

INFORMATION SOCIETIES TECHNOLOGY  
(IST)  
PROGRAMME



**REVIEW REPORT**

IST-004527 - ARTIST2

Embedded Systems Design

Review Y3

Covering project month M25 to M36: 01/09/2006 – 30/08/2007

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## 1 Executive Summary

### 1.1 Project summary:

The long-term objective of ARTIST2 is to build a durable European research community on Embedded Systems Design, by integrating the topics, teams and competencies around a number of essential clusters like Modelling and Components, Compilers and Timing Analysis, Execution Platforms, Control for Embedded Systems, and Testing and Verification etc. If needed, clusters can be adapted through the lifetime of the project. The NoE will act as a Virtual Centre of Excellence in the area of Embedded Systems Design.

The integration into joint research activities will occur at two levels:

- Integration within clusters. Currently, the efforts on the identified topics are fragmented, and there is no European research team that would gather the sufficient critical mass needed. The integration of a topic is a first step towards integrating the area as a whole.
- Integration between cluster topics to create the multi-disciplinary community that will pilot the embedded systems design area. This will be achieved through integration activities that will bring together teams from different clusters.

The Joint Programme of Research Activities includes research both within the clusters and between clusters. Intra-cluster research aims to create critical mass and excellence on each essential topic. Inter-cluster research aims to integrate the area as a whole. The implementation of the Joint

Programme of Research Activities {JPRA} is supported by the Joint Programme of Integrating Activities {JPIA}, including research platforms and mobility of personnel.

A central mission for the NoE is spreading excellence to the community at large, through an ambitious Joint Programme of Activities for Spreading Excellence, including Education and Training, Dissemination and Communication, Industrial Liaison, and International Collaboration.

The project duration is four years, starting on 1<sup>st</sup> September 2004, with an EC contribution of €6.5 Million.

## **1.2 Period under review and main review objective**

The third twelve months are under review. The review objectives are to verify contribution to the main objectives during this period:

- Strengthening Scientific and Technological Excellence for Embedded Systems Design
- Spreading Excellence in Embedded Systems Design
- A Lasting ARTIST Network of Excellence
- Structuring European R&D in Embedded Systems Design

The review was planned and executed in accordance with the contract. The consortium has consumed the expected resources and incurred the expected costs for this phase of the project.

## **1.3 Overall reviewers' conclusion**

The overall impression is very positive with respect to representing the project community in conferences, workshops, seminars etc. Some cluster teams are working well together stimulated by a cluster team manager. This was reflected in the presentations during the review and also in the deliverables. The website continues to prove to be an efficient tool. The main points are summarised below:

- **Strengths:**
  - The NoE project continues to be well on track with a lot of high-quality research and internal communication activities in all the clusters.
  - Quality management - the deliverables were on time and enabled the reviewers to give preliminary feedback ahead of the meeting.
  - There is continued integration between the different partners.
  - The website is now more extensively used as a dissemination tool for interaction in the consortium
- **Improvements:**
  - Quantifying the effect of ARTIST2 in the embedded world should become a permanent concern.
  - Security is treated in a stand-alone way and too focussed on network security; this topic should be better integrated in all aspects of the project.

This report is a combined effort of all the reviewers and there are no points of disagreement between them on its content.

## **2 Organisation and logistics**

This review was held in Brussels, Beaulieu 33 0/54 14 December 2007. Each cluster was represented throughout the review; individuals responsible for management deliverables (VERIMAG and CDC) were also present. See list of participants, list of reports and deliverables & agenda (appended to this report). An electronic copy of each presentation was available beforehand.

### **3 Project Management**

The Management deliverables adequately cover the management aspects of the project. The subsequent sections on each management deliverable may contain comments/criticisms of the latest document reviewed; in such cases, these comments/criticisms should be taken into account when generating the corresponding deliverable at the end of the project.

Although the management team did come up with a lighter-weight process for capturing the needed project information and spending, it seems still to be a burden to collect all this information by the contractual due date.

Some changes of cluster leaders were proposed and accepted by the reviewers.

