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Communication networks and systems for power utility automation

Part 80-3: Mapping to web protocols —
Requirements and technical choices

National foreword

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The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT



Communication networks and systems for power utility automation – Part 80-3: Mapping to web protocols – Requirements and technical choices

INTERNATIONAL
ELECTROTECHNICAL
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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	10
3 Terms and definitions	11
4 Abbreviated terms	12
5 Main involved sub-systems and stakeholders	12
6 Requirements description	14
6.1 General.....	14
6.2 Scope of this clause.....	14
6.2.1 ACSI classes to be mapped	14
6.2.2 Network type	15
6.3 Requirements list.....	15
6.3.1 Transfer time	15
6.3.2 Throughput.....	15
6.3.3 Data integrity (error probability)	15
6.3.4 Reliability	15
6.3.5 Availability.....	15
6.3.6 Interoperability.....	16
6.3.7 Cyber security	16
6.3.8 Device size.....	17
6.3.9 Dynamic extension of the system.....	17
6.3.10 Sensitivity to cost of bandwidth.....	17
6.3.11 Availability of commercial and open source tools	17
6.3.12 Intellectual property	18
6.3.13 Perenniality / Stability of the solution	18
6.3.14 Request for additional resources and engineering	18
6.3.15 Simplicity and easy implementation of the communication solution	18
6.3.16 Ability to become a SCSM / Difficulty in filling the gap	18
6.3.17 One single solution for all smart grid applications	18
6.3.18 Products' time-to-market.....	18
6.3.19 Minimize standardization effort	19
7 SCSM technical description	19
7.1 Technology assessment and choice.....	19
7.2 XMPP overview.....	20
7.2.1 Principles	20
7.2.2 Address scheme	21
7.2.3 Scalability and redundancy.....	21
7.2.4 Server federation.....	22
7.2.5 Stanza example.....	22
7.2.6 Presence monitoring.....	23
7.3 Communication stack overview	23
7.4 Definition of the XML payload	25
7.5 Transport of XML payloads over XMPP.....	28
7.5.1 Mapping over XMPP overview	28

7.5.2	Rules for mapping solicited services	29
7.5.3	Mapping of unsolicited services	31
7.5.4	Usage of presence monitoring	31
7.6	Cyber security.....	32
7.6.1	Security with XMPP	32
7.6.2	Choice of technical solutions for security	33
7.7	Mapping synthesis	33
7.8	Synergy with existing 8-1 mapping.....	35
Annex A (informative) Use cases and requirements for each domain		38
A.1	Use cases for PV-inverters	38
A.1.1	Scope of this clause	38
A.1.2	Architecture overview	38
A.1.3	Use cases	39
A.2	Use cases for hydro and thermal generation	40
A.2.1	Scope of this clause	40
A.2.2	Architecture overview	40
A.2.3	Use cases	41
A.3	Use cases for wind power	43
A.3.1	Scope of this clause	43
A.3.2	Architecture overview	43
A.3.3	Use cases	46
A.4	Use cases for CHP	49
A.4.1	Scope of this clause	49
A.4.2	Architecture overview	50
A.4.3	Use cases	54
A.4.4	References for CHP domain	59
A.5	Use cases of domain Smart Customer (DR)	59
A.5.1	Scope of this clause	59
A.5.2	Architecture overview	60
A.5.3	Use cases	62
A.6	Use cases for E-Mobility	64
A.6.1	Scope of this clause	64
A.6.2	Architecture overview	64
A.6.3	Use cases	64
A.7	Use cases for VPP and Microgrid.....	70
A.7.1	Scope of this clause	70
A.7.2	Architecture overview	71
A.7.3	Use cases	72
A.8	Use cases for feeder automation.....	74
A.8.1	Scope of this clause	74
A.8.2	Architecture overview	74
A.8.3	Use cases	78
A.9	Required services and performances	79
Annex B (informative) Examples of MMS XER payloads		82
B.1	General.....	82
B.2	GetLogicalNodeDirectory	82
B.3	Report	88

Figure 1 – Architecture overview	13
Figure 2 – Device communicating with different trust levels	17
Figure 3 – Architecture main choices	20
Figure 4 – XMPP architecture overview	21
Figure 5 – XMPP Federation	22
Figure 6 – Example of a XMPP telegram	23
Figure 7 – Simplified communication stack	24
Figure 8 – XER encoding vs BER encoding	26
Figure 9 – ASN.1 abstract definition of MMS PDUs (extract)	27
Figure 10 – Example of XER payloads	27
Figure 11 – ACSI XML Message schema for XER payload (extract)	28
Figure 12 – XMPP architecture for IEC 61850	29
Figure 13 – XMPP using TLS and Simple Authentication and Security Layer (SASL)	32
Figure 14 – End to end security over XMPP	33
Figure 15 – Synthesis of SCSM 8-2 structure	34
Figure 16 – SCSM 8-1 and 8-2 synergy	35
Figure 17 – Control center with dual stack SCSM 8-1 / SCSM 8-2	36
Figure 18 – Gateway between SCSM 8-1 and SCSM 8-2	37
Figure A.1 – PV – Architecture overview for data connections to an industrial plant	38
Figure A.2 – PV – Architecture overview for data connections to a residential plant	39
Figure A.3 – Power plants – Typical power operator network architecture	41
Figure A.4 – Power plants – Relationship between the actors	41
Figure A.5 – Examples of the variety of topologies required/supported for wind power	44
Figure A.6 – Example of use within the wind plant	44
Figure A.7 – Example of use between the wind plant and a control center	45
Figure A.8 – Diagram of data use hierarchy levels in condition monitoring	45
Figure A.9 – Types of CHP plants	50
Figure A.10 – CHP – Example of a system architecture	51
Figure A.11 – Number of CHPs in Germany	52
Figure A.12 – CHP use cases and involved actors	53
Figure A.13 – CHP – Graphical presentation of frequency control within the European power system	55
Figure A.14 – CHP – Frequency control time characteristic	55
Figure A.15 – Smart customer – Main actors	60
Figure A.16 – Smart customer – Main elements of the smart customer domain (right column)	61
Figure A.17 – Smart customer – Logical model for customer premises communications	61
Figure A.18 – Smart customer – Communication relationships	62
Figure A.19 – E-Mobility – Architecture overview	64
Figure A.20 – Architectural picture of a microgrid	71
Figure A.21 – Architectural picture of a VPP	72
Figure A.22 – FA – Distributed architecture of a feeder automation system	75
Figure A.23 – FA – Semi-centralized architecture of a feeder automation system	76
Figure A.24 – FA – Centralized architecture of a feeder automation system	77

