

# Request for feedback to the Requirements Gathering Task Force

- [1. Support & management of "availability" profiles](#)
- [2. Support & management of POEM profiles](#)
- [3. Support factors in the A/R calculations](#)
- [4. VO topology information](#)
- [5. Data retention](#)
- [6. Web interface for recalculations](#)
- [7. Graph visualizations on the web UI](#)

## 1. Support & management of "availability" profiles

*Date: 20130723*

### What are the “availability” profiles?

The availability profiles are used to define logical rules on how to aggregate individual status computations into groups through which we calculate the availability and/or reliability metrics. For example, an availability profile defines how the statuses of the Service Endpoints of a specific Service Flavor within a site are taken into account when calculating the status & availability score for that specific Service Flavor. One use case to consider for example is how the availability and reliability metrics of two service endpoints within the same site and of the same service flavor are aggregated. The common practise (i.e. ACE) is to combine such results within an ‘OR’ statement but maybe an extension to that policy should be made depending on service flavor etc. Another interesting use case to consider is how the service flavors results are combined in order to produce a site or NGI A/R metrics. Within ACE this is performed with a flat ‘AND’ logic but maybe alternative policies for calculating the overall results based on weights per service flavor should be discussed.

### Where do we use the “availability” profiles in the A/R Comp Reports?

The “availability” profiles are used in various different stages of the A/R computation:

1. When calculating the A/R of a service flavor we need to know what algorithm we should apply. For example on Site A, there are two service endpoints providing the CREAM-CE flavor. availability Profile A might require that only one service endpoint of a specific service flavor should be up in order to consider the Service Flavour as UP.
2. When calculating the A/R of Site. For example an algorithmic profile might define that for calculating the Site A/R we should aggregate the A/R results from X,Y,Z Service Flavors. Taking this one step further, we could support for different factors for each Service Flavor

(See other request for requirement)

3. When calculating the A/R of an NGI. In this case we need to know how we will aggregate the A/R results of each individual site. For example the availability profile that is used by ACE now, defines that in order to calculate an NGI A/R we aggregate the Site A/R that are weighted with the HEPSPEC value of each Site.
4. When calculating A/R of a VO. For example availability profile A might define that if a service in the list of services is available, the whole group of service is available. Availability profile B might define that the availability is given as average value of all availabilities. And availability profile C might define that if the percentage of available services ( $av=1$ ) in the list is greater than the specified threshold then the availability of the group is equal to one otherwise equal to 0

### **Do we need the ability to define custom “availability” profiles?**

In the current implementation of ACE, there is no notion of availability profiles. The algorithm used for providing the aggregated calculations is hardcoded in the ACE engine and thus it is not possible to provide custom-made A/R reports. This has been one of the major issues that EGI had with ACE and that partially led to the Comp Report mini project.

The availability profiles will be defined in a simple to use and understand format based on logical expressions. Some such examples for a site including 4 types of service endpoints (CREAM-CE, ARC-CE, SRM and FTS) would be:

- (CREAM-CE OR ARC-CE) AND (SRM OR FTS)
- $p \cdot (\text{CREAM-CE OR ARC-CE}) \text{ AND } (1-p) \cdot (\text{SRM OR FTS})$
- $p \cdot (\text{CREAM-CE OR ARC-CE}) \text{ AND } p' \cdot \text{SRM AND } p'' \cdot \text{FTS}$ , where  $p+p'+p''=1$

### **Any limitations / caveats?**

The raise in the number of availability profiles will lead to a significant raise in the computational resources needed for calculating A/R. The definition of custom availability profiles for the central instance, should be limited only to authorized staff of EGI.eu and should have an upper limit for the number of supported profiles.

### **Effort Estimation**

In order to implement this functionality we will require 2.5 PMs for:

- making the calculation engine capable of accepting multiple “availability” profiles
- implementing this functionality within the API exposed towards the operations portal
- developing a profiles management interface for users of the service.

**Feedback from the Requirements Gathering Task Force**

The Task Force agrees with proposed plan and considers this feature to be of **HIGH PRIORITY**

## 2. Support & management of POEM profiles

*Date: 20130723*

### **What are the POEM profiles?**

POEM profiles group different metrics for specific Service Flavors (e.g. CREAM-CE) and should not be confused with the availability profiles. These profiles are used to configure NAGIOS and all other SAM components. The central point that hosts the POEM profile is the central gridmon instance (<http://grid-monitoring.cern.ch/poem>). In case of VO SAM instances POEM profiles are hosted on the VO SAM instance itself.

### **Where do we use the POEM profiles in the A/R Comp Reports?**

In order to calculate the status of each service endpoint we need to know which are the relevant metrics that we should take into consideration. This information is retrieved from the POEM profiles. Currently for a given service flavour all metrics are AND-ed. For each different POEM profile (combination of service flavors and metrics) we calculate a status result.