### **4 Dealing with previous review recommendations**

All but one of the previous review recommendations have been achieved:

#### **4.1 Recommendation 1: Policy for Year 3 Deliverables (same as Year 2)**

- All technical deliverables should be available on the ARTIST2 web site by 30 September 2007.
- All technical deliverables available on the ARTIST2 web site by 30 September 2007 will be pre-assessed by the reviewers by 15 October 2007.
- All technical deliverables **MUST** be available on the ARTIST2 web site by 15 October 2007 {This is a contractual requirement}.
- All technical deliverables **NOT** available on the ARTIST2 web site by 15 October 2007 are **REJECTED**.
- All management deliverables **MUST** be available on the ARTIST2 web site by 15 October 2007.
- If any management deliverables are **NOT** available on the ARTIST2 web site by 15 October 2007, the review meeting is **CANCELLED**.

Achieved

#### **4.2 Recommendation 2: Deliverables**

The 18-month plan document must be modified and resubmitted as soon as possible, no later than 30 January 2007.

Achieved

#### **4.3 Recommendation 3: Activity leader change**

Reviewers understand that there are circumstances pushing to replace an activity leader. The management of the project should take care to ensure continuity.

Achieved

#### **4.4 Recommendation 4: Demos and demonstrators**

Reviewers appreciated demonstrators like the “pig” project and the “lego” one. The use of demos and demonstrator should be encouraged.

Achieved

#### **4.5 Recommendation 5: Deliverables under web format**

Deliverables like D6 and D7 should be provided on the WEB to the benefit of everybody. The planning of the next period should incorporate this kind of format.

Achieved

#### **4.6 Recommendation 6: Peer review of deliverables**

Put a deliverables quality assurance process in place before the next review. For example, deliverables from one cluster could be reviewed by someone in another cluster.

Achieved

#### **4.7 Recommendation 7: Metrics on impact**

In order to assess the impact of ARTIST2, a number of metrics have been defined in the DoW. The project managers need to take a careful look at these and other relevant metrics and start to quantify them. A brief presentation on this topic is expected at the next review. The reviewers recommend that a calculation of the budgets (EC – national etc.) of projects “around” ARTIST2 should be done.

Not achieved. These metrics will be delivered before the end of February 2008.

### **5 Deliverables**

#### **5.1 General comments on presentations**

The presentations by each cluster were homogeneous, following a template.

#### **5.2 General comments on deliverables**

All deliverables have now been accepted.

The deliverables were of a uniform excellent quality, written very professionally. The template provides fields for exactly what is needed to report on progress, and the authors have clearly and concisely populated the template in each case.

In some documents there is too much repetition and information about previous years not needed for this year’s report.

Security is treated in a stand-alone way and too focussed on network security. This topic should be better integrated in all aspects of this project.

#### **5.3 WP0 JPMA: Joint Programme of Management Activities**

##### **5.3.1 D1-Mgt-Y3 Year3 Project Management Report**

ACCEPTED

##### **5.3.2 D2-Mgt-Y3 Year3 Project Activity Report – Exec summary**

ACCEPTED

##### **5.3.3 D2-Mgt-Y3 (cluster RTC) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

##### **5.3.4 D2-Mgt-Y3 (cluster ART) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

### **5.3.5 D2-Mgt-Y3 (cluster CTA) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

### **5.3.6 D2-Mgt-Y3 (cluster EP) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

### **5.3.7 D2-Mgt-Y3 (cluster Control) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

### **5.3.8 D2-Mgt-Y3 (cluster TV) Year3 Project Activity Report**

ACCEPTED

This is a quality document. No specific remarks.

## **5.4 WP1 JPIA: Joint Programme of Integrating Activities**

### **5.4.1 D4-RTC-Y3 Component Modelling and Verification (Platform)**

ACCEPTED

The document is of very good quality. It clearly presents and details the activities of year 3, the various actions of dissemination and collaboration inside and outside the Artist2 perimeter. It has to be noted that the project Persiform ended successfully and that activities on the platform for the analysis of performance of critical system is now driven by a new activity on simulation on wireless sensor network. The activities on dissemination and collaboration are important as shown by the number of papers from partners and from collaboration between partners and by other various communication activities (workshop, schools, ...).

The only point which is not very clear is the relationship with tool vendors (what is the nature of collaboration) and the industrial sector at large. However as discussed during the review meeting, this is not dependent on the Artist2 partners. Note that the listing of references by alphabetical order would improve the readability of the document.

