# EGI-InSPIRE

# DEPLOYED MIDDLEWARE SUPPORT UNIT OPERATIONS PROCEDURES

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Abstract

This document is a follow-up of the preceding MS502, MS507, and MS511. It describes operational procedures of the merged DMSU and TPM teams, while evaluating the experience from this merge. Foreseen changes in the final project year are also discussed.




## I. COPYRIGHT NOTICE



## II. DELIVERY SLIP

| | Name | Partner/Activity | Date |
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## III. DOCUMENT LOG

| Issue | Date | Comment | Author/Partner |
|---|---|---|---|
| 1 | May 27, 2013 | First draft | Aleš Křenek, Zdeněk Šustr/CESNET |
| 2 | June 20, 2013 | Comments from internal review reflected. | Aleš Křenek, Zdeněk Šustr/CESNET |
| 3 | July 11, 2013 | Second draft to include external review comments | Zdeněk Šustr/CESNET |
| 4 | July 24, 2013 | Included minor changes from the 2nd round of review | Aleš Křenek/CESNET |

## IV. APPLICATION AREA

This document is a formal deliverable for the European Commission, applicable to all members of the EGI-InSPIRE project, beneficiaries and Joint Research Unit members, as well as its collaborating projects.

## V. DOCUMENT AMENDMENT PROCEDURE

Amendments, comments and suggestions should be sent to the authors. The procedures documented in the EGI-InSPIRE "Document Management Procedure" will be followed:
https://wiki.egi.eu/wiki/Procedures

## VI. TERMINOLOGY

A complete project glossary is provided at the following page: http://www.egi.eu/about/glossary/.

## VII. PROJECT SUMMARY

To support science and innovation, a lasting operational model for e-Science is needed − both for coordinating the infrastructure and for delivering integrated services that cross national borders.

The EGI-InSPIRE project will support the transition from a project-based system to a sustainable pan-European e-Infrastructure, by supporting 'grids' of high-performance computing (HPC) and high-throughput computing (HTC) resources. EGI-InSPIRE will also be ideally placed to integrate new Distributed Computing Infrastructures (DCIs) such as clouds, supercomputing networks and desktop grids, to benefit user communities within the European Research Area.

EGI-InSPIRE will collect user requirements and provide support for the current and potential new user communities, for example within the ESFRI projects. Additional support will also be given to the current heavy users of the infrastructure, such as high energy physics, computational chemistry and life sciences, as they move their critical services and tools from a centralised support model to one driven by their own individual communities.

The objectives of the project are:

1. The continued operation and expansion of today's production infrastructure by transitioning to a governance model and operational infrastructure that can be increasingly sustained outside of specific project funding.
2. The continued support of researchers within Europe and their international collaborators that are using the current production infrastructure.
3. The support for current heavy users of the infrastructure in earth science, astronomy and astrophysics, fusion, computational chemistry and materials science technology, life sciences and high energy physics as they move to sustainable support models for their own communities.
4. Interfaces that expand access to new user communities including new potential heavy users of the infrastructure from the ESFRI projects.
5. Mechanisms to integrate existing infrastructure providers in Europe and around the world into the production infrastructure, so as to provide transparent access to all authorised users.
6. Establish processes and procedures to allow the integration of new DCI technologies (e.g. clouds, volunteer desktop grids) and heterogeneous resources (e.g. HTC and HPC) into a seamless production infrastructure as they mature and demonstrate value to the EGI community.

The EGI community is a federation of independent national and community resource providers, whose resources support specific research communities and international collaborators both within Europe and worldwide. EGI.eu, coordinator of EGI-InSPIRE, brings together partner institutions established within the community to provide a set of essential human and technical services that enable secure integrated access to distributed resources on behalf of the community.

The production infrastructure supports Virtual Research Communities (VRCs) − structured international user communities − that are grouped into specific research domains. VRCs are formally represented within EGI at both a technical and strategic level.

## VIII. EXECUTIVE SUMMARY

The document describes operational procedures of the software support team in EGI. The team was formed by merge of the former DMSU (Deployed Middleware Support Unit in SA2) and TPM. The daily work of the team consists in assessing problem reports (tickets) coming through the EGI support entry point – the GGUS system, identifying software issues, investigating them in depth, and either providing a solution or reassigning the tickets to 3rd line support units (software developers), typically accompanied with a request to fix a software defect. Besides attending to these tasks the team's expertise can also be applied to producing documentation and consulting on user requirements arriving to EGI.

In PY3 the team handled 701 tickets in total. Out of those 28% were solved by the team, which is an improvement over PY1 (10%) and PY2 (22%). The upcoming period will be affected by the end of EMI and IGE projects, the principal providers of software components to EGI. The impact of that change is evaluated in this Document. Because most of the developer teams committed to carry on providing the support at comparable level, the core of software support process is not endangered. Minor issues emerging from the more loosely coupled coordination of the independent teams are addressed, in particular coordination when multiple developer teams are involved, and an augmented process of closing tickets when component release is delivered.

# TABLE OF CONTENTS

# 1 INTRODUCTION

EGI infrastructure heavily depends on the middleware and other deployed software, which are externally provided by various Technology Providers. Therefore the Deployed Middleware Support Unit (DMSU) was proposed as a team of experts possessing sufficient knowledge of the middleware used in the EGI infrastructure to deliver second level support, thus being able to manage software incidents, while being internal to the project (and the whole EGI.eu-NGI ecosystem), independent on the actual software providers, who are responsible of third level support

Initially, DMSU was a task of SA2, and focused on grid middleware only, forming a specific support unit at the 2nd line of the EGI support infrastructure. A detailed description of its role, internal processes, and interactions was given in [R1, R2, R3]. During the first two years of the project, non-trivial overlaps with the 1st line support (Ticket Process Manager, TPM), were identified, and changes targeting merge of TPM with DMSU and adjusted procedures were proposed. Details of the proposal are given in [R4], its foreseen impact is discussed in [R3]. The changes were implemented in PQ10.

Section 2 describes the new mode of operation and experience with it over approximately eight months. Section 3 briefly summarizes other tasks of the software support team, not directly related to handling GGUS tickets. In Section 4 various metrics describing the work of the team are discussed. Finally, Section 5 deals with the challenges emerging from the end of EMI and IGE projects, the principal software providers for EGI.

# 2 SOFTWARE SUPPORT OPERATION PROCEDURES

This section describes software support operation in a stable state after several months in the new mode as proposed at the end of PY2 and implemented after approval in September 2012.

## 2.1 The 1st line support – role of TPM

TPM represents the 1st line support of the EGI infrastructure as a whole, processing all the reported incidents. The primary entry point for the users is the EGI helpdesk (GGUS).

From the software support point of view, the main TPM task is the identification of software incidents, i.e. of problems that may indicate a bug in the deployed software, non-trivial configuration problems, lack of software documentation, etc. Such GGUS tickets are assigned to the DMSU support unit for further investigation by software experts in the team. Despite the legacy DMSU name is kept, its area of expertise is not restricted to the grid middleware only; it covers the majority of software deployed in the EGI infrastructure supported in GGUS.

Unlike in the initial years of the project the TPM effort is now concentrated on one project partner only (INFN). This change proved to save non-trivial overhead related to regular weekly passing of the TPM shift duty between the partners who were originally responsible of the task, and the internal organization of the team on duty.

Moreover, there is non-trivial personal overlap of the TPM team with the team of software experts. Therefore communication shortcuts exist, saving additional overhead on passing software tickets from the 1st to the 2nd line support. Another achievement was the improved accuracy of ticket assignment to DMSU, visible in the decrease of the auxiliary metric "tickets assigned back to TPM" (see Sect 4).

