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Roadmap for OMG PAS Submissions
Version 4.1, April 1999

Introduction

This is OMG's Roadmap for submitting OMG's open specifications to ISO for transposition into de jure ISO standards. While all of OMG's specifications are not currently referenced, it is general policy, agreed by the Board, that the majority of OMG's specifications will be submitted to ISO. Those being submitted to ISO/IEC JTC1 will use OMG's PAS submitter status with JTC 1 to expedite the process; others, to other ISO TCs, will be submitted using fast track or possibly some other, yet to be negotiated, process.

The Roadmap will be reviewed and, when appropriate, updated as new OMG specifications are adopted. Target dates for submissions will be added as they are agreed. Suggestions as to other OMG specifications that should be added to this Roadmap are welcome. Please contact the editor, Henry Lowe, henry@omg.org.

This document has three major sections:

1. Acronym expansions (it suffers from acromynitis and some readers may not be familiar with all of the acronyms);
2. A table for the OMG specifications which will be submitted to ISO JTC1/SC7 under the ODP umbrella.
3. Two tables for those OMG specifications which do not fit under the ODP umbrella.
4. References to specifications and standards in this roadmap.

1 Acronym Expansions

FCD	Final Committee Draft, an ISO status in standardization process
FDIS	Final Draft International Standard
GIOP	General inter-ORB Protocol
IDL	Interface Definition Language
IIOP	Internet inter-ORB Protocol
JTC1	Joint Technical Committee One (ISO technical committee covering telecommunications and related standards)
LQS	Lexical Query Service
MOF	Meta Object Facility
ODP	Open Distributed Processing
ORB	Object Request Broker
OTS	Object Transaction Service
PAS	Publicly Available Specification (procedure, unique to ISO JTC1, which allows specifications developed outside ISO to be rapidly adopted by ISO – a pointer to current ISO PAS procedures can be found in the document liaison/98-03-03 on the OMG server).
PIDS	Patient Identification Service
RFP	Request for Proposal
RM-ODP	The Reference Model of Open Distributed Processing
SC	Subcommittee
TC	Technical Committee
UML	Unified Modeling Language

2 ODP related submissions

The RM-ODP provides a general framework for distributed processing using open standards and a brief introduction to the standardization requirements that it identifies is given in the Annex to this document. This framework needs to be populated by open specifications, such as those from OMG. In light of this and the already established liaison and good working with relationship with the ISO's ODP experts, OMG will be collaborating with JTC1/SC7 (Software Engineering), submitting many of its specifications to ISO through the PAS process.

For the first of its PAS submission, OMG will submit GIOP/IIOP. The rationale behind this is that, while not an official request from ISO, the ISO draft ISO/IEC FDIS 14752 (Open Distributed Processing - Protocol support for computational interactions) contains a note essentially encouraging OMG to submit this specification. GIOP/IIOP corresponds to channel creation under node management in ODP (see the following table). Since specifications submitted under the PAS process are assigned to a subcommittee for handling review and comments, we will request this submission be assigned to JTC1/SC7.

Plans for subsequent submissions to JTC1/SC7 using PAS are indicated in the table below. The first two columns of this table indicate the ODP function and OMG specification corresponding to that function. The third column in the table indicates the OMG's priority for submitting that particular OMG specification to ISO.

ODP Functions	CORBA Services/Facilities	Priority for PAS
Management functions		
Node management:		
• provided by the nucleus of a node, and concerned with control of processing, storage and communications functions within a node. It provides for:	ORB (CORBA 2.3); with two language mappings, C++ and Java.	High
- management of processing threads	Real-Time ORB Extensions	
- clock access and timer management		
- channel creation and the handling of engineering interface references	GIOP/IIOP Naming Service	Immediate High
- capsule template instantiation and capsule deletion		
Object management:		
• provided, where required, by any object and allows	Persistent State Service (in process); and	Low
- checkpointing	Lifecycle Services	
- deletion of the object		Medium
Cluster management:		
• provided by a cluster manager and allows		
- checkpointing,		
- recovery,		
- migration,		
- deactivation		

