



WLCG Operations for LHC Data Taking

Introduction

1. This document summarises WLCG Operations with a forward looking view: to LHC Data Taking and beyond;
2. A discussion of the evolution of the WLCG service can be found – for completeness – in recent CHEP or other conference papers [1][2][3][4], or in the presentation to WLCG EGEE'08 in Istanbul [5];

Overview

3. For the purpose of this document, the daily operations meeting / conference call held at 15:00 Geneva time is considered to be central to WLCG operations;
4. It is central in more ways than one: 'above' are extensive experiment-specific operations, whose requirements must also be considered as part of WLCG's needs, whereas 'below' are grid(s) and site operations;
5. As suggested by the above, interoperation (and interoperability for an application point of view) are fundamental WLCG requirements: multiple production grids are in use today and full worldwide support is mandatory;
6. The daily operation's meeting is complementary to grid operations tools and procedures: it uses and requires these but acts primarily as a clearing house for issues and problems. Without such a meeting, the centralization and dissemination of information would simply not occur – not even with considerable duplication of effort and at significant cost. (A "service view" cannot be constructed simply by reading GGUS tickets and EGEE/other broadcasts!);
7. The meeting is chaired by the Service Coordinator on Duty (SCOD) – who plays a "run coordinator" style role. (S)he prepares minutes of the call – typically made available the same working day – and presents a weekly summary to the WLCG Management Board (normally available for comment 24 hours in advance). The latter is primarily based on semi-automatic reports of a small number of Key Performance Indicators (KPIs). The exceptions are (literally) the exceptions: alarm and/or abnormally high numbers of GGUS tickets, significant service problems and/or unscheduled interruptions;
8. Sites are required to provide Service Incident Reports (SIRs) for all major problems – those that fail a specific service target in the WLCG Memorandum of Understanding [6], or when explicitly requested by the SCOD. These are typically prepared using a template – the SCOD is responsible for ensuring that the necessary actions are performed in a timely manner (although this is typically spontaneously undertaken by the site concerned);
9. Sites and experiments typically attend the meeting either in person or via phone. A fixed agenda is followed, covering each LHC experiment in turn followed by a round-table of sites and services;



May 14 2009 – Jamie.Shiers@cern.ch – Draft 0.1

10. Through peer pressure, standard WLCG operations procedures – systematic use of GGUS, announcement of interventions etc. – is enforced. This is much more democratic and successful rather than (attempts) by simple edict;
11. Through these light-weight procedures the WLCG service has reached an operations mode that can be considered both stable and sustainable. This is in sharp contrast with the situation at the start of the WLCG Service Challenge programme (considered to be 2005 from a service point of view), or even at the beginning of 2008 (although significant progress had been made in the meantime);
12. It is considered essential that the WLCG Operations requirements be based on those of today – and those foreseen for the imminent data taking era – as opposed to the considerably more manpower intensive and less stable period that has dominated most of the EGEE timeline. The basic requirements to continue in this mode are listed below. Once again, it is stressed that these are significantly lower than those of even one year ago. It is important to understand the reasons for this success – the improvements were by design and not chance.

Requirements

13. The WLCG Service Coordinator role must continue to be staffed. This is mentioned for completeness – it is expected that this role be covered by CERN staff on a rotational basis by a small team (5-8 people), each taking one – two weeks in turn (although in the longer term people from other sites could also usefully participate);
14. The LHC experiments' operations contacts – as a rule of thumb, one person per VO supported by the Tier0/Tier1 site – must (continue to) be staffed. Joint funding (CERN, experiments, sites, external) is considered appropriate here;
15. The basic operations tools that are regularly cited (GGUS, GOCDB, CIC portal, SAM, GridView, DashBoards, Messaging System etc.) – see [7][8] for a more exhaustive list – must continue to be supported and enhanced based on the needs of the application communities using the grid(s); Again, joint funding is considered appropriate in this area (non-VO-specific);
16. The EGEE operations coordination role – currently fulfilled by CERN in collaboration with the ROCs – will simultaneously move outside CERN (presumably to EGI) and change (to more loosely coordinate a much larger number of NGIs). The close coordination between the WLCG Service Coordination team and EGEE operations, assisted by physical proximity and overlapping functions of the teams, will cease to exist as such. This change must be managed in a non-disruptive fashion. Fragmentation into “WLCG” and “non-WLCG” grids is in nobody's interest;
17. Both Application and User Support requirements must be satisfied – an estimate of around 1 part per mil of the user community is suggested for (joint funded) application support – this will be covered further in the proposal for a HEP SSC – but is considered to be extremely cost-effective as compared to other mechanisms for providing peta-scale computing;



May 14 2009 – Jamie.Shiers@cern.ch – Draft 0.1

18. User support is an area of concern: whilst the LHC VOs have pushed for direct ticketing [9] to sites – which considerably reduces the load on TPMs – the evolution from a small number of ROCs to a much larger number of NGIs risks to considerably complicate the task of the TPMs;
19. The “User Support Coordination Role” that has been provided through CERN has and continues to be particularly valuable in directing GGUS developments – such a role, with strong links to the user communities, should be foreseen in the future;
20. Middleware is also a key issue for stable operations: service requirements absolutely must be taken into account for future middleware development and maintenance. This has – regrettably – not been the typical case up until now;
21. [place-holder for statement(s) from Markus.]

Conclusions

22. WLCG Operations has reached stability and sustainability. For relatively low but non-zero cost it can be maintained and enhanced;
23. Manpower to support the key operations tools and to fill needed operations roles – both WLCG and experiment-specific – is required. It is expected that this be jointly funded to allow the successful exploitation of the world-class grid that has been built up over many years, together with international partners that make this a truly global enterprise;
24. We believe that WLCG operations experience and procedures can have significant value to other communities and are keen to share this knowledge.

References

- [1] J. D. Shiers, “*The state of readiness of LHC computing*”, in the proceedings of the International Conference on Computing in High Energy Physics, Mumbai, India, February 2006.
- [2] J. D. Shiers, “*Lessons Learnt from Production WLCG Deployment*”, in the proceedings of the International Conference on Computing in High Energy Physics, Victoria, BC, September 2007.
- [3] “*The Worldwide LHC Computing Grid (worldwide LCG)*”, Computer Physics Communications 177 (2007) 219–223, Jamie Shiers, CERN, 1211 Geneva 23, Switzerland.
- [4] J. D. Shiers, “*Can Clouds Replace Grids? Will Clouds Replace Grids?*”, to appear in the proceedings of the International Conference on Computing in High Energy Physics, Prague, March 2009.
- [5] LHC: [First Contact](#) - Experience with first LHC data in the Worldwide LHC Computing Grid (WLCG) - for [EGEE'08 Istanbul](#) and [EMBnet 20th anniversary conference](#).
- [6] [Memorandum of Understanding for Collaboration in the Deployment and Exploitation of the Worldwide LHC Computing Grid](#), available at <http://lcg.web.cern.ch/LCG/C-RRB/MoU/WLCGMoU.pdf>.
- [7] Ian Bird: EGEE services needed by WLCG - <http://indico.cern.ch/getFile.py/access?contribId=0&resId=1&materialId=0&confId=56364>.
- [8] Ian Bird: WLCG in the EGI/NGI era: <http://indico.cern.ch/getFile.py/access?contribId=0&resId=1&materialId=1&confId=56364>.



May 14 2009 – Jamie.Shiers@cern.ch – Draft 0.1

- [9] T. Antoni, D. Bosio, M. Dimou, “*WLCG-specific features in GGUS*”, to appear in the proceedings of the International Conference on Computing in High Energy Physics, Prague, March 2009.