## 2.2 Software ticket triage and resolution

Upon assignment of a software ticket to DMSU priority of the ticket is assessed by the assigning TPM person; due to the strong integration of TPM and the software support team, the person either has sufficient expertise, or there are other team members available to consult immediately. In case of high priority ("very urgent" and "top priority" in GGUS) the work on the ticket resolution is triggered immediately by contacting an expert in the particular area.

The work on lower priority tickets starts in a "best-effort way", based on email notifications sent by GGUS on assignment to the DMSU mailing list. A team member with appropriate expertise starts working on the ticket, adding a correspondence to the GGUS ticket (either contacting the user with e.g. request for further information, or making an internal comment to let the other team members know that he/she is working on the ticket).

This approach, which covers many cases anyway, is complemented by regular "open ticket sweep" meetings of the team on every Tuesday and Thursday. The meetings are held in a chat room (this approach has been proven to be more ergonomic than phone meetings of such length and frequency), and all the open tickets are revisited, discussing their progress, and exchanging ideas among the team members. Typically, on each ticket an update on the solution progress is recorded.

The final outcome of ticket analysis, either done by a supporter individually, or on the meeting, can be classified as follows:

- A solution to the problem is found. Typically, this is a configuration or usage issue, which is not a consequence of software bug. The solution is thoroughly described within the ticket and it is closed. In average, approx. 25% of tickets can be solved in this way.
- The problem is related to a software bug or, less frequently, an issue in documentation, recommended configuration, or other artefact for which the particular Product Team is responsible. In this case, the problem is thoroughly described, precise conditions to reproduce

it are given if possible, and hints on the affected sub-components, libraries, functionalities in the code are provided eventually. Then the ticket is reassigned to the appropriate 3rd line support unit of the responsible Product Team.

- In the rare case DMSU can't proceed with the ticket analysis due to lack of expertise, the ticket is reassigned to the Product Team unit as is. However, this only concerns a negligible fraction of tickets.

## 2.3 Ticket oversight and follow-up

The oversight of open tickets in DMSU is done automatically twice a week during the DMSU chat meetings. This sweep through all the open tickets makes sure that no tickets are left without supporter's reaction for more than three working days. This is sufficient for the vast majority of tickets which have lower priorities. The less frequent high-priority tickets are always assigned to a specific supporter who has the responsibility to proceed with the ticket quickly.

On the other hand, tickets may get stuck in the "waiting for reply" state when further information from the user is requested. If the user does not respond for longer than a week, reminders are sent regularly. If the user still does not respond for a month, such ticket is closed, assuming the user is not interested in solving the issue anymore. The user can still reopen the ticket any time, though. This process will be automated in PQ13 by GGUS[1].

Once the ticket is reassigned to a 3rd line support unit, the responsibility is transferred to the particular Product Team. The product teams are obliged to react to the ticket in a given time, depending on the priority, as described by the SLAs between EGI and the technology providers [R5, R6]. Compliance to the agreed service level targets is continuously monitored by the software support team (starting with PY3 this task was assigned to the KIT team, who is also responsible for running the GGUS system, and have the expertise and automated tools needed to effectively run this task). Reminders are sent when the deadlines are approaching or they were missed, and regular statistics on the SLA violations are generated and reported to TCB. The process of periodically reminding supporters when a contribution is needed will be also automated in PQ13[2].

Further on, reminders on tickets that were not touched for longer time are generated as well.

During PY1 and PY2 the issue of a growing backlog of unsolved tickets with the technology providers appeared. It was repeatedly discussed at TCB, and an approach of automatically closing such unsolved tickets was proposed. Details are described in [R3]. However, a fairly surprising outcome of PY3 is that deploying such a heavyweight procedure is not necessary anymore. Instead, after having communicated the importance of the issue to the technology providers, and having started to send thorough reminders described above, the situation improved considerably. At the time of this writing, there are only about 100 tickets assigned to third level support teams in an open state older than two months (i.e. having missed a typical release cycle). Because these tickets are distributed among 30 Product Teams, their average number per team is quite acceptable. Moreover, the number of such tickets decreases exponentially with their age, and all of them appear to be active – there is still occasional communication between the submitter and the software developers for further clarification of the issue.

