

Glossary

IDACS Terminology document

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1 Introduction

This document describes the different used terminology in the IDACS project for items used for IDs and ID issuing and for National Access Points charge infrastructure. Terms used for Hydrogen and other bio fuels are not part of this document as they use different terms.

1.1 Document setup

The first part of this document the terms are grouped and explained and not just put in alphabetic order, but in logical combinations and where possible with pictures and diagrams for visualization.

The picture below shows the EV Ecosystem, roles and protocols. The important IDACS components are in between the blue block.

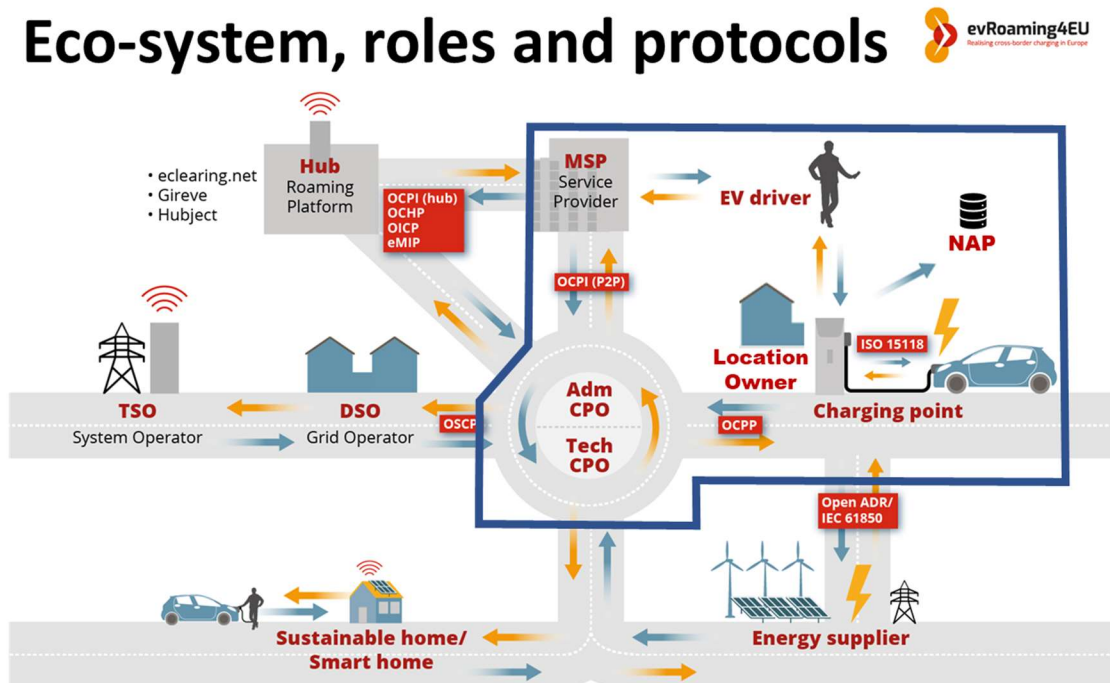
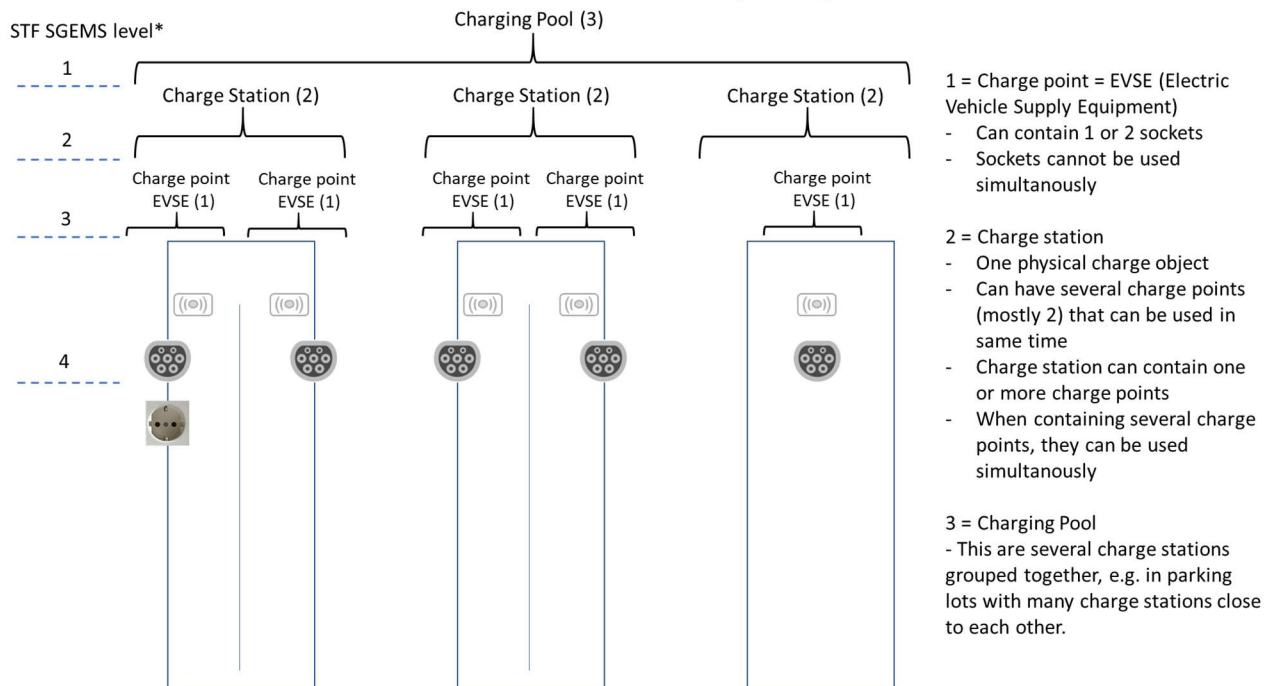