Table 1 – Main involved sub-systems and stakeholders	13
Table 2 – ACSI services to be mapped	24
Table 3 – MMS objects and services in use within this SCSM	25
Table 4 – Mapping synthesis.....	34
Table A.1 – Use case list	39
Table A.2 – Power plants – Use case list	42
Table A.3 – Wind – List of actors	46
Table A.4 – Wind – Use case list	47
Table A.5 – CHP – Use case list	54
Table A.6 – CHP – Other use cases not feasible with existing ACSI.....	59
Table A.7 – Smart customer – Use case list.....	63
Table A.8 – Smart customer – Other use cases not feasible with existing ACSI	63
Table A.9 – E-Mobility – Use case list	65
Table A.10 – VPP/Microgrid – Use case list	72
Table A.11 – VPP/Microgrid – Other use cases not feasible with existing ACSI.....	73
Table A.12 – FA – Use case list.....	78
Table A.13 – FA – Other use cases not feasible with existing ACSI	79
Table A.14 – Synthesis – Usage of modeling classes.....	79
Table A.15 – Synthesis of transfer times	80
Table A.16 – Synthesis – New proposed functions	81

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 80-3: Mapping to web protocols – Requirements and technical choices

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IEC TR 61850-80-3, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1584/DTR	57/1624/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61850 series, published under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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INTRODUCTION

The usage of the IEC 61850 communication standard is largely spreading over all the domains connected to the smart grid, pushing the usage of technologies adapted to the connection of a very large number of applications and devices across the intra/internet (see related use cases in Annex A). The involved domains typically use already well-established protocols for exchanging data with IT level applications like resource planning, asset and maintenance management, etc. Therefore, it becomes imperative to provide an integration strategy that allows the integration of IEC 61850 into these various disparate protocols and information.

In this context, Web Protocols are considered the most appropriate technology for communication with backend systems and possibly field devices.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 80-3: Mapping to web protocols – Requirements and technical choices

1 Scope

This part of IEC 61850, which is a technical report, describes the requirements and gives an overview of the technical solution for using Web Protocols as a new communication mapping (SCSM) for the IEC 61850 standard.

NOTE The notion of Web Protocols covers here the Web Services technologies, extended by other well deployed technologies based on standards used in the IT domain (IETF, ISO, W3C, OASIS, etc.). The advantage is that due to a lot of professional knowledge and practical experiences in the IT world the risk of non-interoperable solutions in the smart grid domain will decrease.

The structure of this part of IEC 61850 illustrates a two-step approach:

- Collection of the use cases and requirements based upon emerging Smart Grid architectural considerations, taking into account the new extended scope of IEC 61850. Clause 6 proposes a synthesis of the global requirements, while the use cases of the various domains are described in Annex A. The considered domains are:
 - PV-inverters
 - Hydro and thermal generation
 - Wind power plants
 - Combined Heat and Power (CHP)
 - Smart customers
 - E-Mobility
 - Virtual Power Plants (VPP) and micro grids
 - Feeder automation
- Evaluation and selection of technologies in order to build a consistent SCSM. Clause 7 presents the future SCSM 8-2, including an overview of the main selected technology: XMPP. The following goals have been particularly considered for the definition of this SCSM:
 - Identify a single profile supporting all the services required by the domains and defined today in ACSI.
 - Cover the full life cycle of a IEC 61850 system, in collaboration with the System Management work in WG10 (from configuration, through conformance testing, down to maintenance). For this purpose, this part of IEC 61850 may recommend some changes to other parts of the IEC 61850 series such as Parts 6 and 10, etc.
 - Deploy cyber-security to ensure a secure environment (in compliance with the IEC 62351 series).
 - Propose rules for cohabitation with other mappings such as IEC 61850-8-1 and IEC 61850-9-2, and possibly recommend communication profiles depending on specific application context (pole-top equipment, inside DER, connection of DER, etc.).
 - Only the A-Profile is addressed here. Nevertheless, support of TCP/IP and UDP/IP is required for the T-Profiles.

What is not included in the study: