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UML Profile for the Global Justice Information Sharing Initiative (Global) Reference Architecture (GRA) (GRA-UML)

Request For Proposal

OMG Document: gov/2013-09-20

Letters of Intent due: 31 *January 2014*
Submissions due: *21 February 2014*

Objective of this RFP

The objective of this RFP is to provide a standard for modeling Global Information Sharing Initiative (Global) Reference Architecture (GRA) artifacts (Services Specification Packages – SSPs) with UML.   (Please see Appendix A for the glossary of terms).

This RFP solicits proposals for the following which together shall comprise "GRA-UML":

- Build on the success of NIEM-UML (focused on data only) and leverage GRA to extend the development of an IEPD to a full services specification.

- UML profiles for modeling GRA SSPs: a profile that will enable the development of Platform Independent Models for GRA SSPs, and a second profile that provides the parameters required to transform the Platform Independent Models for GRA SSP to GRA conformant SSPs (the Platform Specific Model)

- A transformation from UML models that conform to the GRA profiles (described above) to GRA-conformant SSP artifacts

- Optionally, a transformation from a GRA-conformant SSP to a UML model that conforms to the profile(s)

Background:

The Global Reference Architecture (GRA) is an information exchange solution designed to reduce 80 percent of implementation time and costs for state and local justice agencies through reuse of established practices in IT architecture and design.

The GRA is developed and maintained under the governance of the Global Standards Council (GSC). GSC is part of the Global Justice Information Sharing Initiative (Global) which serves as a Federal Advisory Committee (FAC) and advises the U.S. Attorney General on justice information sharing and integration initiatives.

1   Introduction

1.1   Goals of OMG

The Object Management Group (OMG) is a software consortium with an international membership of vendors, developers, and end users. Established in 1989, its mission is to help computer users solve enterprise integration problems by supplying open, vendor-neutral portability, interoperability and reusability specifications based on Model Driven Architecture (MDA). MDA defines an approach to IT system specification that separates the specification of system functionality from the specification of the implementation of that functionality on a specific technology platform, and provides a set of guidelines for structuring specifications expressed as models. OMG has published many widely-used specifications such as UML [UML], BPMN [BPMN], MOF [MOF], XMI [XMI], DDS [DDS] and CORBA [CORBA], to name but a few significant ones.

1.2   Organization of this document

The remainder of this document is organized as follows:

Section 2 – *Architectural Context*. Background information on OMG's Model Driven Architecture.

Section 3 – *Adoption Process*. Background information on the OMG specification adoption process.

Section 4 – *Instructions for Submitters*. Explanation of how to make a submission to this RFP.

Section 5 – *General Requirements on Proposals*. Requirements and evaluation criteria that apply to all proposals submitted to OMG.

Section 6 – *Specific Requirements on Proposals*. Problem statement, scope of proposals sought, mandatory requirements, non-mandatory features, issues to be discussed, evaluation criteria, and timetable that apply specifically to this RFP.

Appendix A – References and Glossary Specific to this RFP

Appendix B – General References and Glossary

1.3   Conventions

The key words **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"** and **"need not"** in this document should be interpreted as described in Part 2 of the ISO/IEC Directives [ISO2]. These ISO terms are compatible with the same terms in IETF RFC 2119 [RFC2119].

1.4 Contact Information

Questions related to OMG's technology adoption process and any questions about this RFP should be directed to *rfp@omg.org*.

OMG documents and information about the OMG in general can be obtained from the OMG's web site: *http://www.omg.org*. Templates for RFPs (like this document) and other standard OMG documents can be found on the Template Downloads Page: *http://www.omg.org/technology/template_download.htm*

2 Architectural Context

MDA provides a set of guidelines for structuring specifications expressed as models and the mappings between those models. The MDA initiative and the standards that support it allow the same model, specifying business system or application functionality and behavior, to be realized on multiple platforms. MDA enables different applications to be integrated by explicitly relating their models; this facilitates integration and interoperability, and supports system evolution (deployment choices) as platform technologies change. The three primary goals of MDA are portability, interoperability and reusability.

Portability of any subsystem is relative to the subsystems on which it depends. The collection of subsystems that a given subsystem depends upon is often loosely called the *platform,* which supports that subsystem. Portability – and reusability – of such a subsystem is enabled if all the subsystems that it depends upon use standardized interfaces (APIs) and usage patterns.

MDA provides a pattern comprising a portable subsystem that is able to use any one of multiple specific implementations of a platform. This pattern is repeatedly usable in the specification of systems. The five important concepts related to this pattern are:

1. *Model* – A model is a representation of a part of the function, structure and/or behavior of an application or system. A representation is said to be formal when it is based on a language that has a well-defined form ("syntax"), meaning ("semantics"), and possibly rules of analysis, inference, or proof for its constructs. The syntax may be graphical or textual. The semantics might be defined, more or less formally, in terms of things observed in the world being described (e.g. message sends and replies, object states and state changes, etc.), or by translating higher-level language constructs into other constructs that have a well-defined meaning. The (non-mandatory) rules of inference define what unstated properties can be deduced from explicit statements in the model. In MDA, a representation that is not formal in this sense is not a model. Thus, a diagram with boxes and lines and arrows that is not supported by a definition of the meaning of a

box, and the meaning of a line and of an arrow is not a model – it is just an informal diagram.

2. *Platform* – A set of subsystems/technologies that provide a coherent set of functionality through interfaces and specified usage patterns that any subsystem that depends on the platform can use without concern for the details of how the functionality provided by the platform is implemented.

3. *Platform Independent Model (PIM)* – A model of a subsystem that contains no information specific to the platform, or the technology that is used to realize it.

4. *Platform Specific Model (PSM)* – A model of a subsystem that includes information about the specific technology that is used in the realization of that subsystem on a specific platform, and hence possibly contains elements that are specific to the platform.

5. *Mapping* – Specification of a mechanism for transforming the elements of a model conforming to a particular metamodel into elements of another model that conforms to another (possibly the same) metamodel. A mapping may be expressed as associations, constraints, rules or templates with parameters that to be assigned during the mapping, or other forms yet to be determined.

OMG adopts standard specifications of models that exploit the MDA pattern to facilitate portability, interoperability and reusability, either through *ab initio* development of standards or by reference to existing standards. Some examples of OMG adopted specifications are:

1. *Languages* – e.g. IDL for interface specification [IDL], UML for model specification [UML], BPMN for Business Process specification [BPMN], etc.

2. *Mappings* – e.g. Mapping of OMG IDL to specific implementation languages (CORBA PIM to Implementation Language PSMs), UML Profile for EDOC (PIM) to CCM (CORBA PSM) and EJB (Java PSM), CORBA (PSM) to COM (PSM) etc.

3. *Services* – e.g. Naming Service [NS], Transaction Service [OTS], Security Service [SEC], Trading Object Service [TOS] etc.

4. *Platforms* – e.g. CORBA [CORBA], DDS [DDS]

5. *Protocols* – e.g. GIOP/IIOP [CORBA] (both structure and exchange protocol), DDS Interoperability Protocol [DDSI].

6. *Domain Specific Standards* – e.g. Model for Performance-Driven Government [MPG], Single Nucleotide Polymorphisms specification [SNP], TACSIT Controller Interface specification [TACSIT].

For an introduction to MDA, see [MDAa]. For a discourse on the details of MDA please refer to [MDAc]. To see an example of the application of MDA see [MDAb]. For general information on MDA, see [MDAd].

Object Management Architecture (OMA) is a distributed object computing platform architecture within MDA that is related to ISO's Reference Model of Open Distributed Processing RM-ODP [RM-ODP]. CORBA and any extensions to it are based on OMA. For information on OMA see [OMA].

3 Adoption Process

3.1 Introduction

OMG decides which specifications to adopt via votes of its Membership. The specifications selected should satisfy the architectural vision of MDA. OMG bases its decisions on both business and technical considerations. Once a specification is adopted by OMG, it is made available for use by both OMG members and non-members alike, at no charge.

This section 3 provides an extended summary of the RFP process. For more detailed information, see the *Policies and Procedures of the OMG Technical Process* [P&P], specifically Section 4.2, and the *OMG Hitchhiker's Guide* [Guide]. In case of any inconsistency between this document or the Hitchhiker's Guide and the Policies and Procedures, the P&P is always authoritative. All IPR-related matters are governed by OMG's *Intellectual Property Rights Policy* [IPR].

3.2 The Adoption Process in detail

3.2.1 Development and Issuance of RFP

RFPs, such as this one, are drafted by OMG Members who are interested in the adoption of an OMG specification in a particular area. The draft RFP is presented to the appropriate TF, discussed and refined, and when ready is recommended for issuance. If endorsed by the Architecture Board, the RFP may then be issued as an OMG RFP by a TC vote.

Under the terms of OMG's Intellectual Property Rights Policy [IPR], every RFP shall include a statement of the IPR Mode under which any resulting specification will be published. To achieve this, RFP authors choose one of the three allowable IPR modes specified in [IPR] and include it in the RFP – see section 6.10.

3.2.2 Letter of Intent (LOI)

Each OMG Member organisation that intends to make a Submission in response to any RFP (including this one) shall submit a Letter of Intent (LOI) signed by an officer on or before the deadline specified in the RFP's timetable (see section

6.11). The LOI provides public notice that the organisation may make a submission, but does not oblige it to do so.

3.2.3 Voter Registration

Any interested OMG Members, other than Trial, Press and Analyst members, may participate in Task Force voting related to this RFP. If the RFP timetable includes a date for closing the voting list (see section 6.11), or if the Task Force separately decides to close the voting list, then only OMG Member that have registered by the given date and those that have made an Initial Submission may vote on Task Force motions related to this RFP.

Member organizations that have submitted an LOI are automatically registered to vote in the Task Force. Technical Committee votes are not affected by the Task Force voting list – all Contributing and Domain Members are eligible to vote in DTC polls relating to DTC RFPs, and all Contributing and Platform Members are eligible to vote in PTC polls on PTC RFPs.

3.2.4 Initial Submissions

Initial Submissions shall be made electronically on or before the Initial Submission deadline, which is specified in the RFP timetable (see section 6.11), or may later be adjusted by the Task Force. Submissions shall use the OMG specification template [TMPL], with the structure set out in section 4.9. Initial Submissions shall be written specifications capable of full evaluation, and not just a summary or outline. Submitters normally present their proposals to the Task Force at the first TF meeting after the submission deadline. Making a submission incurs obligations under OMG's IPR policy – see [IPR] for details.

An Initial Submission shall not be altered once the Initial Submission deadline has passed. The Task Force may choose to recommend an Initial Submission, unchanged, for adoption by OMG; however, instead Task Force members usually offer comments and feedback on the Initial Submissions, which submitters can address (if they choose) by making a later Revised Submission.

The goals of the Task Force's Submission evaluation are:

- Provide a fair and open process
- Facilitate critical review of the submissions by OMG Members
- Provide feedback to submitters enabling them to address concerns in their revised submissions
- Build consensus on acceptable solutions
- Enable voting members to make an informed selection decision

Submitters are expected to actively contribute to the evaluation process.

3.2.5 Revised Submissions

Revised Submissions are due by the specified deadline. Revised Submissions cannot be altered once their submission deadline has passed. Submitters again normally present their proposals at the next meeting of the TF after the deadline. If necessary, the Task Force may set a succession of Revised Submission deadlines. Submitters choose whether or not to make Revised Submissions - if they decide not to, their most recent Submission is carried forward, unless the Submitter explicitly withdraws from the RFP process.

The evaluation of Revised Submissions has the same goals listed above.

3.2.6 Selection Votes

When the Task Force's voters believe that they sufficiently understand the relative merits of the available Submissions, a vote is taken to recommend a submission to the Task Force's parent Technical Committee. The Architecture Board reviews the recommended Submission for MDA compliance and technical merit. Once the AB has endorsed it, members of the relevant TC vote on the recommended Submission by email. Successful completion of this vote moves the recommendation to OMG's Board of Directors (BoD).

3.2.7 Business Committee Questionnaire

Before the BoD makes its final decision on turning a Technical Committee recommendation into an OMG published specification, it asks its Business Committee to evaluate whether implementations of the specification will be publicly available. To do this, the Business Committee will send a Questionnaire [BCQ] to every OMG Member listed as a Submitter on the recommended Submission. Members that are not Submitters can also complete a Business Committee Questionnaire for the Submission if they choose.

If no organization commits to make use of the specification, then the BoD will typically not act on the recommendation to adopt it – so it is very important that submitters respond to the BCQ.

Once the Business Committee has received satisfactory BCQ responses, the Board takes the final publication vote. A Submission that has been adopted by the Board is termed an *Alpha Specification*.

At this point the RFP process is complete.

3.2.8 Finalization & Revision

Any specification adopted by OMG by any mechanism, whether RFP or otherwise, is subject to Finalisation. A Finalization Task Force (FTF) is chartered by the TC that recommended the Specification; its task is to correct any problems reported by early users of the published specification. The FTF first collaborates with OMG's Technical Editor to prepare a cleaned-up version

of the Alpha Specification with submission-specific material removed. This is the Beta1 specification, and is made publicly available via OMG's web site. The FTF then works through the list of bug reports ("issues") reported by users of the Beta1 specification, to produce a Finalisation Report and another Beta specification (usually Beta2), which is a candidate for Formal publication. Once endorsed by the AB and adopted by the relevant TC and BoD, this is published as the final, Formal Specification.

Long-term maintenance of OMG specifications is handled by a sequence of Revision Task Forces (RTFs), each one chartered to rectify any residual problems in the most-recently published specification version. For full details, see P&P section 4.4 [P&P].

4 Instructions for Submitters

4.1 OMG Membership

To submit to an RFP issued by the Platform Technology Committee an organisation shall maintain either Platform or Contributing OMG Membership from the date of the initial submission deadline, while to submit to a Domain RFP an organisation shall maintain either a Contributing or Domain membership.

4.2 Intellectual Property Rights

By making a Submission, an organisation is deemed to have granted to OMG a perpetual, nonexclusive, irrevocable, royalty-free, paid up, worldwide license to copy and distribute the document and to modify the document and distribute copies of the modified version, and to allow others to do the same. Submitter(s) shall be the copyright owners of the text they submit, or have sufficient copyright and patent rights from the copyright owners to make the Submission under the terms of OMG's IPR Policy. Each Submitter shall disclose the identities of all copyright owners in its Submission.

Each OMG Member that makes a written Submission in response to this RFP shall identify patents containing Essential Claims that it believes will be infringed if that Submission is included in an OMG Formal Specification and implemented.

By making a written Submission to this RFP, an OMG Member also agrees to comply with the Patent Licensing terms set out in section 6.10.

This section 4.2 is neither a complete nor an authoritative statement of a submitter's IPR obligations – see [IPR] for the governing document for all OMG's IPR policies.

4.3 Submission Effort

An RFP submission may require significant effort in terms of document preparation, presentations to the issuing TF, and participation in the TF evaluation process. OMG is unable to reimburse submitters for any costs in conjunction with their submissions to this RFP.

4.4 Letter of Intent

Every organisation intending to make a Submission against this RFP shall submit a Letter of Intent (LOI) signed by an officer on or before the deadline listed in section 6.11, or as later varied by the issuing Task Force.

The LOI should designate a single contact point within the submitting organization for receipt of all subsequent information regarding this RFP and the submission. The name of this contact will be made available to all OMG members. LOIs shall be sent by email, fax or paper mail to the "RFP Submissions Desk" at the OMG address shown on the first page of this RFP.

A suggested template for the Letter of Intent is available at http://doc.omg.org/loi [LOI].

4.5 Business Committee terms

This section contains the text of the Business Committee RFP attachment concerning commercial availability requirements placed on submissions. This attachment is available separately as OMG document omg/12-12-03.

4.5.1 *Introduction*

OMG wishes to encourage rapid commercial adoption of the specifications it publishes. To this end, there must be neither technical, legal nor commercial obstacles to their implementation. Freedom from the first is largely judged through technical review by the relevant OMG Technology Committees; the second two are the responsibility of the OMG Business Committee. The BC also looks for evidence of a commitment by a submitter to the commercial success of products based on the submission.

