



VAN

FP6/2004/IST/NMP/2 - 016969 VAN

Virtual Automation Networks

Work Package 10
Exploitation and Dissemination

Task 10.3

Establishment of European Competence Group

Deliverable D10.3-1-V2

European Competence Group – Report 2

Document type	: Deliverable
Document version	: Final
Document Preparation Date	: 24.07.2008
Classification	: Public
Contract Start Date	: 01.09.2005
Duration	: 31.08.2009



Project funded by the European Community
under the “Information Society Technology”
Programme (2002-2006)

Rev.	Content	Resp. Partner	Date
0.1	Set-up of document	Schwab / Siemens	25.06.2008
0.2	Contribution Chapter 1, 2, 3, 4, 5, Annex 1 and Executive Summary	Schwab / Siemens	08.07.2008
0.3	Revision and Finalisation	Klostermeyer / Siemens	24.07.2008

Final approval	Name	Partner
Review Task Level	Mr. Christian Schwab	Siemens
Review WP Level	Ms. Marian Gallego	Cartif
Review Board Level	Dr. Axel Klostermeyer	Siemens

Executive summary

This deliverable is the second document to report on the European Competence Group (ECG) activities.

In general, the ECG is intended to be a consortium of possible end-users from factory and process automation, device and machine suppliers, system integrators, and companies which possibly could provide VAN technology in the future. At ECG meetings, the VAN consortium presents current results of work to get feedback and to evaluate, if especially the end user requirements are met by VAN and to bring the research results into more practical applications.

Please note that only ECG related activities are reported here. The general dissemination activities, including publications, organisation of tracks/sessions on conferences etc. are taken into account in the respective deliverables in Task 10.1 and 10.2.

In particular, this document reports on the last two ECG meetings in Nürnberg (SPS/IPC/Drives Fair in November 2007) and Hannover (Hanover Fair in April 2008.)

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1 Preface

After the establishment of the European Competence Group (ECG) and the success of previous activities and especially the first ECG Meeting in Hannover on 18.04.2007, further ECG meetings have been organised and held during major events in the automation field, and in particular at SPS/IPC/Drives Fair on 28.11.2007 and Hanover Fair on 24.4.2008. The latter meeting has been organised as a joint meeting with the EC STREP Pabadis'Promise.

To have this kind of meeting during the main automation fairs seems to be most promising, as interested people and all experts in the relevant area are on-site and the event can benefit from official marketing activities by the fair organisation. Further on, valuable contacts could be made during related activities such as conferences, formal and informal presentations, which could be seen as preparation and supporting actions for official ECG meetings.

Most of ECG activities are performed during peak periods – lasting from one or two months before an ECG meeting until the meeting itself – although the duration of the respective task is longer. Between the ECG meetings, less effort, such as distribution of marketing materials, establishment of new contacts, is planned.

Preparation, content and feedback of the ECG Meetings are reported in more detail in Chapter 4 of this document.

2 Objectives of European Competence Group

The objective of VAN European Competence Group (ECG) is to provide a platform for dissemination of the project knowledge and concepts, as well as to extend the project results beyond the project consortium and time frame. The competence group represents the requirements and concepts for industrial automation and communication with respect to real-time, security, safety and integration with a European focus. End-users, suppliers and system integrators will be aware of new techniques and new products resulting from VAN project by means of regular ECG activities and articles in relevant magazines and other publications. ECG activities are free of charge for interested companies, and meetings – for discussing their own requirements and constraints – are planned to be held regularly during major events of automation industry such as Hanover Fair or SPS/IPC/Drives in Nuremberg.

After the first ECG meeting in April 2007, the project has made a strong progress and moved towards realistic implementations. Now, implementation work in most of the single WPs coming to a final phase and main focus of work is the specification/implementation work of the Industrial Experimental Setups for Factory and Process Automation.

Parts of the specification and implementation work have been presented and discussed during the second and third ECG meeting which took place during SPS/IPC/Drives Fair in Nürnberg on 28.11.2007 and Hanover Fair on 24.04.2008.

3 Constitution of European Competence Group

The European Competence Group (ECG) should be constituted by representatives of possible suppliers and possible end-users of VAN technology. It is recommendable to have representatives of both classes as ECG members because of their different points of view on VAN, their different requirements, and their consequences for different aspects of the project work.


For the second ECG meeting in November 2007, more than 700 e-mail invitations have been sent around to a wide range of international companies and institutions (the content of these invitations comprised the reason for the ECG meeting, time and place, objective of VAN, partners, and a contact person at Siemens). For reasons of lucidity, nevertheless, it does not seem to be practical to integrate a list of all contacted persons and companies in this document. In general, the existing relations and contacts of the VAN partners inside of several organisation and communities have been playing an important role while preparation of the ECG meeting. Among others, contacts were used from interested parties of Profibus International, Industrial Ethernet activities in general and Profinet technology mainly.

For the third ECG meeting in April 2008, a joint dissemination event with the EC STREP Pabadis'Promise has been organised and conducted during Hanover Fair. It seemed very promising that the synergies of both research projects with the headline "Order based Automation via Public networks – Novel Technologies and Architectures in Automation Technology" and the combination of both Industrial Groups, namely European Competence Group – ECG@VAN – and the Associated Reference Group – ARG@P2, would attract more interested parties than single meetings. Altogether, more than 800 e-mail invitations have been sent around.

Publicity for the events was made via e-mail distribution as mentioned above, and by the fair organiser as such by means of their leaflets which are distributed to all visitors at the entrance of the fair, examples can be seen in the following figures and in Annex 1.


Figure 3.1: Invitation Cover SPS/IPC/Drives on 28.11.2007 (Excerpt)

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Auftragsorientierte Automatisierung über öffentliche Netzwerke
Order based Automation via Public Networks
Convention Center (CC), Saal 104
Donnerstag/Thursday, 24.04.2008, 10:00–12:00 Uhr

Neuartige Technologien und Architekturen in der Automatisierungstechnik
 In verschiedenen Entwicklungsanstrengungen werden neuartige Architekturen und Technologien entwickelt, die Robustheit, Flexibilität und Effizienz von Fertigungssystemen moderner Automatisierungssysteme erhöhen. Im Rahmen der EU-Forschungsprojekte VAN (www.van-eu.eu) und PABADIS/PROMISE (www.pabadis-promise.org) werden verteilte Automatisierungssysteme entwickelt, die lokale und öffentliche Kommunikationsnetze kombinieren, agentenorientierte Verhaltensweisen integrieren und dabei Aspekte wie Echtzeitverhalten, Security und Safety berücksichtigt. Basis der Entwicklungen für die Kommunikationsinfrastruktur in einem VAN-System ist der Ethernet-Standard IEC 61158 Type 10 (PROFINET), bzw. für die Steuerungsarchitektur in einem P2-System der Standard IEC 61499.

Novel Technologies and Architectures in Automation Technology
 In a variety of R&D activities novel automation architectures and technologies are developed, which will increase the flexibility, efficiency and robustness of production and automation systems. Against this background and in the context of the European funded research projects VAN (www.van-eu.eu) and PABADIS/PROMISE (www.pabadis-promise.org), a distributed automation system will be developed, which incorporates local communication networks as well as public wide-area networks, integrates agent based technologies, and considering aspects such as real-time behavior, security and safety. The development of the communication infrastructure in a VAN system is based on Ethernet standard IEC 61158 Type 10 (PROFINET), and for the control architecture in a P2 system the standard IEC 61499.

Veranstalter/ Organizer	Siemens AG, Industry Sector
Sprache/ Language	Deutsch oder Englisch/German or English
Teilnahme/ Participation	Teilnahme kostenfrei in Verbindung mit einer Messeintrittskarte. Anmeldung erbeten per e-mail an: christian.schwab@siemens.com Participation free of charge to HANNOVER MESSE ticket holders. Registration requested by e-mail to: christian.schwab@siemens.com
Kontakt/ Contact	Christian Schwab E-mail: christian.schwab@siemens.com

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Die Architektur eines PABADIS/PROMISE-Automatisierungssystems
The PABADIS/PROMISE Control System Architecture

- | | |
|------------------------|---|
| 10:00–10:10
English | Rationales and benefits of the PABADIS/PROMISE Approach
Arndt Lüder, Universität Magdeburg |
| 10:10–10:25
English | Technical Architecture - Most Flexible Industrial Control Systems
Jörn Peschke, Universität Magdeburg |
| 10:25–10:45
English | Designing decentralized manufacturing Systems
Andreas Schertl, Siemens AG |

Virtuelle Automatisierungsnetzwerke für Industrielle Anwendungen
Virtual Automation Networks (VANs) in Industry

- | | |
|------------------------|---|
| 10:45–10:55
English | Future of Industrial Communication
Christian Schwab, Siemens AG |
| 10:55–11:15
English | Technical Architecture and Prototyping in Factory and Process Automation
Ralf Greiner-Jacob, Siemens AG |
| 11:15–11:30
English | Implementation Aspects
Ralf Messerschmidt, ifak e.V. |
| 11:30–12:00
English | Discussion / Coffee |

Figure 3.2: Leaflet Hanover Fair of 24.04.2008 (VAN Excerpt), see also Annex 1 for better readability

4 Meetings of European Competence Group

This chapter gives an overview about both main ECG meetings.

