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Summary Sheet

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Hard Real-time CORBA

HRTC Dissemination Plan

Abstract:

The present document describes the activities that are going to take place to disseminate HRTC activities and results.

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HRTC Partners:

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1 Introduction

1.1 HRTC Objectives

The objectives of the project are clearly stated in the HRTC Technical Annex:

- (i) to analyze and identify hard-real time requirements posed by CORBA-based distributed control systems, and to develop theory/methodology for hard-real time CORBA applications,
- (ii) to enhance CORBA specifications with corresponding interfaces in order to build distributed control systems that have real-time requirements with hard timing constraints, and
- (iii) to implement a CORBA-pluggable real-time protocol for an ORB for running experiments.

1.2 Dissemination Objectives

As the main results expected from the HRTC project are related with the potential evolution of CORBA Technology to be applied in control systems, the main objective of the dissemination tasks is to make all CORBA Control Systems stakeholders (actual or potential) aware of the potentiality of the technology in the field of control and the evolution envisioned for it.

These stakeholders are:

- The CORBA specifications community
- The Distributed Control Systems community
- The policy makers

Depending on the stakeholder the dissemination activity will be different but, in this project, the main focus will be the CORBA specifications community organized around OMG working groups.

2 Dissemination Activities

2.1 Introduction

The methods selected for the dissemination, exploitation of results and achievement of technology awareness are (in order of importance):

- Dissemination through OMG channels.
- R&D Community by means of participation in symposia, education, courses, journal publications, etc.
- Raising concerns about hard real-time distributed systems engineering in research policy makers
- Disseminating the technology among control manufacturers.

In the subsection below we present a brief summary of intended dissemination actions to be taken during and after the project, together with the relevant target audiences (from the HRTC Project Technical Annex).

2.2 OMG Channels

This activity is related with the dissemination of the technology through the proper channel for CORBA technology: the Object Management Group (www.omg.org) and its well known OMG's Technology Adoption Process¹.

In this activity the steps to follow are:

1. Contact key personnel in OMG.
2. Gather a group of people from universities and companies
3. Elaborate an RFI on Hard Real-time CORBA
4. Elaborate an RFP on Hard Real-time CORBA

¹ See <http://www.omg.org/gettingstarted/processintro.htm>.

5. Elaborate a response to the proposal based on HRTC work.

To achieve these objectives the project team will be actively involved in OMG activities related to embedded and real-time systems (TCs, technical meetings, specific workshops, *etc.*). Obviously, HRTC work will be affected by OMG standardisation process procedures and timing constraints (See Appendix E).

The exact amount of progress in this activity will depend on timing issues imposed by the interaction with OMG technical process.

2.3 Conventional Dissemination Activities

The natural forum for these results is the embedded, real-time, distributed forums; but the results and implications for robotics and automation (as illustrated in our demonstrators) should be of interest within those fields (and this is a primary concern for us). This includes both application and system development aspects. Target symposia are:

- International Symposium on Object-oriented Real-time Computing
- Real-time Systems Symposium
- Workshop on Real-Time and Embedded Distributed Object Computing
- Control Design Conference
- Real-time & Embedded Computer Conference
- Embedded Systems Conference

These contents can also be translated to journal papers to have a wider dissemination across communities. Of specific interest for us are:

- Real-time Systems
- IEEE Distributed Computing
- RTC Europe
- Industrial Computing
- Transactions on Control Systems Technology

Several partners of the project are responsible for the teaching in real-time programming and in real-time systems, with a strong influence of control aspects. It is our aim that results of HRTC should go into either the advanced parts of current courses and/or be part of new planned courses within this area.

2.4 Raising Concerns about the Technology

This activity will be carried out by means of activities within the European research programmes. The main focus for the consortium is the IST programme and the HRTC consortium will collaborate in:

- Delivering reports to key R+D policy-makers
- Participation in meetings and workshops in relation with R+D policies in the field
- Definition of research projects and the elaboration of concrete proposals
- Collaboration in the preparation of Integrated Projects in the field
- Fostering of a network in the field

The consortium also plans to disseminate project results inside other European R+D groups. Concrete groups and actions will be identified in the dissemination workpackage of the project.