### **Do we need the ability to define additional POEM profiles?**

A/R calculations are currently performed for POEM profiles gathered from the central gridmon or VO SAM instances. The A/R engine is currently capable of retrieving profiles from multiple POEM instances and generating results based on fetched POEM profiles.

Enabling definition of additional POEM profiles will require deployment of POEM web portal and MyEGI PI interface on the A/R engine. This POEM instance would then be used only for generating A/R reports and not for configuration of NGI and VO SAM/Nagios instances.

The Requirements Gathering Task Force should provide feedback if definition of additional POEM profiles is required.

### **Do we need the ability to define have additional basic A/R calculation within POEM?**

In the current implementation results of all metrics for a given service flavor are AND-ed. There is no support for different logical operations (e.g. OR, XOR) nor support for different type of aggregations.

The Requirements Gathering Task Force should provide feedback if extension of basic algorithm on service flavors/metrics is required.

### **Any limitations / caveats?**

The set of services flavors and metrics must be in sync with the service flavors and metrics provided by the central gridmon instance or VO SAM instance. This functionality would be limited to mix and match existing service flavors and metrics. The reason for this limitation is because we only get results for service flavors and metrics defined on the central or VO POEM.

Extension of basic A/R calculation within POEM would require development of a new web interface for definition of algorithms for a given POEM profile.

### **Effort estimate**

In order to provide definition of additional POEM profiles we will need 1 PM to:

- run a simplified POEM web and MyEGI interface on top of A/R calculation service
- modify the POEM sync component to check if all the service flavor/metric tuple exist in the external POEM profiles.

In order to provide different A/R calculation within POEM profiles we will need extra 2 PMs to:

- develop a new interface for definition of algorithms (e.g. Metric1 AND (Metric2 OR Metric3))
- extend the A/R engine to use defined algorithms for a given POEM profile.

### **Feedback from the Requirements Gathering Task Force**

The Task Force believes that adding support of adding and managing POEM profiles directly in the A/R engine, would increase the complexity of the system without adding any value to the service. The suggestion of the Task Force is that this feature should be **REJECTED**

## **3. Support factors in the A/R calculations**

Date: 20130723

### **What do we mean about support of factors in the A/R calculations?**

Aggregating results for multiple sites requires handling results of each site differently. For example availability of sites with more CPUs is more important for the availability of the whole infrastructure. The current ACE implementation when calculating the NGI A/R applies a factor based on the HEPSPEC of each site to each individual site A/R before aggregating these results into the NGI A/R calculation.

### **Where do we use custom factors in the A/R calculations?**

Custom factors are used for generation of A/R report for group of sites (e.g. ops NGI A/R or VO A/R report):

- $\text{Avail(NGI)} = F(\text{SiteA}) \times \text{Avail}(\text{SiteA}) + F(\text{SiteB}) \times \text{Avail}(\text{SiteB}) + \dots$

ACE currently uses HEPSPEC as a factor in the calculation of the NGI A/R report. There is no support for additional/alternate factors and applying these to other types of aggregations (e.g. apply different weights to Service Flavors when calculating Site A/R).

### **Do we need the ability to define custom factors?**

In order to enable definition of custom factors for each site we propose using a static file which will contain factor for each site. Format of the file can be csv file. Operators of the service can generate the file by using custom script. We are planning to provide at least one example of script that will generate the file periodically with the HEPSPEC factors extracted from the Top-BDII. Users will be able to define multiple files that the A/R engine will use for generating aggregated A/R reports.

In addition web interface will be required for management of aggregation profiles and definition of file name that will contain factors for each site. Also, A/R engine needs to be extended in order to aggregate site results with custom factors provided in static file.

### **Any limitations/caveats ?**

Limitation of the proposed solution is that users need to generate factor static files. However, with this approach users are able to define multiple aggregated A/R reports. This approach assumes that all sites will be taken into account for aggregated A/R reports and it does not support more complex algorithms (e.g. A/R is 1 if certain percentage of sites is available).

### **Effort estimate**

In order to provide this functionality we will need 2 PMs to:

- define format of the file for definition of factors per site
- provide an example script for generating HEPSPC factor
- develop a new interface for definition of aggregated reports and the file that will be used for each report
- extend the A/R engine to support custom factors.

### **Feedback from the Requirements Gathering Task Force**

The Task Force believes that this would add extra flexibility and value to the service and should be considered as a **MEDIUM PRIORITY** feature.

