MOBI.E OCPI – CEME (EMSP) and OPC (CPO) integration

OCPI Implementation within the context of MOBI.E and PT

VERSION: 1.6

CONTENTS: MOBI.E OCPI – CEME and OPC integration

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1 Introduction

1.1 Document Purpose and Motivations

This document is intended to explicitly present MOBI.E's vision and action plan concerning the implementation of a standardized approach to the Portuguese e-mobility ecosystem to evolve under the guidelines of the OCPI protocol.

In particular, it should be carefully read and understood together with (1).

Due to its technical nature and to make sure that it is understood by all relevant stakeholders (national and foreign) this document has been written in English.

1.2 Target Audience

This document is specifically targeted at the CEME [EMSP]'s and OPC [CPO]'s technical teams (and partners) to be able to perform the required developments to integrate their platforms with MOBI.E.

Chapters 2 and 3 are directed at all the different stakeholders of the MOBI.E's ecosystem.

1.3 Preliminary Remarks

Relevant tables in the document for the different objects show only the supported fields and operations. Whenever a field is not present then this means that it is not supported, eg. even though the request may be valid, the content for those fields that are not supported will be ignored.

Whenever a new field is being proposed, it is prepended by the prefix: "mobie_*".

1.4 Bibliography

1. **NKL.** *OCPI 2.2 Open Charge Point Interface.* 2019.

2. **eMobility ICT Interoperability Innovation Group (eMI3).** *Electric Vehicle ICT Interface Specifications - Part 2: Business Objects.* 2015. V1.0.

1.5 List of Terms and Abbreviations

Term	Language	Name	Definition (if applicable)
CDR	EN	Charge Detail Record	The object to be used for billing purposes.
CEME	PT	Comercializador de eletricidade para a Mobilidade Elétrica	

Term	Language	Name	Definition (if applicable)
CPO	EN	Charging Point Operator	
EMSP	EN	E-Mobility Service Provider	
ERSE	PT	Entidade Reguladora dos Serviços Energéticos	
IPR	EN	Intellectual Property Rights	
MOBI.E	N/A	MOBI.E S.A.	
N/A	EN	Not applicable	
NAP	EN	National Access Point	
NSP	EN	Navigation Service Provider	
OCHP	EN	Open Clearing House Protocol	
OCPI	EN	Open Charge Point Interface	
OCPP	EN	Open Charge Point Protocol	
OICP	EN	Open InterCharge Protocol	
OPC	PT	Operador de Pontos de Carregamento	
TBD	EN	To be decided	

2   MOBI.E OCPI Roadmap

2.1   Why OCPI

Since the beginning of the MOBI.E program, Portugal has sought a pioneering role regarding the implementation of advanced e-mobility management models procedures and best practices seeking to ensure the added value and benefits of a universal and open model.

The step taken in October 2018, with the introduction of the commercial phase, led to the development of a whole set of new integrated processes and data models that finally materialized the benefits of the MOBI.E framework, leading to an integrated ecosystem of almost 100 economic agents (counting CPOs and EMSPs). This model has privileged the following:

- "Certification"-like process for charging stations integration into the Portuguese network;
- Accountability in the integration with the energy sector (DSOs and Electricity retailers);
- Complete data model + full billing pre-processing handled by MOBI.E (above the current regulated obligations);
- Removal of virtually any technological barrier for an entity to operate either as a CPO [OPC] or EMSP [CEME].

Despite its many advantages, it has become clear to MOBI.E that it should attempt to harmonize its data model and processes towards international best practices and standards first and foremost to define a manageable evolving path for the entire ecosystem, and also not to align on "lower" standards imposed by legacy systems and common practices from the local industry incumbents.

As a result and focusing solely on the interfaces between the electric mobility entities (and not with the electric sector), MOBI.E has decided to take a path of convergence with the OCPI *de facto* standard, which should be adapted as the basis for the future evolution of the reference integration API to be implemented by MOBI.E and proposed to the entire ecosystem.

It is (arguably) the only protocol that fulfills all the following requirements:

- It is standard (or it has a vision to become "a standard")
- It converges with the IT industry best-practices concerning data exchange and security
- It is completely IPR-free
- It has an active collaborating community
- Its use is widespread in the world
- It is agnostic to business models
- and, most importantly, under its latest version, it can be adapted and/or extended to the specifics of the MOBI.E ecosystem.