4.5.2 Business Committee evaluation criteria

4.5.2.1 *Viable to implement across platforms*

While it is understood that final candidate OMG submissions often combine technologies before they have all been implemented in one system, the Business Committee nevertheless wishes to see evidence that each major feature has been implemented, preferably more than once, and by separate organisations. Pre-product implementations are acceptable. Since use of OMG specifications should not be dependent on any one platform, cross-platform availability and interoperability of implementations should be also be demonstrated.

4.5.2.2 *Commercial availability*

In addition to demonstrating the existence of implementations of the specification, the submitter must also show that products based on the specification are commercially available, or will be within 12 months of the date when the specification was recommended for adoption by the appropriate Task Force. Proof of intent to ship product within 12 months might include:

- A public product announcement with a shipping date within the time limit.

- Demonstration of a prototype implementation and accompanying draft user documentation.

Alternatively, and at the Business Committee's discretion, submissions may be adopted where the submitter is not a commercial software provider, and therefore will not make implementations commercially available. However, in this case the BC will require concrete evidence of two or more independent implementations of the specification being used by end-user organisations as part of their businesses.

Regardless of which requirement is in use, the submitter must inform the OMG of completion of the implementations when commercially available.

4.5.2.3 *Access to Intellectual Property Rights*

OMG will not adopt a specification if OMG is aware of any submitter, member or third party which holds a patent, copyright or other intellectual property right (collectively referred to in this policy statement as "IPR") which might be infringed by implementation or recommendation of such specification, unless OMG believes that such IPR owner will grant an appropriate license to organizations (whether OMG members or not) which wish to make use of the specification. It is the goal of the OMG to make all of its technology available with as few impediments and disincentives to adoption as possible, and therefore OMG strongly encourages the submission of technology as to which royalty-free licenses will be available.

The governing document for all intellectual property rights ("IPR") policies of Object Management Group is the Intellectual Property Rights statement, available at: http://doc.omg.org/ipr. It should be consulted for the authoritative statement of the submitter's patent disclosure and licensing obligations.

4.5.2.4 *Publication of the specification*

Should the submission be adopted, the submitter must grant OMG (and its sublicensees) a worldwide, royalty-free licence to edit, store, duplicate and distribute both the specification and works derived from it (such as revisions and teaching materials). This requirement applies only to the written specification, not to any implementation of it. Please consult the Intellectual Property Rights

statement (http://doc.omg.org/ipr) for the authoritative statement of the submitter's copyright licensing obligations.

4.5.2.5 *Continuing support*

The submitter must show a commitment to continue supporting the technology underlying the specification after OMG adoption, for instance by showing the BC development plans for future revisions, enhancement or maintenance.

4.6 Responding to RFP items

4.6.1 Complete proposals

Submissions should propose full specifications for all of the relevant requirements detailed in Section 6 of this RFP. Submissions that do not present complete proposals may be at a disadvantage.

Submitters are encouraged to include any non-mandatory features listed in Section 6.

4.6.2 Additional specifications

Submissions may include additional specifications for items not covered by the RFP and which they believe to be necessary. Information on these additional items should be clearly distinguished. Submitters shall give a detailed rationale for why any such additional specifications should also be considered for adoption. Submitters should note that a TF is unlikely to consider additional items that are already on the roadmap of an OMG TF, since this would pre-empt the normal adoption process.

4.6.3 Alternative approaches

Submitters may provide alternative RFP item definitions, categorizations, and groupings so long as the rationale for doing so is clearly stated. Equally, submitters may provide alternative models for how items are provided if there are compelling technological reasons for a different approach.

4.7 Confidential and Proprietary Information

The OMG specification adoption process is an open process. Responses to this RFP become public documents of the OMG and are available to members and non-members alike for perusal. No confidential or proprietary information of any kind will be accepted in a submission to this RFP.

4.8 Proof of Concept

Submissions shall include a "proof of concept" statement, explaining how the submitted specifications have been demonstrated to be technically viable. The technical viability has to do with the state of development and maturity of the

technology on which a submission is based. This is not the same as commercial availability. Proof of concept statements can contain any information deemed relevant by the submitter; for example:

"This specification has completed the design phase and is in the process of being prototyped."

"An implementation of this specification has been in beta-test for 4 months."

"A named product (with a specified customer base) is a realization of this specification."

It is incumbent upon submitters to demonstrate the technical viability of their proposal to the satisfaction of the TF managing the evaluation process. OMG will favor proposals based on technology for which sufficient relevant experience has been gained.

4.9 Submission Format

4.9.1 General

- Submissions that are concise and easy to read will inevitably receive more consideration.

- Submitted documentation should be confined to that directly relevant to the items requested in the RFP.

- To the greatest extent possible, the submission should follow the document structure set out in "ISO/IEC Directives, Part 2 – Rules for the structure and drafting of International Standards" [ISO2]. An OMG specification template is available to make it easier to follow these guidelines.

- The key words **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"** and **"need not"** shall be used as described in Part 2 of the ISO/IEC Directives [ISO2]. These ISO terms are compatible with the same terms in IETF RFC 2119 [RFC2119]. However, the RFC 2119 terms **"must"**, **"must not"**, **"optional"**, **"required"**, **"recommended"** and **"not recommended"** shall not be used (even though they are permitted under RFC2119).

4.9.2 Mandatory Outline

All submissions shall use the following structure, based on the OMG Specification template [TEMPL]:

Section 0 of the submission shall be used to provide all non-normative supporting material relevant to the evaluation of the proposed specification, including:

- The full name of the submission

- A complete list of all OMG Member(s) making the submission, with a named contact individual for each

- The acronym proposed for the specification (e.g. UML, CORBA)

- The name and OMG document number of the RFP to which this is a response

- The OMG document number of the main submission document

- Overview or guide to the material in the submission

- Statement of proof of concept (see 4.8)

- If the proposal does not satisfy any of the general requirements stated in Section 5, a detailed rationale explaining why

- Discussion of each of the "Issues To Be Discussed" identified in Section 6.

- An explanation of how the proposal satisfies the specific requirements and (if applicable) requests stated in Section 6.

Section 1 and subsequent sections of the submission shall contain the normative specification that the Submitter(s) is/are proposing for adoption by OMG, including:

- Scope of the proposed specification

- Overall design rationale

- Conformance criteria for implementations of the proposed specification, clearly stating the features that all conformant implementations shall support, and any features that implementations may support, but which are not mandatory.

- A list of the normative references that are used by the proposed specification

- A list of terms that are used in the proposed specification, with their definitions

- A list of any special symbols that are used in the proposed specification, together with their significance

- The proposed specification itself

Section 0 will be deleted from any specification that OMG adopts and publishes. Therefore Section 0 of the submission shall contain no normative material, and any non-normative material outside section 0 shall be explicitly identified.

The main submission document and any models or other machine-interpretable files accompanying it shall be listed in an inventory file conforming to the inventory template [INVENT].

The submission shall include a copyright waiver in a form acceptable to OMG. One acceptable form is:

"Each of the entities listed above: (i) grants to the Object Management Group, Inc. (OMG) a nonexclusive, royalty-free, paid up, worldwide license to copy and distribute this document and to modify this document and distribute copies of the modified version, and (ii) grants to each member of the OMG a nonexclusive, royalty-free, paid up, worldwide license to make up to fifty (50) copies of this document for internal review purposes only and not for distribution, and (iii) has agreed that no person shall be deemed to have infringed the copyright in the included material of any such copyright holder by reason of having used any OMG specification that may be based hereon or having conformed any computer software to such specification."

Other forms of copyright waiver may only be used if approved by OMG legal counsel beforehand.

4.10 How to Submit

Submitters should send an electronic version of their submission to the *RFP Submissions Desk (rfp@omg.org)* at OMG Headquarters by 5:00 PM U.S. Eastern Standard Time (22:00 GMT) on the day of the Initial and Revised Submission deadlines. Acceptable formats are Adobe FrameMaker source, ISO/IEC 26300:2006 (OpenDoc 1.1), OASIS DocBook 4.x (or later) and ISO/IEC 29500:2008 (OOXML, .docx).

Submitters should ensure that they receive confirmation of receipt of their submission.

5 General Requirements on Proposals

5.1 Requirements

5.1.1 Use of modelling languages

Submitters are encouraged to express models using OMG modelling languages such as UML, MOF, CWM and SPEM (subject to any further constraints on the types of the models and modeling technologies specified in Section 6 of this RFP). Submissions containing models expressed using OMG modeling languages shall be accompanied by an OMG XMI [XMI] representation of the models (including a machine-readable copy). A best effort should be made to provide an OMG XMI representation even in those cases where models are expressed via non-OMG modeling languages.

5.1.2 PIMs & PSMs

Section 6 of this RFP specifies whether PIM(s), PSM(s), or both are being solicited. If proposals specify a PIM and corresponding PSM(s), then the rules specifying the mapping(s) between the PIM and PSM(s) shall either be identified by reference to a standard mapping or specified in the proposal. In order to allow possible inconsistencies in a proposal to be resolved later,

proposals shall identify whether it's the mapping technique or the resulting PSM(s) that shall be considered normative.

5.1.3 Complete submissions

Proposals shall be *precise* and *functionally complete*. Any relevant assumptions and context necessary to implement the specification shall be provided.

5.1.4 Reuse

Proposals shall *reuse* existing OMG and other standard specifications in preference to defining new models to specify similar functionality.

5.1.5 Changes to existing specifications

Each proposal shall justify and fully specify any *changes or extensions* to existing OMG specifications necessitated by adopting that proposal. In general, OMG favors proposals that are *upwards compatible* with existing standards and that minimize changes and extensions to existing specifications.

5.1.6 Minimalism

Proposals shall factor out functionality that could be used in different contexts and specify their models, interfaces, etc. separately. Such *minimalism* fosters re-use and avoids functional duplication.

5.1.7 Independence

Proposals shall use or depend on other specifications only where it is actually necessary. While re-use of existing specifications to avoid duplication will be encouraged, proposals should avoid gratuitous use.

5.1.8 Compatibility

Proposals shall be *compatible* with and *usable* with existing specifications from OMG and other standards bodies, as appropriate. Separate specifications offering distinct functionality should be usable together where it makes sense to do so.

5.1.9 Implementation flexibility

Proposals shall preserve maximum *implementation flexibility*. Implementation descriptions should not be included and proposals shall not constrain implementations any more than is necessary to promote interoperability.

5.1.10 Encapsulation

Proposals shall allow *independent implementations* that are *substitutable* and *interoperable*. An implementation should be replaceable by an alternative implementation without requiring changes to any client.

5.1.11 Security

In order to demonstrate that the specification proposed in response to this RFP can be made secure in environments that require security, answers to the following questions shall be provided:

• What, if any, security-sensitive elements are introduced by the proposal?

• Which accesses to security-sensitive elements should be subject to security policy control?

• Does the proposed service or facility need to be security aware?

• What default policies (e.g., for authentication, audit, authorization, message protection etc.) should be applied to the security sensitive elements introduced by the proposal? Of what security considerations should the implementers of your proposal be aware?

The OMG has adopted several specifications, which cover different aspects of security and provide useful resources in formulating responses. [SEC] [RAD].

5.1.12 Internationalization

Proposals shall specify the degree of internationalization support that they provide. The degrees of support are as follows:

a) Uncategorized: Internationalization has not been considered.

b) Specific to <region name>: The proposal supports the customs of the specified region only, and is not guaranteed to support the customs of any other region. Any fault or error caused by requesting the services outside of a context in which the customs of the specified region are being consistently followed is the responsibility of the requester.

c) Specific to <multiple region names>: The proposal supports the customs of the specified regions only, and is not guaranteed to support the customs of any other regions. Any fault or error caused by requesting the services outside of a context in which the customs of at least one of the specified regions are being consistently followed is the responsibility of the requester.

d) Explicitly not specific to <region(s) name>: The proposal does not support the customs of the specified region(s). Any fault or error caused by requesting the services in a context in which the customs of the specified region(s) are being followed is the responsibility of the requester.

5.2 Evaluation criteria

Although the OMG adopts model-based specifications and not implementations of those specifications, the technical viability of implementations will be taken into account during the evaluation process. The following criteria will be used:

5.2.1 Performance

Potential implementation trade-offs for performance will be considered.

5.2.2 Portability

The ease of implementation on a variety of systems and software platforms will be considered.

5.2.3 Securability

The answer to questions in section 5.1.11 shall be taken into consideration to ascertain that an implementation of the proposal is securable in an environment requiring security.

5.2.4 Conformance: Inspectability and Testability

The adequacy of proposed specifications for the purposes of conformance inspection and testing will be considered. Specifications should provide sufficient constraints on interfaces and implementation characteristics to ensure that conformance can be unambiguously assessed through both manual inspection and automated testing.

5.2.5 Standardized Metadata

Where proposals incorporate metadata specifications, OMG standard XMI metadata [XMI] representations should be provided.

6 Specific Requirements on Proposals

6.1 Problem Statement

The GRA SSPs are used by a number of justice and public safety agencies to define and implement interoperable information sharing services. Currently there are no standard based tools which can be leveraged to model and generate GRA SSPs. As a result creating, reusing and implementing GRA SSPs is a very manual process, and requires comprehensive understanding of the GRA. In addition there will be significant benefit of creating a Platform Independent Model for the GRA SSP. That would enable the GRA SSP to leverage different technologies and standards in the future.

This RFP invites submission team (s) to drive development of a UML Profile for GRA, and tools that automate the SSP development process, and bring consistency across SSPs developed by different members of the intended community.

Provided below is an overview of the GRA and its components/sub-sections.

GRA Overview
The Global Reference Architecture (GRA) is an information exchange solution designed to reduce 80 percent of implementation time and costs for state and local justice agencies through reuse of established practices in IT architecture and design.

The GRA is developed and maintained under the governance of the Global Standards Council (GSC). GSC is part of the Global Justice Information Sharing Initiative (Global) which serves as a Federal Advisory Committee (FAC) and advises the U.S. Attorney General on justice information sharing and integration initiatives.

GRA Components/sub-sections
The GRA addresses various areas in the implementation of information exchange. Together, these areas form critical components of a comprehensive, replicable, and scalable solution to information sharing that balances varied technologies with dynamic policy considerations:

Reference Architecture Planning
The GRA includes recommendations for technical implementation that leverage Service Oriented Architecture concepts, customized for the justice domain. GRA addresses the full range of information sharing use cases by providing a flexible blueprint for implementing interoperable data sharing services across both technologically advanced organizations and those with limited technology resources. Guidelines for beginning implementation projects are available; key documents leveraged during the planning process are the GRA Framework (http://www.it.ojp.gov/docdownloader.aspx?ddid=1223), the GRA Guidelines for Identifying and Designing Services (http://www.it.ojp.gov/docdownloader.aspx?ddid=1171), and the GRA Service Specification Guideline (http://www.it.ojp.gov/docdownloader.aspx?ddid=1215).

Service Specification Packages
GRA solutions to information exchange are made up of a combination of the connection method (often Web Services), the exchange language (use of NIEM is encouraged), and the security specifications (encryption at the transport layer, data layer, etc.). These specifications are packaged into a GRA solution that can be customized to meet an individual organization's needs. A Service Specification Package Template and a number of reference Service Specification Packages are available as part of the GRA and can be found on the GRA website at http://www.it.ojp.gov/gra.

Technical Implementation Guidance
Integrating a Reference Service Specifications Package (SSP) into existing IT infrastructure, despite the level of customization available in a Reference SSP, can involve a learning curve for those new to the implementation of GRA. Technical guidance regarding the GRA specification itself, as well as various guides on the interaction of different services and other aspects of information exchange, are made available as part of the GRA. Key technical documents that are part of the GRA are the GRA Service Interaction Profiles (SIP) and the GRA Execution Context Guidelines which could be found on the GRA website at http://www.it.ojp.gov/gra.

