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SOCRADES

Project Full Title:

**Service-Oriented Cross-layer infRAstructure for
Distributed smart Embedded devices**

Proposal/Contract No: EU FP6 IST-5-034116 IP SOCRADES

Deliverable D10.2 Specifications for standards

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¹ See Annex for explanation of Dissemination Levels, as defined in the DoW

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² As defined in the DoW

³ Scheduled date for approval

⁴ A list of company short tags can be found in DoW

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Dissemination Level:

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|----------------|--|
| PUBLIC | Public |
| PP | Restricted to other programme participants (including the Commission Services) |
| RESTRICTED | Restricted to a group specified by the consortium (including the Commission |
| CONFIDENTIONAL | Confidential, only for members of the consortium (including the Commission Services) |

1. INTRODUCTION

One of the strong commitments from the SOCRADES project is to lead the path towards SoA industrial standardization. This is made possible thanks to the agreed involvement of all major European industrial partners (Schneider Electric, Siemens, ABB and SAP) and research partners (ifak) on this topic as well as their strong general contributions to industrial standardization bodies such as the International Electrotechnical Commission(IEC) and its Technical Committees.

The objective of this document is to specify the path of SOCRADES industrial standardization activities based on the identification of relevant work groups and their mission and objectives. Currently standardization working groups in the domain of SoA are either already started or supposed to be initiated soon the contributions and involvement of SOCRADES partners in the standardization bodies will help and improve SoA industrial standardization in fact.

2. Identification of relevant industrial standardization activities

2.1. Selection of Industrial Standardization Path

Among all standardization bodies, the IEC is the most recognized body in the industrial automation domain. Therefore it can be considered as most appropriate framework of technical standardization for SOCRADES technologies in particular for SoA.

In particular the Technical Committee (TC) 65 “Industrial Process Measurement, Control and Automation” and its Subcommittees (SC) is the most relevant standardization committee to address industrial standardization activities for SOCRADES.

The general scope for the TC as mentioned above is mainly focused on the preparation for international standards and to co-ordinate the standardization activities of the specific working groups assembled as Subcommittees. The specific standardization work is separated by 6 working groups and 2 joint working groups (refer to figure 1) and will be carried out at international context in the fields of equipment and systems where electrical, pneumatic, hydraulic, mechanical or other systems of industrial automation including control and measurement are targeted.

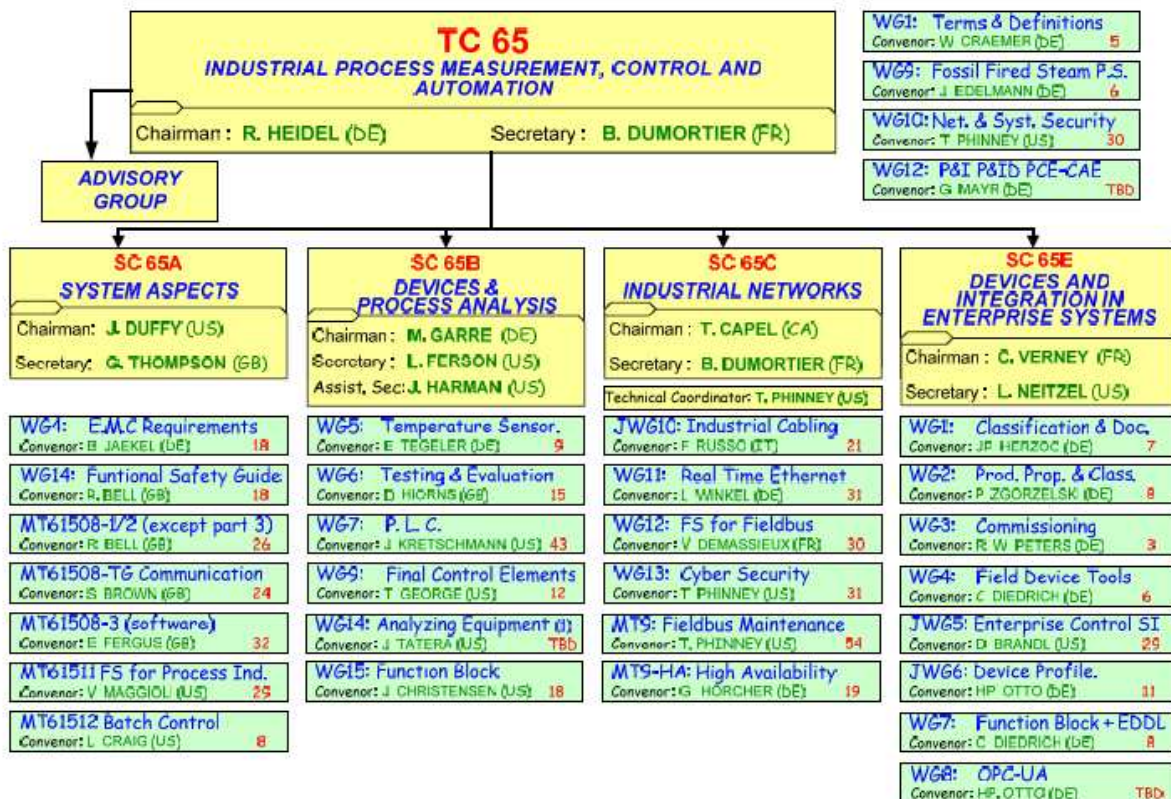


Figure 1: IEC TC 65 organization

All necessary SoA-oriented industrial standardization work in the domain of SOCRADES fits best in particular to the objectives of the IEC TC65 SC65E for “System engineering and management”.

The objectives of this SC are “to prepare international standards to specify digital representation of device properties and functions, methodologies and applications supporting automation of engineering processes, including diagnostic and maintenance techniques” [1].

The mission of the working groups is as follows:

WG1: Classification and documentation

- Standardize the technical items to describe measuring equipment from the application point of view,
- Standardize the terms and definitions of these technical items to obtain a normative vocabulary and documentation. The objective of the normative vocabulary is to have only one term corresponds to one concept and only one concept corresponds to one term,
- Standardize the grouping and subdividing of these technical items,
- Standardize the document exchange format (SGML).

WG 2: Product properties & classification

- This working group will develop document(s) that provide a method for standardizing the descriptions of process control devices (measuring equipment) and specifies how to use the device descriptions for electronic data exchange between two computer systems, e.g. one of a customer and one of a supplier, applying properties and lists of properties.

WG 3: Commissioning

- Commissioning-related specifications

WG 4: Field Device Tool Interface Specification

- Definition of interfaces for both the vertical and the horizontal data flow (Function Control and Data Access) in the framework of a client-server architecture
- Communication interfaces and session models to defines the interaction between the software components and the host application based on data exchange via XML(World Wide Web Consortium (W3C), Extensible Markup Language (XSL))
- Specification of integration of field bus, device or sub-system specific software tool as part of a universal life-cycle management tool of a plant automation system.
- Liaison with Field Device Tool & FDT Group AISBL

WG 7: Function blocks for process control

- Aspects to develop the function blocks for process control regarding architecture of a device connected to the Fieldbus, domain specific function blocks specification, domain specific devices description, communication mapping onto Fieldbus.
- Generic models and systems from TC 65/WG 6 which includes function blocks, generic fieldbus from SC 65C/WG 6, generic description language from ISO TC 184/SC 4.
- Liaison with Fieldbus Foundation and Profibus International - HART Communication Foundation; ISA-SP104.

WG 8: OPC unified architecture

- Standardize a client/server software interface between client applications and industrial automation/control systems.
- Provide a secure, robust interface that allows the client application to browse the objects of an industrial automation or control system, to read and write properties of its objects, to invoke methods on its objects, and to subscribe to its alarms, events, and properties.
- Standardize mappings that allow the interface to be supported by commercial protocols.

JWG 5: Enterprise-Control

- Enterprise-Control System Integration
- Liaison with ISA SP95

JWG 6: Device profiles

- Prepare a guideline which presents a device model to better guide and delineate a device profile's content

SOCRADES partners are already deeply involved and even leading in most of the SC65E working groups.