This path has been initiated in 2020 with the integration of EMSPs in what was called OCPI – Phase 1.

2.2 MOBI.E OCPI Status

2.2.1 Revised Objectives

With the definition of Phase 1, the following list highlighted the long-term perspective on some possible applications enabled by the implementation of OCPI within MOBI.E in its entirety:

1. Enabling other e-mobility stakeholders to get real-time access to charging station information;
2. Notifying EMSP and CPOs that charges have been started or stopped, and update session data accordingly in real-time;
3. Allowing the creation of users by EMSP into MOBI.E via OCPI;
4. Enabling charges to be started via PT EMSP backends (more particularly via apps or ad-hoc charging modes);
5. Enabling PT CPOs to user their own backends for full independent management;
6. Enabling other countries' EMSP to roam and charge in PT (If allowed without the need for a national registered CEME) [please refer to Figure 6 and its comments];
7. Enabling PT EMSP's users to roam and charge in other countries via the PT's CEME app [please refer to Figure 7 and its comments];
8. Sending CDRs to all relevant stakeholders for billing purposes, within the scope of MOBI.E, fully shifting current implementation to OCPI;
9. and many other use cases.

While some of the use cases mentioned above may already be possible with the current MOBI.E implementation, either they used to rely on MOBI.E's own specifications or are not generic enough in order to ensure the coverage of the industry expectations without finer evolutions to the existing models.

2.2.2 Revised Overall Plan

The following table presents the complete plan to achieve the different phases of implementation, as revised.

Table 1 MOBI.E OCPI integration planned phases

Phase	Milestone description	Status / Plan
Phase 1	EMSP Integration	In Production
Phases 2 and 3	CPO Integration	Milestone 0 – 04/08/2021 • Release of update to MOBI.E OCPI document Milestone 1 – 13/08/2021 • Complete detailed test-plan updated and shared with CPOs Milestone 2 – 30/09/2021 • Change of EMSP – MOBI.E integration endpoints by EMSPs. (may be performed sooner)

Phase	Milestone description	Status / Plan
		• Testing environment available for CPOs (may be performed sooner) • Phases 2 & 3 available in production for pilot phase with live charging stations in a semi-controlled environment. Milestone 3 – On hold (waiting for the official date) • End of pilot phase • CPOs may start to integrate fully via OCPI in production (Tariffs and Locations creation may be started sooner depending on successful tests validation)
Phase 4	Foreign E-Mobility Roaming in Portugal	[refer to Figure 6] – Options 1 and 3 already in use
Phase 5	E-Mobility Roaming abroad	[refer to Figure 7] – Not yet addressed

2.2.3 Longer Term Vision

concrete release calendar, namely:

- Vision alignment with key internal stakeholders
- Choice to upgrade to OCPI 3.X when it becomes available (instead of proceeding with the different phases under OCPI 2.2)
- Required changes in e-mobility regulation (namely for Phase 3)
- Political alignment and long-term vision
- Catalogue of value-added services to be provided by MOBI.E

Other phases may be introduced or changed beyond Phase 2, which are not necessarily the ones presented above.

The following table presents a preliminary plan to achieve the different phases of implementation, as presented.
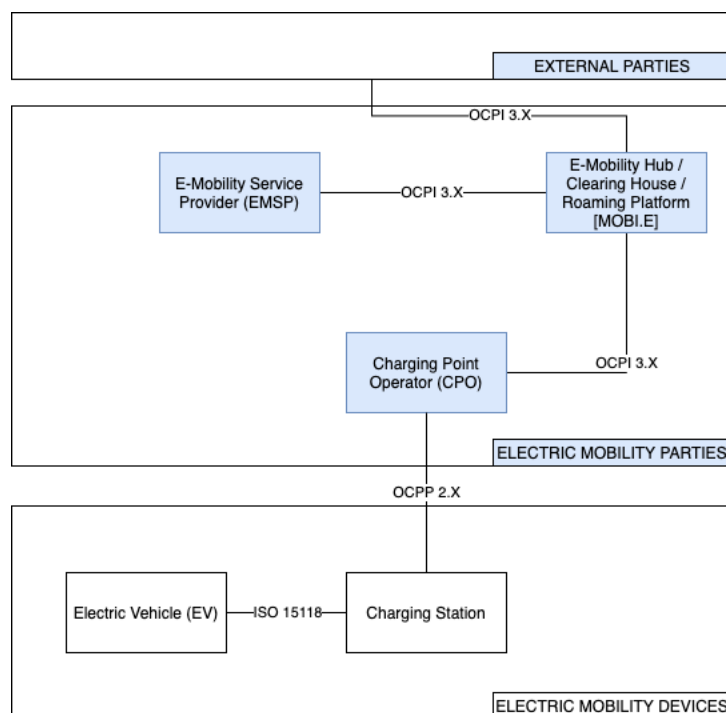
Figure 1 Medium to long-term vision of e-mobility protocols in the PT ecosystem