Policy Guidance

In coordination with the technical implementation of a GRA Reference Service Specification Package, policy-level documents guide interaction between the agencies exchanging information. Examples include Service Level Agreements (SLA), access and identity management specifications, Memoranda of Understanding (MOUs), and many others. While these documents are never specific to GRA implementations, some specific resources are available as part of the GRA.

Model-Driven Architecture and UML

Model-Driven Architecture (MDA) is the OMG approach to defining the functionality of systems in structured models. One of the value propositions of MDA is that software developers can generate executable software. The structured models represent the "logical" view of the required functionality in a *platform-independent model (PIM)* that intentionally avoids any dependency on a particular program language, operating system, application platform, or other physical mechanism. The translation of the PIM into a physical form that a computer can execute happens via one or more transformations supported by tooling designed to bridge the logical and physical layers.

The development of tools to support MDA has relied upon the adoption of open standard modeling formats, such as UML. The very nature of tools that bridge separate domains—such as abstract modeling and physical execution—necessitates an approach that is inclusive of multiple vendors, execution models, and programming languages. It is likely that without the foundation of open standard modeling notations and metamodels, MDA could never have achieved its current level of adoption and success.

Many architects and developers are familiar with UML in its graphical, diagrammatic form—and it is indeed useful for communication via visual models. However, in a MDA context, a significant feature of UML is that it includes a standards-based representation of the structure of the model underneath the graphical representation. The Meta Object Facility (MOF) leverages XMI (XML Model Interchange format) to serialize metamodels for exchange models among a diverse, robust ecosystem of tools. The ultimate result of the standards-based approach is that models exist in a predictable, consistent, vendor-neutral format that allows tools to read, manipulate, and leverage the structure in each model, independent of the graphical representation that is most familiar to human users.

While in theory it may be possible to generate a platform-specific, executable output artifact from an arbitrary UML model, in practice most MDA tools require the use of UML stereotypes, as defined in UML profiles, to guide the generation. UML has long supported the notion of a profile to specialize the UML metamodel in order to meet the requirements of a certain modeling domain or methodology. MDA tools leverage profiles to enable modelers to define model constructs that represent specific concerns such as elements in the physical layer.

While MDA has been most extensively used to support the development of executable software, the philosophy and concepts of MDA can easily be extended to support exchange specification artifacts, such as MPDs, that have a physical representation in XML Schema.

6.2 Scope of Proposals Sought
A Model-driven Approach to GRA SSP Development Leveraging UML

6.2.1   In Scope

Initial implementation experience with NIEM-UML has demonstrated that all the information needed to generate a NIEM conformant MPD can be specified in a properly profiled UML model. The same concepts shall be applied by GRA-UML submitters resulting in further expansion of this model-driven approach to construct complete SSPs. This is expected to lead to significant benefits for the community of GRA SSP developers such as efficiency, reuse and lower barrier to entry.

Leveraging UML makes available a wide array of modelling tools and utilities that are not as readily available for working with XML Schema directly. These tools support capabilities such as:

- Standard visual representation of models (i.e., class diagrams)
- Standard mechanisms for developing model validation rules (e.g., OCL - http://www.omg.org/spec/OCL/)
- Model transformation utilities (e.g., OMG QVT)
- Toolkits for building model editors and utilities (e.g., Eclipse uml2tools - http://www.eclipse.org/modeling/mdt/?project=uml2tools)
- Interchange of models between tools from different vendors or open source projects

Regardless of the tools used upstream in the SSP development process, the ultimate goal of every SSP developer is to create and/or leverage a conformant SSP. Thus, developers will require tools that can extract information from the UML model and use the information to create SSP artifacts, which include:

- SSP Metadata
- SSP Catalog
- SSP Service Model
- SSP Service Description Document (SDD)
- SSP Service Interface Description Document (SIDD)
- SSP Schemas

In addition to SSP artifacts, GRA models may leverage other models and technologies to assist in the integration of GRA into new and existing applications. This may include the generation of mapping specifications, application code or application configuration files. In addition, GRA models may be used to produce "human" artifacts such as documentation and playbooks.

For MDA tools to function correctly (i.e., produce conformant SSPs), the UML model will need to have SSP- and GRA-specific metadata at the model level and the level of individual model elements. In addition, the semantics and structure of the UML

metamodel will need to be constrained based on the SSP- and GRA- specific requirements to ensure a consistent and complete mapping to SSP artifacts. Consistent with the UML standard, these extensions and constraints of the core UML metamodel should be specified in a UML profile.

Principal Elements in a UML Profile for SSPs

The following are the principal elements of a UML profile for GRA SSPs:

- Ability to capture model level metadata necessary to populate required and optional elements in the GRA SSP catalog artifact.
- Ability to capture model level metadata necessary to populate required and optional elements in the GRA SSP metadata artifact.
- Support for basic metadata items on model elements, such as definitions.
- Ability to capture and describe the key GRA SSP concepts of Service, Service Consumer and Service Provider.
- Ability to capture service level metadata necessary to generate the required and optional elements in the GRA SSP Service Description Document (SDD).
- Ability to capture service interface level metadata necessary to generate the required and optional elements of the GRA SSP Service Interface Description Document (SIDD).
- Ability to capture service and service interface level metadata necessary to generate the required and optional representations of the GRA SSP behavior model.
- Ability to define the GRA SSP service interfaces.
- Ability to define the GRA SSP service actions.
- Ability to capture service level metadata necessary to associate an existing NIEM-UML model as the information model of a GRA SSP.
- Ability to capture model and element level metadata necessary to generate the GRA SSP change log.
- Ability to capture service and service interface level metadata to generate the required and optional XML schemas part of the GRA SSP.

In the end, a developer (with supporting tools) should be able to generate a conformant SSP from any UML model that applies the envisioned UML profile properly. Conversely, a developer should be able to create an equivalent profiled UML model from a conformant SSP (If the optional reverse engineering requirement is implemented). This is not to say construction of the tools to support these transformations will be trivial; rather, the point is that the UML model should contain all the information necessary to generate a conformant SSP, and vice versa.

Specific Parts of GRA-UML

A cornerstone of the MDA approach is separation of concerns between what is required to solve a specific problem, the platform independent model (PIM), and the specific technology solutions to be employed in a solution, the platform specific model (PSM).

Using MDA techniques and technologies the platform specific model is "provisioned" from the platform independent model by using mapping and transformation technologies.

The platform independent model (PIM) is a logical specification of a system that does not include specific technology choices or parameters. In the context of GRA the PIM represents the business content of the SSPs without committing to specific technologies like WSDL, XML or packaging concerns for the SSP.

When provisioning from the PIM to the PSM the specific technology choices of the PSM need to be specified as do specific platform specific parameters such as namespaces, metadata, etc. These technology choices and parameters will be specified in a model which will **be specified by a UML profile which might be called "provisioning profile".**

6.2.2   Out of Scope

The following documents which are part of the GRA but are not related to the scope of GRA-UML should be considered out of scope of this RFP:
- GRA Execution Context Guideline v1.2
- GRA Guidelines for Identifying and Designing Services v1.1

6.3 Relationship to other OMG Specifications and activities

6.3.1 Relationship to OMG specifications
The following specifications may be related to GRA-UML:
- Unified Modeling Language (UML) - http://www.omg.org/spec/UML. UML provides an extensible and accepted modeling framework.
- Object Constraint Language (OCL) - http://www.omg.org/spec/OCL. OCL provides a language for specifying constraints in models.
- Unified Profile for DoDAF/MODAF (UPDM)(http://www.omg.org/spec/UPDM/). UPDM is the UML representation of the defense architectural standards DoDAF and MoDAF.
- Meta Object Facility (MOF) - http://www.omg.org/spec/MOF/. MOF provides a framework for meta-modeling in which the abstract syntax of UML and other modeling languages is described.
- XML Metadata Interchange (XMI®) - http://www.omg.org/spec/XMI. XMI provides a XML interchange format for MOF models.
- Query/View/Transformation - QVT (http://www.omg.org/spec/QVT): QVT is the OMG standard for expressing model transformation rules.
- MOF Models to Text Transformation Language - http://www.omg.org/spec/MOFM2T. Model to text provides a way to specify transformation of models to textual representations.