### **5.4.2 D07-ART-Y3 A common infrastructure for adaptive Real-time Systems (Platform)**

ACCEPTED

The document is well written. It is concise and clearly exposes what has been achieved in year 3, dissemination and cooperation activities. The list of publication is impressive and there is a lot of collaborations between cluster partners around the Shark operating system. However the interaction with other clusters seems to remain a bit weak (there is just some mentioning of integrating component model on the OS and interactions with Marte activities). The future work and evolution is also a bit light. What will be the future of Shark? Is there any plan for industrialisation? Is there any plan to integrate tool with the operating system for monitoring its behaviour and ease development? This was discussed during the review meeting and these points will be addressed in the final review and project report.

### **5.4.3 D12-CTA-Y3 Timing - Analysis (Platform)**

ACCEPTED

This is a quality document. No specific remarks.

#### **5.4.4 D13-CTA-Y3 Compilers (Platform)**

ACCEPTED

This is a quality document. No specific remarks.

#### **5.4.5 D14-EP-Y3 System modelling infrastructure (Platform)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap.

While the cover page indicates that HRT (now part of the Real-Time Components cluster) is involved in this activity, the reviewers detect little involvement of RTC in these activities. This absence should be explained. The deliverable is accepted subject to addressing these issues at the next review meeting.

#### **5.4.6 D18-Control-Y3 Design Tools for Embedded Control (Platform)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap.

#### **5.4.7 D22-TV-Y3 Testing and Verification Platform for Embedded Systems (Platform)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap. The first paragraph in 2.3.1 finishes with three instances of “Describe the Technical Achievement here, in clear and concise terms.” A final editing pass is required to remove such things. The 2<sup>nd</sup> paragraph in 2.3.1 mentions the “Eclips” tool platform, which presumably refers to “Eclipse”.

### **5.5 WP2 JPASE: Spreading Excellence**

#### **5.5.1 D3-Mgt-Y3 Report on Spreading Excellence**

ACCEPTED

This is a quality document. No specific remarks.

### **5.6 WP3 JPRA: NoE Integration - Research Activities**

#### **5.6.1 D6-RTC-Y3 Component-based Design of Heterogeneous Systems – updated version**

ACCEPTED

The document presents in detail the results of year 3. The document might have benefited from a more concise expression. The relationship with the industry seems to be a bit weak in term of actions. The dissemination aspects are impressive if we look at the number of publications and the level of conferences while in comparisons joint publications between partners are few showing that interactions between partners can be improved.



The updated version of the document now provides details on the work planned for year 4 and provides the role of partners that were missing in the original version.

#### **5.6.2 D8-ART-Y3 QoS aware Components (NoE Integration)**

ACCEPTED

The document clearly exposes the work achieved in year 3, the role of each partner, the standardisation activities and the future work for year 4. Partners should put more effort on dissemination besides OMG related activities. The link between the activities of the partners is not very clear. It appears like a set of independent activities around QoS and components than an integrated cooperation. Relationship with other clusters is also not evident besides the common background on component with RTC cluster.

#### **5.6.3 D15-EP-Y3 Resource-aware Design (NoE Integration)**

ACCEPTED

This is a quality document. No specific remarks.

#### **5.6.4 D19-Control-Y3 Adaptive Real-time, HRT and Control (NoE Integration)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap.

#### **5.6.5 D23-TV-Y3 Quantitative Testing and Verification (NoE Integration)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap.

### **5.7 WP5 JPRA: Real-Time Components**

#### **5.7.1 D5-RTC-Y3 Development of UML for Real-time Embedded Systems (Cluster Integration)**

ACCEPTED

The document is of good quality. It clearly shows the progress of the group over the last 3 past years and project plans for years 4. The document is concise, clear and provides the necessary information. However the two figures would have benefited from some explanations (at least acronyms of second picture). In section 2.2 the difficulty presented is not clear. The OMG does not preclude members to provide specification to non-member, it just does not want to endorse document which have not been finalized. The disseminations aspects and relationship with industry appear to be a bit weak.

### **5.8 WP6 JPRA: Adaptive Real-time**

#### **5.8.1 D9-ART-Y3 Flexible Resource Management (Cluster Integration) - updated**

ACCEPTED

The document is very well written even if it would have benefited from a more concise style on section 2.2 and perhaps 2.3. The list of publication is important. The actions of cooperation between partners could be presented in more detail. The work plans for year 4 are quite clear. The indications in the last paragraph of section 2.3.1 that repeat “Describe the Technical Achievement here in clear and concise terms” is appreciated from a reviewer's point of view but must be removed

in the final version. The deliverable is accepted taking into account the modification done after the pre-review.

