



EGEE-II review, Q&A notes

8th July notes, discussions

Enric Mitjana: EM
Karsten Decker: KD
John Martin: JM
Jean Pierre Prost: JPP
Martin Walker: MW
Johan Zuidweg: JZ

All directors, activity managers and other presenters/speakers are designated also by their initials.

Bob Jones: BJ
Erwin Laure: EL
Cal Loomis: CL
Sy Holsinger: SH
Maite Barroso: MB
Ian Bird: IB
Markus Schulz: MS
Michael Gronager: MG
Daniel Mallmann: DM
Evangelos Floros: EF
Francisco Castejon: FC
David Manset: DM
Gabriel Zaquine: GZ
Xavier Jeanning: XJ
Claudio Grandi: CG
Olver Keeble: OK
Robin McConnell: RMC
Panos Louridas: PL
Fotis Karayannis: FK

8 July, morning session

Status of the project, Bob Jones (BJ)

- JZ: Very clear presentation. Overspending partners declared all costs. What is the impact?
 - BJ: Declare all costs associated with the project, have to do this in order to get all funds they require internally. This does not mean that more funds will be requested from the EC.
- KD: Cooperation with RP. Substantial and tangible examples lacking.



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- BJ: Examples will be highlighted in all following presentations, notably NA5 and the RPLO. Concrete interoperability work in terms of interoperation. There is a whole host of application specific projects also working with EGEE, to whom we allow access to the infrastructure, provide training and support.
- KD: compared to other flagship projects, best procedures and tools in place to manage a project of such a size. Curious to understand to what extent other projects show interest and if they have adopted them.
 - BJ: ELA have adopted our procedures. Several infrastructure projects have implemented similar management structures. Templates and tools are indeed made available, some have even come to CERN to learn how to use the tools. Timesheet templates are also widely used.
- MW: Production infrastructure: concern in 1st analysis about the successful completion of jobs.
 - BJ: This will be covered in the Technical status and SA3 talks.
- MW: EAC provide feedback etc. What is your assessment of how useful this has been?
 - BJ: Material is considered confidential inside the consortium. This has been very useful as they have put their finger on issues which could pose risks in terms of adoption by other user communities. They review for us all demos of the applications presented at the User Forum or conference and judge them against scientific merit and how well they make use of the IF. This has been a very helpful, unfunded contribution which has been positive for the project.
- JM: Denmark or Norway (slide 5), is this an artifact of the way Scandinavia provides the data?
 - BJ: Figures from Feb 08. The numbers are improving.
- JM: Examples of the growth of various metrics. 6x increase in CPU. Comment on usage going into LHC?
 - BJ: Ratios will be covered in upcoming talks. 2/3 of the workload is associated with the LHC. More than 2/3 of the resources are contributed by LHC partners.
- MW: Staff turnover and activity manager changes. Curious on the impact of this turnover for promotion of young individuals in the project. This is a positive aspect of the project.
 - BJ: Examples will be given in the presentation where individuals have contributed more and more.
 - WvR: at CERN, the LHC start up and various changes internally have caused for the move of young people to higher positions. It is sometimes difficult to find these people.



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- BJ: this is also the case in other partners.
- JPP: How the CB will address the staff retention
 - BJ: Further to recommendation made at the last review, the project made a survey to gather feedback on opportunities for retaining staff in EGEE-III. All CB members participated, more than 90% partners responded. Potential to retain more than 75% of staff in EGEE-III. A key milestone in EGEE-III is the execution plan which identifies what each individual is supposed to be doing in the project. Delays in the contract preparation have caused delays in the preparation of this plan but it will be completed in the Summer.
- MW: Finance. Total RC exceeds the budgeted maximum. How does that get covered?
 - BJ: In preparation for the extension of the project, the CB agreed on the re-distribution of the funds. Partners would be capped at a maximum. This was tracked quarterly and fed back to the PMB, and at a meeting tomorrow, a proposal on how to reach the final numbers will be presented.
 - EM: This is a formal figure, what partners have reported as costs. Not the final figure.
- KD: NESSI interaction, what has been the impact.
 - BJ: The QA head has attended a number of events, trying to track activities to establish potential interactions. A number of the business partners in EGEE participate in NESSI initiatives.
 - GZ: Took part in the user survey made by NESSI.
 - KD: NESSI can take advantage of EGEE's experience, interested in the reciprocal status.
 - BJ: There has been a cross project activity on industry matters.
 - EL: a dedicated session at the EGEE'07 conference invited NESSI representatives. There are no real tangible results just yet. EGEE finds it difficult to understand where NESSI is going and what it is doing.

Technical Status, Erwin Laure (EL)

- JZ: VOs. Quite difficult to attract VOs due to registration process. Has it improved?
 - EL: Yes although don't have the numbers at hand. The VO working group has helped. The most important is through the VO reg process we are creating reg cards, i.e. all info which can be submitted to sites willing to support them to include in their planning. Some local VOs talk to the local ROC and we don't see them. This is part of the EGEE model, including support at different levels.



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- JZ: Job efficiency. This has improved due to more experience. 5% is a figure showing still a lot of failures. Are there standard errors that can be avoided if there is some sort of user training.
 - EL: One of the key is to have an informed site selection process. Those applications using that SAM feature see the results, those who don't see worse picture. We are encouraging VOs to use this feature.
 - IB: the major cause of job failure is site problems. The results of tests can lead to 100% efficiency, ignoring them will not lead to improvement.
- JPP: Components being re-used by partner projects, which are being used specifically?
 - CG: will give a few examples in his JRA1 talk 9 July. There are the grid data storage used by EELA and EUIndia, OSG uses VOMS and Blah (security and information infrastructure). CG will prepare something on this subject.
- JPP: Reporting activities. The figures shown are mainly client components?
 - EL: The priority is to start with client components. Then we actually talk to infrastructures to determine what is really needed. Nothing is imposed, feedback is obtained and priorities are drawn up. This is managed by the TCG (TMB in EGEE-III).
- JPP: If you were to propose a % of platform support at service level versus required components received from the sites?
 - MS: not many infrastructures want to join based on fact that we don't offer support at the moment. Infrastructures that have joined depend on Linux. Running scientific Linux 4 software in parallel.
- JPP: Limitations driven by applications?
 - EL: Indeed. Applications depend heavily on certain features. There are many different limitations.
- JPP: MPI: Are there requests for using MPI across sites
 - EL: Sometimes received but try to push them back as infrastructure not adapted to this. Also if you want to use different clusters it is better to set up a proper workflow.
 - JG: One of the main drawbacks is lack of co-scheduling.
- JPP: A lot of applications MPI provision seems to be a limitation.
 - EL: Now that we do have a configuration tools in place to properly support MPI we must push for deployment. We encourage applications to talk to the sites that will support them.
- Is it part of the VO identity card?
 - EL: yes.
- JPP: Re. infrastructure policy group set up, how does it relate to activities in eIRG?