Most of the above specifications have an active standards process and submitters should consult the OMG web site for possible revised versions of these specifications. Use of newer versions of specifications is encouraged but not required.

6.3.1.1 *UML and OCL*

GRA-UML will be based on UML and GRA-UML will contain UML profiles using OCL constraints, where applicable.

6.3.1.2 *QVT*

Transformations specified in GRA-UML shall be specified in QVT.

6.3.1.3 *SoaML*

SoaML, an OMG specification which defines a UML profile and metamodel for the modeling and design of services within a service-oriented architecture, contains constructs such as Consumer, Provider and Service. An initial mapping of the SoaML constructs and/or representations and the GRA demonstrated that leveraging constructs and/or representations from SoaML as part of GRA-UML will lead to benefits from a perspective of reuse and efficiency.
http://www.omg.org/spec/SoaML/

GRA-UML will constrain and extend the SoaML specification.

6.3.1.4 *BPMN*

The GRA leverages Business Process Modelling Notation (BPMN) for describing service interactions. Leveraging constructs and/or representations from the UML Profile for BPMN 2 Processes, an OMG specification which enables modelers to use BPMN 2 process and collaboration notation syntax for UML activity and collaboration models, will lead to benefits from a perspective of reuse and efficiency.
http://www.omg.org/spec/BPMN
http://www.omg.org/spec/BPMNProfile

6.3.1.5 *UML Profile for NIEM (NIEM-UML)*

GRA-UML will leverage NIEM-UML to specify the information model of a service in a SSP.

http://www.omg.org/spec/NIEM-UML

6.3.1.6 *UPDM*

Submitters may consider leveraging UPDM for GRA-UML. As the normative representation of DoDAF-2 in UML UPDM represents an architectural framework that is expected to be used across government.

6.3.2 Relationship to other OMG Documents and work in progress

6.3.2.1 Information Exchange Framework (IEF) Policy Vocabulary (IEPV)
http://www.omg.org/techprocess/meetings/schedule/IEF_IEPV.html. IEF focuses on policy vocabulary and policy automation.

6.3.2.2   Policy-based Packaging Service (IEPPS)
(*http://www.omg.org/techprocess/meetings/schedule/IEPPS_RFP.html*. IEFPPS
focuses on user defined policies that govern the sharing and protection of
information.

6.4 Related non-OMG Activities, Documents and Standards

6.4.1   GRA Specifications

GRA-UML represents a collaboration between the OMG and GRA
communities. The normative specifications produced under GRA represent
requirements for GRA-UML. These documents include:

- GRA Service Specification Package, v1.0.0
  (http://it.ojp.gov/docdownloader.aspx?ddid=1217)
- GRA Service Specification Guideline, v1.0.0
  http://it.ojp.gov/docdownloader.aspx?ddid=1215)
- GRA Web-Services Service Interaction Profile v1.3
  (http://it.ojp.gov/docdownloader.aspx?ddid=1173)
- GRA Reliable Secure Web Services, Service Interaction Profile v1.2
  (http://it.ojp.gov/docdownloader.aspx?ddid=1134)

6.5 Mandatory Requirements

6.5.1   Submissions shall specify a GRA-UML Logical Profile. The GRA-UML Logical Profile shall be a set of UML stereotypes and properties which support the modeling of SSPs in UML in a technology-independent way. This profile shall support modeling of any content and structure allowed by GRA SSPs, while constraining the modeling of any content and structure disallowed by GRA SSPs, as specified in 6.5.4. The use of the GRA-UML Logical Profile shall result in UML models that are free from dependency on any physical representation (such as XML Schema). In MDA terms, the GRA Logical Profile is a specification of the platform independent model (PIM).

6.5.2   Submissions shall specify a GRA-UML Profile for SSPs. The GRA-UML Profile for SSPs shall be a set of UML stereotypes and properties which specify the details and metadata of a SSP specification to be produced based on logical GRA model(s). Transformations (discussed in 6.5.3) shall be designed to utilize the Profile for SSPs to parameterize the transformation from the GRA-UML Logical Profile (the PIM) to GRA-conformant SSPs (the PSM), where GRA conformance is as defined in 6.5.4. The SSP profile shall govern the inclusion in a UML model of any information necessary to properly generate GRA-conformant SSP artifacts beyond the information found in the GRA-UML Logical profile.

6.5.3   Submissions shall specify a transformation from UML models using the GRA-UML profiles specified in 6.5.1 and 6.5.2 to the set of artifacts required in a conformant SSP, as defined by 6.5.4. Submissions shall utilize the GRA-UML Profiles to model at least one existing GRA SSP and demonstrate the resulting transformation to an SSP. The SSP produced must be GRA conformant, as defined in section 6.5.4, and the XML Schema set contained within the SSP must validate the same set of exchange documents as the existing SSP IEPD. It is not required that the generated SSP be structurally identical[1] to the existing SSP.

6.5.4   The SSPs generated based on models conforming to the GRA-UML profile shall conform to normative GRA specifications referenced in section 6.4.1. These specifications are:

- GRA Service Specification Package, v1.0.0
  (http://it.ojp.gov/docdownloader.aspx?ddid=1217)
- GRA Service Specification Guideline v1.0.0
  (http://it.ojp.gov/docdownloader.aspx?ddid=1215)

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[1] Structurally Identical – documents are considered structurally identical if they are character by character the same (perhaps excluding whitespace). XML Schema and other artifacts may be semantically equivalent (mean the same thing) while not being structurally identical. Requirements for conformance to NIEM and existing artifacts in this RFP require semantically equivalent results, not structural identical documents.

- GRA Web-Services Service Interaction Profile v1.3
  (http://it.ojp.gov/docdownloader.aspx?ddid=1173)
- GRA ebXML Messaging Service Interaction Profile v1.1
  (http://it.ojp.gov/docdownloader.aspx?ddid=1168)

6.5.5   <u>GRA Reliable Secure Web Services, Service Interaction Profile v1.2
(http://it.ojp.gov/docdownloader.aspx?ddid=1134)</u>Specifications shall reuse
constructs and/or representations from SoaML to express the SSP logical model
and will extend SoaML to meet specific requirements of the GRA where
required.

6.5.6   Specifications shall reuse elements and/or representations from UML Profile for
BPMN 2 Processes to express the SSP logical model and more specifically the
SSP interaction model.

6.5.7   Specifications shall define mappings between GRA, and these industry-standard
specifications - OMG SoaML, OASIS SOA-Reference Model, Open Group
SOA Ontology.

6.5.8   Specifications shall use OMG-QVT to specify the transformation of the UML
logical model to all or part of a SSP.

6.6 Non-mandatory features

6.6.1   Submissions may specify a "reverse engineering" transformation from a GRA
conformant SSP to UML models that conform to the GRA-UML profiles. The
reverse engineering shall produce both a "PIM" (A model conforming to the
GRA-UML Logical Profile) and a corresponding "PSM" (A model conforming to
the GRA-UML Profile for SSPs) such that applying the forward engineering
transformations to these models produces a GRA-conformant SSP semantically
equivalent to the input.

6.6.2   The submitters may propose a revision of SoaML which would benefit GRA
needs and the community at large.

6.7 Issues to be discussed

6.7.1   Submissions shall discuss the relationship of GRA-UML with other ongoing and
related GRA standards, the existing GRA specifications and the GRA process.

6.7.2   Submissions shall discuss their relationship with other relevant standards
including but not limited to the Unified Profile for DoDAF/MODAF (UPDM)

6.7.3   If a GRA SIP for the Representational State Transfer (REST) protocol becomes
available during the submission process, submissions may discuss its impact on
the submission.

6.7.4   Submissions shall discuss their relationship with other relevant standards
including but not limited to the IEPPV.

These issues will be considered during submission evaluation. They should not be part of the proposed normative specification. Place your responses to these Issues in Section 0 of your submission.

6.8 Evaluation Criteria

6.8.1   Submissions will be evaluated based on alignment with GRA specifications.

6.8.2   Submissions will be evaluated based on the usability and intuitive representation of GRA models.

6.8.3   Submissions will be evaluated based on the ability of the specification to support technologies other than the current technologies supported in GRA SIPs such as REST (if available in time for this submission).