In particular, the implementation of this reference architecture falls under the following assumptions:

1. End-to-end security on all charging transactions
2. Full auditability of messages across the different interfaces
3. Mandatory certification for all interfaces (platforms)

Any deeper explanation is out of scope for this document.

2.3 Reference Architecture Diagrams

The different diagrams shown in this section reflect a high-level vision on the evolution of the MOBI.E ecosystem throughout the full OCPI implementation.

Generally speaking, the architectures hereby presented refer to the new topologies allowed. In practical terms (except for any decisions on deprecating previously implemented features), previous phase positionings could/should be supported.

As a departure point, let's consider a perspective on the initial architecture implemented:
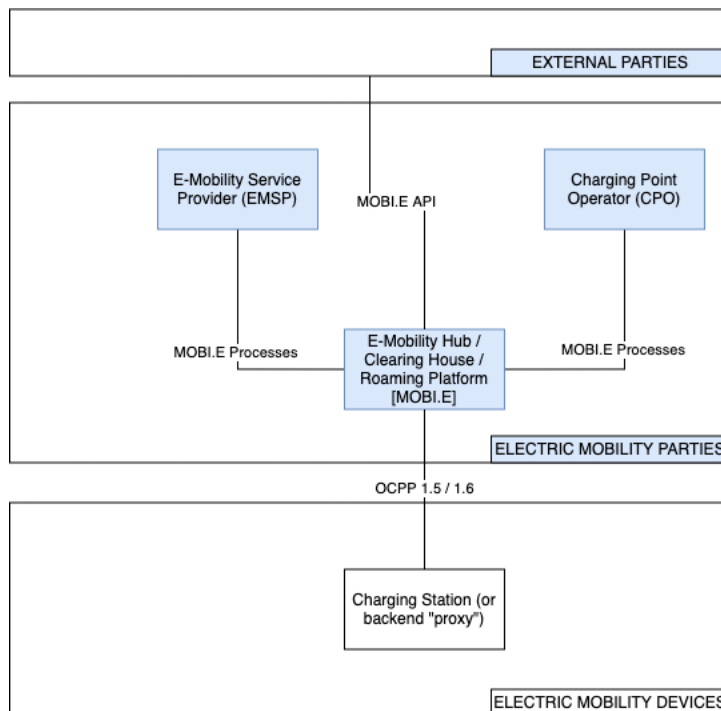
Figure 2 Reference architecture for Phase 0

In Phase 0, we could identify the existing interfaces as a set of:

- Processes and information exchange via manual interfaces (eg. e-mail)
- File-sharing via SFTP
- APIs for
    o Users/cards and contracts CRUD processes
    o Webhooks for events subscription (usage.started, usage.updated, usage.stopped, usage.validated, …)
    o Remote actions (e.g start/stop) but without proper validation across the entire network

2.3.1 Phase 1
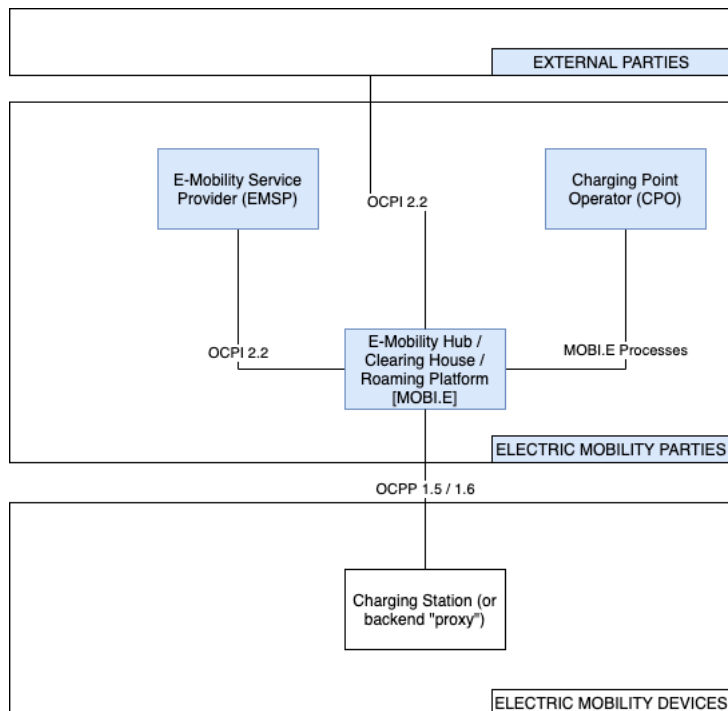
Figure 3 Reference architecture for Phase 1 (Current)

The following changes are highlighted for Phase 1:

- The ability of CPOs to integrate their own backends to MOBI.E via OCPP (specific requirements not covered in this document)
- EMSP integration with MOBI.E via OCPI
- OCPI as the main external interface for 3rd parties' data-sharing

2.3.2 Phases 2 and 3
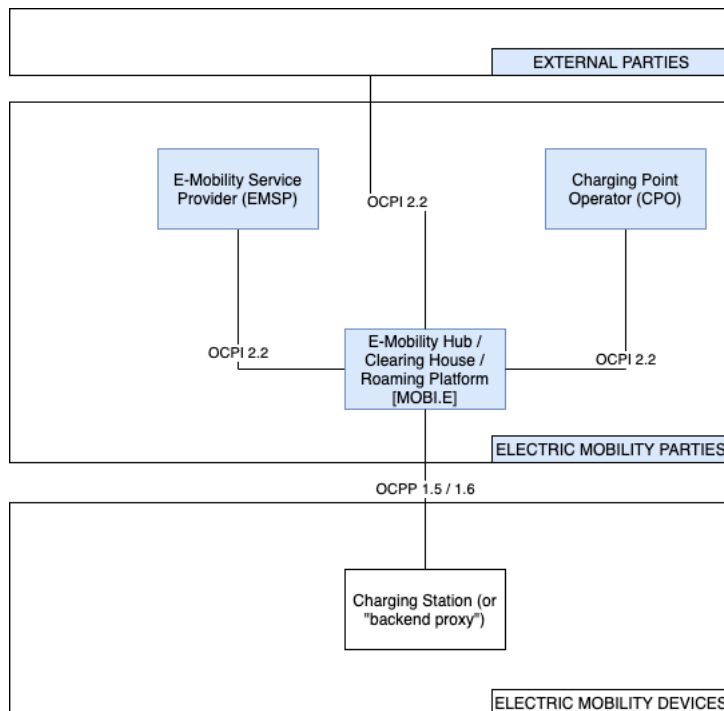
Figure 4 Reference Architecture for Phase 2

With the implementation of Phase 2, CPOs would have the possibility to use the OCPI interface to:
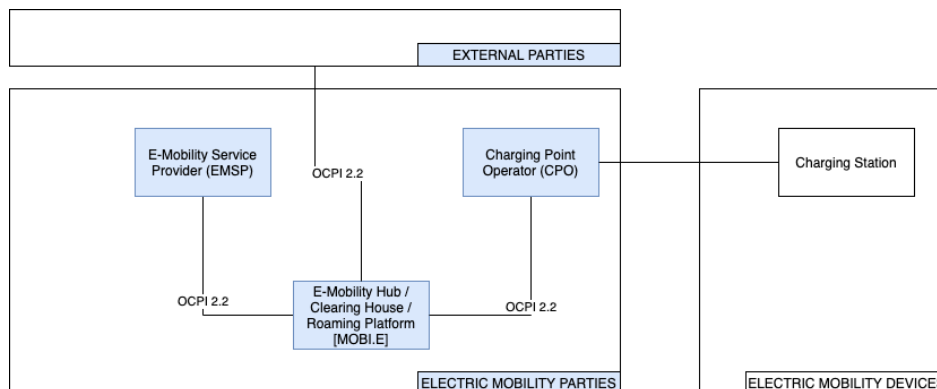
Figure 5 Reference Architecture for Phase 3

With the conclusion of Phases 2 and 3, CPOs gain the ability to be in full control of the charging process and may now use the OCPI interface to:

- Create and update tariffs
- Send real-time data via the Sessions module
- Integrate billing data with CDRs
- Create and update charging station data
- Notify MOBI.E (and the EMSP) of any change with charging station availability

It should be noted that contrary to the previous document version, and according to ERSE regulations, MOBI.E will keep the obligation as the sole source for CDR data.