Figure 1: Overview Eco system, roles and protocols

First the main terms for Charging stations/Charging points are explained in chapter 2. Followed in chapter 3 by the terms used for the different roles that are related to charge station networks. The different relevant protocols are described in chapter 4.

2 Charge stations, charge points, etcetera

Enclosed an overview of the most used terms concerning charge stations.



* STF SGEMS level = EU Sub Group Electro Mobility Services, advisory group for EU who defined levels in charge infrastructure overviews

Figure 2: overview used terms charge stations

The first charge station on the left side contains both 2 **charge points**. The left charge point contains 2 **sockets** (a type 2 socket and Shuko household socket) and the right charge point has 1 socket.

The terms charge point and EVSE are both used but mean the same. **Each charge point should have its own ID.**

In the situation of DC chargers you often see one station which has only one charge point but has two or three sockets: type 2 DC, Chademo and CCS. In that situation only one of them can be used at a time.

Connector

A connector is the physical interface between the charging station and the electric vehicle through which the electric energy is delivered:

- A plug on a cable (one side consists of a 'male' plug and the other side of the 'female version'). The plug of one side of the cable fits into the outlet of the charging point and the plug on the other side of the cable fits into the inlet on the vehicle;
- A plug attached on an inseparable cable of the charging station (common for fast charging stations). This plug fits in the inlet of the vehicle;
- An induction plate (see chapter 7);
- A pantograph (see chapter 7).

Connectors and **Sockets** are used in a mixed way, as for the usage for IDs and NAPs, but also for protocols there is no difference.

A **Charging Pool** also called **Pool** consists of one or multiple charging stations and the accommodating parking lots. The charging pool is operated by one charge point operator (CPO) at one location/address and GPS coordinates. The charging pool is an

object relevant for cartographic view, guiding tools and all features that represent a charging infrastructure element on a map. A charging pool is defined by: One location/address and GPS coordinates and operated by one charge point operator. Using a charging pool is not a must, you can also group charging stations via other ways.

