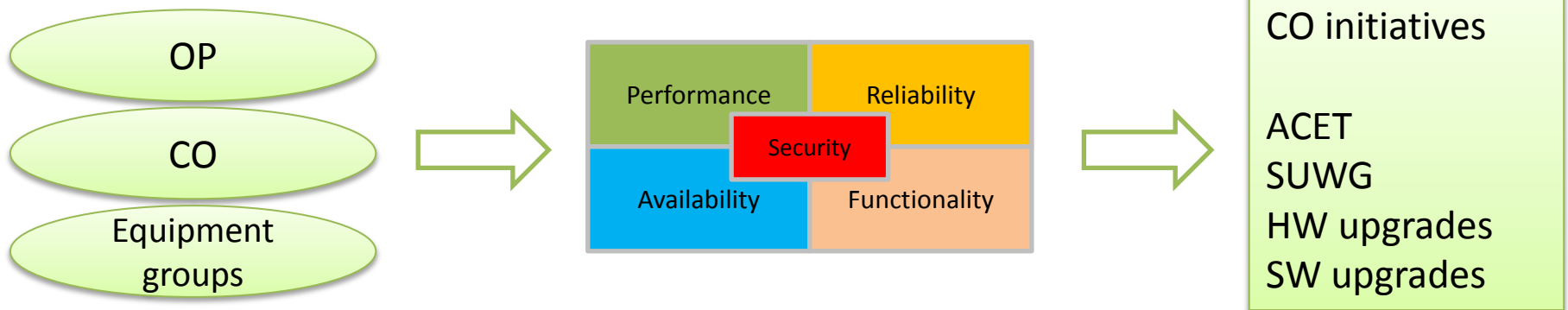
Vito, Javier, Katarina, Pierre, Nicolas, Roman, Wojtek, Jakub, Greg, Zory, Chris, Mark, Jean-Claude, Luigi, Jeremy, Niall



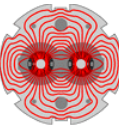
- Opening statements
- CO Infrastructure
- Development environment
- Ergonomics
- Core components
- Exploitation
- Conclusions

Opening Statements

- The controls system infrastructure is not energy/intensity dependent
6.5TeV, 25ns and higher intensity have no obvious implications based on current input from OP
- LS1 activities are driven by input and requests from OP and Equipment Groups as well as by CO evaluations.
- LS1 aims are to further improve performance, reliability, availability and functionality - while meeting required security standards



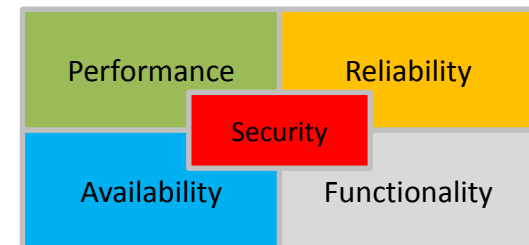
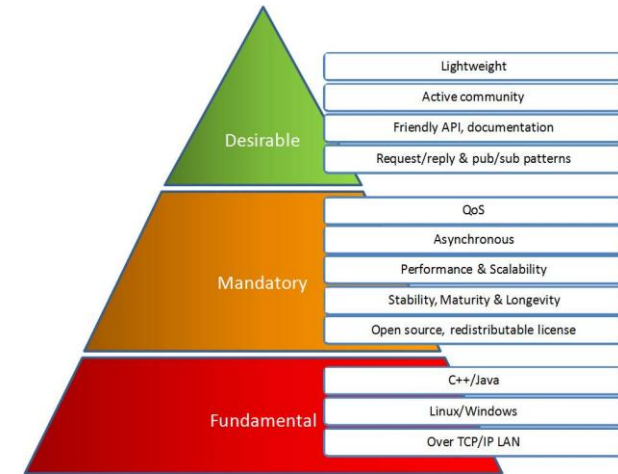
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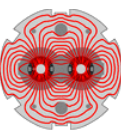
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Infrastructure Improvements