[1] The workflow of the new GGUS automated process is described at: https://wiki.egi.eu/wiki/FAQ_GGUS-Waiting-For-Submitter-Process.

[2] The workflow of the new GGUS automated process is described at: https://wiki.egi.eu/wiki/FAQ_GGUS-Waiting-For-PT-Process

# 3 OTHER SOFTWARE SUPPORT TASKS

## 3.1 Monitoring user fora

Similarly to previous periods, software support team members follow other user and system administrator's fora and both international and national mailing lists, where problems related to the same software are discussed. The team members contribute to discussions there, and bring issues with broader impact as new GGUS tickets. The following are the main ones:

- lcg-rollout@jiscmail.ac.uk – legacy named list used for discussing deployment problems at many EGI sites
- unicore-support@lists.sf.net – main support channel for UNICORE middleware, installation and configuration questions as well as runtime problems and site specific UNICORE extensions are discussed there.
- dpm-users-forum@cern.ch – active list for DPM specific issues
- user-forum@dcache.org – specific dCache mailing list
- nordugrid-discuss@nordugrid.org – operational issues of NorduGrid. ARC Bugzilla is also followed.

## 3.2 Requirement assessment

Some of tickets arriving to software support are classified (either initially or during their analysis) as requirements requesting new functionality. In addition, resolving incident tickets may yield further requirements on functionality. The software support team assesses such requirements in terms of estimated effort to implement the requested changes. If the effort is not large, the requirements are assigned to the 3rd line support as low priority tickets. On the contrary, in the case of considerable estimated effort a ticket is spawned through the standard EGI requirements gathering channel – the requirements queue in EGI RT.

On the other hand, the requirement evaluation team of EGI may need to request the team expertise to assess an arriving requirement. Technically, this is processed as a ticket submitted to GGUS which is analyzed, commented properly, and closed then. Again, such requests are quite rare, not consuming large effort. The most important case in PY3 was the discussion of integration of the Globus Online file transfer service with EGI storage services relying on the SRM OGF standard.

## 3.3 Feedback to EGI Operations and production of documentation

Some of the issues identified during ticket resolution may not affect only the individual submitter but can have a broader impact. In order to make the EGI operations teams and users aware of such issues, the software support team provides digests of such problems. In particular, symptoms, impact, and possible workarounds are documented and the issues are reported to the regular Operations meetings[3].

The team expertise is also available for preparation of specific documentation which targets specific middleware usage on the EGI infrastructure and which reaches beyond the standard documentation provided by technology providers. Unlike PY2 there was no strong demand for such documentation in PY3, though.

[3] https://wiki.egi.eu/wiki/Grid_Operations_Meetings

# 4 METRICS

In PY3, the software support handled 701 tickets in total (the tickets handled in PY2 amount to 786). Fluctuations are usually related to the release calendar of new software versions. Out of those 701 tickets, 195 (28%) were solved by the EGI software support team, which indicates an improvement over PY1 (10%) and PY2 (22%), which is due to the increased expertise of the team. Detailed numbers of tickets handled per quarter are shown in the table below.

| Metric | PQ9 | PQ10 | PQ11 | PQ12 |
|---|---|---|---|---|
| Number of tickets assigned to DMSU | 179 | 157 | 173 | 192 |
| Number of tickets solved by DMSU | 40 | 48 | 52 | 55 |
| Number of tickets reassigned to TPM | 22 | 8 | 6 | 3 |
| Number of tickets assigned to 3rd level support units | 116 | 105 | 130 | 131 |
| Mean/median time to solve software support tickets in days | 18.9/10.8 | 28.5/11.1 | 19.1/4.0 | 15.3/2.1 |

**Table 1 Numbers of software tickets and solution times per PY3 quarter**

In particular, the number of tickets assigned back to TPM dropped to 39 (5%) with a clear decreasing trend. This reflects the change in the procedure, tickets related to batch systems and operational tools don't require to be bounced back through TPM anymore, and they are reassigned directly. The remaining few tickets reflect wrong initial assessment of an operational problem. In PQ11 and PQ12 the ratio of such tickets dropped to 2.5% which is more than an acceptable error rate. It also witnesses the advantage of merging TPM and DMSU teams.