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- BJ: The work done with the policy group is separate from eIRG. The eIRG has national representatives nominated. The policy group is really to look at what can be done to collaborate. Based on that work we can go back to bodies such as eIRG and say that we are close to achieving one of the points in their working group.
- MW: Curious about the distribution in size. A large number of VOs.
 - EL: This will be provided in NA4 talk.
- MW: In the scientific results, “changing the way science is done”. Example? There has been discussion in the research community about web 2.0 methods and science 2.0. Using social networking and sharing web tools to facilitate doing science. Is this something that is thought about?
 - EL: Web 2.0, science 2.0, clouds etc. are terms we hear about more and more. As EGEE we have been careful in jumping on those wagons. Our goal is to provide an infrastructure, federate the resources. Collaborative tools that have been around are playing a part but this is not the remit of EGEE. Applications have been using these tools for their internal collaboration.
One of the best examples of new collaborations being formed thanks to EGEE is in the WISDOM effort.
 - CL: a very good example of Grid technology changing the way science is done. Geoscope is another example, seismic data from around the world. Once the data is on the grid, they can look at new things they can do.
- MW: since you mention Clouds. In the material provided, a rather nice essay on Cloud computing was provided. There was an indication that a comparison of costs had been done. Found it highly implausible. Would like to come back to that during the review.
 - BJ: Will present something in the final talk.
- MW: Scientific Linux: JPP raised the question about app dependencies. Technology is evolving very rapidly, op system distribution have to keep up, notably in peripheral technology. One of the difficulties is that issue of up to date drivers. Wondering whether the intention is to continue doing an op system distribution.
 - EL: Scientific Linux not done by EGEE. It is not clear who owns it. EGEE took the decision to have Scientific Linux as reference platform.
 - IB: Scientific Linux is redhat Linux, collaboration between Fermilab and CERN. Basically a standard Linux distribution with some adjustments for CERN environment. gLite runs on all of the derivations.
- KD: with restructuring efforts, how far are you, from gLite in a box, which can be bundled into typical Linux distribution?



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- EL: In terms of distribution, one can consider that we are there. The configuration is quite complex.
- MS: Main reason not to bundle it with OS it frequent updates are required for the MW stack.

NA4, Cal Loomis (CL)

- JZ: Deliverable, sentence “an issue is that commercial applications cannot use publicly funded infrastructure”. What is the meaning? How does it affect exploitation?
 - CL: This is an issue raised in slide 10. This is a problem because of network considerations. Case in France where they wanted to use the resources, but we couldn't as they couldn't use the network. Not sure there is much that can be done to improve this. Use of commercial software on the Grid. Progress is being made with licensing models, and compatibility with the Grid. Work with MatLab is a positive example.
- JZ: Slide 18, bottom chart, there obviously more small VOs, but more people are in the bigger ones.
 - CL: All VOs here are registered. The VOs must be registered to be able to gather statistics on them.
- JZ: in terms of people being registered, most users are registered in that sense. The majority if users are in registered VOs.
 - CL: Users must have a certificate. Which they get through their local CA. We know who the users and VOs are through the information system.
- MW: Are members users?
 - CL: Yes.
- MW: How do you estimate people impacted?
 - CL: Contact for each registered VO. Send an email requesting estimate of people impacted by the work. The number of affected users is subjective.
- MW: Expect a significant increase by LHC users soon. In terms of growth of CPUs or Cores, what is the impact?
 - CL: We count cores rather than CPUs.
- If you're expecting this increase, how much headroom is available to accommodate non-LHC users?
 - CL: The non LHC users actually do bring resources into the Grid. That's the model used for a long time. People should bring in the average usage into the Grid itself. We shouldn't expect freeloaders on the Grid.
- MW: Geocluster particularly interesting. One of the difficulties for oil and gas industry is the average age of geophysicists increase is one year per year. How to bring in younger people?
 - CL: CGG people are on the younger end of the scale.



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- MW: Mentioned the inflexibility of ISVs, Gaussian is well known in this respect. Do you see any possibility of persuading them to be more reasonable in licensing?
 - CL: yes. Different licensing models, users pay for license more and more (good example is MatLab). This could convince them.
- MW: Comment – Grid observatory noted as bridge to computer science community, could also be for the Cloud computing vendor community. There are significant opportunities for synergies between grid and Cloud.
- JPP: Reported applications, numbers are stable or increasing. Are they the same applications?
 - CL: No, it depends on the community. HEP is the same more or less, others are completely different. The Earth science community has shorter experiments for instance. HEP are more stable for longer. IT depends on the area.
- JPP: Is one effect of this evolution just due to the discipline changing applications, or that some applications are not good candidates for Grid?
 - CL: Few of those are seen, almost all applications ported are good candidates. We weed out those apps which will not work well early on. In areas where there is large turnover of applications, there is less CPU usage (slide 8). The turnover is reflected more in total CPU usage rather than whether it's a large calculation or not.
- JPP: Users and members. Do you see a lot of turnover there? Are users transient? Certificates enable them to be counted as users.
 - CL: Even though applications change, it is usually the same people who regard the grid as useful and use it for their next experiment. There is still a significant overhead to become a user on the Grid.
- JPP: Did you start looking at patterns used by applications. MPI based applications? High throughput types? Parametric? Workflow based?
 - CL: such categorisation has not been done systematically. What may help with this is the Grid observatory in EGEE-III which will take all usage data and see what's going on.
- JPP: Sometimes limitation to app deploy is access to data at sites. Comment?
 - CL: In terms of reliability. What is seen is reliability in terms of no. of failed jobs. That number comes up as easy to measure and see. The same applies to storage. The work done for CPUs is to make that success rate better.
- KD: Service desk organization. Can postpone the q to SA1. Often tickets are assigned to the wrong expert, therefore a dispatching problem. How is it addressed?



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- CL: Team in place in EGEE-III NA4 dedicated to routing tickets for better assignment. Inside GGUS there are feedback mechanisms and an escalation procedure is in place.