- Low-level renovations
 - LHC: 500+ CPU upgrades (multi-core, Linux, 64bit)
 - Injectors (ACCOR project): CPU upgrades, timing, modules, ...
- FESA3: New major version
 - Multi-core CPU support
 - Thread priority management
 - Inheritance
 - Navigator situation will be reviewed
- CMW: Major upgrade
 - Improved handling of slow clients (non-blocking communication)
- OFSU technical review with BI and OP

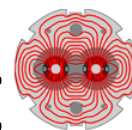


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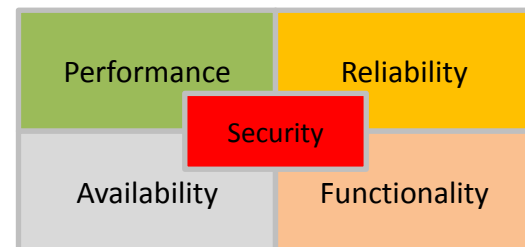
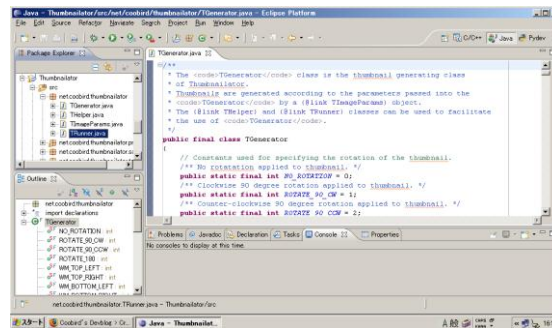


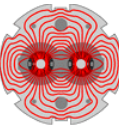
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Better Development Environment



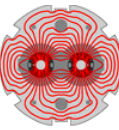
- Faster virtual machines
- Better development platforms
 - No development on TN
 - Review will determine the best solution: Virtual machines or office machines
- Unified commonBuild for Java & C++
- Rigorous Testbed for all core software
 - CMW, FESA, Timing, LSA
- Better documentation
 - Developer guidelines, quality assurance, software APIs
- BE-optimized Eclipse in place now



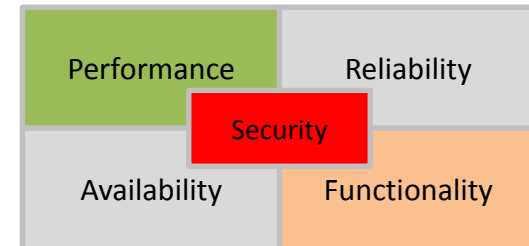


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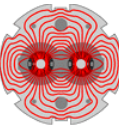
Improved Ergonomics in CCC



- New powerful consoles
- 2013 review – proposals include
 - More mobile keyboards/mice to avoid cables
 - Wireless headsets to keep hands free
 - Monitor size and orientation for better usability
- Console Manager major rewrite
 - Review will be organized to formalize requirements



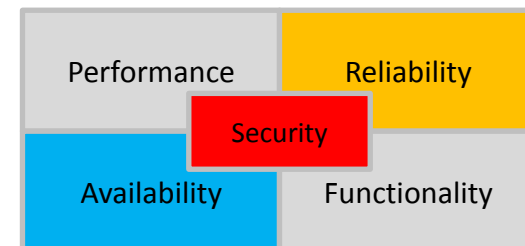
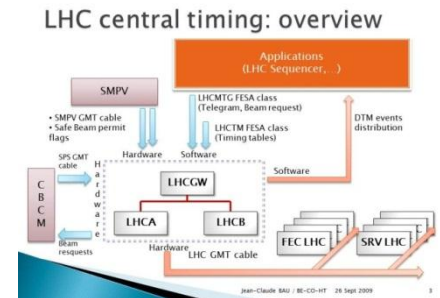
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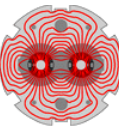
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Timing