4.1 ECG Meeting at SPS/IPC/Drives 2007

As planned, the second ECG meeting has been organised and conducted during SPS/IPC/Drives Fair in Nürnberg on 28.11.2007. It was mainly intended to give the guests a good overview about the topic industrial communication, starting from today's architecture to future approaches and use-cases.

At that point, an introduction into the VAN main concepts and the specification with a special focus on three main VAN topics have been given. Compared to the previous ECG meeting with the main topics *wireless communication, usage of public networks in automation and engineering aspects*, slightly different topics have been chosen. To come into a deeper discussion with the participants, the event has been organised as workshop with several presentations for mental stimulation and with time for feedback and review (and coffee ...).

To "catch" the participants from a technical point of view, the first presentation has been a general overview of the future of industrial communication aiming to the VAN project and the VAN vision in particular. This has been followed by a deeper view into the VAN architecture, ranging from the VAN main architecture, VAN device types and VAN domains with the respective VAN extensions, to the planned prototypes (Industrial Experimental Setups) with a special focus on the IES for Process Automation. Three main VAN topics of the workshop have been devoted to the usage and implementation of web services in a VAN system, the application of public networks for industrial automation and the topic Safety in the context of industrial application of heterogeneous networks.

The following table shows the agenda as it was shown during the meeting – all presentations were written and held in English language.

Table 4.1: Agenda of ECG Meeting #2

#	ECG Meeting, 28.11.2007 @ SPS/IPC/Drives Fair Agenda	Presentation by
1	Future of Industrial Communication – Virtual Automation Networks (VANs) in Industry	Klostermeyer / Siemens A&D
2	VAN – Technical Architecture and Prototyping	Greiner-Jacob / Siemens A&D
3	Details – Web Service related Implementation	Messerschmidt / ifak
4	WANs – Public Networks in Industrial Automation	Wolframm / Teleport Sachsen-Anhalt
5	Features – How safe are Public Networks?	Deuter / Phoenix Contact

4.2 ECG Meeting at Hanover Fair 2008

As already discussed above, the ECG meeting in Hanover 2008 has been organised as a joint dissemination event with the EC STREP Pabadis'Promise (P2). The combination of both projects and the bundle of interested parties seemed to be very promising. The title of the event "Order based

Automation via Public networks – Novel Technologies and Architectures in Automation Technology” has attracted a wide range of experts of the field of automation.

The presentations themselves were subdivided into two main parts, part 1 with the focus on P2, and part 2 has been devoted to the VAN project.

With the paradigm "The Order is the Application", in P2 a new control architecture based on distributed intelligence, a new manufacturing ontology, an embedded Real-Time agent platform for control, a new generation of RFID's, a new generation of field control devices, and building blocks for a new generation of Enterprise Resource Planning systems have been developed. The P2 part started straight forward with rationales and benefits of P2 which was followed by the technical architecture. A deeper view in the design of decentralised manufacture system has been given in the last P2 presentation.

Considering all aspects of P2, it became very obvious that a reliable communication infrastructure for local and for wide-area communication is a main precondition for the concept. Thus, the VAN project came into the game.

“As usual”, to catch the participants from a technical point of view, in the first VAN presentation an overview of the state-of-the-art of industrial communication and a view in the future resulting in the presentation of the VAN project has been given. This has been followed by a deeper view into the VAN architecture with the respective VAN extensions. In the last presentation implementation aspects and the presentation of real use-cases have been shown. Additionally, specific emphasis has been given to the Industrial Experimental Setups for Process and Factory Automation.

All presentation have been written and held in English.