3 The OMG Process

3.1 Introduction

Object Management Group (OMG) members write and adopt their specifications according to a very strict process, set out in the group's *Policies and Procedures Manual*, affectionately known as the P&P. This is a summary/description that may be inaccurate. Only the P&P is valid as a reference.

These are common terms used in OMG's literature:

- TF (Task Force) The group of people in charge of the initial steps of a new specification or re-specification.
- RFI (Request for Information) A document asking for comments, experiences, opinions, ideas (information) about a specific technology potentially specifiable.
- TC (Technical Committee) Subgroup inside the OMG in charge of a specific area of interest.
- RFP (Request for Proposals) An OMG official document requesting for proposals of specifications addressing the target topic. This means that the OMG asks its members to propose their own visions as potential specifications to be adopted by the OMG.
- AB (Architecture Board) Technical management committee inside OMG.
- LOI (Letter of Intention) A letter from a member organization expressing its intention to submit a proposal in response to a request for proposals.
- BOD (Board of Directors) OMG managing committee.

- FTF (Finalization Task Force) A group of people in charge of polishing the specification to be finally approved.
- RTF (Revision Task Force) A group of people in charge of generating a new revision of the specification.

3.2 Who does what, as the process evolves?

Participants play one of two primary roles during the process:

- A large group of OMG members participate in writing the RFP, evaluating the submissions that arrive in response, and voting on the results. We'll call this group the *voters*. The makeup of this group changes as the votes move from the TF, through the AB, TC, and finally the BOD.
- A smaller group write and edit the submissions. We'll call this group the *Submitters*. The members of this group are identified on OMG's web page for each standards effort, which you can access from our *Work in Progress* page. Once the LOI deadline passes, members of this group can drop out, but not join (or re-join). All submitters are automatically also voters, but not all voters are submitters.

The two roles are complementary. A shallow look suggests that they might be antagonistic at times, but this is not so: The culture of consensus at OMG creates an environment where these two groups cooperate as they work towards the goal of high-quality specifications.

3.3 What are the process stages?

This introduction contains only a thumbnail sketch of each stage of the technology adoption process. Each stage has a full-page description of its own in the OMG Web site.

3.3.1 Optional RFI stage

1. The TF writes an RFI and votes to recommend issuance by its parent TC.
2. The TC votes to issue the RFI.
3. The TF accepts, reads, and analyzes responses to the RFI.

3.3.2 TF issues RFP, evaluates submissions

1. Possibly using information received via the RFI, the TF writes and votes to recommend issuance of an RFP by its parent TC.
2. The AB approves the RFP.
3. The TF's parent TC votes to issue the RFP.
4. On or before the LOI deadline, one or more OMG member companies submit LOIs.
5. On or before the Initial Submission deadline, which typically falls three weeks before an OMG technical meeting week, all or most of these companies submit initial submissions.
6. Interested OMG members read the submissions, and comment on them during the meeting (especially if they find things they don't like, of course).
7. During the interim between this meeting and the revised submission deadline, interesting things may happen.
8. The revised submission deadline may be extended. There may be multiple deadlines for revised submissions.
9. On or before the revised submission deadline, one or more revised submissions may be submitted.
10. OMG members read and evaluate the revised submission (most likely) or submissions (less likely). If most members consider the submission worthy, a series of votes begins.

3.3.3 Voting to Adopt an OMG specification

1. If the votes are to begin at the meeting that immediately follows the revised submission deadline, a procedural hurdle known as the "vote to vote" is encountered.
2. The TF votes to recommend adoption to its parent TC.
3. The AB votes approval.
4. The parent TC votes to recommend to OMG's BOD.
5. The BOD Business Subcommittee (BSC) reports to the BOD on Business Committee Questionnaire responses from the submitters.
6. If at least one satisfactory response was received, the BOD votes to adopt the specification. At this point, the submission becomes an official OMG *Adopted Specification*, but does not receive a release number.

3.3.4 Finalization

1. The TC charts a Finalization Task Force (FTF).
2. The FTF performs the first maintenance revision on the specification, resolving issues submitted to OMG, while

simultaneously producing implementations back in their companies.

3. The FTF-revised version of the specification is adopted as official OMG technology, through the same series of votes as the original submission (TF, AB, TC, and BOD). This time it receives a release number, and is designated an *available specification*.
4. The document is edited into a formal OMG specification.
5. Typically, products reach the market around this time too.