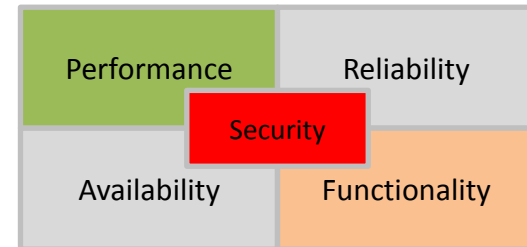
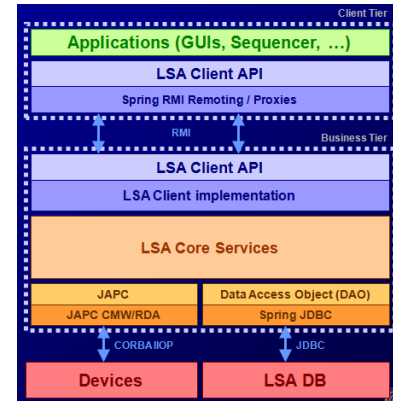
- Move from LynxOS to Linux
 - OP must anticipate commissioning time
- “Time lost” (mastership, sequence change)
 - Not solely a timing issue, it links with PS/PSB operation too
 - Cycle editor GUI optimization: Formalized OP requirements needed
- Injection into wrong ring (SPS timing)
 - Proposals involving changes in Timing and uses of SIS have been approved by Machine Protection Working group and will be implemented
- Injector timing renovation, openCBCM
 - Includes general timing review, i.e. it is the 11 occasion for stating any new requirements



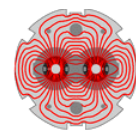
Improved LSA Performance



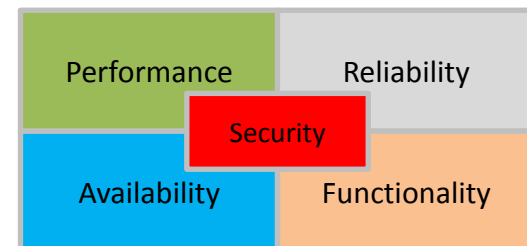
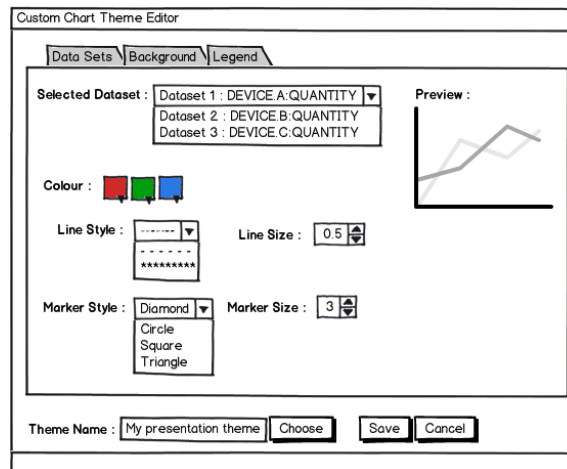
- Regeneration of settings
 - Clean-up of settings will be done by OP
 - CO provides faster HW with more RAM
 - Smarter regeneration (only changed settings)
 - CO to provide tools to simplify clean-up
Based on OP input
- More LSA operations can be RBAC-protected as requested by OP
“Prevent trim changes from outside CCC”

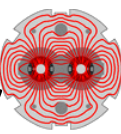


Data Analysis



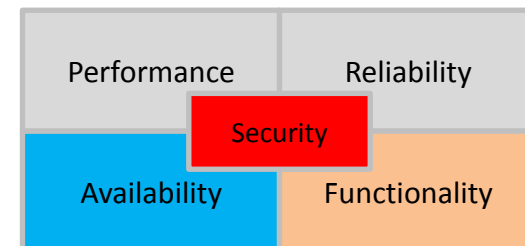
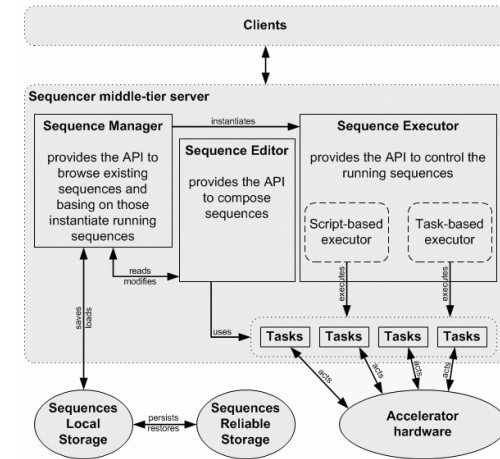
- Action from Evian 2011
CO resources allocated for LS1
- Logging
 - Accept more data and data types (e.g. Bunch-by-Bunch, QPS, LHC Wirescans, Statistics...)
 - Month-long storage will be supported – data owners must be assigned by OP
- Analysis framework
 - Provide generic frameworks for analysis and visualization (e.g. run statistics)
 - Integrate with a wider range of data sources (PM, eLogBook, ...)
- Minimize ad-hoc solutions and use of SDDS
- Needs continued strong collaboration with OP (A. McPherson)

