

LCG RTAG 12:
Collaborative Tools
Summary of Final Report

Steven Goldfarb

LCG - Project Execution Board Meeting

CERN – 28 June 2005

Mandate

Proposed by Dario Barberis to PEB (12 Jan 2004):

Mandate:

- assess the needs for collaborative tools of all collaboration members, located at CERN, major labs or smaller institutes, including isolated (“laptop”) users
- survey the existing technologies and consider costs, performance, hardware and bandwidth requirements, interconnectivity
- make concrete proposals about how CERN videoconferencing facilities and support organization might be consolidated, improved and better supported in the immediate future, with strong emphasis on the performance as perceived by remote users

In Particular The RTAG Should Address:

- Working Venues (type of room, equipment, ease of use)
- Integration (where possible) of existing infrastructure (e.g.audio/video transmission between auditoria, re-use of local audio/projection systems,...) where feasible
- Which systems (VRVS, Access Grid, etc.)
- Collaboration on Desktop (CERN LAN, general support)
- Relationship to networking
- Future integration into "grid-based analysis"?

Composition

Participant	Institute	Representing
Peter Hristov	CERN-PH/AIP	Alice
Steven Goldfarb (chair)	University of Michigan	Atlas
Roger Jones	Lancaster University	Atlas
Bolek Wyslouch	MIT	CMS
Ian McArthur	University of Oxford	LHCb
Gerhard Raven	NIKHEF	LHCb
Alberto Pace	CERN-IT/IS	Internet Services
David Foster	CERN-IT/CS	Communication Services
Mick Storr	CERN-HR/PMD	Training
Mick Draper	CERN-IT/UDS	User and Document Services
Tony Doyle	University of Glasgow	GridPP
Philippe Galvez	CalTech	VRVS
Christian Helft	LAL - IN2P3 (Orsay)	HTASC-CSMM Chair
Les Robertson (ex-officio)	CERN-IT/DI	LCG-PEB Chair

Activities

Investigation

- *weekly, in-depth discussions between representatives of the LHC collaborations and experts in the RTAG;*
- *informal interaction with the CERN video and phone conferencing staffs;*
- *analysis of formal and informal surveys of LHC collaboration members;*
- *basic tests of equipment and video conferencing systems using the facilities installed in various CERN conference rooms.*

Documentation

- *Report to PEB (1 Jun 2004)*
<http://cern.ch/muondoc/rtag12/Presentations/PEB/20040601/InterimReport.ppt>
- *Report to PEB (30 Nov 2004)*
<http://cern.ch/muondoc/rtag12/Presentations/PEB/20041130/ProgressReport.ppt>
- *Final Report (CERN-LCG-PEB-2005-07, 27 Apr 2005)*
<http://cern.ch/LCG/documents.html>

Principal Findings

The RTAG has found a large and growing gap between the requirements of the LHC Collaborations for high quality, robust collaborative tools, and the availability of these tools at CERN and at the participating institutes. This gap is the result of increasing need for and growing popularity of the tools, as the experiments enter the critical stage of commissioning, assembly, and software development, and a lack of dedicated resources on the part of CERN and the collaborations to address this demand.

Principal Findings

Large and Growing Need for Collaborative Tools by LHC, HEP

- *Video and Phone Conferencing, Meeting Management*
- *Presentation, Tutorial Archiving*
- *Document, Application Sharing*
- *Usage Growing at 30%/year (VRVS)*