3.3.5 OMG specification maintenance Cycle

1. A recurring maintenance cycle starts here. The TC charters an RTF and sets deadlines for its report and specification revision. .
2. The RTF collects and acts on issues submitted to OMG, producing a revised specification.
3. The revised specification is adopted through the series of four votes.
4. A new RTF is chartered, and the process repeats.

3.3.6 Retiring Obsolete Specifications

1. Obsolete (not superseded) specifications may be retired.

4 Calendar of Activities

4.1 OMG Technical Meetings

People from HRTC will participate in the main technical activities of the OMG attending the Technical Meetings.

The purpose of this activity is the organization of a task force to coordinate activities and foster the elaboration of specifications related with the increased predictability needed in control applications.

The main groups inside OMG relevant for HRTC are: ORBs (MARS), real-time (RTESS) and manufacturing (ManTIS).

4.1.1 Helsinki, FINLAND

September 30-October 4, 2002

Resp: UPM

4.1.2 Washington, DC USA

November 18-22, 2002

Resp: UPM

4.1.3 Burlingame, USA

January 27-31, 2003

Resp: TUV

4.1.4 Location TBA

March 24-28, 2003

Resp: TUV

4.1.5 Location TBA

June 2-6, 2003

Resp: TUV

4.2 Workshops and Conferences

Obviously, the participation will be conditioned to the acceptance of the conference program committee.

4.2.1 WRTP 2003

27th IFAC/IFIP/IEEE Workshop on Real-Time Programming
Lagow, Poland, 14-17 May 2003

Paper submission deadline: October 21, 2002

Resp: UPM

4.2.2 AARTC 2003

9th IFAC Workshop on Algorithms and Architectures for Real-time
Control
Sheffield, UK, 12-16 June 2003

Paper submission deadline: Not yet established.

Resp: UPM

4.2.3 ISORC 2003

6th IEEE International Symposium on Object-oriented Real-time
Distributed Computing

Hakodate, Hokkaido, Japan, May 14-16, 2003

Paper submission deadline : November 1, 2002

Resp: UPM

4.2.4 RTSS

23rd IEEE International Real-Time Systems Symposium

Austin, TX. (USA), December 3-5

Paper submission deadline for WiP²: October 21, 2002

Resp: UPM

4.2.5 RTE-DOC 2002

OMG Workshop on Real-Time and Embedded Distributed Object Computing

Burlingame (USA), January 25-28, 2003

Paper submission deadline: Not yet established.

Resp: LTH

4.2.6 RTE-DOC 2003

OMG Workshop on Real-Time and Embedded Distributed Object Computing

Washington D.C. (USA), July 14-17, 2003

Paper submission deadline: Not yet established.

Resp: LTH

4.2.7 ADCHEM 2003

International Symposium on Advanced Control of Chemical Processes
Hong Kong (China) June 18-20, 2003

Paper submission deadline: November 1, 2002

Resp: UPM

4.2.8 Other potential conferences

- Control Design Conference
- Real-time & Embedded Computer Conference
- Embedded Systems Conference

4.3 Journal Articles

Journal Articles on the use of CORBA for control systems will be prepared for journals, but due to the duration of the project, it is not expected to have any publication before the end of the project.

² Work in Progress.

Potential candidates are:

- Real-time Systems
- IEEE Distributed Computing
- RTC Europe
- Industrial Computing
- Transactions on Control Systems Technology

They have been selected due to their different scope and audience.

4.4 Increasing Technology Awareness

4.4.1 Delivering brochures

This will be achieved by means of the elaboration and distribution of two brochures:

- CCS Technical Brochure (M9, UPM)
- CCS Executive Summary (M6, SCI)

This will be delivered to key personnel in R+D policy makers, R+D organizations and development companies.

4.4.2 Meetings in relation with R+D policies

This will be done as opportunities appear.

4.4.3 Definition of research projects

A concrete project to address the implementation of a high temporal predictability broker will be defined. This will be done inside the FP6 framework (if opportunities appear).

4.4.4 Collaboration in Integrated Projects

Immersion of HRTC long term objectives into an Integrated Project. This will be done inside the FP6 framework (if opportunities appear).

4.4.5 Fostering of a network

A network to address the issues of object-based controllers will be defined. This will be done inside the FP6 framework (if opportunities appear).