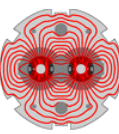




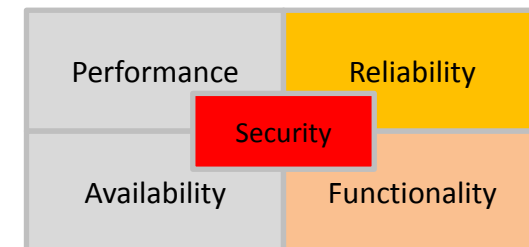
Extended Sequencer Functionality

- Sequencer functionality will be added
 - Parameterized sequences
 - Parallelizable sub-sequences
 - Increased integration with State Machine
 - Freezing GUI being investigated
 - Xwindows, not Java, is the current suspect
 - As usual, new tasks will be added on request
- State Machine - change requests to be defined and discussed
 - Checks during nominal cycle vs. MD
 - “Blocking” vs. “Performance” checks

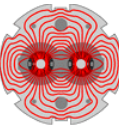




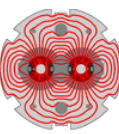
- LASER – new implementation
 - Brings mode-dependent alarms
 - Gives more influence to OP in alarms declaration
 - LASER team will migrate current alarms
- Improvement of alarm quality
 - OP effort is essential
 - New tools to assist clean-up will be provided
 - LASER team will actively assist in clean-up