Table 4.2: Agenda of ECG Meeting #3

#	Joint ECG / ARG Meeting, 24.04.2008 @ Hanover Fair Agenda	Presentation by
Part 1: PABADIS’PROMISE Control System Architecture		
1	Rationales and Benefits	Lueder / Univ. of Magdeburg
2	Technical Architecture – Most Flexible Industrial Control Systems	Peschke / Univ. of Magdeburg
3	Designing Decentralized Manufacturing Systems	Schertl / Siemens CT
Part 2: Virtual Automation Networks (VANs) in Industry		
4	Future of Industrial Communication	Schwab / Siemens I IA
5	Technical Architecture and Prototyping in Factory and Process Automation	Greiner-Jacob / Siemens I IA
6	Implementation Aspects	Messerschmidt / ifak

4.3 Feedback

During the “pure” VAN meeting, on an average 20 persons visited the ECG conference. On the other hand, the joint dissemination event with P2 attracted 35 interested parties.

All participants approved the main objectives and the concepts of both projects in general. In particular for VAN, most questions which were asked referred to the difference between the VAN concept and solutions which are already available. In particular, questions on the following topics were raised and discussed:

- Realisation of real-time in Wide Area Networks, performance classes and realisation aspects.

- Service Level Agreements and Provider Switching in case of failure connection.
- Name based Routing and the usage of standard automation protocols.
- Prototype platforms and realisation scenarios.
- Implementation aspects of the IES for PA.
- The difference of the usage of web services and VPN technology in the context of automation, establishment of the runtime tunnel.

4.4 Future Activities

The next ECG meeting is planned to take place during the SPS/IPC/Drives fair in Nürnberg between 25. and 27. November 2008 and possibly at Hanover Fair 2009.

After three conferences, it could be shown that the concept works very well as such and should be kept for future activities:

The workshop always starts with the presentation of the state-of-the-art and existing solutions for industrial communication. This will be followed by a view in the future which aims in the VAN project with some special technical “highlights” of VAN. To make the story complete, an overview of applications and use-cases and in particular presentations of the IES for FA and PA should not be missed.

Additionally, the concept as such, to rent a room during one of the main automation fairs, invite people via a dedicated database, and, moreover, to use the general fair publicity to attract further participants shall also be kept.

5 Conclusion

Both of the main ECG events of the reporting period have shown the interest of external experts and the relevance of the project: on the one hand due to an increasing number of visitors, and on the other hand due to the quality of discussions during and after the events. The quality of the workshop could be ensured due to the concept of the presentation of “research activities underlined of realistic use-cases” and due to the merged forces of both projects, VAN and P2.

For VAN, most of the guests stated that the problems and methodologies which are investigated in the project are of high relevance in real applications. The course of the activities does reflect industrial needs and requirements, especially in the context of possibly application of wide-area networks for industrial communication and telecontrol aspects.

The guests agreed that the realisation scenarios and in particular the Industrial Experimental Setups for FA and PA are promising and convincing for the application of the VAN concept. Most of the statements which hint to open problems do not query the VAN concept in general, but rather concretisation and completion issues.

Most of the guests showed their interest in future results of the project.

A Annex 1

For a better readability this annex contains the VAN excerpt of the day program of Hanover Fair of 24.04.2008.

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Veranstalter/
Organizer Siemens AG, Industry Sector

Sprache/
Language Deutsch oder Englisch/German or English

Teilnahme/
Participation Teilnahme kostenfrei in Verbindung mit einer Messe Eintrittskarte. Anmeldung erbeten per e-mail an: christian.schwab@siemens.com
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Kontakt/ Contact Christian Schwab
 E-mail: christian.schwab@siemens.com

Die Architektur eines PABADIS' PROMISE-Automatisierungssystems
The PABADIS' PROMISE Control System Architecture

- 10:00–10:10 **Rationales and benefits of the PABA-**
 English **DIS' PROMISE Approach**
 Arndt Lüder, Universität Magdeburg
- 10:10–10:25 **Technical Architecture - Most Flexibe In-**
 English **dustrial Control Systems**
 Jörn Peschke, Universität Magdeburg
- 10:25–10:45 **Designing decentralized manufacturing**
 English **Systems**
 Andreas Schertl, Siemens AG

Virtuelle Automatisierungsnetzwerke für Industrielle Anwendungen
Virtual Automation Networks (VANs) in Industry

- 10:45–10:55 **Future of Industrial Communication**
 English Christian Schwab, Siemens AG
- 10:55–11:15 **Technical Architecture and Prototyping in**
 English **Factory and Process Automation**
 Ralf Greiner-Jacob, Siemens AG
- 11:15–11:30 **Implementation Aspects**
 English Ralf Messerschmidt, ifak e.V.
- 11:30–12:00 **Discussion / Coffee**
 English