

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Information exchange for electric vehicle charging roaming service –
Part 1: General**

**Échange d'informations pour le service d'itinérance de la recharge des véhicules
électriques –
Partie 1: Généralités**



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**Information exchange for electric vehicle charging roaming service -
Part 1: General****FOREWORD**

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IEC 63119-1 has been prepared by IEC technical committee 69: Electrical power/energy systems for electrically propelled road vehicles and industrial trucks. It is an International Standard.

This second edition cancels and replaces the first edition published in 2019.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the scope is expanded to include differentiation between home and visited service provider roles and adds an explicit definition of roaming entity;
- b) adds definitions for "home charging service provider (home-CSP)", "visited charging station operator (visited-CSO)", and "charging detail record (CDR)", and expands related terms such as "service" and "roaming entity";
- c) introduces abbreviation variants for "home-CSP" and "visited-CSO" in the terminology, aligning with North American and European conventions;

- d) updates the communication protocol stack by adopting a newer TLS version (upgraded from 1.2 to 1.3);
- e) system architecture and communication interfaces include detailed interactions between home-CSP and visited-CSO;
- f) adds a definition for "service" to cover a broader range of applications such as parking and reservation management;
- g) adds a distinction between "charging detail record (CDR)" and "service detail record (SDR)" and clarifies their relationship in the terminology;
- h) enhances the description of user credential transfer methods in communication interfaces with greater diversity;
- i) enhances the description of the mixed mode in the classification of roaming service models, emphasizing improved user experience through faster response times.

The text of this International Standard is based on the following documents:

Draft	Report on voting
69/1050/FDIS	69/1063/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 63119 series, published under the general title *Information exchange for electric vehicle charging roaming service*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

1 Scope

This part of IEC 63119 establishes a basis for the other parts of IEC 63119, specifying the terms and definitions, general description of the system model, classification, information exchange and security mechanisms for roaming between EV charging service providers (CSPs), charging station operators (CSOs) and clearing house platforms through roaming endpoints. It provides an overview and describes the general requirements of the EV roaming service system.

The IEC 63119 series is applicable to high-level communication involved in information exchange/interaction between different CSPs, as well as between a CSP and a CSO with or without a clearing house platform through the roaming endpoint.

The IEC 63119 series does not specify the information exchange, either between the charging station (CS) and the charging station operator (CSO), or between the EV and the CS.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

electric vehicle

EV

electric road vehicle

vehicle propelled by an electric motor drawing current from a rechargeable storage battery or from other portable energy storage devices (rechargeable, using energy from a source of the vehicle such as a residential or public electric service), which is manufactured primarily for use on public streets, roads or highways

[SOURCE: IEC 61851-1:2017, 3.4.1, modified – The definition has been expanded and the note to entry has been deleted.]

3.2

service

suite of functions provided by the service provider to the EV users, such as energy transfer, reservation management, parking, etc.

3.3

electric vehicle user

EV user

person or legal entity using the vehicle and providing information about its needs

[SOURCE: IEC SRD 62913-2-4:2019, Table 3]

3.4**electric vehicle supply equipment****EV supply equipment**

equipment or a combination of equipment that provides specific functions to supply electric energy from a fixed electrical installation or supply network to an EV for the purpose of charging and discharging

3.5**charging service provider****CSP**

role that manages and authenticates EV user's credentials and provides the billing and other value-added services to the customer

Note 1 to entry: CSP is also abbreviated as EMSP in EU and NA.

3.6**charging station operator****CSO****charging point operator****CPO**

party responsible for the provisioning and operation of the charging infrastructure (including charging sites), and managing electricity to provide requested energy transfer services

Note 1 to entry: The CSO shall operate a roaming endpoint to achieve a roaming service.

3.7**e-mobility service provider****EMSP**

party responsible for providing high-value services related to the use of an EV

Note 1 to entry: Examples of high-value services include renting an EV, reservation of parking service, navigation services and energy services which include charging station provider in relation with CSO.

[SOURCE: IEC SRD 62913-2-4:2019, Table 3]

3.8**home charging service provider****home-CSP**

entity which has a contract with the EV user and can authorize an energy transfer session to another CSP/CSO

3.9**visited charging station operator****visited-CSO****visited charging point operator****visited-CPO**

CSO/CPO that the EV user visits for getting energy transfer service, which is not the EV user's home-CSP

3.10**roaming**

information exchanges and related provisions between CSPs, which allow EV users to use a single credential and contract to access services on multiple e-mobility networks and contract to access the charging services provided by multiple CSPs or CSOs through roaming endpoints

3.11**roaming entity**

entity which provides roaming service to EV user, including home-CSP, visited-CSO and cleaning house (CH)

3.12**clearing house****CH****mobility clearing house****MCH****roaming platform****e-mobility clearing house****E_MOCH**

optional intermediate actor that facilitates authorization, billing and settling procedure for EV charging service roaming, between two clearing partners

Note 1 to entry: The terms "MCH" (mobility clearing house), "roaming platform" and "E_MOCH" (e-mobility clearing house) can be found depending on the region.

3.13**credential**

physical or digital asset that carries the roaming service user's identity or contract ID, which is used for authentication and security purposes

EXAMPLES

- static or dynamic QR code;
- username/password;
- RFID card;
- digital certificate transferred through the plug and charge process.

3.14**service detail record****SDR**

data package containing all necessary information within one unique identification which is needed for billing or informing of/about a service session of a specific customer

3.15**charging detail record****CDR**

data package containing all necessary information within one unique identification which is needed for billing or informing of/about an energy transfer session

3.16**charging session**

collection of charging transactions at a charge point related only to the charging of an EV assigned to a specific customer in a specific time frame with a unique identifier

Note 1 to entry: The charging session is a subset of the service session.

3.17**service session**

collection of services around a charge point mainly related to the charging of an EV assigned to a specific customer in a specific time frame with a unique identifier

3.18**charging transaction**

smallest billable part of a charging session representing the transfer of energy in a specific time frame

3.19**roaming endpoint****RE**

entity containing all the related roaming functions

3.20
charging station
CS

physical equipment, consisting of one or more EV supply equipment, which manages the energy transfer to and from electric vehicles

3.21
energy transfer service

unit of continuous energy transfer between EV supply equipment and EV battery

3.22
distribution system operator
DSO

party operating a distribution system

[SOURCE: IEC 60050-617:2009, 617-02-10, modified – The terms "distribution network operator" and "distributor" have been deleted.]

4 General description for roaming service models**4.1 General**

The IEC 63119 series covers roaming-related communication exchange. Clause 4 specifies the general relationship of roaming with the relevant technologies.

Figure 1 shows an overview of roaming, grid and transportation technology. There could be other related technologies which are not presented in this figure; not all interface reference points are plotted.

The information exchange of roaming focuses on actors between different home-CSPs, as well as between a home-CSP and a visited-CSO with or without clearing house platform through the roaming endpoint. The clearing house is an optional actor to complete the roaming functions, which can be completely or partially executed directly between different service providers.

For connections between grid and roaming technologies, there is a connection between the visited-CSO and the charging station. To implement the smart grid function, there could be other optional communication connections. For example, the distribution system operator can send the smart charging profile directly to the home-CSP.

For connections between roaming, grid and transportation technologies, it is also possible to have information exchange between the intelligent transportation system (ITS) and the roaming systems.