6.8.4   Submissions shall be evaluated based on their reuse and integration with SoaML.

6.8.5   Submissions shall be evaluated based on their reuse and integration with the UML Profile for BPMN 2 Processes.

6.8.6   Submissions shall be evaluated based on their reuse and integration with other existing standards such as the Unified Profile for DoDAF/MODAF (UPDM) 2.1, and their ability to incorporate other interchange standards and approaches.

6.8.7   Submissions will be evaluated based on their ability to specify the conformance requirements associated with the testing of a model for consistency with GRA.

6.9 Other information unique to this RFP

6.10 IPR Mode – Non-assert covenant

6.11 RFP Timetable

The timetable for this RFP is given below. Note that the TF or its parent TC may, in certain circumstances, extend deadlines while the RFP is running, or may elect to have more than one Revised Submission step. The latest timetable can always be found at the OMG *Work In Progress* page at http://www.omg.org/schedules under the item identified by the name of this RFP. Note that "<month>" and "<approximate month>" is the name of the month spelled out; e.g., January.

Event or Activity	Planned Date
Complete DRAFT RFP	July 18th, 2013
RFP final review and comment	*August 1st, 2013*
RFP placed on OMG document server	*August 23rd, 2013*
Approval of RFP by Architecture Board Review by TC	*September 26th, 2013*

TC votes to issue RFP	*September 27th, 2013*
LOI to submit to RFP due	*January, 31st, 2014*
Initial Submissions due and placed on OMG document server ("Four week rule")	*February 21st, 2014*
Initial Submission presentations	*March 23rd, 2014*
Voter registration closes	*April 21st, 2014*
Revised Submissions due and placed on OMG document server ("Four week rule")	*May 16th, 2014*
Revised Submission presentations	*June 16th, 2014*
Final evaluation and selection by TF *Recommendation to AB and TC*	*June 17th, 2014 {If vote to vote can be obtained}*
Approval by Architecture Board *Review by TC*	*June 19th, 2014*
TC votes to recommend specification	*August, 2014*
BoD votes to adopt specification	*September, 2014*

Appendix A References & Glossary Specific to this RFP

A.1 References Specific to this RFP

- GRA Service Specification Package, v1.0.0
- GRA Execution Context Guidelines v1.2 6
- GRA Web-Services Service Interaction Profile v1.3
- GRA Reliable Secure Web Services, Service Interaction Profile v1.2

A.2 Glossary Specific to this RFP

GRA	Global Reference Architecture
SOA	Service-oriented Architecture
API	Application Programming Interface
NIEM	National Information Exchange Model
IEPD	Information Exchange Package Documentation
SSP	Service Specification Package
SDD	Service Description Document
SIDD	Service Interface Description Document

GRA-SIDG	GRA Service Identification and Design Guidelines
GRA-SSG	GRA Service Specification Guideline
GRA-SSP	GRA Service Specification Package
GRA-SIP	GRA Service Interaction Profile

Architecture – A set of artifacts (that is: principles, guidelines, policies, models, standards, and processes) and the relationships between these artifacts that guide the selection creation and implementation of solutions aligned with business goals.

Awareness – A state whereby one party has knowledge of the existence of the other party. Awareness does not imply willingness or reachability.

Behavior Model – The characterization of, and responses to, temporal dependencies between the actions on a service.

Business Process Models – A description (usually formal and often graphical) of a series of activities that culminate in the achievement of some outcome of business value. Some (but not necessarily all) of the steps in this series of activities involve producing a real-world effect provided by a capability, and some of the steps require a consumer to use a service. Each one of these steps, then, provides the contextual justification for service interaction between a particular consumer and particular provider.

Capabilities – Real-world effect(s) that service provider(s) are able to provide to a service consumer.

Consumer Systems – The information system that gains access to another partner's capability offered by means of a service.

Domain Vocabularies – Includes canonical data models, data dictionaries, and markup languages that standardize the meaning and structure of information for a domain. Domain vocabularies can improve the interoperability between consumer and provider systems by providing a neutral, common basis for structuring and assigning semantic meaning to information exchanged as part of service interaction. Domain vocabularies can usually be extended to address information needs specific to the service interaction or to the business partners integrating their systems.

Enterprise Integration Patterns – Enterprise integration has to deal with connecting multiple applications running on multiple platforms in different locations. Enterprise Integration Patterns help integration architects and

developers design and implement integration solutions more rapidly and reliably. Most of the patterns assume a basic familiarity with messaging architectures. However, the patterns are not tied to a specific implementation.

Execution Context – The set of technical and business elements that form a path between those with needs and those with capabilities and that permit service providers and consumers to interact.

Framework – A set of assumptions, concepts, values, and practices that constitutes a way of viewing the current environment.

Information Model – The characterization of the information that is associated with the use of a service. The scope of the information model includes the format of information that is exchanged, the structural relationships within the exchanged information, and the definition of terms used.

Interaction – The activity involved in making use of a capability offered, usually across an ownership boundary, in order to achieve a particular desired real-world effect.

Interface Description Requirements – Establishes common characteristics of service interface descriptions. These requirements address areas such as required interface contents, naming rules, documentation rules, and specification of a standard structure and format for descriptions.

Intermediaries – Routers and transformers are collectively called intermediaries. This term indicates that routers and transformers generally sit between other services and "mediate" the interaction by managing the transmission of messages between them or by reformatting messages in transit.

Global Justice Reference Architecture – The Global JRA is an abstract framework for understanding significant components and relationships between them within a service-oriented environment. It lays out common concepts and definitions as the foundation for the development of consistent service-oriented architecture (SOA) implementations within the justice and public safety communities. The term refers to the modular architecture that cleanly and appropriately identifies and separates technical and governance layers so that standards can be developed to improve interoperability. The Global JRA is being developed by Global; it leverages the work of others, such as the state of Washington, and builds upon the work of OASIS.

Messages – The entire "package" of information sent between service consumer and service (or vice versa), even if there is a logical partitioning of the message into segments or sections.

Message Definition Mechanisms – Establishes a standard way of defining the structure and contents of a message; for example, Global JXDM- or NIEM-conformant schema sets. Note that since a message includes the concept of an "attachment," the message definition mechanism must identify how different sections of a message (for example, the main section and any "attachment" sections) are separated and identified and how attachment sections are structured and formatted.

Message Exchange Patterns – Identifies common sequences of message transmission between service consumers and services. They provide a label to a series of message transmissions that have some logical interrelationship.

Message Validators – An intermediary that examines a message to ensure that the contents adhere to established business rules.

Collaboration – A capability that coordinates interaction with multiple services. A collaboration is often implemented using an open industry standard implementation mechanism, which allows the implementation to be shared across tools and platforms.

Process Model – The characterization of the temporal relationships between and temporal properties of actions and events associated with interacting with the service.

Provider Systems – The information system that offers the use of capabilities by means of a service.

Provisioning Models – The responsibility/models for making a service available to customers in a manner consistent with formal (or occasionally informal) customer expectations.

Reachability – The ability of a service consumer and service provider to interact. Reachability is an aspect of visibility.

Real-World Effects – The actual result(s) of using a service, rather than merely the capability offered by a service provider.

Reference Architecture – A reference architecture is an architectural design pattern that indicates how an abstract set of mechanisms and relationships realizes a predetermined set of requirements.

Reference Model – A reference model is an abstract framework for understanding significant relationships among the entities of some environment that enables the development of specific reference or concrete architectures using consistent standards or specifications supporting that environment. A reference model consists of a minimal set of unifying concepts, axioms, and relationships within a

particular problem domain, and is independent of specific standards, technologies, implementations, or other concrete details.

Repository – Stores models and interface descriptions in a central location that is accessible to appropriate stakeholders. A repository will permit searching for models and interface descriptions based on a range of identifying criteria. A repository will also map logical service identifiers with physical addresses.

Services – The means by which the needs of a consumer are brought together with the capabilities of a provider.

Service Agreements – A document that establishes policies and contractual elements for a given interaction or set of interactions (that is, for one or more services).

Service Consumers – An entity that seeks to satisfy a particular need through the use of capabilities offered by means of a service.

Service Contracts – An agreement by two or more parties regarding the conditions of use of a service.