#### **5.8.2 D10-ART-Y3 Real-Time Languages (Cluster Integration)**

ACCEPTED

This is a quality document. No specific remarks.

#### **5.9 WP7 JPRA: Compilers and Timing Analysis**

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#### **5.10 WP8 JPRA: Execution Platforms**

##### **5.10.1 D16-EP-Y3 Communication-centric systems (Cluster Integration)**

ACCEPTED

This is a quality document. No specific remarks.

##### **5.10.2 D17-EP-Y3 Design for low power (Cluster Integration)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap.

#### **5.11 WP9 JPRA: Control for Embedded Systems**

##### **5.11.1 D20-Control-Y3 Control in real-time computing (Cluster Integration)**

ACCEPTED

The document is well written. It clearly describes the achievements in year 3, the dissemination activities and the integration activities. The list of publications indicates significant technical progress and interaction among the cluster members. The future work plans are appropriate and consistent with the roadmap. Note that references 53 and 54 are identical to 14 and 15 in D20-Control-Y3. This repetition does not seem to be necessary.

##### **5.11.2 D21-Control-Y3 Real-time techniques in control system implementations (Cluster Integration)**

ACCEPTED

This is a quality document. No specific remarks.

#### **5.12 WP10 JPRA: Testing and Verification**

##### **5.12.1 D24-TV-Y3 Verification of Security Properties (Cluster Integration)**

ACCEPTED

This is a quality document. No specific remarks.

### **6 Future work – last year Work Programme**

### **7 Assessment of objectives**

The project continues to be relevant and the original objectives, as expressed in the DoW, are still valid and will be for the final project year.

## **8 Recommendations**

Approximately the same recommendations as in the previous review remain valid.

### **8.1 Recommendation 1: Policy for Year 4 Deliverables (similar to Year 3)**

- All technical deliverables should be available on the ARTIST2 web site by 30 October 2008.
- All technical deliverables available on the ARTIST2 web site by 30 October 2008 will be pre-assessed by the reviewers by 15 November 2008.
- All technical deliverables **MUST** be available on the ARTIST2 web site by 15 November 2008 {This is a contractual requirement}.
- All technical deliverables **NOT** available on the ARTIST2 web site by 15 November 2008 are **REJECTED**.
- All management deliverables **MUST** be available on the ARTIST2 web site by 15 November 2008.
- If any management deliverables are **NOT** available on the ARTIST2 web site by 15 November 2008, the review meeting is **CANCELLED**.

### **8.2 Recommendation 2: Deliverables**

The last year work plan document must be modified and resubmitted as soon as possible, no later than 28<sup>th</sup> February 2008. It should take into account the granted one month extension of the project.

### **8.3 Recommendation 3: Activity leader change**

Reviewers understand that there are circumstances pushing to replace an activity leader. The management should continue to take care to ensure continuity.

### **8.4 Recommendation 4: Demos and demonstrators**

The use of demos and demonstrator continues to be encouraged.

### **8.5 Recommendation 5: Peer review of deliverables**

Continue to put a deliverables quality assurance process in place.

### **8.6 Recommendation 7: Metrics on impact**

In order to assess the impact of ARTIST2, a number of metrics have been defined in the DoW. The project managers need to take a careful look at these and other relevant metrics and start to quantify them. This topic was neglected in the previous period and should absolutely be present during the end of the project review. The reviewers continue to recommend that a calculation of the budgets (EC – national etc.) of projects “around” ARTIST2 should be done.

The metrics which are not confidential should appear on the web site of the project to better demonstrate the project impact.

### **8.7 Recommendation 8: Final review & deliverables**

The final review and deliverables of year 4 should stress the future of the network of excellence and the different component which have been developed, enhanced or integrated during the project (e.g. Shark operating system, tools, ...)