Inadequate Support

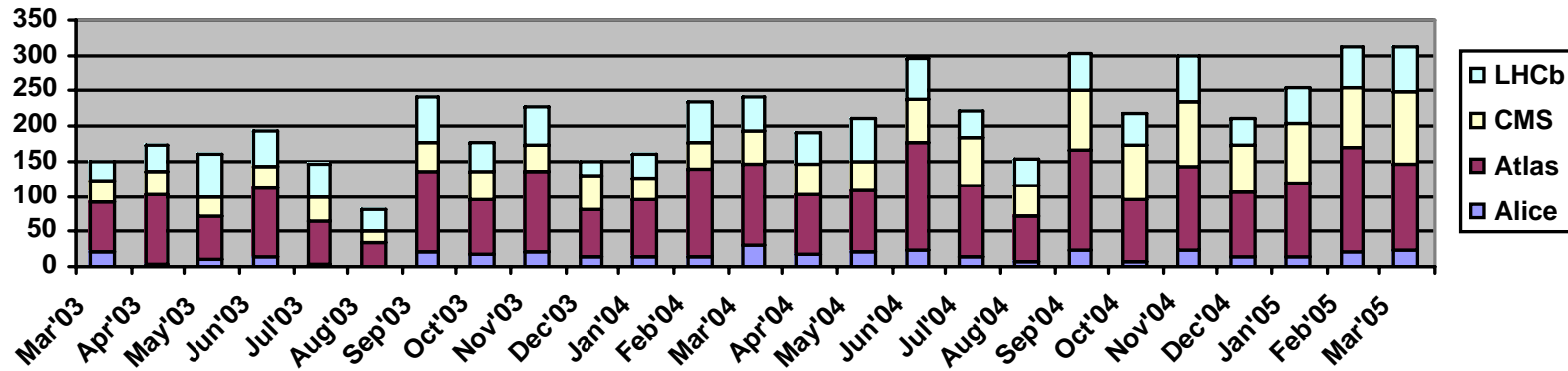
- *No Coordinated Program for CERN, LHC Experiments*
- *Insufficient Facilities at CERN*
- *Existing Facilities in Poor Shape*
- *Lack of Guidelines for Equipping Facilities at CERN, Institutes*
- *Need for Integration of Tools, Adaptation to Grid*

Solutions Complex

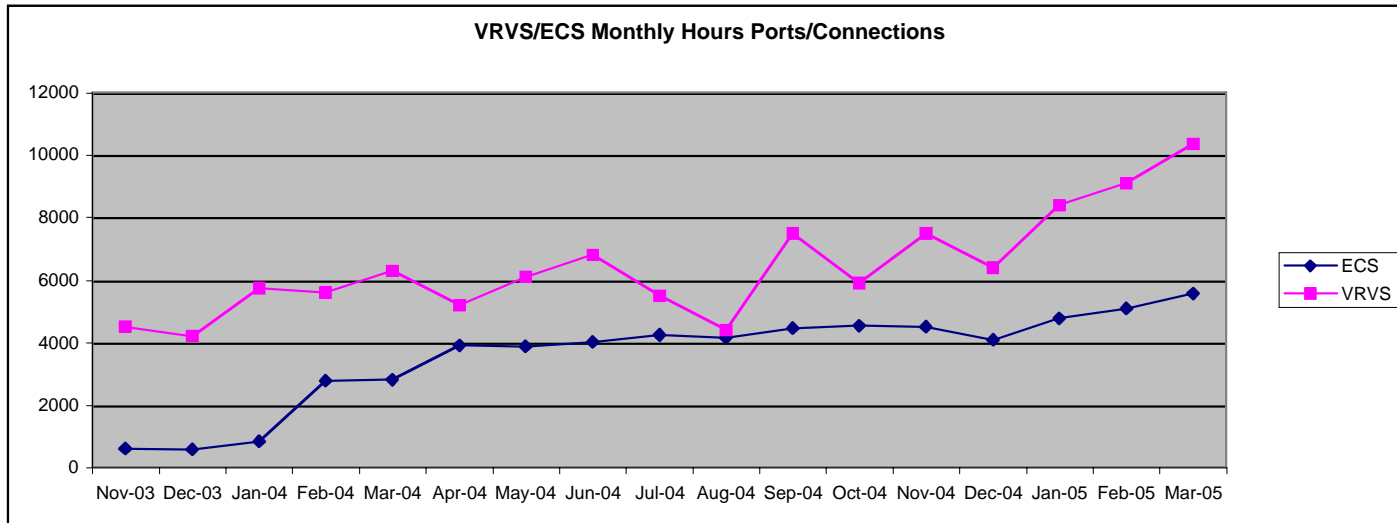
- *Field is Growing, Changing Very Fast*
- *No Turn-Key Solution*
- *Must Have R&D Component to Any Solution*

Principal Findings

Meetings



Video Conferences



Primary Recommendations

Rec 1 We recommend that CERN establish and maintain a Collaborative Tool Service to support the needs of the LHC collaborations.