Dissemination, communication and outreach, including business - Sy Holsinger (SH)

- JM: Very clear presentation. Strong point seen this year is how effectively you have gotten close to users of the infrastructure. In User Forums, what is the balance for attracting established and new users?
 - BJ: Few examples. In the abstracts submitted and presented, tend to be established users. New groups often have the UF as a milestone where they can present their progress. New structures such as ESFRI are given a rendez vous to come and talk to users to determine how they can use the Grid. Majority if people are still existing users, but good channel for new users.
- MW: Comment about positioning. There are significant opportunities for synergy between Grid and Cloud, change title of “Grid vs Cloud” to something like “grid and..” or “grid meets..” on the web to be non-confrontational.
 - SH: Agreed.
- JPP; Industry days. Main outcome?
 - SH: At start of industry days, the expectation was just to get the message out. Over the course of time, the target audience has been reached so expectations are increasing. Main objective would be to have a company to come in and run pilot applications. Some participation from EBA, e.g. Total UK demo results from industry days.
 - BJ: Imense is another example, a UK company which got venture capital to do image processing on Grid.
- JPP: Collecting feedback from participants?
 - SH: all Industry days are followed up with participants. A lot of them are return visitors who have seen the benefits. Constellation technologies said it was a powerful means by which to meet other businesses.
- JM: Collaborating projects. One area of interest: some of the EU projects are concerned with digital library formation. Do they make use of EGEE? How is that progressing?
 - FH: DILIGENT project has been followed by D4Science, still making use of their own IF as well as EGEE PPS. Same software and IF used.
 - EL: Workshop at OGF23 in Barcelona on that topic, it seems we are now getting movement in DL community. EGEE is contributing to this.
- KD: Commercial training. Industry forum report states that a certain fraction of those interested in commercial training would be ready to pay not more than



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4420 Euros. How did this number come about? This is a large amount of money for training. What would they get for it? How long would it last? ISO courses for lead auditors are offered at a rate of 2000-3000 Euros for 2-5 days.

- BJ: This was a survey run by Qi3, and the number comes from conversion of Sterling to Euro. Through Linalis, who are interested in offering commercial training to companies. This will be covered in NA3 presentation.
- KD: This could be a tremendous source of income and the project could be rich! Second question on Slide 19, Security audit for glite implementation carried out. What is the meaning of Audit here?
 - GZ: This was a study of gLite security to see whether they are compliant with CNES security aspects. They gave a full report which was positive and this will be covered in JRA2 talk.

8 July, afternoon session

SA1, Maite Barroso (MB)

- JM: Anticipatory tests for the LHC, they seem to be stress tests to show the IF works at the expected work load. Did you observe any side effects from these tests, any increase in failure of jobs, any impact on other VOs?
 - MB: Not that we noticed. Weekly meetings with the ROCs and sites, no impact observed. Problems reported through usual channels.
- JM: Interoperability. Any included in these stress tests? LHC partners also on OSG.
 - MB: dealing with interoperations. Support, helpdesk, Grid monitoring - all this was used by LHC experiments. On interoperability, not sure, used it in production.
 - IB: LHC uses several Grid infrastructures, EGEE is the biggest. The challenge is using all of those. Most of the procedures are derived from EGEE.
- JM: mentioned 3 other Grid infrastructures which EGEE is interoperable with. How heavily is this used in practice?
 - IB: LCG, driving force behind interoperation so far, OSG and Nordic Grid are heavily involved. NAREGI will also be used.
 - MS: NAREGI is just in the phase of building up the IF. There is nothing yet to interoperate with.
 - BJ: The NAREGI operations team came to CERN last July and had a day long meeting on how operations are organized, and visited Lyon's French operations. They are now building their own structure now.



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- JPP: In common computing readiness challenges, run with all 4 LHC experiments?
 - MB: yes
- CMS: 100,000, up to 200,000 jobs. With the other experiments, how many jobs will commonly be run and do you see any risk?
 - IB: In May, all 4 experiments ran at scales they needed to run. All ran together and in excess of their targets. There is no issue with the number of jobs needed to run. This is not just on EGEE, but also on other F.
- JZ: Slide 16. Dips in the average. What causes these dips?
 - IB: This is the 8 best sites and not always the same 8 are the best. These outages are caused by e.g. power cuts. The biggest problem is the complexity of the storage system. The larger Tiers 2 don't have that problem as they have lower complexity.
- JZ: Slide 15: It's more or less always the same sites that have problems. Is there a mechanism in place to help improve?
 - MB: These graphs are from WLCG. The best ones are probably always the same. The first step is to make the problems public. All these different initiatives to give them proper tools to do self-detection and be self-contained. If the VOs find the problems it is already too late. This is the only way by which the process can become self-sustainable.
- KD: Related to incident management and service desk. Wants to better understand ticket dispatching process? Bugs and change request? Helpdesk escalation and process? To what extent users are affected? User support process?
 - MB; First entry point, new feature: the user has possibility to assign to specific group. First triage, Ticket process manager. Team of people on rota who receive all tickets and assign them to correct support units or interact with users to get more information, and sometimes even try to give an answer to the ticket. Then it goes to operations supports units who deal with sites in the region, MW support units. VO specific support is available as well.
- KD: More concerned with keeping track. How many tickets in the system are still unresolved? Ticket dispatching requires a lot of skills and knowledge about the whole system and is a tricky business.
 - MB: First level triage is difficult, for the amount of tickets we have and the complexity of the load, we believe it is working. This approach may have to change if the complexity increases. This is a topic in EGEE-III. With respect to unresolved tickets, a new status has been set



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to verify the progress. The user is in charge of this and can say whether it is solved or not. All the tickets, even if sent to different system, at the end of the day the reference is kept in GGUS. The only problems difficult to track are middleware problems opened in Savannah. Here a close collaboration with Savannah is in place, but this is not automated and requires a single person to highlight the link.

- **KD:** Incident management. The support model is a potential vulnerability of the entire activity. There is a threat from the User who may lose confidence if tickets are not solved quickly enough. How would you assess this risk? Is it big?
 - **MB:** with current process, we meet users very often, where we get feedback on process and problems. This is a way to mitigate the risk. Most of the VOs are very happy. One year ago we were still analyzing what to improve; in the last months, the improvements have been made with the users to ensure they feel part of the process and the tools.
- **KD:** Standards and ITIL: Invested time in evaluating standards and ITIL and that some of you received some training. This corresponds to a certain effort invested in familiarizing with this. What are the benefits?
 - **GZ:** This will be discussed under the JRA2 talk.
- **MW:** slide 5 - non-HEP jobs: there seems to have been a slow decline in number of jobs per day. But on Slide 6, CPU months has risen steeply. Is the number of CPUs per job? Is this typically '1' so the jobs are running longer? It will be interesting to re-visit this with MPI in mind.
 - **MB:** yes.
 - **CL:** note that computational chemistry uses MPI a lot.