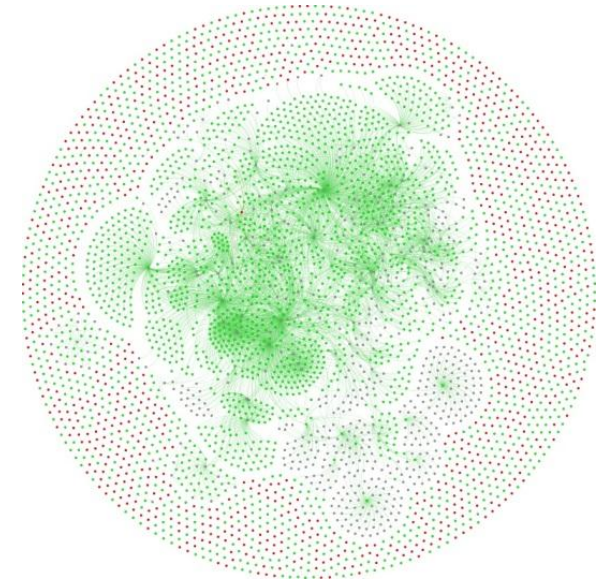
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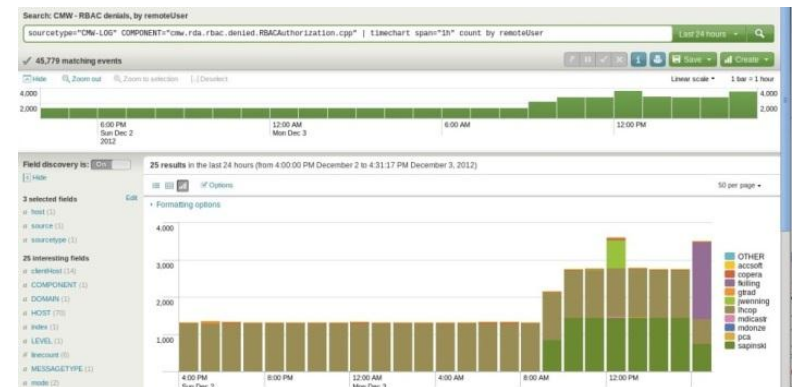
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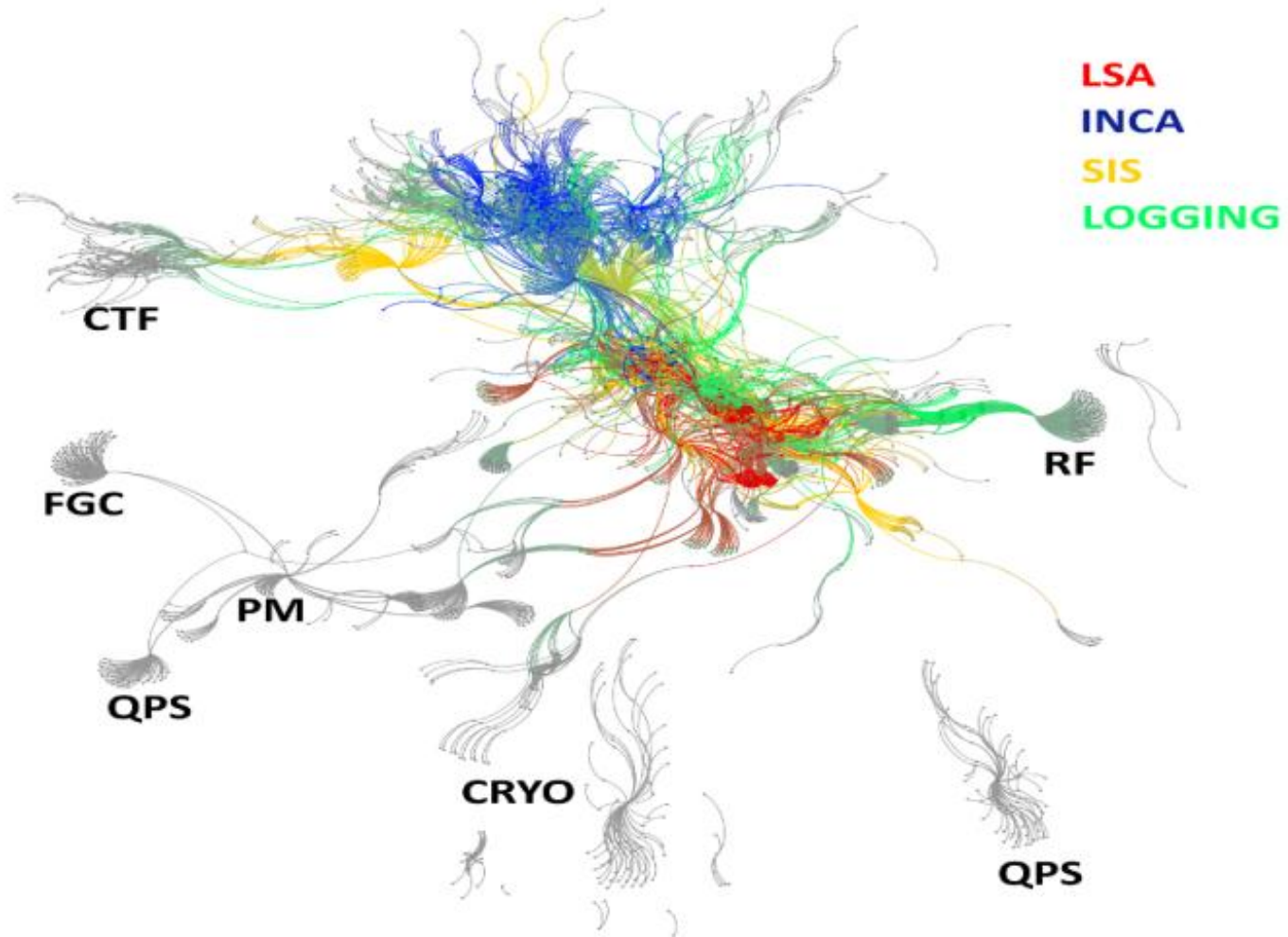
- Improving the diagnostic facilities of the controls system in preparation of new LHC-style exploitation model in injectors
- Visualization of services and their relations
- Accessible and useful documentation
- Centralized tracing analysis
- FEC configuration feedback and analysis
- Process instrumentation
- Dependency analysis and visualization