This service must provide:

- *coordination between the LHC collaborations and CERN concerning the development, installation and maintenance of collaborative tools for the LHC;*
- *management of a coherent project designed to address the requirements of the LHC collaborations, to set priorities, and to design, plan and conduct the implementation;*
- *help for external institutes, in the form of suggestions for standard infrastructure, advice on installation and utilization, documentation and “help desk” type facilities;*
- *participation in other collaborative tool initiatives of interest to the LHC and HENP community, in general;*
- *sufficient research and development to maintain expertise in the various fields of collaborative tools, to provide solutions to LHC-specific problems, and to keep the facilities in step with the rapidly changing environment.*

Direction for this service must receive oversight from each of the LHC collaborations.

Primary Recommendations

Rec 2 We recommend that the CTS maintain and support VRVS as a standard video conferencing service for the LHC collaborations.

Adequate resources should be provided to guarantee that

- *CERN conferencing rooms be fully functional for the usage of VRVS for the entire LHC physics life cycle;*
- *operational aspects (reflector set up and maintenance, end point equipment choice and usage recommendations, end user support) of VRVS for the LHC community be taken on by CERN in collaboration with the VRVS team;*
- *documentation be provided for the recommended installation, maintenance and usage of video conferencing facilities at CERN and at the participating institutes. Integration of this documentation with the existing documentation of VRVS is highly recommended*

CERN should define and sign a Memorandum of Understanding with the VRVS team in order to ensure that missing functionality be implemented and that access to VRVS remain free and efficient for the LHC community.

Primary Recommendations

Rec 3 We recommend that the CTS establish, maintain and support an industry standard H.323 MCU-based video conferencing service for the LHC collaborations, complementary to and interoperable with VRVS.

This service might take various forms in its implementation (co-funding of ECS, of other national facilities, installation of infrastructure at CERN, or a mix), but its operation should appear to the end-user as being under CERN's responsibility, and be as close as possible to the state of the art without impinging its stability.

If CERN chooses to operate its own infrastructure, this service should be deployed in close cooperation, and interoperate with existing ones in other countries, particularly ECS.

Adequate resources should be provided to guarantee that

- *CERN conferencing rooms be fully functional for the usage of this system for the entire LHC physics life cycle;*
- *the system be interoperable with VRVS;*
- *a common interface be developed and maintained for the two systems.*

Interoperability with VRVS at least at the user interface level will be a goal of its deployment.

Primary Recommendations

Rec 4 We recommend that the CTS provide user support for desktop/laptop phone and video conferencing for LHC collaborators situated at CERN, at their home institutes or elsewhere, as appropriate.

The support would include

- *software downloads and group licenses , as needed;*
- *hardware recommendations, equipment installation and usage guidelines;*
- *a reasonable level of on-line support;*
- *a web site with a portal, HowTo's, FAQ's, etc., as appropriate.*

The LHC Collaborative Tool Service would provide the guidelines and compliance would be a requirement for support.

Primary Recommendations

Rec 5 We recommend that the CTS install, maintain and support a 24/7 operator-free phone conferencing system at CERN.

The system should provide

- *a web-based booking system;*
- *an optional remote documentation system providing users with the equivalent of Web Conferencing functionality;*
- *possibility of CERN-originated calls, as needed (and paid for);*
- *definition of a Voice Over IP interface so as to provide the possibility of interoperation with video conferencing systems, such as VRVS.*

Primary Recommendations

Rec 6 We recommend that the CTS equip and maintain all auditoria and meeting rooms in building 40, as well as those located elsewhere at CERN, commonly used by the LHC collaborations, for integrated phone and video conferencing.

