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SwA Evidence Metamodel

Request For Proposal

OMG Document: swa/2007-09-03

Letters of Intent due: November 29, 2007
Initial Submission due: December 12, 2007

Objective of this RFP

This RFP solicits proposals for a metamodel for representing information related to Software Assurance Evidence (referred as SwA Evidence). This metamodel shall provide a common repository structure that will facilitate the exchange of information between different Software Assurance tools and services.

This is the first in the series of Software Assurance (SwA) standards that include claims, arguments and evidence, that once all completed will establish a common framework for analysis and exchange of the information related to software trustworthiness. This completed framework will allow users to begin SwA activities knowing that there is interoperability between the different tools producing highly automated SwA solutions. Standardization will ensure that end users are investing not just in individual tools but also rather into a coordinated strategy. To complete framework our roadmap includes additional RFP(s) related to representation of Software Assurance Claims and Arguments.

This RFP recognizes the existence of OMG specifications that are related to SwA. The response to this RFP should utilize these specifications or indicate why they are inadequate. Responders to this RFP are encouraged to reuse and

possibly extend (if needed) existing OMG standards in order to make them more appropriate to the SwA domain.

For further details see Chapter 6 of this document.

1.0   Introduction

In response to government and commercial pressures to provide software that is safe and secure enough to use for critical applications, the members of the Object Management Group have formed a Software Assurance (SwA) Special Interest Group (SIG). The charter of the SwA SIG is to act as an incubator for SwA technology standardization initiatives.

The SwA SIG is considering a range of possible technology standardization initiatives, as described in the Software Assurance Whitepaper. The basic approach to software assurance being used in the OMG is that, for each software artifact of interest, there exist a set of *claims* (generally related to safety and security) about the software artifact, a set of facts (collectively called *evidence*) about the software artifact, and a set of *assurance arguments* that use the evidence to show that the software artifact does, in fact, satisfy the claims.

During the SwA discussions that have resulted in the conceptual model described above, the notion of a conceptually unified repository containing the claims, arguments, and evidence has started to emerge. The current hypothesis is that the most appropriate place to start the SwA standardization effort is with metamodels and models for the repository.

The most effective and useful public standards are those based on actual experience, so the challenge with the repository is to identify existing standards for SwA claims, arguments, or evidence and then derive aspects of the OMG repository metamodel from them. After extensive discussion, the SwA SIG has concluded that there are suitable existing standards for both SwA claims and various kinds of SwA evidence. The question, then, is where to start. The usual OMG answer is to start with the technology in which one or more members have a compelling interest and business case for developing, implementing, and using a standard specification.

The specification topic chosen for this RFP is the metamodel for SwA evidence (i.e., facts) comprised of or derived from records of the design and implementation of a software artifact as well as from its development process, operational environments and people involved in creating that same software artifact. This topic was chosen because the OMG is focused on software development and management technologies and one of the most critical, but woefully underspecified, aspects of existing SwA standards is the software artifact evidence.

1.1   Goals of OMG

The Object Management Group (OMG) is the world's largest 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 established numerous widely used standards such as OMG IDL[IDL], CORBA[CORBA], Realtime CORBA [CORBA], GIOP/IIOP[CORBA], UML[UML], MOF[MOF], XMI[XMI] and CWM[CWM] to name a few significant ones.

1.2   Organization of this document

The remainder of this document is organized as follows:

Chapter 2 - *Architectural Context* - background information on OMG's Model Driven Architecture.

Chapter 3 - *Adoption Process* - background information on the OMG specification adoption process.

Chapter 4 - *Instructions for Submitters* - explanation of how to make a submission to this RFP.

Chapter 5 - *General Requirements on Proposals* - requirements and evaluation criteria that apply to all proposals submitted to OMG.

Chapter 6 - *Specific Requirements on Proposals* - problem statement, scope of proposals sought, requirements and optional 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 "**must**", "**must not**", "**required**", "**shall**", "**shall not**", "**should**", "**should not**", "**recommended**", "**may**", and "**optional**" in this document are to be interpreted as described in RFC 2119 [RFC2119].

1.4   Contact Information

Questions related to the OMG's technology adoption process may be directed to *omg-process@omg.org*. General questions about this RFP may be sent to *responses@omg.org*.

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

2.0   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

optional rules of inference define what unstated properties you can deduce from the 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, templates with parameters that must be assigned during the mapping, or other forms yet to be determined.

For example, in case of CORBA the platform is specified by a set of interfaces and usage patterns that constitute the CORBA Core Specification [CORBA]. The CORBA platform is independent of operating systems and programming languages. The OMG Trading Object Service specification [TOS] (consisting of interface specifications in OMG Interface Definition Language (OMG IDL)) can be considered to be a PIM from the viewpoint of CORBA, because it is independent of operating systems and programming languages. When the IDL to C++ Language Mapping specification is applied to the Trading Service PIM, the C++-specific result can be considered to be a PSM for the Trading Service, where the platform is the C++ language and the C++ ORB implementation. Thus the IDL to C++ Language Mapping specification [IDLC++] determines the mapping from the Trading Service PIM to the Trading Service PSM.