CMW client connections

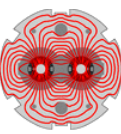


A map of CERN control system



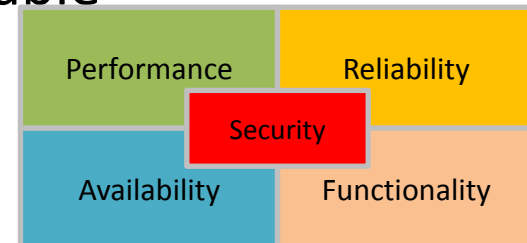
Sampled the 4th December 2012

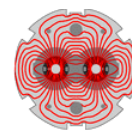
Joel Lauener, CERN



Better Exploitation

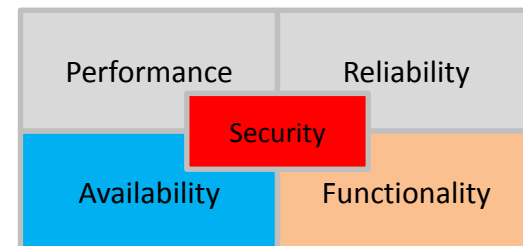
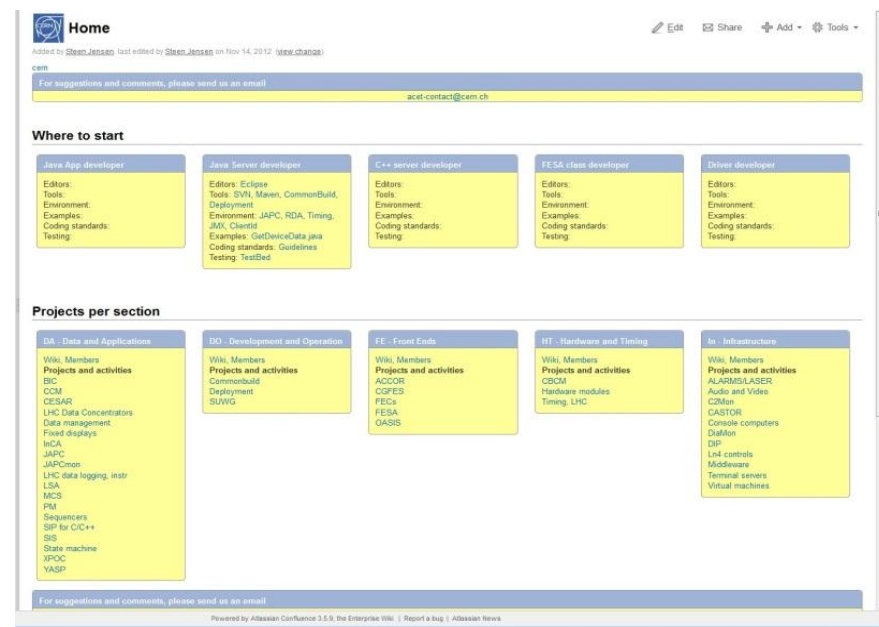
- DiaMon will be more user friendly and provide more information
 - ACET provides dependency view, OP can create custom views too
 - An easier mechanism for reporting status issues (feedback button) will be implemented
 - More diagnostic data will be available (dependencies, process metrics, configuration feedback)
- Moving to pro-active approach by improving early detection of problems
 - Process monitoring in DiaMon
 - Configuration analysis
 - Centralized trace analysis
- Better contact information: Up to date and available

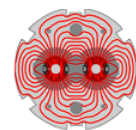




- CO documentation portal as entry point for newcomers
 - Developer guidelines
 - Useful links
 - Procedures
 - security, intervention,...
 - Exploitation specific pages
 - Contact information (consistent with web-piquet)
 - Adapted to OP needs
- Improved wiki/site structure (CO)
 - All major CO projects will contribute

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Home

Edit Share Add Tools ▾

Added by [Steen Jensen](#), last edited by [Steen Jensen](#) on Nov 14, 2012 ([view change](#))

cem

For suggestions and comments, please send us an email

acet-contact@cem.ch

Where to start

Java App developer

Editors:
Tools:
Environment:
Examples:
Coding standards:
Testing:

Java Server developer

Editors: Eclipse
Tools: SVN, Maven, CommonBuild, Deployment
Environment: JAPC, RDA, Timing, JMX, ClientId
Examples: GetDeviceData.java
Coding standards: Guidelines
Testing: TestBed

C++ server developer

Editors:
Tools:
Environment:
Examples:
Coding standards:
Testing:

FESA class developer

Editors:
Tools:
Environment:
Examples:
Coding standards:
Testing:

Driver developer

Editors:
Tools:
Environment:
Examples:
Coding standards:
Testing:

Projects per section

DA - Data and Applications

Wiki, Members
Projects and activities
BIC
CCM
CESAR
LHC Data Concentrators
Data management
Fixed displays
InCA
JAPC
JAPCmon
LHC data logging, instr
LSA
MCS
PM
Sequencers
SIP for C/C++
SIS
State machine
XPOC
YASP

DO - Development and Operation

Wiki, Members
Projects and activities
Commonbuild
Deployment
SUWG

FE - Front Ends

Wiki, Members
Projects and activities
ACCOR
CGFES
FECs
FESA
OASIS

HT - Hardware and Timing

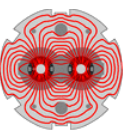
Wiki, Members
Projects and activities
CBCM
Hardware modules
Timing, LHC

Inf - Infrastructure

Wiki, Members
Projects and activities
ALARMS/LASER
Audio and Video
C2Mon
CASTOR
Console computers
DiaMon
DIP
Ln4 controls
Middleware
Terminal servers
Virtual machines

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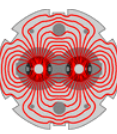
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Smooth versus Radical Changes

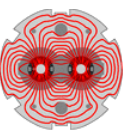
- TS: Smooth, localized, backward-compatible upgrades
 - Sector-wide “Smooth upgrades” WG for TS’s in 2012
 - Careful planning and discussion of changes before TS
 - Only backward-compatible changes with possible roll-back
 - Risky/big changes have been deferred to LS1
- During LS1: Radical, global and “big-bang” changes
 - We have to do these changes, to ensure availability and maintainability
 - Changes at all layers (HW, OS, CMW, FESA3, Java, Oracle, ...)
 - CO will thoroughly test in the Controls Testbed
 - Big-bang => Dry runs, lead by OP, are vital for final validation!
 - Tools for supporting smooth upgrades (what has changed, better roll-back)
- Most components will be validated in the Injectors, but OP-organized dry runs remain essential
 - Proposal: 2 months, 2 weeks and 2 days before beam



Conclusions

- Control system is not energy/intensity dependent, no obvious implications due to 6.5TeV, 25ns and increased intensity
 - New development and consolidation work is planned both in HW and SW core controls infrastructure and the high level controls system
 - Certain topics require input from OP
 - The work planned for LS1 should bring extensive improvements and additional functionalities with evident amelioration in the availability and performance of the overall control system
 - Rigorous test procedures and tools are in place
 - OP-organized dry runs are essential
- 24 • Proposal: 2 months, 2 weeks, 2 days before beam

Appendix: Contact Persons



- CommonBuild: Niall Stapley
- Console Manager: Vito Baggiolini
- Data analysis framework: Jakub Wozniak, Alick McPherson
- Dependency view: S. Jensen
- Development platforms: Luigi Gallerani
- DiaMon: Mark Buttner
- Documentation portal: S. Jensen
- Eclipse: Niall Stapley
- Ergonomics: Pierre Charrue
- FESA: Stephane Deghaye
- Hardware renovation: Marc Vanden Eynden
- LASER: Mark Buttner
- Logging: Chris Roderick
- LSA/InCA: Greg Kruk
- Middleware: Wojtek Sliwinski
- Security : Luigi Gallerani
- Sequencer: Roman Gorbonosov
- SIS: Jakub Wozniak
- Smooth Upgrades: Vito Baggiolini
- State Machine: Roman Gorbonosov
- Timing: Jean-Claude Bau
- Testbed: Jeremy Nguyen Xuan
- Virtual machines : Luigi Gallerani