The equipping and maintenance of the rooms is to be coordinated by the LHC Collaborative Tool Service and should provide at least:

- *quality audio and video transmission to and from the facility for phone and/or video conference participants;*
- *ability to share documents remotely in a clear format;*
- *ability to record presentations made in the facility to produce archived web lectures.*

The rooms, which are to be shared by the collaborations appropriately, should be equipped in a manner that is as standardized as possible. That is, same or similar equipment should be used, accounting for small necessary changes due to room size, dimension, and usage, with the goal of:

- *reducing initial purchasing and maintenance costs;*
- *simplifying usage and reducing user training.*

While technical support and maintenance should be provided by the service, operator support could be provided for a fee, depending on the needs.

Primary Recommendations

Rec 7 We recommend that the CTS extend current web casting and web archiving services to include all auditoria and meeting rooms in building 40, as well as those located elsewhere at CERN, commonly used by the LHC collaborations.

These services, as appropriate, will include

- *fixed installations (in large auditoria, recording studio);*
- *a portable pool of equipment (for meeting rooms);*
- *recording and archival support, possibly on a pay-on-command basis.*

It is expected that the necessary technical infrastructure, including web cast server hardware, streaming licenses, archive database and portal, be provided by CERN.

Primary Recommendations

Rec 8 We recommend that the CTS take on the leading role in the development of a global Computer Supported Collaborative Work Environment for the LHC community.

Missing pieces of an LHC-wide collaborative work environment would be developed and integrated with existing systems, including video, phone and web conferencing, document sharing, and presentation archiving systems. Some additional features, particularly useful for the meeting environment, could include:

- *meeting organization;*
- *global video and audio conferencing room booking system;*
- *meeting management;*
- *recording and archival of documents, presentations and sessions.*

More generally, a particular effort will be targeted at defining and implementing an integrated environment that presents the various collaborative tools to the end user with a consistent user interface.

Primary Recommendations

Rec 9 We recommend that the CTS support development to equip IP-based tools used by the LHC collaborations, such as VRVS, with a Grid certificate authentication and authorization mechanism.

This mechanism ought to be integrated with the existing infrastructure to provide the capability of single sign-on at a user's desktop for both the experiment analysis environment and the collaborative environment within which the physics analysis is performed.

The Price Tag

Video Conferencing Facility

Material for Small Š Medium Video Conferencing Facility at	Cost Range (kCHF)
H.323 Video Conferencing Unit	6.0 Š 15.0
Phone Bridge	2.0 Š 3.0
Slide Transmission Add-On (a la H.239)	2.0 Š 3.0
Video Monitor (TV)	1.0 Š 2.0
PC with Display, Peripherals	4.0 Š 6.0
Document Projector with VGA Output	4.0 Š 6.0
2 Projectors with Screens	6.0 Š 10.0
Ceiling Microphones + 1 or 2 Standard Microphones	2.0 Š 3.0
Carpeting, Curtains, Sound Tiles, Lights	2.0 Š 8.0
Lights, Speakers	1.0 Š 2.0
Wireless Transmitter, Ethernet Fanout, Plugs & Cables	0.5 Š 1.0
Total Material Expenses	30.5 Š 59.0

The Price Tag

Video Conferencing Facility

Additional Material for Equipping an Auditorium at CERN	Cost Range (kCHF)
Audio Integration and Mixing System	6.0 Š 20.0
Additional Speakers	1.0 Š 2.0
Additional Lights	1.0 Š 2.0
Additional Microphones	2.0 Š 5.0
Additional Expenses for Projectors with Screens	5.0 Š 20.0
Ceiling Microphones + 1 or 2 Standard Microphones	2.0 Š 3.0
Additional Expenses for Carpeting, Curtains, Sound Tiles, Lights	5.0 Š 15.0
Miscellaneous Expenses for Room Control Integration	5.0 Š 20.0
Total Additional Material Expenses	27.0 Š 87.0

The Price Tag

Lecture Recording Facility

Material for Lecture Recording & Archiving Facility at CERN	Cost Range (kCHF)
Video Camera, Tripod, Accessories	3.0 Š 10.0
Remote Presentation Microphones	0.5 Š 1.5
Portable Audience (Wall or Ceiling) Microphones	0.5 Š 2.0
Portable Light Units	0.2 Š 1.0
Laptop, Peripherals for Remote Presentations	5.0 Š 10.0
PC with Display, Peripherals, Encoding Capabilities	10.0 Š 15.0
High Quality In-House Lighting for Studio	0.3 Š 1.0
Carpeting, Curtains, Sound Tiles in Recording Studio	5.0 Š 15.0
Lecture Database Storage and Server	25.0 Š 50.0
Total Material Expenses	49.5 Š 101.0

