Grid Resource Allocation Agreement Protocol

GRAAP-WG working session 1

Tuesday, 16 March, 2010

Munich, Germany

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GRAAP Sessions at OGF28

March 16, Location: HGB-A 022

- Session 1   15:00 – 16:30 Group discussion on the state of the group, recent activities, state of the experimental document, state of the WS-Agreement Negotiation GFD, WS-Agreement spec. polishing.
  (this session)

March 18, Location: HGB-A 014

- Session 2 10:30 – 12:00 Presentations of the proposed approach for negotiation. Group work on Negotiation draft document.

- Session 3 13:30 - 15:00 Continue group work on Negotiation towards a GFD with the WS-Agreement Negotiation specification.

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Agenda

- Status of the Working group

  - WS-Agreement Experience document

  - Now focusing on WS-Agreement-Negotiation

- Activities since last OGF

  - f2f meetings on negotiation in Sankt Augustin and Dortmund

  - Paperwork

  - Implementation

- State of the experience document

- Results of the sub-group meetings on negotiation

- WS-Agreement polishing

- Advance Reservation profile

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Status of the Working Group

- Status of the working group
    - Finished work on WS-Agreement Experience document
    - Now focusing on WS-Agreement-Negotiation
        - Need regular phone conferences to finish the draft

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Activities since last OGF

- ## Status of the Working group

  - ### WS-Agreement Experience document

  - ### Now focusing on WS-Agreement-Negotiation

- ## Activities since last OGF

  - ### f2f meetings in Sankt Augustin and Dortmund

  - ### Paperwork

    - Revision of the experience document and response to OGF editor

    - Draft of the WS-Agreement Negotiation specification

  - ### Implementation

    - Stable version of multi-round negotiation based on WS-Agreement 1.0 and initial negotiation proposal in the SmartLM project

    - Will be updated using the negotiation draft spec

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Experience document

- **State of the Experience Document**

  - Public comment ended October 30 2009

  - Received two comments

  - The document was revised taking into account most of the comments

  - A letter to the OGF editor was sent explaining why some comments did not result in changes of the document

  - Experience document now published as GFD.167

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Experience document - comments

- Toshi

> Minor comment on the Legend in Section 5 Constructs used in
>
> WS-Agreement – An Analysis
>
> There seem to be two kinds of ways of denoting yes and no:
>
> Y or y / N or n. Is there any difference in the meaning? If not then
>
> there should be a consistent way of denoting.
>
> Other wise, I think this document is very important in
>
> showing how WS-Agreement is actually used in various projects.

Replaced N by n and Y by y in the table.

Experience document - comments

- Jens

> The goals of the WS-Agreement specification is to standardise the terminology and the concepts, and the WSDL, for the WS-Agreement protocol.
>
> Example scenarios in GFD.107 cover job submission, advance reservation of resources, and negotiating QoS (called "service parameterization" in the document). All these scenarios appear to be covered by the experiences document.
>
> The experiences document does not discuss the expected behaviours of the service entities (agreement providers and consumers) described in GFD.107

Added a clarification in Section 4.

Experience document - comments

- Continued

The WS-Agreement implementations are used in grids with very diverse middleware stacks (GT4, GRIA, Unicore-based, etc) -- this is good because it means the software is applicable in a wide range of contexts.

Made this explicit in Section 4.

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Experience document - comments

- Continued

It is not immediately clear how many independent implementations there are. Section 5.1 suggests there are somewhere between six and eight -- are they completely independent or do they share code or libraries, eg. to implement the underlying WS-* protocols? More than one project used WSAG4J. In any case, it would appear there are "enough" implementations.

Added a clarification in Section 4 about the number of code independent implementations and those sharing a common framework.

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Experience document - comments

- Continued

> However, it would appear from section 7 that only two implementations have been used for interoperation testing. It would be helpful to have interoperation testing between other implementations.

The major purpose of section 7 is to show that interoperation is possible between two code-independent implementations and across different middlware stacks. Due to the different goals, foci and use-cases showing interoperability between implementations of the different projects would require a huge effort to converge to a minimal common use-case. However, in many of the projects several components use WS-Agreement to negotiate agreements on resource usage, thus in each of these projects we have different implementations of providers and consumers of WS-Agreement (also across administrative domains) showing the interoperability on the level of the language and protocol specification of WS-Agreement.

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Experience document - comments

- Continued

> Moreover, the interoperation testing appears to rely on XSLT to translate one WSRF format to another one, via an interoperability proxy. This may be outside the scope of WS-Agreement but does not bode well for interoperation. On the positive side, it does show that different implementations were used.

This translation with XSLT is required only because of the implementation of different WSRF versions in GT4 and UNICORE at the time of the interoperation tests.

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Experience document - comments

- Continued

Are there implementations in languages other than Java, specifically C or C++? None are mentioned in the experiences document. Successful interoperation between C/C++ implementations and Java implementations would be particularly convincing.

Added a clarification in Section 4.

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Experience document - comments

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- Continued

There is no doubt the WS-Agreement specification has been useful to the projects referred to in the experiences document. Conversely, there is no doubt that having a standard for WS-Agreement is useful because the projects have a need for this type of protocol and it's clearly better to have standard than for each project to "roll its own."