### **8.8 Recommendation 9: Virtualization**

The consortium should position itself toward an important technology such as virtualization which can solve some problems such as transparent support of multicore, isolation/reservation of resources, reducing power consumption. In the industry, processor vendors (Intel, AMD), RT operating system vendors (Windriver (VxWorks, RTLinux), ENEA (OSE), Green Hills (Integrity),

Mentor graphic (Nucleus)), general purpose operating systems vendors (Redhat, Novel/SuSE, Microsoft, Sun) are all putting a lot of efforts to introduce this technology everywhere.

## **9 Review conclusion**

The proposed integration of the research community continues to be very relevant. The consortium enhanced the performance of its technical work. The overall impression is very good. The presentations were clear and well delivered. The people presenting showed energy and enthusiasm and this is better than having a static deliverable. The harmonising of the work is very much appreciated. The deliverables are of high quality.

Reviewers prefer the condensed format for the review (just one day). As the network is now running smoothly, such a condensed review is more appropriate. The reviewers see real integration within clusters, between the clusters, and geographically over EUROPE. The communication seems to work really well. The consortium is finally the on the way to achieving the goals of a NoE.

**Next Meeting:** The next review is planned in Brussels on December 12<sup>th</sup> 2008. The same formula as this year will apply with a one day review with the cluster leaders.

Reviewer's signature:

## 10 Appendix: state of project deliverables by WP

| WP  | Work package title                                     | Lead contractor       | Start month | End month | Deliverable ID                                                                           | Status   | Comment |
|-----|--------------------------------------------------------|-----------------------|-------------|-----------|------------------------------------------------------------------------------------------|----------|---------|
| WP0 | JPMA :<br>Joint Programme of<br>Management Activities  | 1 CDC                 | 0           | 48        | <b>D1-Mgt-Y3</b><br>Year 3 Project Management Report                                     | accepted |         |
|     |                                                        | 2 UJF/<br>VERIMAG     | 0           | 48        | <b>D2-Mgt-Y3</b> (executive summary)<br>Year3 Project Activity Report                    | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster RTC)<br>Year3 Project Activity Report                          | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster ART)<br>Year3 Project Activity Report                          | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster CTA)<br>Year3 Project Activity Report                          | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster EP)<br>Year3 Project Activity Report                           | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster Control)<br>Year3 Project Activity Report                      | accepted |         |
|     |                                                        |                       |             |           | <b>D2-Mgt-Y3</b> (cluster TV)<br>Year3 Project Activity Report                           | accepted |         |
| WP1 | JPIA :<br>Joint Programme of<br>Integrating Activities | 2 UJF/<br>VERIMAG     | 0           | 48        | <b>D4-RTC-Y3</b><br>Component Modelling and<br>Verification (Platform)                   | accepted |         |
|     |                                                        | 37 Scuola<br>Sant'Ana | 0           | 48        | <b>D7-ART-Y3</b><br>A common infrastructure for adaptive<br>Real-time Systems (Platform) | accepted |         |
|     |                                                        | 25 Saarland           | 0           | 48        | <b>D12-CTA-Y3</b><br>Timing - Analysis (Platform)                                        | accepted |         |
|     |                                                        | 3 Aachen              | 0           | 48        | <b>D13-CTA-Y3</b><br>Compilers (Platform)                                                | accepted |         |
|     |                                                        | 12 DTU                | 0           | 48        | <b>D14-EP-Y3</b><br>System modelling infrastructure<br>(Platform)                        | accepted |         |
|     |                                                        | 16 KTH                | 0           | 48        | <b>D18-Control-Y3</b><br>Design Tools for Embedded Control<br>(Platform)                 | accepted |         |
|     |                                                        | 4 Aalborg             | 0           | 48        | <b>D22-TV-Y3</b><br>Testing and Verification Platform for<br>Embedded Systems (Platform) | accepted |         |