- deletion of the cluster **Capsule management:** • provided by a capsule manager and allows - instantiation (including recovery and reactivation) - checkpointing - deactivating - deleting of all clusters in a capsule - deletion of the capsule itself		
Coordination functions **Event notification:** • records and makes available event histories: - event producers interact with the function to create event histories - the function notifies registered event consumers of the availability of event histories. **Checkpoint and recovery:** • coordinates - checkpointing of clusters - recovery of failed clusters from *checkpoints*. • governed by policies covering when clusters should be checkpointed and where the associated checkpoints should be stored, when and where clusters should be recovered, and which checkpoint should be recovered. **Deactivation and reactivation:** • coordinates - deactivation of clusters - reactivation of clusters • governed by policies covering when clusters should be deactivated and where the associated checkpoints should be stored, when and where clusters should be reactivated, and which checkpoint should be used for reactivation. **Group:** • provides the necessary mechanisms to coordinate the interactions of objects in a multiparty binding **Replication:**	Event Service; Notification Service (Note that these should submitted together) Lifecycle Service; & Externalization Service Persistent State Service (in process)	High High Low Low

• concerned with the special case of a group in which the objects in the group are behaviourally compatible • provides the necessary mechanisms to ensure that the group appears to other objects as if it were a single object and also allows the membership of the group to be increased or decreased • can be used at the level of a cluster, in conjunction with the group function, to form a coordinated set of replica groups where the objects in each cluster form a replica group		
Migration: • coordinates the migration of a cluster from one capsule to another • can operate either by replicating the cluster, making use of the replication function, or by deactivating the cluster and reactivating it in another cluster, using the deactivation and reactivation function. **Transaction:** • coordinates and controls a set of transactions to achieve a specified level of visibility and permanence, subject to policies that determine the actions of interest for the transaction • an ACID transaction is a special case of the transaction function for which the transactions have the properties of being atomic, consistent, isolated and durable. **Engineering interface reference tracking:** • monitors the transfer of engineering interface references between engineering objects in different clusters • determines when the supporting infrastructure for the reference is no longer required because no object in any other cluster can bind to the referenced interface.	Lifecycle Services Objects by Value; Fault tolerance(in process) Transaction Service (OTS 1.1)	Medium Medium Low High+
Repository functions **Storage:** • stores data **Information organization:** • manages a repository of information described by information schema and allows - modification and updating of both the schema and the repository - querying the repository **Relocation:**	Query Service & Relationship Service	Low

• manages a repository of locations for interfaces and management functions for clusters supporting those interfaces **Type repository:** • manages a repository of type specifications and type relationships	Interface Repository; MOF (1.3); XMI	Aligned with FCD 14769 (Medium if needed) Medium
Trading: • supports - export of service offers by service providers in the form of information about the interface at which the service is provided - import by service users of service offers matching specific requirements	Trader Service	Already a standard, ISO / IEC 13235-1
Security functions • address requirements for confidentiality, integrity, availability and accountability • provide services that can be applied both to objects themselves and to the interactions between objects **Access control:** • prevents unauthorized interactions with an object **Security audit:** • monitors and collects information about security related actions • allows the analysis of the information to review policies, controls and procedures **Authentication:** • function provides assurance of the claimed identity of an object. **Integrity:** • detects and/or prevents the unauthorized creation, alteration or deletion of data. **Confidentiality:** • prevents the unauthorized disclosure of information **Non-repudiation:** • prevents one object in an interaction from denying its involvement in the interaction **Key management:** • provides facilities for the management of cryptographic keys	Security Services	High-

Naming: 1. functionality identified by IS 14771, Open Distributed Processing - Naming Framework	Naming Service	
Notation: • for expressing ODP viewpoint specifications	UML; IDL	High Already a standard, ISO / IEC 14750

3 OMG specifications which do not fit under the ODP.

The following table contains a list of OMG Specifications which do not fit under ODP but do fall within the scope of JTC1 which means they may be transposed into ISO using PAS. ISO JTC1's SCs through which they can be submitted are listed where known.