Interoperability, Markus Schulz (MS), Michael Gronager (MG), Daniel Mallmann (DM)

- **JPP:** Trouble ticketing integration?
 - **MG:** the ARC team is part of the EGEE operations team. We get the tickets in GGUS and can handle them internally so central integration is achieved.
 - **MS:** For UNICORE we have a longer road to travel until we reach that point.
 - **MD:** It is necessary to have one point to access trouble ticket system so they don't have to choose if they contact DEISA or EGEE
- **JPP:** UNICORE: Presented how from EGEE environment can access supercomputer supported by UNICORE.



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- DM: For UNICORE system, the target interface runs as a single target system. There are security issues with the prototype.
- MS; During EGEE-II this was not the focus. In the Description of Work, the direction was to get the jobs flowing from EGEE to UNICORE, hence why it was not reported.

Demos, Evangelos Floros (EF), Francisco Castejon (FC), David Manset (DM),

- JM: Very impressed with the way the technical information has been hidden in the demos. To what extent do you use the full grid capabilities, and how do you see that changing as you scale up
 - FC: We need a lot of storage space to keep the data and statistics to get more meaningful results. This need scales up as we scale up/
 - DM: We are acquiring a lot of data from patients, and this needs them to sign consent forms and then have a whole day of tests. It is hard to acquire all this data, and we have not filled up all the storage space available. We are also not using the full compute capabilities available.
- JM: The grid infrastructure is mainly built on research networks. Do these applications hit any network limitations, and do you foresee any when you scale up the application, or do your limitations lie elsewhere?
 - DM: Most of the hospitals have access to GEANT, and we have no real network problems.
 - EL: In general, on the EGEE infrastructure the network is not a limiting factor. For those applications which exceed the limits they provide their own optical network.

JRA2 (with focus on QA), Gabriel Zaquine (GZ),

- JM: Has anything happened that has suggested other metrics you would like to have been recording? Particularly looking at availability from an application viewpoint.
 - GZ: Quality assurance is iterative, we define metrics, review them and then change them. We have two groups working on availability, particularly the dashboard team, who are working on how applications can see availability
 - BJ: Key metrics were defined at the start and have evolved. New ones will be added for EGEE III. Some have been retained through the lifetime of EGEE II to provide historical data and continuity.
 - EL: Two examples of how we have adapted are the activity reviews which were introduced and have worked very well, and the gLite restructuring.
- JM: Interesting to see you continue to collect data for historical reasons. What would you drop?



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- BJ: NA2 have been very successful in gathering numbers, and have developed a tool to do this. But this approach is not successful in all activities, due to the nature of the activity. For example, for applications it doesn't work, the only solution is to go and see people, as they will not fill in forms.
- JZ: The project exceeded all targets. Do you see this continuing to EGEE-III or have you reached the zenith?
 - BJ: We don't chase buzzwords. Have seen huge increases in interest in the subject, which could be due to rebranding it as "cloud computing" etc, but that doesn't matter. Our key objective is to disseminate the benefits of grids. The infrastructure continues to grow, new users are coming along. Some industry sectors (e.g. finance) are maturing, others are new.
 - EL: One metric we will see decrease is the number of languages material is available in. While this is important for press releases etc, it is less useful for technical documents.
- KD: What was your attitude to ITIL and ISO standards before and after implementing it?
 - GZ: Now there is acceptance of this technology both inside and outside the project. It was not easy at the beginning. We use ITIL as source of best practice, and adapt the algorithms to fit EGEE. People are happy because they can see it is used in the wider business community. The important point is a common language and terminology.
 - EL: It gives us the means to check what we are doing against established people. It is not necessary for EGEE to be the driving force. We can draw on institutes who work with EGEE. We see the trend in the community and benefit from it.
 - BJ: ITIL is helpful as a checklist, and training is available in the department. Looking at the costs vs the benefits it is positive at the moment.
- KD: There is a strong focus on technical security. Most security breaches are caused by people. What are you doing for organizational and personal security awareness?
 - EL: This has not been highlighted as no task is dedicated to it. The Operations people deal with security on a daily basis and are aware of any issues. Policies are currently being developed.
 - DK: This is an important issue. There is training for site managers and sys admins. Policy docs are in development. ISSEG did a lot of awareness and training.
- MW: For EGEE II are there one or more metrics you will definitely consider?



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- BJ: Globally, the introduction of country reviews is essential when looking forward to EGI, and the NGI model. We are also refining the underlying accounting tools and metrics gathering so we can provide information about the people involved.
- MW: Do you see any ways of improving the partner reviews?
 - EL: They have been improved by moving to a country basis. It is not practical for all activities to do it on an activity basis. The term “review” is not so useful. They are more of an open exchange between partners/countries and the project, which is needed in a project of this size.
 - BJ: Activity managers are keen on country reviews but also want to keep their own internal reviews. These have led to the implementation of all-hands meetings within activities, which has improved internal communications and helped with the fact that we have no dead partners.
- MW: In a project this size have you experienced any security attacks?
 - DK: We have had general internet security related attacks, but not yet had any grid specific attacks.
 - EL: We work closely with OSG, and both security officers work closely together. Interoperability means that an attack on either us or them could have implications for the other.
- KD: Have you been subject to any social engineering attacks? Phishing for example?
 - BJ: We have not seen anything directed at EGEE as a grid. Individual sites may have done.

SA2, Xavier Jeannin (XJ)

- JM: The optical network is specific for LHC. Do you see any other applications that might put a heavy load on the network?
 - XJ: We will have more dedicated networks when the needs are identified.
 - EL: We have not identified such a community yet, but are gaining experience through the LHC private network.
 - BJ: It is partly due to the nature of the community. With LHC the data is created all in one place. Other communities have more distributed data creation. CERN and the LHC work will benefit other future projects that have a similar data model.
 - WvR: Industry can now provide such bandwidths.
- JPP: DO you have any concerns about the quality of GEANT?
 - XJ: It is difficult to achieve a good quality of service in some areas.
- JPP: How will it get better?