The overall average ticket solution time is 20 days while the median is 5 days. Given that many of the tickets require rather complicated analysis, and in most cases additional information from the submitter is required (and waiting time for the submitter counts to this metric), these figures are acceptable. Most of the contributions to the fairly high average come from PQ9 and PQ10 which cover the vacation period when the submitter responses tend to take long time obviously.

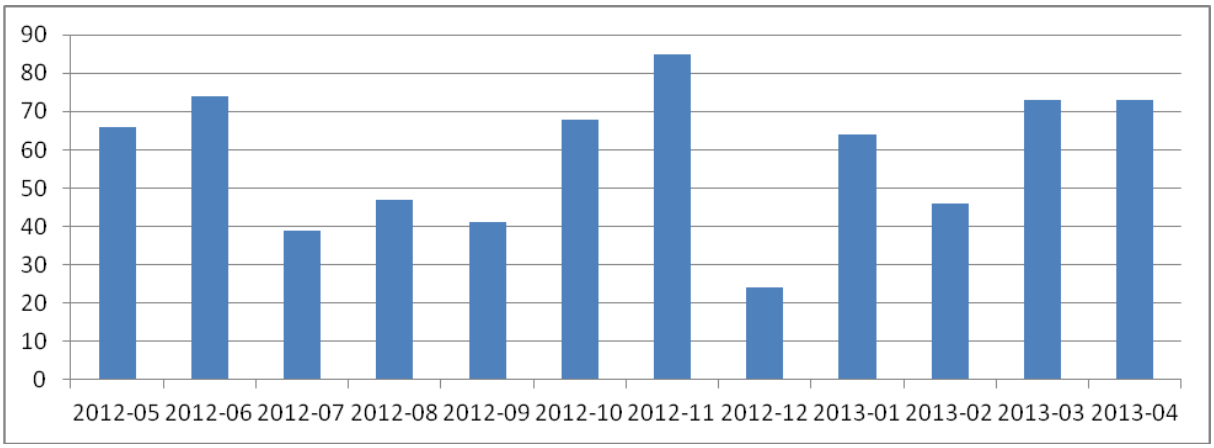


**Figure 1 Number of tickets assigned to DMSU per month**

Monthly distribution of tickets assigned to DMSU is shown in Figure 1. Apart from vacation periods (July-September and December) the load is fairly uniform (the peak in November and drop in February seem to be random fluctuations).