Service Design Principles – The documentation to provide consistent guidance regarding the overall partitioning of capabilities into services and the relationships between services.

Service Interaction Profiles (SIP) – Defines a family of industry standards or other technologies or techniques that together demonstrate implementation or satisfaction of:
o   Service interaction requirements.
o   Interface description requirements.
o   Message exchange patterns.
o   Message definition mechanisms.

Service interaction profiles are included in the Global JRA to promote interoperability without forcing the organization to agree on a single way of enabling service interaction. Each service interface will support a single profile; a service will have multiple interfaces if it supports multiple profiles.

Service Interaction Requirements – Define common rules of service interaction. Typically, these requirements are nonfunctional in nature, in that they are not directly related to the capability used by the service consumer, nor are they related to the real-world effect resulting from use of that capability. Rather, the requirements enforce (or support the enforcement of) policies or contracts or otherwise protect the interests of particular business partners or the business organization overall.

Service Interfaces – The means by which the underlying capabilities of a service are accessed.

Service Model – Interaction depends on two things. First, the designers of potential consumers need to be able to find services and, once found, establish a physical interaction mechanism with them. Second, the designers of potential consumers need a description of the actions that can be performed on a service, as well as the structure and meaning of information exchanged during the interaction. These needs are addressed by the concept of a service's information model and behavioral model, collectively called service models in the Global JRA.

Service Modeling Guidelines – Documents guidelines for services provided and consumed among partners. It provides guidance as well as compliance information regarding the modeling and description of services to promote consistency.

Service-Oriented Architecture (SOA) – Service-Oriented Architecture is a paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with, and use capabilities to produce desired effects consistent with measurable preconditions and expectations.

Service Policies – A statement of obligations, constraints, or other conditions of use, deployment, or description of an owned entity as defined by any participant.

Service Providers – An entity (person or organization) that offers the use of capabilities by means of a service.

Transformers – A capability that receives a message and transforms it into another format before transmitting it on to another destination.

Visibility – The capacity for those with needs and those with capabilities to be able to interact with each other.

Willingness – A predisposition of service providers and consumers to interact.

Appendix B   General Reference and Glossary

B.1   General References

The following documents are referenced in this document:

[BCQ] OMG Board of Directors Business Committee Questionnaire, *http://doc.omg.org/bcq*

[CCM] CORBA Core Components Specification
http://www.omg.org/spec/CCM/

[CORBA] Common Object Request Broker Architecture (CORBA)
http://www.omg.org/spec/CORBA/

[CORP] UML Profile for CORBA,
http://www.omg.org/spec/CORP

[CWM] Common Warehouse Metamodel Specification
http://www.omg.org/spec/CWM

[EDOC] UML Profile for EDOC Specification
http://www.omg.org/spec/EDOC/

[Guide] The OMG Hitchhiker's Guide
http://doc.omg.org/hh

[IDL] Interface Definition Language Specification
http://www.omg.org/spec/IDL35

[INVENT] Inventory of Files for a Submission/Revision/Finalization
http://doc.omg.org/inventory

[IPR] IPR Policy
http://doc.omg.org/ipr

[ISO2] ISO/IEC Directives, Part 2 − Rules for the structure and drafting of
International Standards
http://isotc.iso.org/livelink/livelink?func=ll&objId=4230456

[LOI] OMG RFP Letter of Intent template
http://doc.omg.org/loi

[MDAa] OMG Architecture Board, "Model Driven Architecture - A
Technical Perspective*"*
http://www.omg.org/mda/papers.htm

[MDAb] Developing in OMG's Model Driven Architecture (MDA)
http://www.omg.org/mda/papers.htm

[MDAc] MDA Guide
http://www.omg.org/docs/omg/03-06-01.pdf

[MDAd] MDA "The Architecture of Choice for a Changing World
http://www.omg.org/mda

[MOF] Meta Object Facility Specification
http://www.omg.org/spec/MOF/

[NS] Naming Service
http://www.omg.org/spec/NAM

[OMA] Object Management Architecture
http://www.omg.org/oma/

[OTS] Transaction Service
http://www.omg.org/spec/OTS

[P&P] Policies and Procedures of the OMG Technical Process
http://doc.omg.org/pp

[RAD] Resource Access Decision Facility
http://www.omg.org/spec/RAD

[ISO2] ISO/IEC Directives, Part 2 – Rules for the structure and drafting of International Standards
http://isotc.iso.org/livelink/livelink?func=ll&objId=4230456

[RM-ODP]
ISO/IEC 10746

[SEC] CORBA Security Service
http://www.omg.org/spec/SEC

[TEMPL] Specification Template
http://doc.omg.org/submission-template

[TOS] Trading Object Service
hptp://www.omg.org/spec/TRADE

[UML] Unified Modeling Language Specification,
http://www.omg.org/spec/UML

[XMI] XML Metadata Interchange Specification,
http://www.omg.org/spec/XMI

B.2   General Glossary

Architecture Board (AB) - The OMG plenary that is responsible for ensuring the technical merit and MDA-compliance of RFPs and their submissions.

Board of Directors (BoD) - The OMG body that is responsible for adopting technology.

Common Object Request Broker Architecture (CORBA) - An OMG distributed computing platform specification that is independent of implementation languages.

Common Warehouse Metamodel (CWM) - An OMG specification for data repository integration.

CORBA Component Model (CCM) - An OMG specification for an implementation language independent distributed component model.

Interface Definition Language (IDL) - An OMG and ISO standard language for specifying interfaces and associated data structures.

Letter of Intent (LOI) - A letter submitted to the OMG BoD's Business Committee signed by an officer of an organization signifying its intent to respond to the RFP and confirming the organization's willingness to comply with OMG's terms and conditions, and commercial availability requirements.

Mapping - Specification of a mechanism for transforming the elements of a model conforming to a particular metamodel into elements of another model that conforms to another (possibly the same) metamodel.

Metadata - Data that represents models. For example, a UML model; a CORBA object model expressed in IDL; and a relational database schema expressed using CWM.

Metamodel - A model of models.

Meta Object Facility (MOF) - An OMG standard, closely related to UML, that enables metadata management and language definition.

Model - A formal specification of the function, structure and/or behavior of an application or system.

Model Driven Architecture (MDA) - An approach to IT system specification that separates the specification of functionality from the specification of the implementation of that functionality on a specific technology platform.

Normative – Provisions to which an implementation shall conform to in order to claim compliance with the standard (as opposed to non-normative or informative material, included only to assist in understanding the standard). For the purposes of the GRA-UML submission all normative requirements of the GRA SSP must be met while the non-normative requirements for GRA SSP shall be considered.

Normative Reference – References to documents that contain provisions to which an implementation shall conform to in order to claim compliance with the standard.

Platform - A set of subsystems/technologies that provide a coherent set of functionality through interfaces and specified usage patterns that any subsystem that depends on the platform can use without concern for the details of how the functionality provided by the platform is implemented.

Platform Independent Model (PIM) - A model of a subsystem that contains no information specific to the platform, or the technology that is used to realize it.

Platform Specific Model (PSM) - A model of a subsystem that includes information about the specific technology that is used in the realization of it on a specific platform, and hence possibly contains elements that are specific to the platform.

Request for Information (RFI) - A general request to industry, academia, and any other interested parties to submit information about a particular technology area to one of the OMG's Technology Committee subgroups.

Request for Proposal (RFP) - A document requesting OMG members to submit proposals to an OMG Technology Committee.

Task Force (TF) - The OMG Technology Committee subgroup responsible for issuing a RFP and evaluating submission(s).

Technology Committee (TC) - The body responsible for recommending technologies for adoption to the BoD. There are two TCs in OMG – the *Platform TC* (PTC) focuses on IT and modeling infrastructure related standards; while the *Domain TC* (DTC) focuses on domain specific standards.

Unified Modeling Language (UML) - An OMG standard language for specifying the structure and behavior of systems. The standard defines an abstract syntax and a graphical concrete syntax.

UML Profile - A standardized set of extensions and constraints that tailors UML to particular use.

XML Metadata Interchange (XMI) - An OMG standard that facilitates interchange of models via XML documents.