3 Roles

This chapter is describing the terms/roles in the following part of the IDACS focus area:

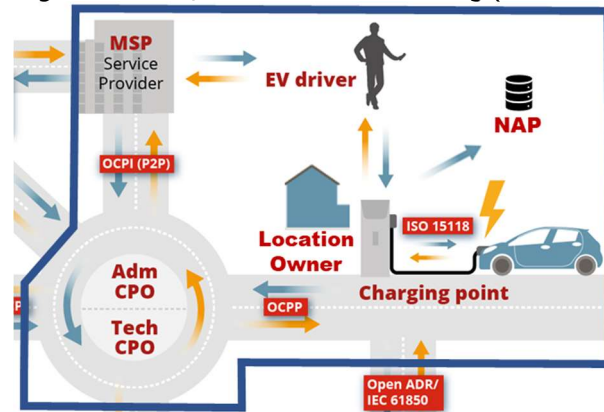


Figure 3: Roles IDACS focus area

The **EV driver** is the person who is taking the energy from the charge station for his/her Electric Vehicle (EV). This person does not need to be the owner of the vehicle. The EV driver can either:

- Have a contract with the Mobility Service Provider (MSP) And/or
- Is buying the energy from the charge point directly from the Charge Point Operator, which can be done via the location owner – This is called the Ad Hoc translation where no subscription or registration with any party is needed

The EV driver is charging at a **Charge point or Charge Station**, often these terms are mixed as a charge point can also be directly the charge station (see also chapter 2). These Charge Points have their own full ID also called EVSE ID.

The charge station placed at an area or building that is owned by a **Location owner**. The can be relevant as the location owner can 'outsource' the management of the charge point to a Charge Point Operator. Location owners can have their own ID. E.g. in France cities who own the location have an ID that is used for the EVSE ID, but have the operations outsource to an external Charge Point Operator.

The **Charge Point Operator (CPO)** is managing the charge stations and often seen as one entity or one role. As the technical management of a charge station can be quite complex, the role of CPO can be split in **Technical CPO** (= the manufacturer) and the **Administrative CPO** (the party that is managing the transactions and daily operations). A charge station has only one connection to the operator; because of that the roles are split at the CPO level.

The Administrative CPO need to have an ID and is using them for the Charge Points as EVSE ID.

The CPO must offer Ad Hoc charging services to EV drivers

The **Mobility Service Provider (MSP), also called E-Mobility Provider (EMP) or E-Mobility Service Provider (EMSP) or just Service Provider (SP)** is the organisation who is offering charging services to an EV driver and has a charging contract with that EV driver. Often via subscription, but other ways are also possible.

The MSP must have contracts with CPOs to get access to their charge stations. Also a technical connection is needed. This can be done directly (peer to peer) or via a roaming hub who is managing many connections at the same time.

4 Used protocols

Several protocols are used in the Electric Vehicle value chain. The main ones that could be relevant for IDACS are mentioned and explained in this chapter.

4.1 General protocols

OCPP - Open Charge Point Protocol/ Open Charge Alliance

The Open Charge Point Protocol (OCPP) has been designed and developed to standardize the communications between an EV charge point and a central system, which is used for operating and managing charge points. The communication protocol is open and freely available to ensure the possibility of switching from charging network without necessarily replacing all the charging stations or significant programming, including their interoperability and access for electric grid services. The protocol is intended to exchange information related to transactions and for operating a charge point including maintenance. It can also be used for schedule-based EV charging. For Roaming OCPP provides technical access to the charge point and facilitates forwarding of transactions to the E- mobility Operator/ Mobility Service Provider. More information:

www.openchargealliance.org/protocols/ocpp/ocpp-20.

ISO/IEC 15118

This protocol is setup to support plug and charge directly between electric vehicle and charge station, without the need of additional cards/tokens to use. The OEM can act here as MSP and authorisation is done via the car. ISO 15118 also contains strong data security between car and charge station. Current usable version is ISO 15118-2:2014. For the use of this standard, both cars and charge stations need be equipped with specific soft- and hardware. At this moment it is not (yet) used for mass deployment. The standard also defined together with eMI3 the first ID formats, but want now the management of this ID format done by other organisation.

<https://www.iso.org/standard/55366.html>

Open ADR – Open Automated Demand Response Standard / OpenADR Alliance

The protocol is aimed at automating demand response communication, it supports a system and/or device to change power consumption or production of demand-side resources. This can, for example, be done based on grid needs, either by means of tariff and/ or incentives or emergency signals that are intended to balance demand to sustainable supply. The OpenADR protocol specification profiles A and B are publicly available at no cost from: www.openadr.org.