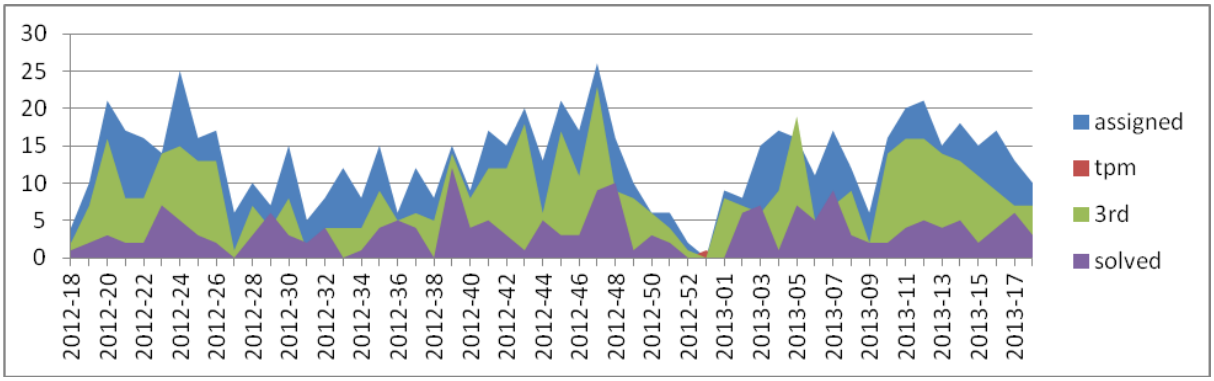


**Figure 2. Weekly distribution of software tickets assigned, solved, and reassigned**

Finally, the weekly ticket distribution is shown in the figure above, mostly for completeness and for comparison with [R3]. The high oscillations in this graph allow observing that typically the number of tickets reassigned to 3rd line support closely follows the number of assigned tickets – this indicates that tickets related to software bug are identified quickly and they are reassigned to the appropriate 3rd line support units without unnecessary delay. This can be also supported with auxiliary metrics: the average and median times to reassign a ticket to 3rd line support are only 2 days and 53 minutes respectively in PY3.

# 5 TRANSITION TO THE POST-EMI/IGE ERA

The projects EMI (the European Middleware Initiative) and IGE (Initiative for Globus in Europe) were the principal technology providers to EGI for the first three project years. However, because of the middleware architecture, where many of EMI components depend (directly or indirectly) on Globus, the relationship of EGI to those two projects was quite different in terms of EGI software support. Besides being a collection of individual product teams, the EMI project funded third level support and also served as an umbrella organization arching over all its product teams who were, in turn, responsible for their respective products. On the contrary, IGE used to deliver quite few products only, and a majority of them had to be integrated with EMI products first, while only a minority was accepted into EGI's repository independently.

Both projects came to an end in spring 2013, on 30 April or 31 March, respectively. For DMSU, this meant focusing on several major objectives for ensuring continuity of support:

1) Defining the commitment of each individual product team to provide support through GGUS to ensure that tickets reaching the third level escalation step receive enough support;

Defining the type of responsiveness that individual product teams are willing to provide to EGI users and operators through GGUS;

2) Maintaining communication with technology providers.

This section explains how the objectives are going to be achieved.

## *5.1 Service Level Declarations*

There were Service Level Agreements (SLAs) between EGI and EMI [R5], and between EGI and IGE [R6], which – among others – defined communication channels and reaction times. According to those SLAs, the Global Grid User Support (GGUS) Portal was accepted as the main channel for reporting and tracking issues. Reaction times were specified in both SLAs thus:

| Severity Level | Response Time |
|---|---|
| Severity 1 | 4 hours within working hours |
| Severity 2 | 2 working days |
| Severity 3 | 5 working days |
| Severity 4 | 15 working days |

**Table 2 Response times defined by the SLAs between EGI and EMI, and between EGI and IGE**

The majority of Product Teams formerly gathered within the EMI or IGE have pledged to continue supporting and/or developing their respective products. They have likewise pledged to continue serving support requests registered through GGUS.

In a survey organized in April 2013, Product Teams were also asked to declare their target response times for service tickets received through GGUS. The teams were requested to sign up for one of 3 pre-defined response time levels, build up from the values selected in the former SLAs. Results of the survey are summarized in Table 3. Most Product Teams, representative of core products used within the EGI infrastructure, have pledged to provide reaction times of no more than five days for all levels of severity. Among them, however, over ½ also declared that they would react within one working day to higher-severity issues.

| Severity Level | Response Time | | | |
|---|---|---|---|---|
| | *Level unspecified* | *Level 1* | *Level 2* | *Level 3* |
| Severity 1 | Best effort | 5 working days | 1 working day | 4 hours |
| Severity 2 | Best effort | 5 working days | 1 working day | 1 working day |
| Severity 3 | Best effort | 5 working days | 5 working days | 1 working day |
| Severity 4 | Best effort | 5 working days | 5 working days | 5 working days |
| | 9 % – Grid-SAFE, Ogsa-dai | 41 % – ARGUS, BES-GRAM, CERN Data, gLite MPI, Globus Appliances, GridWay, GSISSH-Term, NORDUGRID-ARC, SHIWA-GT5-Adapter | 45 % – CERN BDII, CREAM, dCache, EMIR, gLite security, L&B, NGI_CZ/Metacentrum, QCG, UNICORE, VOMS-StoRM 9 % – GGUS | |