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- XJ: there are some standards, but we have to wait for GEANT to use them. It is hard to know if they will be popular.
- EL: Putting this into perspective, it is the guaranteed quality of service that is not good. We have good service overall.
- JPP: Do you see needs not met by GEANT? Do you see influence EGEE/EGI could have? Is there a flow of information from users to the network providers?
 - BJ: EGEE is very successful at capturing the “user’s voice” and would like to see that in the network layer. Some users have a good communication link with the network layer. Other users don’t have that link, and this is a role EGI could play.
- JM: Where is the IPv6 demand coming from?
 - XJ: The motivation comes from training, not users, and the drive is from the network.
- JPP: Do you have actions for non IPv6 components you depend on but don’t control?
 - XJ: Firstly consider that the middleware will work on a hybrid IPv6 and IPv4, so we can move step by step and not in one go. For external components the idea is to use new versions.
 - EL: We need to be prepared for IPv6 to be mainstream. For 3rd parties we have built gLite on well supported, recent components. We don’t see 3rd party dependencies to be a major problem. During EGEE III we would like to see one site IPv6 enabled.

9th July, morning session

JRA1, Claudio Grandi (CG)

- KDJM: About the gLite authorization issues. Is that in a sense a vulnerability in the security? Is it visible to users?
 - CG: this is not a vulnerability. E.g. if the compute element authorises the users on a specific partition of the system, and the matchmaker on the WMS thinks the authorisation on the compute element will be done in a different way and go on a different system, then the wrong choice on the best resource to send the job will be made. This is a way for the application to exploit the VOMS authorisation in a better way.
- JPP: The essential actions would be taken within next 6 months. Can you give examples?
 - CG: Firstly, we are developing a common library to be used on Compute element, to ensure the same rules to give authorisation are followed and



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match what the WMS and compute element are doing same thing. There is a document attached to JRA1.7 (found in same EDMS page) which describes in detail the actions in the short term.

- JPP: Cream CE. You have mentioned that you have performed testing, running 10k jobs per day. With respect to some experiments, CMS in particular, do you believe that CREAM CE can reach that level of scalability fairly soon? This may be an important issue.
 - CG: 10k jobs per day on a single CE is well above the needs of the application. The WMS, front end for submission for users, needs to scale more than the CE as you can deploy more CEs. The architecture is such that if components don't scale, simply add components linearly to achieve scalability. The problem lies on management side in managing more CEs which is important. Not critical architecturally.
- JPP: gLite CE has been included in condor and redhat. Will the CREAM CE be a replacement there?
 - CG: EGEE will use CREAM as a reference compute element. EGEE will not try to use gLite CE as provided by Condor for the infrastructure. It is available there so for those who want to use it can, it is compatible with the WMS. CREAM will provide the same functionalities and more. The LCG CE, Globus pre-web service based, will continue to be supported until CREAM can replace it completely. The production CE is the LCG CE not the gLite CE.
- JPP: Will condor support their version of gLite CE?
 - CG: we will continue to accept requirements from Condor, for components of gLite they need to make their CE work (Blah, Exec..) and also on what concerns submission. That side is easy as we are using condor G in the WMS. It is them supporting us in Condor G to do submissions.
- JM: Porting to new platforms. A lot of effort has gone in to make it more manageable. What demand is there for these ports to new platforms, and in EGEE-III (with reduced manpower), how far do you expect to be able to meet them?
 - CG: Big investment has been made in EGEE-II on ETICS and restructuring. The effort can therefore be lower in future and we'll be able to do more. For what concerns platforms, the needs of applications concern worker node and user interface (UI) on which more effort will be spent. The other Linux-like platforms are highest ranking for applications, but we also have requirement for user interface on windows.
 - EL: Postpone this discussion to SA3 talk.
- KD: Re-engineering efforts. State that culture of maintainability improved. How has this been achieved?

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- CG: When the developers need external components, he/she thinks twice. Before developing a product, this should go to the engineering management team and ask if components are available; if so, what version to use. There have been serious discussions inside EMT regarding real need to include new external dependencies in the stack. While before the developer was just starting using a component because it was needed, now it is discussed in greater depth.
- KD: In this context, how do you ensure new developers also think twice?
 - CG: I hope that the management structure in place ensures developer clusters participate to the EMT and coordinate activities of their own groups therefore have responsibility to ensure that developers follow guidelines of EMT. In any case there is no possibility that any component goes to production without all EMT rubber stamps. In the worse case, someone will have to redo the work if not done according to rules, but this is unlikely to occur as strong effective coordination is in place.
- KD: Hindsight is a wonderful thing. What would you have done differently?
 - CG: Preview testbed is something that would not have been done. For what concerns ETICS, I would probably ed a little bit more before adopting it for the dev. I would have made the requirements coming from developers stronger since the beginning, but must note that we could not have achieved what we have without ETICS. I would have made JRA1 requirements clearer.
- MW: Mentioned number of organisations outside EGEE using gLite. Are any of those orgs contributing towards the software engineering effort or is there the intention that they will in EGEE-III?
 - CG: There are several support projects already helping us from which we take tools for middleware such as OSG etc. Important components come from GridSite that is part of gLite in EGEE-III. The RESPECT programme is meant to collect all high level services useful for applications that will work on top of EGFE infrastructure and made available to all users.
 - EL: The MPI support was developed together with int.eu grid project, OMII Europe have provided components to the stack. The RESPECT programme is one of the major paths for those projects as they are mainly applications projects. We focus on foundation and high level services are provided by other projects.

SA3, Markus Schulz (MS)

- KD: Testing and certification. Assume testing process is done in 2 steps: component then integration.

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- MS: First deployment, then smoke tests. For the component test, there is the concept of baseline release which represents what is currently in production. We test the component against this baseline, check for breaks etc. This reflects also the in-practice situation, where we have many different sub-versions in all different sites which explains why we do that.
- KD: In integration, what test coverage that can be achieved?
 - MS: Test coverage in terms of lines of codes is not looked at as we have a lot of dead wood in the code. We have a list of gLite middleware components, not all in the list and features are used. It is far from total coverage. Use cases are fully covered now. Problems seen in the last 8 months are problems that arise from heavily used or aged services, which are difficult to test. We prepare a certain state and test an operation. A good example is the ability to delete files in rapid manner. Time behaviour turns out to be a critical issue for instance, when an experiment worked for 4 weeks solid. Then they wanted to start over and all disks needed to be cleaned for this. All catalogs done over 2 weeks in distributed infrastructure over 2 weeks had to be undone in 30 minutes. This was a critical bug as it blocked their use of resources. We work closely with users, observe their activities, and put in test cases. In the long run, more deep testing must be done.
- KD: Certification. How is this done exactly? When is a component certified?
 - MS: Will be described in next presentation. Acceptance criteria are defined. For some, they do not run all the time, e.g. with a minor change to WMS, full acceptance test for stress and scalability takes more than 5 days to run. We only re-run part of the certification if the developers indicate that changes made are structural and can be a problem. Check for completeness of documentation, release nodes.
- KD: Does it take approx. two weeks for re-engineering components, integration etc?
 - MS: No. We release component by component and then update those changes ready at a given time. If work on WMS, you can work 6 months and then say there is change ready to go through the process. This can take time depending on the component and readiness as we iterate on patches. If ready it is taken and we have a window where we take all ready changes and move to the pre-production service (PPS). At end of time where the component matures on PPS, there is a release window and anything ready moves to production. Time between change in code and change in production IF can be infinite. There is a constant flow of change but you don't wait for any other change. We only roll out backward compatible changes.