Note that the Trading Service model expressed in IDL is a PSM relative to the CORBA platform too. This highlights the fact that platform-independence and platform-specificity are relative concepts.

The UML Profile for EDOC specification [EDOC] is another example of the application of various aspects of MDA. It defines a set of modeling constructs that are independent of middleware platforms such as EJB [EJB], CCM [CCM], MQSeries [MQS], etc. A PIM based on the EDOC profile uses the middleware-independent constructs defined by the profile and thus is middleware-independent. In addition, the specification defines formal metamodels for some specific middleware platforms such as EJB, supplementing the already-existing OMG metamodel of CCM (CORBA Component Model). The specification also defines mappings from the EDOC profile to the middleware metamodels. For example, it defines a mapping from the EDOC profile to EJB. The mapping specifications facilitate the transformation of any EDOC-based PIM into a corresponding PSM for any of the specific platforms for which a mapping is specified.

Continuing with this example, one of the PSMs corresponding to the EDOC PIM could be for the CORBA platform. This PSM then potentially constitutes a PIM, corresponding to which there would be implementation language specific PSMs derived via the CORBA language mappings, thus illustrating recursive use of the Platform-PIM-PSM-Mapping pattern.

Note that the EDOC profile can also be considered to be a platform in its own right. Thus, a model expressed via the profile is a PSM relative to the EDOC platform.

An analogous set of concepts apply to Interoperability Protocols wherein there is a PIM of the payload data and a PIM of the interactions that cause the data to find its way from one place to another. These then are realized in specific ways for specific platforms in the corresponding PSMs.

Analogously, in case of databases there could be a PIM of the data (say using the Relational Data Model), and corresponding PSMs specifying how the data is actually represented on a storage medium based on some particular data storage paradigm etc., and a mapping from the PIM to each PSM.

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, UML for model specification, OCL for constraint specification, 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].

5. *Protocols* – e.g. GIOP/IIOP [CORBA] (both structure and exchange
   protocol), XML Metadata Interchange [XMI] (structure specification
   usable as payload on multiple exchange protocols).

6. *Domain Specific Standards* – e.g. Data Acquisition from Industrial
   Systems (Manufacturing) [DAIS], General Ledger Specification
   (Finance) [GLS], Air Traffic Control (Transportation) [ATC], Gene
   Expression (Life Science Research) [GE], Personal Identification
   Service (Healthcare) [PIDS], etc.

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].

3.0   Adoption Process

3.1   Introduction

OMG adopts specifications by explicit vote on a technology-by-technology
basis. The specifications selected each satisfy the architectural vision of MDA.
OMG bases its decisions on both business and technical considerations. Once a
specification adoption is finalized by OMG, it is made available for use by both
OMG members and non-members alike.

Request for Proposals (RFP) are issued by a *Technology Committee* (TC),
typically upon the recommendation of a *Task Force* (TF) and duly endorsed by
the *Architecture Board* (AB).

Submissions to RFPs are evaluated by the TF that initiated the RFP. Selected
specifications are *recommended* to the parent TC after being *reviewed* for
technical merit and consistency with MDA and other adopted specifications and

endorsed by the AB. The parent TC of the initiating TF then votes to *recommend adoption* to the OMG Board of Directors (BoD). The BoD acts on the recommendation to complete the adoption process.

For more detailed information on the adoption process see the *Policies and Procedures of the OMG Technical Process* [P&P] and the *OMG Hitchhiker's Guide* [Guide]. In case of any inconsistency between this document and the [P&P] in all cases the [P&P] shall prevail.

3.2   Steps in the Adoption Process

A TF, its parent TC, the AB and the Board of Directors participate in a collaborative process, which typically takes the following form:

Development   and   Issuance of RFP

RFPs are drafted by one or more OMG members who are interested in the adoption of a standard in some specific area. The draft RFP is presented to an appropriate TF, based on its subject area, for approval and recommendation to issue. The TF and the AB provide guidance to the drafters of the RFP. When the TF and the AB are satisfied that the RFP is appropriate and ready for issuance, the TF recommends issuance to its parent TC, and the AB endorses the recommendation. The TC then acts on the recommendation and issues the RFP.

Letter of Intent (LOI)

A Letter of Intent (LOI) must be submitted to the OMG signed by an officer of the member organization which intends to respond to the RFP, confirming the organization's willingness to comply with OMG's terms and conditions, and commercial availability requirements. (See section 4.3 for more information.). In order to respond to an RFP the organization must be a member of the TC that issued the RFP.

- *Voter Registration*

Interested OMG members, other than Trial, Press and Analyst members,   may participate in specification selection votes in the TF for an RFP. They may need to register to do so, if so stated in the RFP. Registration ends on a specified date, 6 or more weeks after the announcement of the registration period. The registration closure date is typically around the time of initial submissions. Member organizations that have submitted an LOI are automatically registered to vote.

Initial Submissions

Initial Submissions are due by a specified deadline. Submitters normally present their proposals at the first meeting of the TF after the deadline. Initial Submissions are expected to be complete enough to provide insight on the technical directions and content of the proposals.