|     |                                                    |    |                 |    |    |                                                                                                   |          |  |
|-----|----------------------------------------------------|----|-----------------|----|----|---------------------------------------------------------------------------------------------------|----------|--|
| WP2 | JPASE :<br>Spreading Excellence                    | 2  | UJF/<br>VERIMAG | 0  | 48 | <b>D3-Mgt-Y3</b><br>Report on Spreading Excellence                                                | accepted |  |
| WP3 | JPRA :<br>NoE Integration -<br>Research Activities | 32 | Uppsala         | 13 | 48 | <b>D6-RTC-Y3</b><br>Component based Design of<br>Heterogeneous Systems                            | accepted |  |
|     |                                                    |    |                 |    |    |                                                                                                   |          |  |
|     |                                                    | 24 | UP Madrid       | 0  | 48 | <b>D8-ART-Y3</b><br>QoS aware Components<br>(NoE Integration)                                     | accepted |  |
|     |                                                    | 31 | Bologna         | 0  | 48 | <b>D15-EP-Y3</b><br>Resource-aware Design<br>(NoE Integration)                                    | accepted |  |
|     |                                                    | 19 | Lund            | 0  | 48 | <b>D19-Control-Y3</b><br>Adaptive Real-time, HRT and Control<br>(NoE Integration)                 | accepted |  |
|     |                                                    | 30 | Twente          | 0  | 48 | <b>D23-TV-Y3</b><br>Quantitative Testing and Verification<br>(NoE Integration)                    | accepted |  |
| WP5 | JPRA :<br>Real-Time Components                     | 8  | CEA             | 0  | 48 | <b>D5-RTC-Y3</b><br>Development of UML for Real-time<br>Embedded Systems (Cluster<br>Integration) | accepted |  |
| WP6 | JPRA :<br>Adaptive Real-time                       | 7  | Cantabria       | 24 | 48 | <b>D9-ART-Y3</b><br>Flexible Resource Management<br>(Cluster Integration)                         | accepted |  |
|     |                                                    | 34 | York            | 18 | 48 | <b>D10-ART-Y3</b><br>Real-Time Languages<br>(Cluster Integration)                                 | accepted |  |
|     |                                                    |    |                 |    |    |                                                                                                   |          |  |
| WP7 | JPRA :<br>Compilers and Timing<br>Analysis         |    |                 |    |    |                                                                                                   |          |  |
| WP8 | JPRA :<br>Execution Platforms                      | 29 | TUBS            | 0  | 48 | <b>D16-EP-Y3</b><br>Communication-centric systems<br>(Cluster Integration)                        | accepted |  |
|     |                                                    | 31 | Bologna         | 0  | 48 | <b>D17-EP-Y3</b><br>Design for low power<br>(Cluster Integration)                                 | accepted |  |

|      |                                           |    |        |   |    |                                                                                                             |          |  |
|------|-------------------------------------------|----|--------|---|----|-------------------------------------------------------------------------------------------------------------|----------|--|
| WP9  | JPRA :<br>Control for Embedded<br>Systems | 19 | Lund   | 0 | 48 | <b>D20-Control-Y3</b><br>Control in real-time computing<br>(Cluster Integration)                            | accepted |  |
|      |                                           | 33 | UPVLC  | 0 | 48 | <b>D21-Control-Y3</b><br>Real-time techniques in control system<br>implementations<br>(Cluster Integration) | accepted |  |
| WP10 | JPRA :<br>Testing and Verification        | 30 | Twente | 0 | 48 | <b>D24-TV-Y3</b><br>Verification of Security Properties<br>(Cluster Integration)                            | accepted |  |

## 11 List of PO and reviewers

| Name             | Organisation              | Email                              |
|------------------|---------------------------|------------------------------------|
| Javid Khan       | European Commission       | javid.khan@cec.eu.int              |
| Joseph Sventek   | University of Glasgow     | joe@dcs.gla.ac.uk                  |
| Michel Ruffin    | Alcatel                   | Michel.Ruffin@alcatel.com          |
| Martin Timmerman | Dedicated Systems Experts | m.timmerman@dedicated-systems.info |

## 12 Agenda (as executed)

December 14 2007

| Time  | Presentation                                                   | Speaker                                              |
|-------|----------------------------------------------------------------|------------------------------------------------------|
| 09:00 | Project Officer's Announcements                                | Project Officer                                      |
|       | <b>Management Overview</b>                                     |                                                      |
| 09:15 | Objectives, General Structure and Scientific Management        | Scientific Coordinator: Joseph Sifakis (UJF/VERIMAG) |
|       | <b>Adaptive Real-Time component cluster</b>                    |                                                      |
| 9:45  | Achievement and Perspectives cluster overview                  | Bengt Johnsson (Uppsala)                             |
|       | SPEED as a case study                                          | Bernard Josko (OFFIS)                                |
|       | <b>Adaptive Real Time</b>                                      |                                                      |
| 10:12 | Achievements and perspectives cluster overview                 | Giorgio Buttazo (Sant'Anna – Pisa)                   |
|       | Dynamic and Pervasive Networks                                 | Björn Andersson (Porto)                              |
|       | <b>Compilers and Timing Analysis</b>                           |                                                      |
| 10:43 | Achievements and Perspectives – overview by new cluster leader | Peter Marweder (Universität Dortmund)                |
| 11:10 | <b>Break</b>                                                   |                                                      |
|       | <b>Execution platforms</b>                                     |                                                      |
| 11:30 | Achievements and Perspectives - overview                       | Jan Madsen (DTU)                                     |
|       | <b>Control for Embedded Systems</b>                            |                                                      |
| 11:58 | Achievements and perspectives                                  | Karl-Erik Årzén Lund University                      |
| 12:35 | <b>Lunch</b>                                                   |                                                      |
|       | <b>Testing &amp; Verification</b>                              |                                                      |
| 13:40 | Achievements and perspectives – cluster overview               | Kim Guldstrand Larsen<br>CISS, Aalborg University    |
| 14:15 | Verification of Security protocols                             | Sandro Etalle, University of Twente                  |
| 14:33 | <b>Spreading excellence</b>                                    | Bruno Bouyssounouse                                  |
| 14:50 | <b>End of the presentation</b>                                 |                                                      |
|       | Reviewers discussion                                           |                                                      |
|       | Reviewers debriefing                                           |                                                      |
| 16:15 | <b>End of meeting</b>                                          |                                                      |
|       |                                                                |                                                      |



## 13 Attendees

### 13.1 Project officer and reviewers

Javid Khan (DG Information Society and Media)

Michel Ruffin (Reviewer - Alcatel)

Joe SVENTEK (Reviewer - )

Martin Timmerman (Reviewer – Dedicated Systems Experts)

### 13.2 Participants from consortium

| Name                  | Email                                  | Speaker |
|-----------------------|----------------------------------------|---------|
| Bruno Bouyssounouse   | Bruno.Bouyssounouse@imag.fr            | Yes     |
| Karl-Erik Årzén       | karlerik@control.lth.se                | Yes     |
| Giorgio Buttazzo      | giorgio@sss.it                         | Yes     |
| Pierre Wolper         | pw@montefiore.ulg.ac.be                |         |
| Joseph Sifakis        | Joseph.Sifakis@imag.fr                 | Yes     |
| Sandro Etalle         | sandro.etalles@utwente.nl              | Yes     |
| Jean-Marc Jezequel    | jezequel@irisa.fr                      |         |
| Bengt Jonsson         | bengt@it.uu.se                         | Yes     |
| Reinhard Wilhelm      | wilhelm@cs.uni-sb.de                   |         |
| Peter Puschner        | peter@vmars.tuwien.ac.at               |         |
| Kim Guldstrand Larsen | kgl@cs.aau.dk                          | Yes     |
| Josko                 | josko@offis.de                         |         |
| Nicolas Markey        | markey@lsv.ens-cachan.fr               |         |
| Benedikt Bollig       | bollig@lsv.ens-cachan.fr               |         |
| Peter Marwedel        | peter.marwedel@udo.edu                 | Yes     |
| Alejandro Alonso      | aalonso@dit.upm.es                     |         |
| Jan Madsen            | jan@imm.dtu.dk                         | Yes     |
| Nicolas Markey        | markey@lsv.ens-cachan.fr               |         |
| Bjorn Andersson       | bandersson@dei.isep.ipp.pt             | Yes     |
| Mário Alves           | mjf@isep.ipp.pt                        |         |
| Sandro Etalle         | sandro.etalles@utwente.nl              | Yes     |
| Jean-François Forté   | jean-francois.forte@caissedesdepots.fr |         |
| Frédéric Vollé        | frederic.volle@caissedesdepots.fr      |         |
| Eduardo Tovar         |                                        | Yes     |
| Bernhard Josko        |                                        | Yes     |
| Björn Lisper          | bjorn.lisper@mdh.se                    | Yes     |