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- JPP: There are 2 entities for decision on prioritization process. TCG (long term) and EMT (short term). How do you guarantee progress in the medium term?
 - MS: The TCG maintains a list of strategic goals and follows up on this. Regular sessions are held to go through list and where assigned activities report. It is clear, e.g. for security issues, blocking bugs, etc. that the EMT overrules and delays strategic goals. To ensure they are followed up this is done through TCG by following this list of defined goals.
- JPP: Have you seen much delay in strategic directions of TCG? Have some priorities been transferred to EGEE-III?
 - MS: Certainly. EGEE is an infrastructure, it is not a biotope for new middleware. The priority is to provide a usable infrastructure for users. If this means software components are delayed to keep the infrastructure running, that is the priority. We are an incubator for new software and concepts but that is not the main goal.
- JPP: Is the rule that most of the strategic new features or components are rarely happening or are they happening in timeframe envisioned by TCG?
 - EL: This is a managed process. Take into consideration daily needs of operations and re-assess strategic goals accordingly. The gLite restructuring delayed many things. This was necessary. It does not mean that new functionality did not come in. e.g. the secure data management suite would have been liked to be in action earlier, but we kept applications working by providing single instances of services needed. Now re-injected in release process.
 - MS: Invest a lot of SA3 activity in new components. Stress test beds for CREAM CE. At any given time, 2-3 people are working just on new components. Also introduced new data management component and pushed it through the process. It has to be clear that we cannot endanger the infrastructure to work on new interesting software. Some user communities depend on the infrastructure too much.
- JPP: New communities and new requirements: do you see some of them impacted as a result of them being discouraged from coming on board as expecting a component which is then delayed?
 - CL: What is clear for applications is that gLite provides core functionality. High level services come from outside and those provide additional services that communities need. For a long time in NA4, the emphasis was that for significant new functionality needed it has to come from outside. gLite is core and functions well right now. This impact has been minimal. The MPI support is put on and external to WMS right now.
- JPP: Concurrent support of gLite 3.0 and 3.1. As pointed out, 3.0 is being phased out. With regard to patches still for 3.0, does this involve mainly defect fixes?



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How could you try to speed up the transition and migration of sites from a phasing out version 3.0?

- MS: This is a difficult question. We try to speed up however sites have constraints. If you look at the main difference between 3.0 and 3.1, it is the reference OS (different flavour of redhat, different compiler support etc.). If sites have strong local user communities that depend on this, it is difficult to convince site to move. The infrastructure that EGEE represents is a federation of largely independent sites. Some sites took up to 2 years to move away from previous LCG-2.7 incarnation. For 260 sites it is a challenge. Some will move quickly, others not. In the long term the vision is the use of more virtualization technology for this.
- JPP: A lot of work in restructuring the code in separating client and server. With respect to users, they are used to certain platforms and expect certain worker nodes to keep on running etc. The assumption was that most of defects were more on the server side than client side. The fact that you will be able to provide multiple platform support will help. This whole situation should improve from a server standpoint.
 - EL: Deprecate previous versions. It takes too long for some sites to upgrade. Specific SAM tests can identify particularity of problems linked to the site.

Software metrics, Oliver Keeble (OK)

- JPP: In your chart about severities and mean time for treating various defects, one thing to consider is having 2 dimensions: severity is the one that the reporter of a defect assigns and the second, the priority or another term which would be the importance you, as testing team assign to the bug based on impact of bug on user community and track both. This average curve would follow the importance of the bug.
 - OK: We are half-way there. This tracks short term release priorities. What we have is pretty much what is suggested but it is binary. This is easy because it doesn't require a massive amount of assessment of each issue. Doing another assessment with better granularity would imply more work for sure.
- JPP: What would also be important to track is correlation between severity and importance.
- MW: Patches tend to queue up waiting for expert attention. That sounds like something likely to be a persistent fact. Then there is also the fact that there is too much dependence on experts at a central site. Is this aspect something that will always be necessary to have?



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- OK: We will always require experts. Not all our certifiers can be interchangeable. The automation evoked is important here. Less of the certifiers are therefore necessary. We need to be able to spread work around a bit. A lot of new people in EGEE-III to train up. In SA3, process of identifying who will do what to build up expertise, but needs investment
- MW: Will it eventually possible for this to be fully distributed without need for central site?
 - OK: Half the SA3 labour is at CERN. There will always be a case therefore that a lot of expertise will be at CERN.
 - MS: Can distribute more and more but some form of coordination is needed. A strong central team is needed.
 - EL: Another feature in EGEE-III is the cluster of competence concept. We hope that this will build local knowledge better and that the components, once passed in certification stage will be of better quality so effort will be reduced.
- MW: Necessity for central coordination: This suggests there is a dependency on continuity of people who embody that expertise over time. All this moves in the direction of sustainability.

NA3, Robin McConnell (RMC)

- KD: Accreditation scheme for trainers and training material. How is it done?
 - RMC: We accredit the trainers, starting off with a lightweight process, whereby we first looked at the most experienced trainers for a number of years and accredited them. Then this was opened it up. Trainers need a proposer and seconder for each application to ensure peer review. This process will be maintained. We are also working on a registry which will pull in all experience according to modules. Training material: we recommend, particularly for all induction courses that partners use exemplar material as designated by editorial taskforce composed of top 5 experienced trainers who approve the material.
- KD: So there is no supervised training for those who want to be accredited, no exams?
 - RMC No examinations. The lightweight process relies on peer review.
 - BJ: Robin also mentioned Linalis, no an EBA. One interest to pursue is not only training for a fee, they also have exp in training accreditation. This must be done step by step.
- JM: The table of the locations for training events. Wondered how locations are chosen:



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- RMC: Chosen by partners themselves. Look at needs in particular environment and select location accordingly. Before EGEE-II there were no trainers in Asia Pacific, Sent trainers to train trainers there and conduct first courses. IN terms of choosing events, we try to be flexible where possible.
- JM: Participant days. The training activity had exceeded the target for both years in year 1. The target 1500 is for two years. It has been exceed by a factor of 4. Are all of these courses funded from the project or are there contributions from partners?
 - RMC: We contribute EGEE resources to other projects. It goes both ways.
- JM: In giving 4 times as many courses, have you been able to do within original budget?
 - EL: the location and venue is provided by the partner, with all logistical support. This is a major contribution.
- JZ: eLearning. How much training can be done through e-learning? Many courses require hands on practice.
 - RMC: More e-learning foreseen in the future. On many training courses now there is a mixture of face to face training and online tutorials with assistance from tutors in the room. Then they can follow up online at their own pace.
- JZ: Any feedback from participants as to what kind of courses they prefer?
 - RMC: This is not a metric we have been following. Feedback on classroom courses has been on quality of presentations and quality of tutoring.
- JPP: WRT Linalis, do we know type of courses they will deliver?
 - BJ: This is only a recent development. A MoU has been established. They sent someone to the User Forum to take part in the training session there to see how it is done. They also took part in the train the trainer session and had one on one tutoring. They see this as a commercial opportunity. We have not yet got to the point of the detail of the sort of training they will offer. This will kick off around EGEE'08.
- JPP: Do you foresee at next EGEE conference, in maybe the business track, Linalis maybe providing some type of training to participants or some kind of awareness activity?
 - This is in discussion with NA2. Linalis will be present and will talk about what they do and intend to do. A large proportion of the participants at the conference are scientific users, for whom a training session is planned the weekend before. We will promote them there.

NA5, Panos Louridas (PL)



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- JM: When eIRG was set up, it has membership from member and associated states within the framework programme, not specifically with Grid expertise. What we see here is that the EGI and EGI_DS are focusing exclusively on the Grid aspects. Last year, a presentation was given on the NGI survey. This is very important, but at the time it was early days. Are there any plans in the EGI_DS to repeat the survey?
 - FK: Indeed, an updated survey was carried out in the EGI_DS project, done by CESNET.
 - PL: The information was also put online.
 - FK: there is also the knowledge base, a repository built with input from NGI, providing information on their status, use cases submitted by different user communities etc. This is useful resource.
 - Bj: Since last September, all that work has been taken up by EGI-DS
- JM: From an EGEE point of view, are you satisfied with progress?
 - BJ: This will be covered in the next presentation.
- MW: Under the issues, you state “EGI_DS must be inclusive”. Is it?
 - PL: There are not specific problem with the interaction there. Good collaboration is achieved. It is therefore not an issue, just a requirement.
- JPP: What is the incentive for potentially identified collaborating projects to become registered?
 - EL: The reason for project register is to improve communication between EGEE and the related projects. It also enables identification of synergies, which are also developed at concertation events, through dissemination material (CP booklet) distributed at conferences, etc.
 - FK: EGEE is horizontal and will collaborate with all application, infrastructure and other projects.
- JPP: The Collaborating project event was attended by 70 representatives. Did they come from the registered projects or from additional?
 - EL: Also from additional projects. We try to track people who come to conferences, ask them where they are from in the registration etc.
 - BJ: We tell them certain things that can be offered by EGEE as service through mail shots: operations, training, Support, large dissemination channels (articles in iSGTW for example). This is interesting for them and a definite incentive. We can therefore give them exposure to user communities.

Plans for the future, Bob Jones (BJ)

- JPP: Is there a plan in EGI_DS on putting a structure in place for EGI so that it can start immediately at end EGEE-III?



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- BJ: As an outsider, as project director invited as observer to EGI-DS. The draft Blueprint exists which is already a good achievement. Attracting a lot of attention, there are a lot of conflicting views as to what is the scale, focus, intended users, funding sources. We expect that they will come to a fairly mature version by EGEE'08. The essential thing that has to happen is to get the NGI s to commit to the funding model proposed, obtain the commitment of the EC to fund part of EGI. The second year will be a year of lobbying, to convince all countries to commit to this and putting in place all structures needed to make this possible. EGI could fly with a core set of NGI signing up. From EGEE's point of view we must understand what this would mean. EGEE provides all input necessary for the Blueprint to be consistent. There will have to be a managed process or find a mechanism to bridge the gap.
- JPP: In terms of the JRUs, you don't cover all countries in which you have beneficiaries. This could be a risk, as some users may not be covered by straining NGI
 - BJ: every country that has more than one academic partner has a JRU. Slovakia, Slovenia, Czech Republic only have one partner so no JRU. WE have not insisted on this for the Asia and US partners.
 - FK: As part of the blueprint there is a tender for a central organization which will host the central coordination body, egi.org.
- JPP: On EGI_DS website, the report there is still the NA5 EGEE-II report. Maybe there is an update underway?
 - FK: There is a new survey and the results will be made available.
- JM: Slide 17, EGI_DS, it appears that the coverage of countries is complete. Presumably there are partners in common between EGEE-III and EGI_DS? Who would be the driving partners in EGI_DS.
 - BJ: Indeed. EGI_DS is a consortium of 9 partners. Coordinated by University of Linz, CERN is also a partner. The intention is to represent all the NGIs. All countries sent EGI_DS a letter of support, identifying a key representative to sit on the EGI_DS Policy Board.
- KD: You are going to manage EGEE-III with 2% of the budget. How is this going to be done? It includes more load with less money.
 - EGEE-II was managed with 3%, however the budget was a bit higher. The money available for international collaboration is less. The NA1 funding covers all the Project office, the director and technical director. It does not cover the activity managers, paid under each activity.
- JM: Is the reduction in funds related to new cost reporting in FP7? The headline figure gives a slightly rosier figure compared with actual funds available.