2.2. Identification of relevant working groups

After several meetings with the standardization experts, the most "natural" standardization path is seen through this committee.

A first WG about OPC UA, led by Siemens, is starting in September 2007. This WG has been initiated by Schneider Electric in agreement with the OPC Foundation; the latter has declared to be open to evolutions of the emerging OPC UA standard whenever better solutions can be proposed and agreed upon. The future standard will be called IEC 62541-x, with x=1, ..., 12 (corresponding to the 12 "parts" of the current OPC UA specification). Its timeline for (latest) completion is set to February 2011.

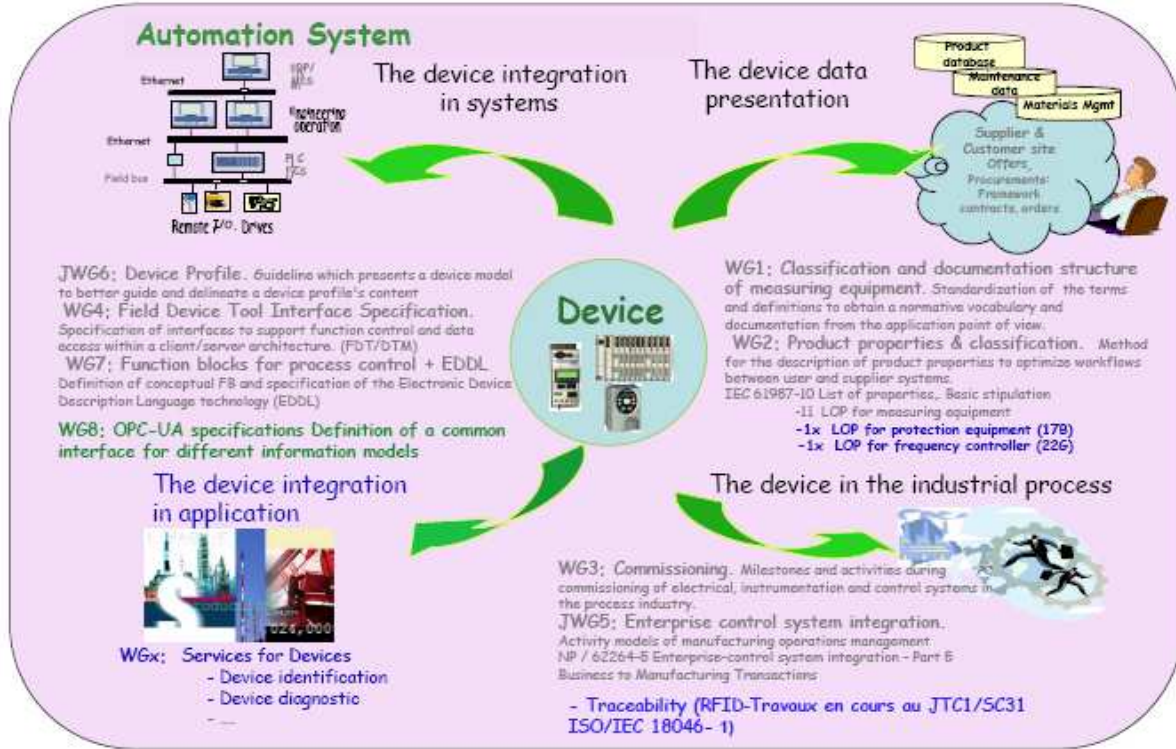
There is already a fair degree of commonality between DPWS and OPC UA, both specifications being based on XML, SOAP 1.2, WSDL 1.1, WS-Addressing and WS-Discovery, but there are also differences that set the two specifications apart; in particular, whilst DPWS exclusively uses standard WS-* specifications, OPC UA introduces some specific protocols of its own, which jeopardizes its generality and induces the need for specific OPC client solutions, as opposed to generic Web Service clients. SOCRADES therefore proposes to maximize the convergence between DPWS and OPC UA in the context of the upcoming IEC 62541 standardization work.