The Price Tag

Human Resources

Job Title	Profile	Source	FTE
Coordinator of the CTS	Senior Physicist or Engineer	CERN	1.0
Conferencing Facility Staff	Engineer or Technician	CERN	3.0
Lecture Archive Staff	Engineer or Technician	CERN	1.5
Camera Operators	Engineer or Technician	CERN	1.5
Software Development & Support	Software Engineers or Programmers	CERN/LHC	4.0
Collaboration Liaison (1 each)	Physicist	LHC	2.0
Total Personnel			13.0

Based on Current Level of Usage

The Price Tag

Totals (Very Very Rough Estimates)

- *Total Equipment Price Tag*
 - 13 small-medium meeting rooms: 650 kCHF
 - 7 auditoria: 700 kCHF
 - 2 lecture recording facilities: 120 kCHF
 - MCU or equivalent: 200 kCHF
 - **Total 1.5 MCHF**
- *Total HR Price Tag*
 - 4-5 additional hires (+ expenses): 400 kCHF/year
 - Temporary hires: 100 kCHF/year
 - **Total 500 kCHF/year**
- *Total Losses to Collaboration Otherwise*
 - Lost Resources for Dysfunctional Meetings: 2-3 MCHF/year
 - Lost Resources for Travel, Training: 1-2 MCHF/year
 - Lost Resources Due to Poor or Missing Communication: **Priceless**

LHC Support for Recommendations

Geneva, 26 June 2005

Memorandum

From: T. Nakada, Spokesman of the LHCb experiment
To: S. Goldfarb, Chair of RTAG 12
Subject: Endorsement of Report

I endorse strongly the conclusion on the collaboration tools reported by the Requirements and Technical Assessment Group 12 (RTAG 12) of the LHC Computing Grid Project in CERN-LCG-PEB-2005-07. Recommendations given in the report correspond to the needs of the collaboration, which will further increase with coming years.

LHC Support for Recommendations

From: Michel Della Negra <Michel.Della.Negra@cern.ch>
Subject: RTAG12 support from CMS
Date: 28 June, 2005 08:50:26 CEST
To: Les Robertson <Les.Robertson@cern.ch>
Cc: Steven Goldfarb <Steven.Goldfarb@cern.ch>, WYSLOUCH Bolek <wyslouch@MIT.edu>

Dear Les,

I would like to support strongly the recommendations of the RTAG-12 committee on collaborative tools. The CMS experiment relies heavily on remote conferencing and other forms of information exchange with remote collaborators. CMS detector construction and development, and the collaborative efforts in physics preparation all require easy access to reliable video and audio facilities at CERN. The success of the CMS physics program, its timeliness and the quality of the results will depend critically on the ability of CMS collaborators to communicate independently of where their institutions are located. I think that CERN should play an important role in assuring the availability of resources for collaborative tools.

Best Regards,

Michel

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LHC Support for Recommendations



ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Laboratoire Européen pour la Physique des Particules
European Laboratory for Particle Physics

The availability of adequate Collaborative Tools will be an essential ingredient for the successful operation of ATLAS before and during the data taking period, and to achieve the experiment's scientific goals. Indeed, given the size of the Collaboration, and its geographical spread, Collaborative tools are very crucial to ensure effective and efficient participation of ATLAS members to the activities of the experiment.

The presently available phone and video-conferencing facilities are well below the level required to achieve such a goal.

Therefore, ATLAS supports strongly the main conclusions of the LCG RTAG12 and its recommendations. We recognize that financial resources may allow only partial or staged implementation of the RTAG12 proposal.

We also note that this issue should be addressed at the CERN Management level, and not only at the LCG level.

Peter Jenni

A handwritten signature in blue ink, appearing to read 'P. Jenni'.