## 14 Partner list for this period

| Role | N° | Name                                | Short Name    | Country |
|------|----|-------------------------------------|---------------|---------|
| CO   | 1  | Caisse des Dépôts et Consignations  | CDC           | FR      |
| CR   | 2  | University Joseph Fourier / Verimag | UJF / Verimag | FR      |
| CR   | 3  | RWTH Aachen                         | Aachen        | DE      |
| CR   | 4  | BRICS – Aalborg University          | Aalborg       | DK      |
| CR   | 5  | AbsInt Angewandte Informatik GmbH   | AbsInt        | DE      |
| CR   | 6  | University of Aveiro                | Aveiro        | PT      |

|    |    |                                                                   |                |    |
|----|----|-------------------------------------------------------------------|----------------|----|
| CR | 7  | Universidad de Cantabria                                          | Cantabria      | ES |
| CR | 8  | Commissariat à l'Énergie Atomique<br>Laboratoire LIST             | CEA            | FR |
| CR | 9  | Centre Fédéré en Vérification,<br>Université de Liège             | CFV            | BE |
| CR | 10 | Czech Technical University                                        | Czech TU       | CZ |
| CR | 11 | Dortmund University                                               | Dortmund       | DE |
| CR | 12 | Technical University of Denmark                                   | DTU            | DK |
| CR | 13 | Swiss Federal Institute of<br>Technology                          | ETHZ           | CH |
| CR | 14 | France Telecom R&D                                                | FTR&D          | FR |
| CR | 15 | Institut National de Recherche en<br>Informatique et Automatique  | INRIA          | FR |
| CR | 16 | Royal Institute of Technology                                     | KTH            | SE |
| CR | 17 | Linköping University                                              | Linköping      | SE |
| CR | 18 | Centre National de la Recherche<br>Scientifique / Laboratoire LSV | LSV / CNRS     | FR |
| CR | 19 | Lund University (Sweden)                                          | Lund           | SE |
| CR | 20 | University of Mälardalen                                          | Mälardalen     | SE |
| CR | 21 | Kuratorium OFFIS e. V.                                            | OFFIS          | DE |
| CR | 22 | PARADES EEIG                                                      | PARADES        | IT |
| CR | 23 | University of Pavia                                               | Pavia          | IT |
| CR | 24 | Universidad Politecnica de Madrid                                 | UP Madrid      | ES |
| CR | 25 | Saarland University                                               | Saarland       | DE |
| CR | 26 | ST Microelectronics - Central R&D                                 | STM            | FR |
| CR | 27 | Technical University of Eindhoven                                 | Eindhoven      | NL |
| CR | 28 | Technical University of Vienna                                    | TU Vienna      | AT |
| CR | 29 | Technical University Braunschweig                                 | TUBS           | DE |
| CR | 30 | University of Twente                                              | Twente         | NL |
| CR | 31 | University of Bologna                                             | UoB            | IT |
| CR | 32 | Uppsala University                                                | Uppsala        | SE |
| CR | 33 | Universidad Polytechnica de Valencia                              | UPVLC          | ES |
| CR | 34 | University of York                                                | York           | UK |
| CR | 35 | Polytechnic Institute of Porto                                    | Porto          | PT |
| CR | 36 | EPFL Lausanne                                                     | EPFL           | CH |
| CR | 37 | Scuola Superiore Sant'Anna                                        | Pisa           | IT |
| CR | 38 | ACE                                                               | ACE            | NL |
| CR | 39 | Tidorum                                                           | Tidorum        | FI |
| CR | 40 | the University of Kaiserslautern                                  | Kaiserslautern | DE |

## 15 Project calendar

| Month | 2004 | 2005      | 2006      | 2007      | 2008      |
|-------|------|-----------|-----------|-----------|-----------|
| Jan   |      | 5         | 17        | 29        | 41        |
| Feb   |      | 6         | 18        | 30        | 42        |
| Mar   |      | 7         | 19        | 31        | 43        |
| Apr   |      | 8         | 20        | 32        | 44        |
| May   |      | 9         | 21        | 33        | 45        |
| Jun   |      | 10        | 22        | 34        | 46        |
| Jul   |      | 11        | 23        | 35        | 47        |
| Aug   |      | <b>12</b> | <b>24</b> | <b>36</b> | <b>48</b> |
| Sep   | 1    | 13        | 25        | 37        |           |
| Oct   | 2    | 14        | 26        | 38        |           |
| Nov   | 3    | 15        | 27        | 39        |           |
| Dec   | 4    | 16        | 28        | 40        |           |