Schneider is also implementing an OPC UA plug-in over the DPWS-C V3 component, providing then a common solution for both DPWS and OPC UA, which leads to a common agreement between Schneider Electric and Siemens towards this solution.

Furthermore, a new work item around SoA diagnostic will be proposed beginning of 2008, going to a new Diagnostic WG to be started in 2008. This WG should be led by Schneider. These two WGs together will use the SOCRADES results and propose the resulting SoA industrial standard.

SC65E DEVICE AND INTEGRATION IN ENTERPRISE SYSTEMS

8 working groups, 75 experts from 20 nationalities focused on the process control



IEC work in progress, IEC New Work Item proposal, =S= work in progress

Figure 2: IEC TC 65E objectives

2.3. Alternate standardization path

In the IEC standardization process, we can use either the nominal path, or the PAS (Publicly Available Specification) as described hereunder.

INTERNATIONAL STANDARDIZATION PROCESS

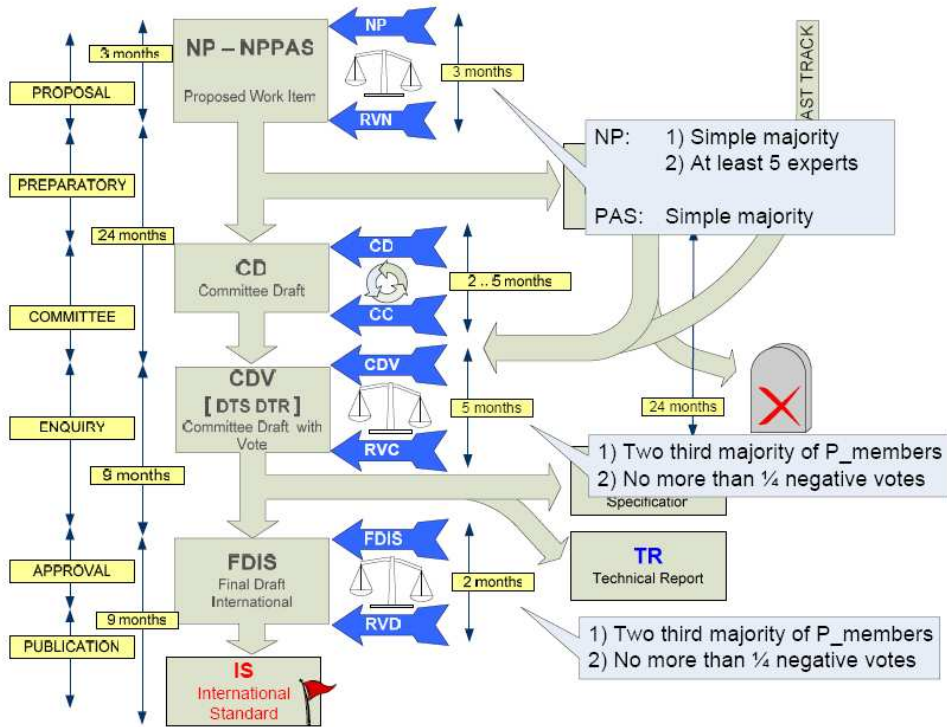


Figure 3: Overview Publicly Available Specification (PAS)

The PAS path is simpler and quicker, and has been for example recently used for the UPnP specifications.

This path would be well adapted to standardize the DPWS specification at the IEC level. This path may be complimentary to the normal path that we envision to follow through the two IEC WGs described above.

3. CONCLUSION

Thanks to the strong support of Schneider Electric, Siemens, ABB, SAP and ifak in this standardization process and thanks to the strong positions held by Siemens, ifak and Schneider Electric in the IEC TC 65E, a clear standardization path is foreseen through two working groups of this committee that are either already started or initiated soon.

An alternate standardization will be explored. However, the feasibility of this path is not today confirmed: The DPWS specifications, even if public, and even if anybody can implement them freely, are under the Microsoft copyright. The Microsoft agreement must then be given to the consortium, and we must get their full support to go in this direction. We will shortly explore the feasibility of this alternate path.

4. REFERENCES

[1] IEC homepage TC65E, <http://www.iec.ch>