2.3.3   Phase 4

The following diagram showcases all possible options for interactions concerning roaming transactions occurring in Portugal:
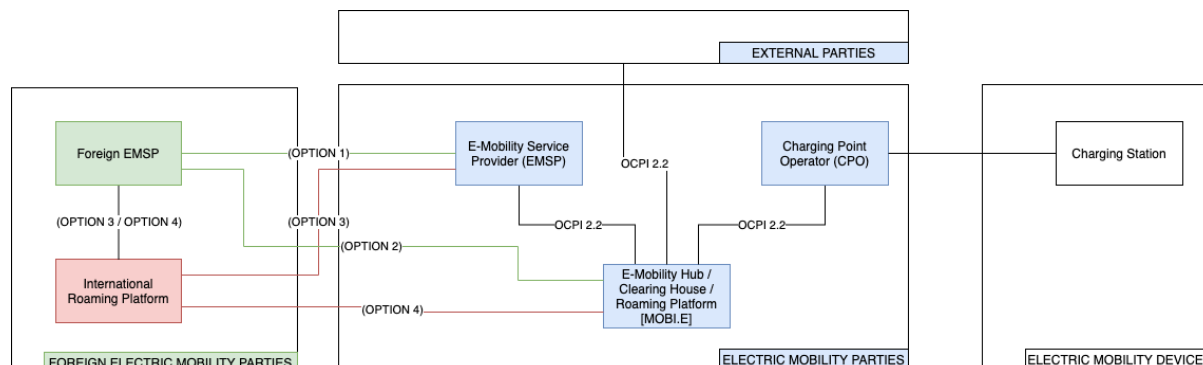
Figure 6 Reference Architecture for Phase 4

The discussion concerning the different options presented is outside of the scope of this document.

It is assumed that for MOBI.E integrations, for a foreign service provider (or hub) to operate in Portugal, then there are only 2 possibilities:

1. The foreign EMSP becomes a CEME in Portugal
2. The foreign EMSP reaches an agreement with a CEME in Portugal and all requests are handled via the CEME interface [OPTIONS 1 OR 3 in Figure 6]

2.3.4   Phase 5 (reference only)

The following diagram showcases all possible options for interactions concerning roaming transactions occurring abroad by Portuguese customers:
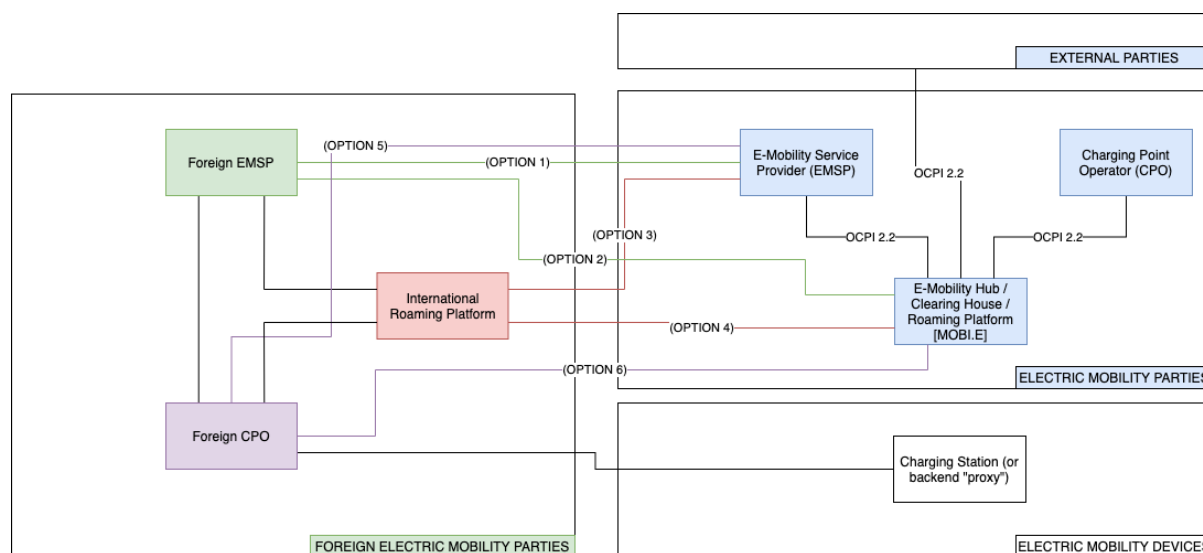
Figure 7 Reference Architecture for Phase 5

The discussion concerning the different options presented is outside of the scope of this document.

Again, it is assumed that for MOBI.E network customers to charge abroad, then the CEMEs (EMSPs) are completely free to pursue their own integrations, thus favoring OPTIONS 1, 3, or 5 in the diagram above.

2.4 Features overview

Table 2 MOBI.E OCPI High-Level Features Rollout

Feature	Phase 1	Phase 2	Phase 3
Charging Stations lifecycle management	CPOs will continue to communicate with MOBI.E via the existing processes.	CPOs will be able to communicate with MOB.E via OCPI.	
Charging Stations Management and Connectivity	Charging Stations must be directly connected to the MOBI.E platform via OCPP.	Charging Stations may be connected to MOBI.E via the CPO backend (via OCPI).	
Users and Tokens Synchronization	Supported via the OCPI interface (existing API will no longer be supported).		
Charge Authorization	MOBI.E authorizes all charges based on the information synced by the EMSP.	End-user authorization must be performed on MOBI.E's backend.	
Remote Start / Stop (including ad-hoc charging)	Supported and only available via the OCPI interface.		
Charging Station Reservation	Not supported within the MOBI.E public network, by definition.	To be evaluated as a value-added service for private locations.	
Smart Charging	Not supported as per current regulation.		

2.5 General rules and legacy support

It is not mandatory for an EMSP operating in Portugal to be integrated with MOBI.E via OCPI. An EMSP may continue to operate using the existing (legacy interfaces). Its only practical limitation lies in the fact that no remote operations would be allowed (namely remotely starting/stopping a charge).

MOBI.E will continue to retroactively support its default CPO functions as per OCPI Phase 1. It is not mandatory for CPOs to migrate into OCPI.

There shall be no apps directly connected to MOBI.E's backend.

Once implemented, all relevant information shall be available on MOBI.E's OCPI endpoints, e.g. real-time session update shall be performed even for transactions that did not originate on the OCPI interface (eg. charging with an RFID card).

All existing APIs for tokens creation will cease to be supported upon the release of Phase 1.

Integration via files shall continue to be supported indefinitely.

2.6   Support of new OCPI versions

MOBI.E shall keep a policy to be an active participant / follower of OCPI and translate its requirements onto the MOBI.E ecosystem.

MOBI.E commits to providing guidelines and an action plan concerning relevant changes whenever a new version has been presented, with a maximum delay of 3 months following publication of the standard.

There are currently no expectations to migrate to V3.0 or when it will officially be released.

2.7   Other protocols support

While it is clear that other protocols exist that implement similar use cases, such as OICP or OCHP, MOBI.E does not explicitly support these protocols.

3 MOBI.E OCPI Definitions

3.1 Overview

3.1.1 Relevant Assumptions

- For Phase 1, all charging stations are connected to the MOBI.E backend. If the CPO chooses to use its own backend system, then it must comply with OCPP and from MOBI.E's perspective it shall be completely transparent and allow relevant operations.
- Once Phases 2 and 3 are complete, any CPO may integrate their own charging stations via the OCPI interface.
- It SHALL NOT be mandatory for all interfaces to be implemented meaning that, for instance, a CPO may create locations and tariffs and still be using MOBI.E as the CPO platform for charging stations integrations
- All responses SHOULD be paginated
- All DELETE request must have a Credentials body
- EMSPs must keep all user tokens synchronized with MOBI.E at all times, so that all transactions can be authorized and correctly integrated into MOBI.E's backend.
- Whenever physical cards are used, it is still expected that users shall be registered onto the MOBI.E platform
- MOBI.E will continue to be the sole source for CDRs generation even when CPOs are fully integrated. No direct connections between EMSPs/CPOs are formally allowed (if they need to be considered for CDR-creation purposes)

3.1.2 Overall Topology

From a charging topology perspective,

- o Connector: Socket/Plug – OK
- o EVSE: EVSE – OK
- o Location: To be taken as a Charging Station

MOBI.E platform shall be used in a variant of the Hub Model [3.7], which may also have a role equivalent to that of a CPO, by default. Roles to be considered:

Table 3

Role	Equivalent Role in MOBI.E
CPO	OPC [MOBI.E for Phase 1]
EMSP	CEME
HUB	MOBI.E
NAP	N/A
NSP	All parties requesting locations data

3.1.3   Message Routing

OCPI Message Routing as described in Section 4.1.7 of OCPI 2.2-d2 will not be implemented by MOBI.E.

3.1.4   Implemented Modules

Depending on the role, the following module relationship exists:

Table 4 Mandatory roles to be implemented by MOBI.E and the EMSP [CEME] within OCPI

Module	MOBI.E	EMSP	CPO
CDRs	X	Optional	Optional
Commands	X	Optional	Optional
Credentials	X	X	X
Hub Client Info	X	Optional	Optional
Locations	X	Optional	Optional
Sessions	X	Optional	Optional
Tariffs	X	Optional	Optional
Tokens	X	Optional	Optional
Versions	X	X	X

Only the above modules are implemented on MOBI.E's side.

Even though some modules can be considered to be optional, it is strongly encouraged to implement them.

For a CPO that has the Locations module implemented then they MUST have ALL charging stations connected to its own backend (and not to MOBI.E's CPO module).

If an EMSP or CPO requires to know which entities are connected to the hub then they SHOULD implement the HubClientInfo Module.

3.1.5   Endpoint structure

Recommendations:

Endpoint for MOBI.E shall be https://pgm.mobie.pt/ocpi/hub/versions/

All EMSP endpoints should be of the form: https://[emsp_server]/ocpi/emsp/versions/

All CPO endpoints should be of the form: https://[cpo_server]/ocpi/cpo/versions/

For all other external providers, they are free to use any structure.

3.1.6   Security considerations

Even though the current OCPI certification only requires server-side SSL certificates for communication between platforms, MOBI.E shall impose additional requirements to prevent access to data, namely:

- Client-side certificate issued by MOBI.E to be used by EMSP or CPO system
- TLS minimum version is 1.2

The MOBI.E platform shall perform a functional validation of the security requirements on the interface, e.g. it must not be possible for a platform using EMSP1 (CPO1) credentials to communicate with MOBI.E via an IP (or certificate) registered with EMSP2 (CPO2).

Any credentials-related policies shall be declared within the corresponding OCPI module.

For a given EMSP (or CPO) it is possible for different modules to be implemented by the role to belong to different platforms (if and only if there is no overlap between functions).

The same system may represent one or more entities (and roles). Credentials shall be specific to each role.

3.1.7   Offline Behavior

In terms of offline behavior, the MOBI.E platform will not perform any retry when pushing data.

All platforms must make sure that the relevant objects are successfully created/modified on MOBI.E's platform namely:

- Tokens for EMSPs
- Sessions for CPOs

3.2   Versions module

3.2.1   Technical considerations

MOBI.E endpoint: https://pgm.mobie.pt/ocpi/hub/versions/

Details endpoint: https://pgm.mobie.pt/ocpi/hub/2.2/details

The only version supported by MOBI.E (as of this document) shall be v2.2. It is not possible to perform an integration without explicit OCPI 2.2 endpoints.

It SHALL be possible for one role to have more than one platform supporting its OCPI implementation. However, it is REQUIRED that only one module endpoint exists per role.

The entities shall use the endpoint according to the role that MOBI.E represents to them (SENDER or RECEIVER). Example for a CPO:

- Locations shall be PUT to /ocpi/hub/cpo/2.2/locations
- CDRs shall be GET from /ocpi/hub/cpo/2.2/cdrs

The 'Authorization' header is not encoded in Base64 as defined in the protocol.

3.2.2   Version Request Example

3.2.2.1   Version GET Request

```json
{
    "version": "2.2",
    "endpoints": [
        {
            "identifier": "credentials",
            "role": "SENDER",
            "url": "https://pgm.mobie.pt/ocpi/hub/2.2/credentials"
        },
        {
            "identifier": "locations",
            "role": "SENDER",
            "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/locations"
        },
        {
            "identifier": "locations",
            "role": "RECEIVER",
            "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/locations"
        },
        {
            "identifier": "sessions",
            "role": "SENDER",
            "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/sessions"
        },
        {
            "identifier": "sessions",
            "role": "RECEIVER",
            "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/sessions"
        },
        {
            "identifier": "cdrs",
            "role": "SENDER",
            "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/cdrs"
        },
        {
```

```
    "identifier": "cdrs",

    "role": "RECEIVER",

    "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/cdrs"

},

{

    "identifier": "tariffs",

    "role": "SENDER",

    "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/tariffs"

},

{

    "identifier": "tariffs",

    "role": "RECEIVER",

    "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/tariffs"

},

{

    "identifier": "tokens",

    "role": "RECEIVER",

    "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/tokens"

},

{

    "identifier": "tokens",

    "role": "SENDER",

    "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/tokens"

},

{

    "identifier": "hubclientinfo",

    "role": "SENDER",

    "url": "https://pgm.mobie.pt/ocpi/hub/2.2/hubclientinfo"

},

{

    "identifier": "commands",

    "role": "RECEIVER",

    "url": "https://pgm.mobie.pt/ocpi/hub/cpo/2.2/commands"

},

{

    "identifier": "commands",

    "role": "SENDER",

    "url": "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/commands"
```