**Table 3 Response times declared by product teams in a Post-EMI/IGE Era survey**

Table 2 suggests that although service level will diminish for a minority of products, overall the response times of individual product teams will remain similar to what they were while the SLA was in place. In addition, EGI is also negotiating with Product Teams to see if they are willing to enter their separate service level agreements, rather than just declaring the target levels, but that is an on-going activity at the time of this writing.

## 5.2 Communication Channels

The overall mode of communication between DMSU and the technology providers required only little change. In respect of issues affecting individual middleware products, i.e. a majority of reported issues, DMSU was already communicating directly to individual product teams within EMI. There were only a few types of issues where EMI needed to be contacted at a project level. These are discussed in the following subsections.

### 5.2.1 Repository Issues

Occasional dependency issues in the EMI repositories – caused typically by missing dependencies, or by the necessity to keep older versions of updated components available – were formerly reported to, and taken care of, by the EMI release manager. Since the end of the EMI project, there are new ways of resolving repository issues, depending on their nature:

- **Product-specific repository issues** – in cases where a specific dependency or other repository adjustment is required by a single product distributed from its own distribution repository, the change may be requested to the respective Product Team and implemented in their own distribution repository. As explained above, DMSU already communicates with individual product teams on other product-specific issues, and this kind of repository issues may now be resolved over the same channel.

Direct communication is also used if the Product Team makes its product available through a distribution-wide repository such as Fedora/EPEL or Debian.

• **Wider-scope distribution repository issues** – expecting the decommissioning of the EMI repository, EGI invited the representatives of existing product teams as well as former EMI release management to join the UMD Release Team (URT). By doing so, the expertise required to manage a middleware distribution repository is still available within EGI. At the time of this writing, the original EMI repository is still maintained, and can be used as an up-stream source of fixes, even for repository issues. Should it fail to provide timely updates, or should it get decommissioned, eventually, it would still be possible to fix these kinds of issues directly in UMD through the URT, which – as explained above – now possesses adequate expertise.

For the purpose of DMSU, the URT can now be contacted to resolve issues that would have been formerly forwarded to EMI.

Aside of the URT, the institutes formerly participating in EMI have also started a Middleware Development and Innovation Alliance (MeDIA), which could potentially serve as another central point of contact with technology providers in the future. At the time of this writing, however, MeDIA is not yet fully operational and cannot be evaluated as a point of contact for the DMSU.

### 5.2.2 Issues concerning multiple Product Teams

Occasionally the DMSU does not possess enough expertise to decide which product is responsible for a reported issue. In those cases, while EMI existed, DMSU could forward the issue to a catch-all EMI Support Unit, and passively monitor the resolution process while the responsible team was identified and the issue assigned within EMI. After EMI ended, DMSU no longer has this option and must identify the responsible product team. This may be achieved in two ways:

- Since the majority of Product Teams remain grouped in post-EMI collaborations such as MeDIA, the technical staff of multiple Product Teams with suspected responsibility for the issue can be contacted, and they can also rely on those channels to request assistance from other teams or coordinate their response. MeDIA, for instance, has been established specifically with maintaining mutual awareness as one of its goals.
- Issues can be difficult to attribute to a single product team if a chain of products is affected and the problem manifests itself in a product different from the one causing it. Still, DMSU should be able to rely on experts for the obviously affected product to analyse the issue and suggest the direction for further investigation. While this analysis is normally done by the DMSU, in rare cases it is justified to ask the producers of the affected component for clarification and help. Also, members of other SUs are allowed to contribute to tickets assigned to a different SU, which simplifies and speeds up resolution of any such issue.