Revision Phase

During this time submitters have the opportunity to revise their Submissions, if they so choose.

Revised Submissions

Revised Submissions are due by a specified deadline. Submitters again normally present their proposals at the next meeting of the TF after the deadline. (Note that there may be more than one Revised Submission deadline. The decision to set new Revised Submission deadlines is made by the registered voters for that RFP.)

Selection Votes

When the registered voters for the RFP believe that they sufficiently understand the relative merits of the Revised Submissions, a selection vote is taken. The result of this selection vote is a recommendation for adoption to the TC. The AB reviews the proposal for MDA compliance and technical merit. An endorsement from the AB moves the voting process into the issuing Technology Committee. An eight-week voting period ensues in which the TC votes to recommend adoption to the OMG Board of Directors (BoD). The final vote, the vote to adopt, is taken by the BoD and is based on technical merit as well as business qualifications. The resulting draft standard is called the *Alpha Specification*.

Business Committee Questionnaire

The submitting members whose proposal is recommended for adoption need to submit their response to the BoD Business Committee Questionnaire [BCQ] detailing how they plan to make use of and/or make the resulting standard available in products. If no organization commits to make use of the standard, then the BoD will typically not act on the recommendation to adopt the standard - so it is very important to fulfill this requirement.

Finalization

A Finalization Task Force (FTF) is chartered by the TC that issued the RFP, to prepare an Alpha submission for publishing as a Formal (i.e. publicly available) specification, by fixing any problems that are reported by early users of the specification. Upon completion of its activity the FTF recommends adoption of the resulting Beta (draft) specification. The parent

TC acts on the recommendation and recommends adoption to the BoD. OMG Technical Editors produce the Formal Specification document based on this Beta Specification.

Revision

A Revision Task Force (RTF) is normally chartered by a TC, after the FTF completes its work, to manage issues filed against the Formal Specification by implementers and users. The output of the RTF is a Beta specification reflecting minor technical changes, which the TC and Board will usually approve for adoption as the next version of the Formal Specification.

3.3   Goals of the evaluation

The primary goals of the TF evaluation are to:

Provide a fair and open process

Facilitate critical review of the submissions by members of OMG

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.

4.0   Instructions for Submitters

4.1   OMG Membership

To submit to an RFP issued by the Platform Technology Committee the submitter or submitters must be either Platform or Contributing members on the date of the submission deadline, while for Domain Technology RFPs the submitter or submitters must be either Contributing or Domain members. Submitters sometimes choose to name other organizations that support a submission in some way; however, this has no formal status within the OMG process, and for OMG's purposes confers neither duties nor privileges on the organizations thus named.

4.2   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. Several staff months of effort might be necessary. OMG is unable to reimburse submitters for any costs in conjunction with their submissions to this RFP.

4.3 Letter of Intent

A Letter of Intent (LOI) must be submitted to the OMG Business Committee signed by an officer of the submitting 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. These terms, conditions, and requirements are defined in the *Business Committee RFP Attachment* and are reproduced verbatim in section 4.4 below.

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. The LOI is typically due 60 days before the deadline for initial submissions. LOIs must be sent by fax or paper mail to the "RFP Submissions Desk" at the main OMG address shown on the first page of this RFP.

Here is a suggested template for the Letter of Intent:

This letter confirms the intent of <___organization required___> (the organization) to submit a response to the OMG <___RFP name required___> RFP. We will grant OMG and its members the right to copy our response for review purposes as specified in section 4.7 of the RFP. Should our response be adopted by OMG we will comply with the OMG Business Committee terms set out in section 4.4 of the RFP and in document omg/06-03-02.

<____contact name and details required____> will be responsible for liaison with OMG regarding this RFP response.

The signatory below is an officer of the organization and has the approval and authority to make this commitment on behalf of the organization.

<___signature required____>

4.4 Business Committee RFP Attachment

This section contains the text of the Business Committee RFP attachment concerning commercial availability requirements placed on submissions. This attachment is available separately as an OMG document omg/06-03-02.

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Commercial considerations in OMG technology adoption

A1   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.

A2   Business Committee evaluation criteria

A2.1   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 dependant on any one platform, cross-platform availability and interoperability of implementations should be also be demonstrated.

A2.2   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.

A2.3   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 a license to organisations (whether OMG members or not) on non-discriminatory and commercially reasonable terms which wish to make use of the specification. Accordingly, the submitter must certify that it is not aware of any claim that the specification infringes any IPR of a third party or that it is aware and believes that an appropriate non-discriminatory license is available from that third party. Except for this certification, the submitter will not be required to make any other warranty, and specifications will be offered by OMG for use "as is". If the submitter owns IPR to which an use of a specification based upon its submission would necessarily be subject, it must certify to the Business Committee that it will make a suitable license available to any user on non- discriminatory and commercially reasonable terms, to permit development and commercialisation of an implementation that includes such IPR.

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. However, in all events, the submitter shall also certify that any necessary licence will be made available on commercially reasonable, non-discriminatory terms. The submitter is responsible for disclosing in detail all known restrictions, placed either by the submitter or, if known, others, on technology necessary for any use of the specification.