OSCP - Open Smart Charging Protocol/ Open Charge Alliance

The Open Smart Charging Protocol communicates forecasts of the available capacity of the electricity grid to other systems. The protocol is based on a budgetary system where client systems can indicate their needs to a central system, which guards against overuse of the grid by handing out budgets per cable. If a system requires more it can request more, if it requires less it can hand back part of its budget, to be available for other systems. The OSCP protocol is publicly available at no cost from:

www.openchargealliance.org/protocols/oscp/oscp-10.

IEC 61850

The IEC 61850-90-8 document is not a protocol in itself. It is a technical report which describes an object model for electric mobility. It models Electric Vehicles as a specific form of Distributed Energy Resource according to the paradigms defined in IEC 61850. The IEC 61850 specification is publicly available at limited cost from the website of IEC:

www.iec.ch/dyn/www/f?p=103:23:0:::::FSP_ORG_ID:1255.

4.2 Roaming related protocols

EV Roaming enables EV drivers to charge at each charging station and manages the billing of the charge action towards the driver. Condition is an open charging infrastructure for electric drivers. It means a shared use of charging infrastructure, independent of technology, without fiscal and legal obstacles.

OCPI - Open Charge Point Interface protocol/ NKL Nederland

OCPI is an independent roaming protocol that makes it easy to exchange data. It can be used both by companies (peer-to-peer) and via a roaming hub or platform. The protocol is supported internationally. With OCPI EV drivers get an insight into the availability and costs of charging points. OCPI protocol is publicly available at no cost via NKL Nederland. OCPI development is co-funded by the projects evRoaming4EU and ECISS, which receive EU and NL subsidies. More information: www.nklnederland.nl and www.evroaming4.eu.

OCHP - Open Clearing House Protocol/ e-clearing.net

The Open Clearing House Protocol (OCHP) is a protocol which is meant for exchanging authorization data, charging transaction and charge point information data for roaming via the e-clearing.net platform. The protocol consists of 2 parts:

1. A part that is specifically for communication between market parties and an EV clearing house;
2. A part that is for peer to peer communication between market parties, this is called OCHPdirect.

The OCHP is publicly available at no cost. More information on: <https://e-clearing.net>.

eMIP – eMobility Interoperation Protocol / GIREVE

The eMobility Interoperation Protocol, called eMIP, is provided by GIREVE as part of his main business objective: "open access to vehicle charging stations". eMIP targets two goals:

1. enabling roaming of charging services by providing a charge authorisation;
2. a data clearing house API and providing access to a comprehensive charging point database.

The eMIP protocol is publicly available at no cost. More information:

www.gireve.com/wp-content/uploads/2017/02/Gireve_Tech_eMIP-V0.7.4_ProtocolDescription_1.0.2_en.pdf.

IEC 63119

IEC 63119 is a standard that is currently being developed : Information exchange for Electric Vehicle charging roaming service. It contains of four parts: Part 1: General – aimed publication date August 2019, Part 2: Use Cases, Part 3: Message structure, Part 4: Cybersecurity and information privacy. All last three parts have aimed publication date March 2022. More information:

www.iec.ch/dyn/www/f?p=103:23:0::::FSP_ORG_ID:1255.

OICP - Open InterCharge Protocol / Hubject

The Open InterCharge Protocol (OICP) is a roaming protocol which can be used to communicate with the Hubject B2B Service Platform. This platform enables exchanging roaming messages between an EMSP and a CPO. The protocol consists of two parts that together create the protocol: a separate part for the EMSP and a separate part for the CPO. The OICP protocol is publicly available at no cost. More information on:

www.hubject.com/en/downloads/oicp (Roaming Hub).

Sources

RVO: Electric vehicle charging - Definitions and explanation

https://www.rvo.nl/sites/default/files/2019/01/Electric%20Vehicle%20Charging%20-%20Definitions%20and%20Explanation%20-%20january%202019_0.pdf

eMI3 Standard V1

<http://emi3group.com/documents-links>

eMI3 Standard V1, part 2

<http://emi3group.com/wp-content/uploads/sites/5/2018/12/eMI3-standard-v1.0-Part-2.pdf>