ISO TC/SC	CORBA Services/Facilities	OMG Contact	Priority for PAS
JTC1/SC17	Currency	Jack Hassell	Medium
JTC1/SC32/WG2	LQS	Tom Culpepper	Medium

The following table contains a list of OMG Specifications which do not fit under ODP and do not fall within the scope of JTC1, therefore cannot be transposed into ISO using JTC1's PAS). The ISO TCs/ SCs in which they might be standardized are listed where known. Other non-PAS methods of transposition into ISO will have to be explored.

ISO TC/SC	CORBA Services/Facilities	OMG Contact	Priority for PAS
TC 215	PIDS	Mary Kratz	High
TC184/SCxx	Simulation	Fred Kuhl	High

4 Documents Referenced

1.	RM-ODP	ISO/IEC 10746 parts 1, 2, and 3 – available in members-only area of OMG server as om/96-10-02, om/96-10-03, and om/96-10-04. Non-OMG members can get these from the ISO web site at http://www.iso.ch/infoe/catinfo.html. Part 3 contains an overview of all the ODP Functions in this document.
2.	ISO Protocol support for computational interactions	ITU-T Rec. X.931(draft) | ISO/IEC FDIS 14752950 – available in members-only area of OMG server as pas/98-06-01).. Non-OMG members can get these from the ISO web site at http://www.iso.ch/infoe/catinfo.html.
3.	CORBA 2.3:	http://www.omg.org/pub/docs/formal/98-12-01 – not yet available.
4.	C++ Mapping:	http://www.omg.org/pub/docs/formal/98-02-25
5.	Java Mapping:	http://www.omg.org/pub/docs/formal/98-02-29
6.	GIOP/IIOP:	http://www.omg.org/pub/docs/formal/98-02-18.pdf
7.	Persistent State Services:	new version submissions being evaluated
8.	Lifecycle Service:	http://www.omg.org/pub/docs/formal/97-12-13.pdf
9.	Real-Time	submissions being evaluated
10.	Event service	http://www.omg.org/pub/docs/formal/97-12-11.pdf
11.	Notification Service	http://www.omg.org/pub/docs/formal/telecom/98-01-01.pdf
12.	Externalization Service	http://www.omg.org/pub/docs/formal/98-12-16.pdf
13.	Component	submissions being evaluated
14.	Work Flow	submissions being evaluated
15.	Fault Tolerant	submissions being evaluated
16.	Objects by Value	http://www.omg.org/pub/docs/formal/98-12-01 – not yet available
17.	OTS	http://www.omg.org/pub/docs/formal/formal/98-07-09.pdf
18.	LQS	http://www.omg.org/pub/docs/formal/99-03-06.pdf
19.	Relationship Service	http://www.omg.org/pub/docs/formal/97-12-16.pdf
20.	Interface Repository	http://www.omg.org/pub/docs/formal/formal/98-02-13.pdf
21.	ISO Type Repository	ISO/IEC 14769|draft X.960 (original ODP Type Repository being aligned with MOF) estimated for 1999 – not available to public.
22.	OMG MOF	Yet to be published as book together with UML
23.	ISO Trader	ISO/IEC 13235-1 and ITU-T Recommendation X.950 – available in members-only area of OMG server 1995/95-07-06. Non-OMG members can get these from the ISO web site at http://www.iso.ch/infoe/catinfo.html.
24.	OMG Trader	http://www.omg.org/pub/docs/formal/formal/98-07-08.pdf
25.	Security Service	http://www.omg.org/pub/docs/formal/98-12-17.pdf
26.	UML	Yet to be published as book together with MOF
27.	ISO IDL	ISO/IEC 14750 and ITU-T Recommendation X.920. Available from the ISO web site at http://www.iso.ch/infoe/catinfo.html.
28.	OMG IDL	http://www.omg.org/pub/docs/formal/98-02-08.pdf
29.	PIDS	http://www.omg.org/pub/docs/formal/99-03-05.pdf
30.	Simulation	http://www.omg.org/pub/docs/mfg/98-06-06.pdf

Annex

Background material: ODP functions and CORBA services

1. Introduction

This Annex provides background material relevant to proposals for the submission of OMG Specifications for adoption as ISO standards through the PAS (Publicly available standards) process.