A2.4   Publication of the specification

Should the submission be adopted, the submitter must grant OMG (and its sublicensees) a world- wide, 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.

A2.5   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.

4.5   Responding to RFP items

4.5.1   Complete proposals

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

Submitters are highly encouraged to propose solutions to any optional requirements enumerated in Chapter 6.

4.5.2   Additional specifications

Submissions may include additional specifications for items not covered by the RFP that they believe to be necessary and integral to their proposal. Information on these additional items should be clearly distinguished.

Submitters must give a detailed rationale as to why these specifications should also be considered for adoption. However 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.

4.5.3   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.

4.6   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.

4.7   Copyright Waiver

Every submission document must contain: (i) a waiver of copyright for unlimited duplication by the OMG, and (ii) a limited waiver of copyright that allows each OMG member to make up to fifty (50) copies of the document forreview purposes only. See Section 4.9.2 for recommended language.

4.8   Proof of Concept

Submissions must 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 to the satisfaction of the TF managing the evaluation process, the technical viability of their proposal. OMG will favor proposals based on technology for which sufficient relevant experience has been gained.

4.9   Format of RFP Submissions

This section presents the structure of a submission in response to an RFP. *All submissions* must contain the elements itemized in section 4.9.2 below before they can be accepted as a valid response for evaluation or a vote can be taken to recommend for adoption.

4.9.1   General

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

- o Submitted documentation should be confined to that directly relevant to the items requested in the RFP. If this is not practical, submitters must make clear what portion of the documentation pertains directly to the RFP and what portion does not.

- • The key words "**must**", "**must not**", "**required**", "**shall**", "**shall not**", "**should**", "**should not**", "**recommended**", "**may**", and "**optional**" shall be used in the submissions with the meanings as described in RFC 2119 [RFC2119].

4.9.2   Required Outline

A three-part structure for submissions is required. Part I is non-normative, providing information relevant to the evaluation of the proposed specification. Part II is normative, representing the proposed specification. Specific sections like Appendices may be explicitly identified as non-normative in Part II. Part III is normative specifying changes that must be made to previously adopted specifications in order to be able to implement the specification proposed in Part II.

PART I

A cover page carrying the following information:

- The full name of the submission

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

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

- The document number of the main submission document

- An inventory of all accompanying documents, with OMG document number, short description, and whether they are normative.

List of OMG members making the submission (see 4.1) listing exactly which members are making the submission, so that submitters can be matched with LOI responders and their current eligibility can be verified.

Copyright waiver (see 4.7), in a form acceptable to the 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."

If you wish to use some other form you must get it approved by the OMG legal counsel before using it in a submission.

For each member making the submission, an individual contact point who is authorized by the member to officially state the member's position relative to the submission, including matters related to copyright ownership, etc. (see 4.3)

- Overview or guide to the material in the submission

- Overall design rationale (if appropriate)

- Statement of proof of concept (see 4.8)

- Resolution of RFP requirements and requests

    Explain how the proposal satisfies the specific requirements and (if applicable) requests stated in Chapter 6. References to supporting material in Part II should be given.

    In addition, if the proposal does not satisfy any of the general requirements stated in Chapter 5, provide a detailed rationale.

- Responses to RFP issues to be discussed

    Discuss each of the "Issues To Be Discussed" identified in Chapter 6.

PART II

The contents of this part should be structured based on the template found in [FORMS] and should contain the following elements as per the instructions in the template document cited above:

Scope of the proposed specification

Proposed conformance criteria

Submissions should propose appropriate conformance criteria for implementations.

Proposed normative references

Submissions should provide a list of the normative references that are used by the proposed specification

Proposed list of terms and definitions

Submissions should provide a list of terms that are used in the proposed specification with their definitions.

Proposed list of symbols

> *Submissions should provide a list of special symbols that are used in the proposed specification together with their significance*

Proposed specification.

PART III

Changes or extensions required to adopted OMG specifications

> *Submissions must include a full specification of any changes or extensions required to existing OMG specifications. This should be in a form that enables "mechanical" section-by-section revision of the existing specification.*

4.10   How to Submit

Submitters should send an electronic version of their submission to the *RFP Submissions Desk* (*omg-documents@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, ODF (ISO/IEC 26300), OASIS Darwin Information Typing Architecture (DITA) or OASIS DocBook 4.x (or later).

Submitters should make sure they receive electronic or voice confirmation of the successful receipt of their submission. Submitters should be prepared to send a single hardcopy version of their submission, if requested by OMG staff, to the attention of the "RFP Submissions Desk" at the main OMG address shown on the first page of this RFP.

5.0   General Requirements on Proposals

5.1   Requirements

5.1.1   Submitters are encouraged to express models using OMG modeling languages such as UML, MOF, CWM and SPEM (subject to any further constraints on the types of the models and modeling technologies specified in Chapter 6 of this RFP). Submissions containing models expressed via 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   Chapter 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 the mapping technique or the resulting PSM(s) are to be considered normative.

5.1.3   Proposals shall be *precise* and *functionally complete*. All relevant assumptions and context required for implementing the specification shall be provided.