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- BJ: Indeed. We compared EGEE-III with EGEE-II (FP7 versus FP6), and there was an average increase in costs of 10% which entails a reduction in manpower. This is the rule for all FP7 projects.
 - JZ: Cloud versus Grid is a very interesting topic. Does Amazon even come close to satisfying the requirements for computing that EGEE satisfies?
 - BJ: Currently, if both systems are compared, it is hardware as a service that you get from Amazon. There are not high level services that EGEE provides. One can imagine that it will evolve, and that high level services will start appearing.
 - JZ: Will a private company be able to offer the same kind of scale?
 - BJ: Current reports indicate that the scalability is not what it seems. So it is comparing apples and pears. The architect form Amazon will be present at EGEE'08.
 - JM: Cloud computing does not allow to specify what hardware to run on.
 - BJ: one of the aspects of cloud computing is virtualization. We want to do more in that area. There are advantages in the simplicity of the interfaces. EGEE looks a lot more complex as we expose 2 types of interfaces, to the users, but we must also expose the users to the resources providers. You don't see that in Cloud.
 - MW: There is tremendous scope for synergistic relations with the cloud community. There are a lot of services that your community would need which would not be provided. The interface to a Grid is much more complex, this can be simplified.
 - BJ: We'd be willing to do more on this but we do not have the effort available.
 - JPP: The cloud computing view goes beyond the hardware aspect of the service.
 - BJ: Indeed, for our paper, we took the position of what is there now.
- EM reminded the reviewers that this was the last opportunity for questions.
- JPP: in the number of registered VOs and the number of reported applications, it seems to me that they are close to the same number. You may have more registered VOs than reported applications. Is this the case?
 - CL: The number is 126 registered VOs, 118 reported applications. Registered VOs also count infrastructure VOs which test various aspects of infrastructure. This is a minimal difference.
 - JPP: Is the common rule of one application per VO coherent? Or is there a different model?
 - CL: It depends very much on what the VO does and what the goals are. The earth science VO for instance has several applications in it. This evolves every year as well. Other application areas, such as the LHC VOs are more restricted in number of applications.



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- JPP: Getting resources allocated is done on a VO basis or an application basis? A VO may have two very different applications. Is there a conceptual assumption made in terms of resource allocation?
 - CL: to date there have been no issues of this type. The gLite core services are very basic. In that respect there are not great variations in what the applications need. This goes at a higher level.

Closing session

Mitjana opened the session, calling on rapporteur John Martin to provide the feedback from the reviewers.

John Martin took the floor. He first asked to thank a number of people, notably the Project Office for the arrangements for the reviewers, CERN for hosting the review, the members of the project for the very high standard of preparation of the material and for the quality of the presentations. This is particularly important as this is a large scale, complex project, and the quality of the material helps guide the reviewers through it.

All the reviewers agree that they are particularly pleased with the openness, transparency and responsiveness shown to the reviewers.

Martin noted the reviewers' appreciation of the fact that the previous review recommendations were usefully provided in one place with corresponding follow up, as well as the inclusion of a section on lessons learned the reports on major activities, all of high quality.

This is something they will recommend other projects do in other reviews and the reviewers will recommend the EC implement this generally.

Martin noted that the intention for the report is for it to be surprise free, but noted that some things may arise in the report preparation.

This is a very well organised project, in terms of overall management and individual activities. This is to the credit of everyone, as when hearing each talk, one forgets how complex the project is. This is testament to the high quality and fluidity of the project.

Particular progress is noted on the work on application support. This is very impressive. The degree to which the project has been able to contact and understand the needs of the user community is remarkable.

Further the project has been quite bold in taking particular decisions, which can be high risk, such as the gLite restructuring and use of ETICS. All this is vindicated by the outcome.

The QA has been continually refined. Reviewers are particularly impressed by standards in the area.

Improved interoperability, which was a concern 12 months ago.



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They note a steady rise in reliability helped by use of monitoring tools. 12 months ago a concern was in area of personnel and management, staff turnover and retention. Actions taken have been extremely good and it appears as less of a concern now.

The contribution to EGI, which is the future of grids in Europe, is exceedingly important. It is obvious the contributions of the project have been significant in past 12 months. The reviewers note the increased participation in Grid standardisation effort.

On dissemination, training work with Related Projects, international cooperation: there were no concerns 12 months ago, and they continue to be models of their kind. And finally, the project has consistently met and exceeded its targets.

Comments on some issues arising. There are fewer than a year ago and that reflects the fact that recommendations made at the time are now redundant.

- Still an issue over job failure rates.
- Also on updating of middleware throughout the sites connected, need for timely updates. This might cause problems with user support and requirements.
- Patch delays are also an issue. It has been noted as difficult for the patches to be processed and this is an obvious throughput limitation. There are schemes in place to prioritize but the delays are still there.
- Limitations in interoperability still present, but considerable successes are recognized, with UNICORE notably. Noted the experiences with other systems, and that it is essential to have a dedicated user community to make things happen. Recommend contact of the Fusion community which may lead to a potential candidate.
- Issues with IPR identified: The comments on patenting the of drugs coming out of the program raises questions on how this should be handled.
- Finally, the obvious tension between non-commercial and commercial users of the infrastructure is a potential issue.

A few words about the forthcoming recommendations:

There will be fewer this time, reflecting continual refinement of the project.

1. Acceptance of deliverables
2. Recognize that is the final review of the project. The intention is of course to give detailed feedback. The probable format will be similar to collecting the lessons learned from each activity. They will certainly indicate those agreed with, disagree with and any they feel are missing.
3. New activities encouraged to continue:
 - a. The contacts with ESFRI and with the ERC. These are clearly potential new sources of user communities.



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- b. Encourage contacts with Fusion community.
- c. “Cloud watching” is also recommended. There are potential benefits for low threshold users, i.e. people to whom the cost of starting with grids is a deterrent. This applies to researchers and business communities.

Final remarks: Keep up the good work and the reviewers wish the project every success for the future.

Jones concluded by thanking the reviewers for the favourable assessment of the project, thanking them for their feedback from the first review which has been so useful in continuous improvement in the project.

Jones thanked all project members for making the project a success.

Martin added that it was very good to hear and see new activity leaders.

Mitjana took the floor, thanking the reviewers for their hard work in reviewing such a complex and large scale project.

He joined them in thanking the Consortium, and the management in such good preparations for the review. He is glad to see that performance does not drop in quality over time. He explicitly thanked the Project Office and the presenters who took part in this review.

Concerning the project in general, by all means and standards this has been an outstanding collaboration in the past two years. It is impressive from the funding agency perspective. There is no doubt that the e-infrastructures programme would not be what it is without EGEE-II: the benefits of what is done are not concealed within the programme, it goes well beyond other projects and this is clearly visible and commendable.

The challenges are now ahead. EGEE-III is now signed and in place. The challenges are a little different in nature from those faced in EGEE and EGEE-II and it is hoped the good performance will continue there.

He thanked all 1400 or so members of EGEE-II.

Von Rueden closed the meeting with thanks to the reviewers, confirming that all efforts will be followed in the future. He noted that one of the reasons for the success of EGEE is the community behind the work which has strict deadlines. The Grid is not an option, it is a must.

He thanked the EC for continued support, the reviewers and agreed the challenges lie ahead.

The review meeting closed at 17.40.