I would expect that if the WSRF interoperation problems were addressed(obviously outside the scope of the WS-Agreement projects), the two WS-Agreement implementations would fully interoperate. In other words, they actually do interoperate, the proxy is only needed to make the WSRF implementations interoperate. If this were true, my concerns about interoperations would just be that interoperation has been tested on only two implementations, it would be nice to see wider interoperation testing.

While I am also concerned about the lack of C++ implementations, there is clearly a lot of experiences with WS-Agreement in different projects, and the protocol fills a need. A lot of high quality work has been done by the group, and it shows in the documents. If the remaining concerns could be addressed in a satisfactory way, I would recommend that GFD.107 be promoted to full OGF standard

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Results of the sub-group f2f

- Three meetings after the GRAAP sessions at OGF27

  - During OGF in Banff (13.10.09)

  - Sankt Augustin (10.11.09

  - Dortmund (12.3.10)

  - Participants from University of Delft, Technical University of Dortmund, Technical University of Berlin, Fraunhofer Institute SCAI

- As result of the meetings we converged to the draft sent by Oliver

  - Generic

    - specific negotiation approaches are out of scope

    - but, different negotiation approaches (2 party negotiation, multi party negotiation, auctions, agent based negotiation) may be implemented using the spec

  - To be presented in detail in session GRAAP#2

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Negotiation spec roadmap

Now (03/10):   Discussion of draft spec during OGF28

Before OGF29 (06/10):   Finalisation of the spec through 4-weekly phone
                             conferences,

At OGF29 (06/10):   Final discussion of the spec

After OGF29 (07(09):   Submit to editor for public comment period

At OGF30 (10/10):   Revise spec taking into account the comments

After OGF30 (11/10):   Submit revised spec to editor to be published as
                             proposed recommendation

                             Start implementations

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WS-Agreement polishing (1)

A number of smaller issues have been reported after publication of GFD.107

1. Pages 14 and 15 talk about /wsag:Agreement/wsag:AgreementContext but the element is /wsag:Agreement/wsag:Context.

2. Page 16 references /wsag:Context/wsag:TemplateID instead of ...TemplateId (lowercase d)

3. In point 4.2.6.3.1 KPI Target (page 25), it says that the "KPITarget" element should contain a "KPIName" element and a "Target" element. In the schema, the second element is not named "Target" but "CustomServiceLevel" (page 57).

4. Occurrences of wsag:Location in the text (p. 21, 31) show the element to contain a xs:anyType. The XML Schema (p. 55) lists it as a xs:string however.

5. Section 4.2.6.3.1, page 25: <wsag:Target> in <wsag:KPITarget> should contain xs:anyType besides this, <wsag:Target> should be renamed to <wsag:CustomServiceLevel>, see bug artf6284

6. Section 4.2.6.4.2, page 27: <wsag:ValueExpr> in <wsag:Penalty> should contain xs:anyType

7. On page 27, the XML snipppet doesn't correspond to the xsd definition.
   Assesment vs Assessment
   ValueExpr vs ValueExpression

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WS-Agreement polishing (2)

A number of smaller issues have been reported after publication of GFD.107

8. Section "4 Agreement Structure" contains one occurrence of "TemplateID" which should be changed to "TemplateId".

9. In section 4.2.6.1 on page 23, xs:any should be followed by a question mark as it is optional.

10. The example in section 4.2.6.4.2 (p. 27) contains the tag "AssesmentInterval" twice – should be "AssessmentInterval"

11. Chapter 4.2.6.3 on page 25 contains "Service Leve lObjective" (wrong space)

12. The figure should contain the string "Terminated" instead of "Terminate" in section 7.1 (p. 34)

13. Page 78, Appendix 3: "Preference business values in guarantee terms can be used to guide which the choice of, for example, system configurations for jobs" To Guide which ?

14. Page 80, Appendix 4: "The example shows a service that defines a Web as well as a Web service interface. " That defines a Web?

15. Page 22, the <Variables> tag is introduced. This is a typo, it should be replaed by <VariableSet> as defined in the wsdl page 55

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WS-Agreement polishing (3)

Comments received after publication of GFD.107

1. The variables on page 22 define name, metric, and then location. Where is the
    unit defined? Would it also be relevant to define a type?
    For example, I would think that the bandwidth example on the same page could
    take as unit "Mbit/s", which then can be compared to the KPItarget of the
    Guarantee terms.

2. The TermStateType base-type allows to refer to a term by a termName attribute.
    For ServiceDescriptionTerms the name is not required to be unique. It makes
    sense to have two SDTs with the same name="RESOURCE_DESCRIPTION" but referring
    to different services with different serviceNames. Therefore, it would make
    sense to extend the TermStateType by an additional attribute serviceName.

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Advance Reservation Profile

Need to decide how to proceed with the initial proposal

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:ar="http://www.ogf.org/graap/AR/2009/04/"
    targetNamespace="http://www.ogf.org/graap/AR/
    2009/04/" attributeFormDefault="qualified" elementFormDefault="qualified">
  <xs:complexType name="TimeWindowType">
    <xs:sequence>
     <xs:element ref="ar:StartTime" minOccurs="0"/>
     <xs:element ref="ar:EndTime" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="StartTime" type="xs:dateTime" />
  <xs:element name="EndTime" type="xs:dateTime" />
  <xs:element name="AllocationTimeConstraint" type="ar:TimeWindowType" />
  <xs:element name="AllocationTime" type="ar:TimeWindowType" />
</xs:schema>
```

Received several comments, e.g. add Duration, support regularly repeated reservations (like in iCal), ...

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