5.1.4   Proposals shall specify *conformance criteria* that clearly state what features all implementations must support and which features (if any) may *optionally* be supported.

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

5.1.6   Proposals shall justify and fully specify any *changes or extensions* required to existing OMG specifications. In general, OMG favors proposals that are *upwards compatible* with existing standards and that minimize changes and extensions to existing specifications.

5.1.7   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.

5.1.8   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.

5.1.9   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.

5.1.10   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.

5.1.11   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.

5.1.12   Proposals shall be compatible with the architecture for system distribution defined in ISO's Reference Model of Open Distributed Processing [RM-ODP]. Where such compatibility is not achieved, or is not appropriate, the response to the RFP must include reasons why compatibility is not appropriate and an outline of any plans to achieve such compatibility in the future.

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

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

Which accesses to security-sensitive elements must 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 must 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. [CSIV2] [SEC] [RAD].

5.1.14   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 5.1.13 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, usage of OMG standard XMI metadata [XMI] representations must be provided as this allows specifications to be easily interchanged between XMI compliant tools and applications. Since use of XML (including XMI and XML/Value [XML/Value]) is evolving rapidly, the use of industry specific XML vocabularies (which may not be XMI compliant) is acceptable where justified.

6.0 Specific Requirements on Proposals

The Object Management Group (OMG) Software Assurance (SwA) Architecture Board Special Interest Group (AB SIG) sponsored by Architecture Driven Modernization Task Force is creating a set of standards to facilitate the interoperation of Software Assurance tools. The following section outlines the problem statement, scope of proposals sought, relationship to existing OMG specifications, related activities, documents and standards, mandatory and optional requirements, issues to be discussed, evaluation criteria and timetables.

6.1 Problem Statement

While organizations are becoming increasingly dependent on software, targeted attacks against software are on the rise, causing harm to the infrastructure and disrupting business operations. There is a growing consensus in the industry and government that the software industry needs to actively address the root causes of exploitable vulnerabilities and implement methods to improve software resilience to attacks from the onset, thereby enhancing software trustworthiness. Unfortunately, it is becoming increasingly difficult to establish or verify whether or not software is sufficiently trustworthy, due to a variety of factors such as code complexity, net-centricity, globalization, use of open source and COTS, etc.

As complications to assessing trustworthiness will likely continue to evolve, formalized and standardized mechanisms/approaches must be developed that increase software assurance. Furthermore, to make software assurance practical, automation and meaningful exchange of this assurance-related information is needed.

Essential to meeting these challenges is the exchange of meaningful regulatory and dependability requirements and claims of compliance backed by rationale and evidence in a standardized manner. Software suppliers, tool vendors, acquirers, users, and others would benefit from a flexible and extensible means for its representation and exchange.

6.1.1 Software Assurance Evidence

This RFP solicits proposals for a metamodel for representing and exchanging information related to Software Assurance Evidence. Information about evidence is a set of the attributes that fully defines and characterizes the evidence. Examples of attributes are:
- Conducted – a given collection technique requirement is followed: TRUE or FALSE

- Completed – the agreed upon collection technique yielded results : TRUE or FALSE
- Traceability – the actual data collected for compliance assessment or the path indicating where the data is stored
- Reference – reference to claim and arguments that evidence is collected for
- Compliance – result of compliance assessment: TRUE or FALSE

For each claim, agreed upon collection techniques are used to capture the evidence. Collection techniques can be automatic, semiautomatic or manual.

Evidence is collected during SwA assessment activities to support the contention that a defined system will satisfy the particular requirements ultimately determining software trustworthiness. The software assessments could be performed throughout SDLC and evidence collected incrementally over the time or assessment can be done as a part of certification and accreditation process and evidence collected at once. The SwA Evidence is the facts about, but not limited to software artifacts/applications, people who developed them, methodologies, development process, development and operational environments, and regulatory compliance controls. In order to make this process more practical and scalable, especially in the area of evidence related to software artifacts, higher automation supported by tools is required. One common characteristic of various tools and services that address this SwA assessment challenge is *analysis* of the software assets (for example: source code modules, database, build scripts, etc.) to obtain evidence for claim/requirement compliance. No single vendor can hope to provide all of the innovative techniques required to analyze/assess the diversity of languages, platforms and technologies of the multitude of applications. Each tool/service implements a portion of the analysis related to software trustworthiness. Such tool-specific analysis may be restricted to a particular source language and/or particular platform and/or specific technology. Currently, the results/outputs of this tool-specific analysis are preserved or presented using proprietary representation structures. All the above may hinder interoperability between different tools making it very difficult to complete SwA assessment. The metamodel for SwA Evidence shall overcome this issue by providing a common repository structure that will facilitate collection and exchange of data produced by individual tools as a result of particular analysis during Software Assurance Assessment. The metamodel shall represent a variety of evidence related but not limited to the process, people, environment, software artifacts (physical and logical views) and regulatory compliance controls, at various levels of abstraction. The primary purpose of this metamodel is to promote a common interchange format that will allow interoperability between SwA tools, services and their respective outputs. The metamodel shall be comprehensive and extensible. This will enable vendors to focus their efforts on development of tools for specific SwA analysis/assessment capabilities (where gaps are

identified) while integrating with products of other vendors to provide a comprehensive SwA solution for users of this technology.