2 ODP standards

2.1 The RM-ODP

The Reference Model for ODP (RM-ODP), ITU-T Rec. X.900-904 | ISO/IEC 10746, provides the overall framework for ODP standardization. It comprises two main parts:

- ITU-T Rec. X.902 |ISO/IEC 10746-2: **Foundations**, which defines the concepts and analytical framework for the description of distributed processing systems, including a general framework for the assessment of conformance;
- ITU-T Rec. X.903 | ISO/IEC 10746-3: **Architecture,** which defines how ODP systems are specified and the infrastructure providing distribution transparencies;

ITU-T Rec. X.904 | ISO 10746-4: **Architectural semantics** complements these two main parts by providing a formal interpretation of the modelling concepts and viewpoint languages in terms of existing formal description techniques.

The RM-ODP is generic, that is, independent of, and equally applicable to, arbitrary application domains making use of or requiring distributed systems technology. For some specific application domains it will be necessary to refine and specialize the RM-ODP to suit particular needs, resulting in:

- specific reference models which cover individual types of enterprise, use concepts and common functions given in the RM-ODP, and define additional conceptual detail and specific functions, e.g., Telecommunication Information Networking Architecture (TINA);
- standards for the realization of specific functions needed for particular applications and possibly identified in a specific reference model, e.g. interfaces for telephone call connection.

Because it is generic the RM-ODP also enables disparate distributed system technologies to be integrated into cost effective technical system solutions to business requirements. In particular, the ODP approach addresses such issues as federation, transparency and system management, and by defines a fine grained framework of reference points to support the integration of functions from different sources.

2.2 Specific standards

Four categories of standards are identified within the overall framework provided by the RM-ODP:

- additional architectural frameworks, which complement the RM-ODP in specific areas such as naming, security and conformance assessment;
- notation standards, which define notations for expressing specifications of different aspects of system integration and distribution, and rules for relating different specifications;
- component standards, which define a single ODP function or closely interrelated set of ODP functions, possibly capable of implementation as a single hardware or software platform;
- component composition standards, which define the coordinated use of a number of components to achieve some objective of the system as a whole, such as provision of a specific transparency.

Note: Some standards may specify both components and their composition (so that a useful facility can be implemented directly). Other standards may form the basis for a number of component composition standards, for example, an ODP Relocator standard would be referenced in component composition standards for the provision of location or migration transparencies.

The RM-ODP provides a framework for component standards and component composition standards for ODP functions which permits a number of different approaches to their realization. This flexibility is necessary if the framework is to have a reasonable lifetime, incorporating new developments as they mature. Thus, a specific standard or set of standards specifies one particular solution to the provision of some ODP requirement, making all the specific choices needed for implementation of open products to be possible, and there may be a number of such standards, corresponding to different design choices. In time, new technologies will be incorporated, leading to new generations of standards within the one ODP framework.

3 The architectural context of ODP component and component composition standards

The RM-ODP Part 3 (ISO/IEC Part 3) defines a generic architecture for distributed systems in terms of the concepts and rules for two viewpoint descriptions of a system:

- the computational description, which is concerned with the functional decomposition of the system computation into a set of objects that interact at interfaces - enabling system distribution and portability;
- the engineering description, which is concerned with the (object-based) infrastructure required to support system distribution.

Related to these descriptions Part 3 identifies a set of distribution transparencies that may be supported by the infrastructure and a set of ODP functions necessary to support the architecture and implement the distribution transparencies. Most of the function standards relate to the engineering description - the exception is the trading function.

ODP component standards specify the provision of the ODP functions identified by the RM-ODP Part 3. ODP component composition standards specify the provision of distribution transparencies through the use in combination of appropriate ODP functions.

4 ODP functions and CORBA object services

CORBA and the architecture defined by the computational and engineering viewpoint languages of the RM-ODP are essentially consistent as means of describing systems implemented in terms of configurations of distributed objects. Both identify common infrastructure functions that support the operation of such systems and simplify their implementation - CORBA object services on the one hand and the ODP functions on the other. There is significant commonality between these two sets of functions and the main body of this document gives a mapping between CORBA services and ODP functions.

It should be noted that, at present, there are no CORBA specifications that would correspond to ODP component composition standards specifying ODP distribution transparencies.