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Communication networks and systems for power utility automation – Part 7-6: Guideline for definition of Basic Application Profiles (BAPs) using IEC 61850

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International Standard IEC 61850 has been prepared IEC technical committee 57: Power systems management and associated information exchange.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
57/1986/DTR	57/2034/RVDTR

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 document 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 document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The IEC 61850 series of standards offers a broad basis for communication networks and systems in power utility automation. Due to its broad coverage of power utility automation applications, it is up to the standard's user (utility, vendor, system integrator, etc.) to pick and choose specific options from the standard in order to meet the requirements of the intended objective. As a consequence, implementations of IEC 61850 represent specific subsets of the standard.

In the context of standards the term "profile" is commonly used to describe a subset of an entity (e.g. standard, model, rules).

Accordingly an IEC 61850 standard profile contains a selection of data models (mandatory elements), applicable communication services and relevant engineering conventions (based on the Substation Configuration Language SCL defined in IEC 61850-6) for an application function of a specific use case in the domain of power utility automation.

Depending on the scope and objective different profile types can be distinguished:

- User profile – defined subset that is valid for a specific user / organization (e.g. utility)
- Product / device profile – implemented subset in a specific vendor product /device
- Domain profile – defined subset for a specific domain and relevant use cases (e.g. monitoring of substation)
- Application / function profile – subset covering a specific application or function (e.g. substation interlocking)

These profile types target the reduction of complexity and facilitation of interoperability for their specific scope and during engineering and device / substation lifetime. In order to achieve both these goals, a properly defined profile and appropriate implementations (processes, tools, products) that support the profile are required.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 7-6: Guideline for definition of Basic Application Profiles (BAPs) using IEC 61850

1 Scope

This part of IEC 61850, which is a technical report, is focused on building application / function profiles and specifies a methodology to define Basic Application Profiles (BAPs). These Basic Application Profiles provide a framework for interoperable interaction within or between typical substation automation functions. BAPs are intended to define a subset of features of IEC 61850 in order to facilitate interoperability in a modular way in practical applications.

It is the intention of this document to provide a common and generic way to describe the functional behaviour of a specific application function in the domain of power utility automation systems as a common denominator of various possible interpretations/implementations of using IEC 61850.

The guidelines in this document are based on the functional definitions of

- IEC 61850-5, Communication requirements for functions and device models, which gives a comprehensive overview of all application functions needed in a state-of-the-art substation automation implementation.
- IEC TR 61850-7-500, Basic information and communication structure – Use of logical nodes for modelling application functions and related concepts and guidelines for substations, which illustrates and explains application functions for the substation/protection domain of Logical Nodes in modelling simple and complex functions, to improve common understanding in modelling and data exchange, and finally to lead to interoperable implementations.
- IEC TR 61850-90-3, Using IEC 61850 for condition monitoring diagnosis and analysis, which gives use cases and data modelling for condition monitoring diagnosis and analysis functions for substation and power grid facilities.

This document does not describe the applications and respective implementation requirements; the focus is on their typical information exchange including data and communication services and engineering conventions.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61850-5:2013, *Communication networks and systems for power utility automation - Part 5: Communication requirements for functions and device models*

IEC 61850-7-2, *Communication networks and systems for power utility automation - Part 7-2: Basic information and communication structure - Abstract communication service interface (ACSI)*

IEC TR 61850-90-3, *Communication networks and systems for power utility automation - Part 90-3: Using IEC 61850 for condition monitoring diagnosis and analysis*

IEC TR 62361-103:2018, *Power systems management and associated information exchange - Interoperability in the long term - Part 103: Standard profiling*