Defining meta-data and metamodel elements to support SwA evidence is not an isolated exercise. Proposals should represent the wide variety of established industry and government programs that support the SwA activities. The specifications should borrow from these sources as necessary so as to avoid reinventing the wheel.

To improve accessibility, proposals may need to represent evidence categories such as environment evidence, software artifacts evidence, process evidence, people evidence, policy compliance evidence, regulatory compliance evidence, etc.

6.1.2   Business Value

SwA Evidence Metamodel (SAEM), a standard for defining SwA Evidence, ensures the consistency in exchanging, expressing and understanding information related to software trustworthiness and traceability. SwA Evidence provides strategic and tactical guidance throughout the SwA assessment process. It facilitates the ability to evaluate, estimate and determine compliance with requirements and ultimately, level of confidence that software is trustworthy.

6.1.3   Interoperability Benefits

Over the past few years, a strong cross-section of SwA participants (software intensive organizations, users, consumers, auditors and regulators) has emerged with the objective of promoting software assurance within the community. Until recently, these participants have been working mostly in isolation. Fortunately, they are coming together in places such as the Object Management Group. Future standardization of SwA concepts and methodologies must build upon a combination of prior experiences, domain knowledge, and best practices, and will ultimately facilitate interoperability for the creation, exchange, and use of assurance-related information among community participants. This will allow:

- Different participants to initiate collaboration and activities in areas of SwA through common assurance standards and framework

- Enabling of a new generation of supporting solutions that benefit all participants and

- Enhancement/improvement in automation of SwA activities by enabling interoperability between different supporting solutions (toolsets)

Once the formal framework for claims, arguments and evidence is completed, the expected results include

- Software providers and system integrators can engineer products that will meet the expectations for product-level assurance in advance for the acquisition and deployment of software including regulatory controls

- Software intensive organizations and system integrators would be able to make arguments and verifiable claims to their customers that their software systems and internal controls are sufficiently trustworthy

- Customers would have methods to verify those arguments and claims through collected and presented evidence

SwA specifications and corresponding solutions will enable projects with critical software product portfolios to build secure and reliable products.

6.2   Scope of Proposals Sought

This RFP solicits proposals for an extensible metamodel for representing information related to Software Assurance Evidence. This metamodel shall provide a common repository structure that will facilitate the exchange of information between different Software Assurance tools and services.

Examples of the categories of evidence that SAEM is expected to accommodate include:
- Programming language facts (e.g., syntax and semantics);
- Contextual facts about the software artifact (naming, dependencies, language(s) used, etc);
- Facts about how the software artifact is structured (e.g., functions, modules, packages, components, etc);
- Facts about the design representations of the software artifact (e.g., level of abstraction, kind of design representation, etc);
- Assurance relationships between kinds of SAEM facts;
- Refinement and traceability relationships among categories of SAEM facts;
- Annotation elements that allow design and implementation rationale to be captured as SAEM facts;
- Development practices followed during development process
- Regulatory compliance controls

For more information and context regarding these categories refer to SwA Whitepaper.

Consistent with other models defined by OMG, the SAEM will be defined using the MOF metamodeling language. As such, it will have a standard textual representation presented by XMI. Consequently, the exchange of evidence data defined by SAEM will be in the XMI. These models will, similarly, be compatible with MOF repositories for storage and retrieval by various tools.

6.2.1   RFP Assumptions

Responders should take note of the following assumptions with respect to this RFP:

None

6.3   Relationship to Existing OMG Specifications

This RFP relates to several existing OMG specifications, as shown below:

MOF 2.0 (formal/2006-01-01)	Facilitates SAEM definition and exchange formats (XMI, etc.)
Knowledge Discovery Metamodel (KDM) (ptc/06-06-07)	The KDM documents software artifacts and their operational environment for evidence collection
IT Portfolio Management (dtc/04-11-03)	IT Portfolio Mgmt. establishes the universe of non-software aspects of the enterprise. Relevant for Representing Evidence regarding the operational environment
UML (formal/05-07-04; formal/05-07-05)	UML artifacts can serve as SwA evidence of software design.
Reusable Asset Specification (RAS) (formal/2005-11-04 ; formal/2006-01-04)	Reusable Asset Specification provides a way to define reusable asset packages for a domain of interest and a general classification mechanism. Relevant for Representing Evidence regarding previously created and deployed software artifact.
UML™ Profile for Systems Engineering (SysML) (ptc/2006-05-04)	SysML, an extension of UML 2.1, defines unit of measure and probability distributions for properties of system components. Relevant for Representing Evidence regarding expressed requirements.
SPEM 2.0 - Software Process	Relevant for Representing Evidence

Engineering Metamodel (ptc/07-03-03)	regarding Software Development Process
UML™ Profile for Modeling QoS and Fault Tolerance Characteristics and Mechanisms (formal/2006-05-02)	This extension of UML 2.0 is a framework for describing quality of service requirements and properties which refers to three measures: risk frequency, reliability and availability.
Semantics of Business Vocabulary and Business Rules (SBVR) (dtc/06-03-02)	Relevant for defining vocabulary for Claims and Arguments that will be referenced from Evidence. This specification defines the vocabulary and rules for documenting the semantics of business vocabulary, business facts, and business rules; as well as an XMI schema for the interchange of business vocabularies and business rules among organizations and between software tools.

6.4   Related Activities, Documents and Standards

Related documents and standards relevant to this RFP include:

- swa/2007-09-02: Software Assurance White Paper

- admtf/05-11-07: Metrics Package White Paper

- admtf/06-09-03 Software Metrics Metamodel RFP

- admtf/2007-09-03: Software Metrics Metamodel

- admtf/2007-09-02: Abstract Syntax Tree Metamodel

- admtf/05-11-06: Analysis Package White Paper

- admtf/04-09-03: Modernization Scenarios: Mapping the KDM to Modernization Initiatives

- ISO/IEC 15939: Software engineering - Software measurement process

- IEC 61508 (Functional Safety of Electrical /Electronic/Programmable Electronic Safety Related Systems.

Reference documents:

- *Common Criteria for Information Technology Security Evaluation, Part 3 – ISO/IEC 15488, Version 3.0*, International Standards Organization, June 2005

- *Common Methodology for Information Technology Security Evaluation ISO/IEC 18045, Version 3.0*, International Standards Organization, July 2005

- DODI8500.1 – DoD Information Assurance

- DO178B – Software Considerations in Airborne Systems and Equipment Certification

There is no known overlap with specification activities or specifications, competing or complementary, from other standards bodies.

6.5   Mandatory Requirements

This section specifies the mandatory requirements that must be satisfied by any proposal submitted in response to this RFP.

1. Submissions shall define a metamodel for representing information related to Software Assurance Evidence

2. Submissions shall conform to MOF 2.0 and be delivered in both MOF XMI and English-language formats.

3. Submissions shall be expressed using UML.

4. Submissions shall define a consistent terminology for software assurance evidence that will be used throughout the specification.

5. Submissions shall distinguish between at least the following evidence subclasses: software artifacts, methodologies, development process, people, operational and development environment, regulatory compliance controls

6. Submissions shall define the content elements which are necessary and sufficient to represent common kinds of evidence listed in section 6.2 of this document, in SwA Whitepaper as well as in the reference documents listed in section 6.4.

7. Submissions shall define evidence attributes which are necessary and sufficient to represent compliance information such as but not limited to

Conducted, Completed, Traceability, Reference and Compliance (for more explanation refer to section 6.1.1).

8. Submissions shall have means to represent evidence of compliance (e.g. all relevant content elements are marked TRUE) and non compliance (e.g. some content elements are marked FALSE or Unmarked meaning incomplete).

9. Submissions, where applicable shall conform to ADM specifications and specifications listed in section 6.3. More specifically submissions shall align with KDM 1.0 when defining evidence related to the artifacts of the existing software systems, ASTM (work in progress, doc. # admtf/2007-09-02) when defining evidence related to programming language facts, and SMM (work in progress, doc. #admtf/2007-09-03) when defining evidence related to measurements and metrics of existing software systems.

10. Submissions shall define the evidence attributes, which are necessary and sufficient to describe the rigor of evidence content (e.g., informal, semi-formal, formal).

11. Submissions shall define aggregation elements for grouping evidence.

12. Submissions shall provide the means for representing relationships between individual or aggregated evidence content and other individual or aggregated evidence content (e.g., high-level to low-level design or relating tests to claims).

13. Submissions shall provide the means for representing relationships between evidence content whether it be located within the same evidence repository or in an external repository.

14. Submissions shall provide the means for annotating evidence with its history and rationale.

15. Submissions shall provide a mechanism for extensibility of the metamodel.

16. Submissions shall provide the means for annotating evidence with the measurement and metrics.

6.6   Optional Requirements

This section specifies the optional requirements that may be satisfied by any proposal submitted in response to this RFP.

1. Submissions may define evidence repository annotation elements for describing the purpose, scope, and context of a specific repository.

2. Submissions may define evidence versioning elements for performing version management of evidence content.

3. Submissions may define access control annotation elements for asserting authorized policies for access to individual or aggregated evidence content.

4. Submissions may consider making evidence model as a separate entity vs. making it as a part of existing models. This is encouraged.

6.7   Issues to be discussed

These issues will be considered during submission evaluation. They should not be part of the proposed normative specification.

The submission shall discuss measurement uncertainty, usability and validation with respect to the SAEM.

6.8   Evaluation Criteria

Evaluation of proposals will include consideration of the following:

1. Coverage of the explicit and implicit evidence elements specified in the cited *Reference Documents* in section 6.4.

2. Submissions shall have considered all other relevant OMG specifications.

3. Suitability as a basis for implementing a SwA evidence repository.

6.9   Other information unique to this RFP

None

6.10   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	Actual Date
Preparation of RFP by TF	
RFP placed on OMG document server	*Aug. 27, 2007*
Approval of RFP by Architecture Board Review by TC	*Sep. 28, 2007*

TC votes to issue RFP	Sep. 28, 2007
LOI to submit to RFP due	Nov. 29, 2007
Initial Submissions due and placed on OMG document server ("Four week rule")	Feb. 11, 2008
Voter registration closes	Feb. 10, 2008
Initial Submission presentations	Mar. 10, 2008
Preliminary evaluation by TF	
Revised Submissions due and placed on OMG document server ("Three week rule")	Aug. 23, 2008
Revised Submission presentations	Sep. 22, 2008
Final evaluation and selection by TF Recommendation to AB and TC	Dec. 10, 2008
Approval by Architecture Board Review by TC	Dec. 2008
TC votes to recommend specification	Mar. 2009
BoD votes to adopt specification	Mar. 2009

Appendix A   References and Glossary Specific to this RFP

A.1   References Specific to this RFP

A.2   Glossary Specific to this RFP

Appendix B   General Reference and Glossary

B.1   General References

The following documents are referenced in this document:

[ATC] Air Traffic Control Specification,
http://www.omg.org/technology/documents/formal/air_traffic_control.htm

[BCQ] OMG Board of Directors Business Committee Questionnaire,
http://www.omg.org/cgi-bin/doc?bc/02-02-01

[CCM] CORBA Core Components Specification,
http://www.omg.org/technology/documents/formal/components.htm

[CORBA] Common Object Request Broker Architecture (CORBA/IIOP),
http://www.omg.org/technology/documents/formal/corba_iiop.htm

[CSIV2] [CORBA] Chapter 26

[CWM] Common Warehouse Metamodel Specification,
http://www.omg.org/technology/documents/formal/cwm.htm

[DAIS] Data Acquisition from Industrial Systems,
http://www.omg.org/technology/documents/formal/dais.htm

[EDOC] UML Profile for EDOC Specification,
http://www.omg.org/techprocess/meetings/schedule/UML_Profile_for_EDOC_FTF.html

[EJB] "Enterprise JavaBeans™", *http://java.sun.com/products/ejb/docs.html*

[FORMS] "ISO PAS Compatible Submission Template".
http://www.omg.org/cgi-bin/doc?pas/2003-08-02

[GE] Gene Expression,
http://www.omg.org/technology/documents/formal/gene_expression.htm

[GLS] General Ledger Specification ,
http://www.omg.org/technology/documents/formal/gen_ledger.htm

[Guide] The OMG Hitchhiker's Guide,, *http://www.omg.org/cgi-bin/doc?hh*

[IDL] ISO/IEC 14750 also see [CORBA] Chapter 3.

[IDLC++] IDL to C++ Language Mapping, *http://www.omg.org/technology/documents/formal/c++.htm*

[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/docs/omg/01-12-01.pdf*

[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/technology/documents/formal/mof.htm*

[MQS] "MQSeries Primer", *http://www.redbooks.ibm.com/redpapers/pdfs/redp0021.pdf*

[NS] Naming Service, *http://www.omg.org/technology/documents/formal/naming_service.htm*

[OMA] "Object Management Architecture™", *http://www.omg.org/oma/*

[OTS] Transaction Service, *http://www.omg.org/technology/documents/formal/transaction_service.htm*

[P&P] Policies and Procedures of the OMG Technical Process*, http://www.omg.org/cgi-bin/doc?pp*

[PIDS] Personal Identification Service, *http://www.omg.org/technology/documents/formal/person_identification_service.htm*

[RAD] Resource Access Decision Facility, *http://www.omg.org/technology/documents/formal/resource_access_decision.htm*

[RFC2119] IETF Best Practices: Key words for use in RFCs to Indicate Requirement Levels, (*http://www.ietf.org/rfc/rfc2119.txt).*

[RM-ODP] ISO/IEC 10746

[SEC] CORBA Security Service,
http://www.omg.org/technology/documents/formal/security_service.htm

[TOS] Trading Object Service,
http://www.omg.org/technology/documents/formal/trading_object_service.htm

[UML] Unified Modeling Language Specification,
http://www.omg.org/technology/documents/formal/uml.htm

[UMLC] UML Profile for CORBA,
http://www.omg.org/technology/documents/formal/profile_corba.htm

 [XMI] XML Metadata Interchange Specification,
http://www.omg.org/technology/documents/formal/xmi.htm

[XML/Value] XML Value Type Specification,
http://www.omg.org/technology/documents/formal/xmlvalue.htm

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 that one must conform to in order to claim compliance with the standard. (as opposed to non-normative or informative which is explanatory material that is included in order to assist in understanding the standard and does not contain any provisions that must be conformed to in order to claim compliance).

Normative Reference – References that contain provisions that one must conform to in order to claim compliance with the standard that contains said normative reference.

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 the OMG's Technology Committee. Such proposals must be received by a certain deadline and are evaluated by the issuing task force.

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 – *Platform TC* (PTC), that focuses on IT and modeling infrastructure related standards; and *Domain TC* (DTC), that focus 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.