Finally there can be issues that actually affect multiple products. While EMI represented a single point of contact for multiple product teams, it was possible to maintain a single thread of communication with EMI. After that project ended, communication on such issues must be maintained with individual product teams separately, which increases the load a little, but is manageable.

## *5.3 Accepting a component release and closing tickets*

Another aspect of EMI coordination, which will not be followed directly anymore, is a strong coordination of the component releases. All the EMI components were released in some of EMI major releases or updates containing minor or revision releases, not individually. Numerous integration and smoke tests were run as a part of the EMI release process, therefore the probability of a release of incompatible or otherwise interfering component versions was reasonably low. Then the EMI releases were taken by the EGI UMD team, and after passing the validation and verification process the releases were included in UMD in a generally deterministic timeframe. The agreed process included

closing software tickets by the developers once a release which fixed the issue was done by the technology provider. Because the coordinated EMI/IGE/dCache releases were taken up by UMD regularly, the arrival of the fix to the infrastructure (i.e. its availability to the reporting user) was expected in few weeks only, after the verification and stage rollout periods.

In the upcoming period, the release process will be loosely coupled. This will inevitably increase the danger of unintended introduction of incompatible changes and other interferences among the components. Therefore, the whole UMD release process will be augmented. Therefore it is not feasible to close the tickets on delivery of the component; however, it is also not possible to leave the burden of the tickets on the Product Team because they cannot directly influence this stage of the release process.

The current proposal suggests adding a new stage to the ticket life cycle. In order to implement the changes the following must be done:

- introduce a new “UMD release” support unit in GGUS
- define an additional “fixed component version” field in GGUS
- implement automated support of closing tickets upon release
- include the process in the ticket oversight

Once a fix is available and the corresponding component release is finished by the Product Team, the new component version is recorded with the ticket, and it is passed on to the new support unit “UMD release” instead of being closed directly.

When the new component release passes the UMD verification and stage rollout, all the tickets referring to this or older versions of the component are closed. Because the information of released components is available in the UMD repository, this step can be automated.

When, for some reason, the component release is rejected by UMD, the ticket remains with the UMD SU, and it will be closed by the same process on the next component release which makes its full way to UMD.

Finally, the process must be complemented with semi-manual ticket oversight. In particular, tickets that remain with UMD SU too long must be assessed and appropriate actions have to be taken. This task is foreseen to be done by the ticket oversight team within the software support unit. For the time being no automated support is planned, it may be introduced later if the experience shows the real number of tickets that have to be handled in this way is too high.

# 6 CONCLUSION

In PY3, the core of the software support team that deals with handling software related tickets, worked along the procedures started in PY1 and refined in PY2. The performance of the team gradually improves. This is witnessed by the increasing ratio of tickets being resolved by the team itself, without reassigning them to the 3rd line support.

The proposed merge of TPM and DMSU teams, as proposed in [R3] was implemented successfully.

The upcoming challenge is the end of the EMI and IGE projects, which may have some impact on the work of software support as well. However, the vast majority of the product teams committed to provide support to their products on comparable service targets using GGUS as the principal interface. For this reason most of the software support processes adopted by EGI will be only moderately affected.

Any issues that may emerge in PY4 related to the more loosely coupled coordination of support and release of the individual products after EMI and IGE will be handled through appropriate mitigation actions.

# 7 REFERENCES


| | |
|---|---|
| **R 1** | MS502: DMSU Operations Procedures, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/69 |
| **R 2** | MS507: Deployed Middleware Support Unit Operations Procedures, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/504 |
| **R 3** | MS511: Deployed Middleware Support Unit Operations Procedures, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/1134 |
| **R 4** | Revision of TPM and DMSU activities, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/1104 |
| **R 5** | SLA with EMI, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/461 |
| **R 6** | SLA with IGE, HTTPS://DOCUMENTS.EGI.EU/DOCUMENT/442 |