## **4. VO topology information**

*Date: 20130723*

### **Why do we need separate retrieval of topologies for VOs**

For the NGI/EGI A/R calculations we retrieve the topology from the authoritative place, which is the GOCDB. In the case of VO A/R calculations, we need to know which subset of sites is part of that specific VO and this information is not provided by the GOCDB.

### **How do we perform VO topology retrieval today**

Currently the Operations Portal “synthesizes” a view of the VO topology by combining information retrieved from the TOP-BDII and enriched by the information provided by the GOCDB. Similar approach is used by SAM - component Aggregated Topology Provider (ATP) synchronizes topology information from multiple sources: GOCDB, OIM, Top-BDII and VO feeds.

### **Do we need a new way to retrieve VO topology?**

The information retrieved from the TOP-BDII is the information that Sites are publishing about a specific VO. This information is not controlled by the VO, but rather by each site independently. This has the effect that misconfigured or problematic sites might alter the “synthesized” view of the topology of a specific VO.

We propose an alternate method of retrieving VO topology based on what the VO considers as the VO infrastructure. Our solution will use the VO feeds that are generated and provided by

each VO SAM instance and in the case of the VOs, should be the authoritative place to discover what the VO considers as the VO infrastructure. In addition this source of topology information is the most relevant for A/R calculation because the VO SAM instance will send results only for service endpoints defined in the VO feed.

### **Any limitations/caveats?**

The VO feeds must be provided for each VO SAM instance. The information they include needs to be configured manually by the VO SAM instance operators. We do not consider this as a show stopper though, as this manual configuration is already mandatory for the SAM VO Nagios box. In addition we do not impose new requirement for manual configuration but rather reuse source of information used by the VO SAM instance

### **Effort estimate**

In order to provide this functionality we will need 0.5 PM to:

- extended the topology sync component to process the information from VO feeds.

### **Feedback from the Requirements Gathering Task Force**

The Task Force agrees with the proposal described in the document and suggests that this functionality is treated with **HIGH PRIORITY**

## **5. Data retention**

*Date: 20130723*

### **What data are we talking about?**

In order to calculate A/R we need to retrieve the metric results that are published to the Message Broker network. This set of data is what we call RAW DATA. On this initial data set we need to create a set of intermediate data (what we call EVALUATED DATA) that will help us in the end to calculate the A/R. This EVALUATED DATA correspond to the status computation per service endpoint with respect to time (the integral so to say that is being taken from the time-stamped initial data). Finally we have the final A/R RESULTS. To get from the RAW DATA to the EVALUATED DATA and the A/R RESULTS we make use of the POEM PROFILES, the registered on gocdb DOWNTIMES and the registered on gocdb TOPOLOGY information. The POEM PROFILES and the TOPOLOGY information is collected and saved once per day. The DOWNTIMES are collected -at the moment- dynamically prior to the Reliability calculations and

for the time period under evaluation.

### Do we need data retention?

In order to be able to perform recalculations, we will need to have available the source data for the period in which we can go back in time and perform the recalculation. Also, the A/R results should be available indefinitely. Our proposal:

- RAW DATA (1 month)
- POEM PROFILES (2 months - for 1 month in the past to do recalculations)
- TOPOLOGY (2 months - for 1 month in the past to do recalculations)
- EVALUATED DATA (2 months - for 1 month in the past to do recalculations)
  - TIMELINES (indefinite - needed also for MRS functionality)
- A/R RESULTS (indefinite)

### Any limitations/caveats?

No limitations are foreseen with the current data retention policies. If this would be to change (longer data retention periods especially for the RAW DATA and/or the EVALUATED DATA) we would need to reassess the storage resources availability.

### Effort estimate

In order to implement data retention policy we require 0.5PM.

#### Feedback from the Requirements Gathering Task Force

The suggestion of the Task Force is that the Data Retention periods should be a configurable option of the system and that the defaults proposed by the mini project are reasonable. This should be addressed as a **MEDIUM PRIORITY**.

## 6. Web interface for recalculations

*Date: 20130730*

- We will provide interfaces for the recalculation of availabilities / reliabilities.
- Once the figures have been computed the NGI Managers could access through an authenticated form to these interfaces.
- They will be allowed to exclude some specific metrics for a given site and compute availabilities / reliabilities again on the chosen time period



- Access rights will be granted with the NGI Manager roles defined in GOC DB

Estimation : 1 PM

## 7. Graph visualizations on the web UI

*Date: 20130730*

The different results and availability/reliability figures are available through reports. These reports will be accessible with different granularities and formats:

- The complete reports (hourly and daily details ) will be accessible during 2 months
- The monthly summary will be accessible during the whole project .
- Reports will be also generated for a given period.
- The figures will be downloadable in chart pictures , pdf , json , csv.

Estimation : 0.5 PM