SUPPORT DOCUMENT

```
    }
  ]
}
```

3.3 Credentials module

3.3.1 Technical considerations

MOBI.E is always the Sender of the Credentials module.

Whenever an EMSP/CPO wants to register its platform onto MOBI.E, the EMSP/CPO shall supply MOBI.E with CREDENTIALS_TOKEN_A.

The OCPI registration process within MOBI.E shall fail if:

- The CEME/OPC has not implemented a compatible (2.2) version for OCPI.
- The CEME/OPC has not implemented the required modules (please refer to Table 4 above).

The following operations shall be supported by all systems:

o Changing endpoints for the current version
o Updating the credentials and resetting the credentials token

Any of the parties shall be able to initiate any of the above processes.

MOBI.E shall implement an internal process to renew credentials with all systems on a periodical basis. By default, this shall be enforced 7 days after the last credentials change.

All operator logos and data shall be provided via the business details field. It is the "role" responsibility to keep this information updated.

The object Credentials sent from the MOBI.E HUB will have:

- role: HUB
- country_code: PT
- party_id: MOB

Credentials endpoint shall have the role "RECEIVER".

Add regex for the URL type fields:

• An URL a string(255) according to the following regex:
  https?:\/\/(www\.)?[-a-zA-Z0-9@:%._+~#=]{1,256}\.[a-zA-Z0-9()]{1,6}\b([-a-zA-Z0-9()@:%_+.~#?&//=]*)

3.3.2 Credentials Request and Response Examples

3.3.2.1 Credential GET Request

```
{
    "headers": {
        "X-Request-ID": "ed010385-db7c-4263-a7c5-70345df459c7",
        "X-Correlation-ID": "16dcd32a-1c6f-4aa7-81e3-e7feaa754886"
    },
    "queryParams": {},
    "pathParams": {},
    "body": {}
}
```

3.3.2.2 Credential GET Response

```
{
    "headers": {
        "X-Request-ID": "ed010385-db7c-4263-a7c5-70345df459c7",
        "X-Correlation-ID": "16dcd32a-1c6f-4aa7-81e3-e7feaa754886"
    },
    "queryParams": {},
    "pathParams": {},
    "response": {
        "status_code": 1000,
        "status_message": null,
        "data": [
            {
                "version": "2.2.1",
                "url": "https://pgm.mobie.pt/ocpi/hub/versions/2.2.1"
            },
            {
                "version": "2.2",
                "url": " https://pgm.mobie.pt/ocpi/hub/versions/2.2"
            },
            {
                "version": "2.1.1",
                "url": " https://pgm.mobie.pt/ocpi/hub/versions/2.1.1"
```

```
            }
        ],
        "timestamp": "2024-04-10T14:24:45Z"
      }
}
```

3.3.2.3   Credential POST Request

```
{
    "headers": {
        "X-Request-ID": "ab9ee0fd-263e-4601-8de3-589ce1e73a75",
        "X-Correlation-ID": "16dcd32a-1c6f-4aa7-81e3-e7feaa754886"
    },
    "queryParams": {},
    "pathParams": {},
    "body": {
        "token": "5720c20b-a0b4-458c-8187-b7d11eb357f3",
        "url": "https://pgm-qld.mobie.pt/ocpi/hub/versions",
        "roles": [
            {
                "role": "HUB",
                "party_id": "MOB",
                "country_code": "PT",
                "business_details": {
                    "name": "MOBI.E HUB"
                }
            }
        ]
    }
}
```

3.3.2.4   Credential POST Response

```
{
    "headers": {
        "X-Request-ID": "ab9ee0fd-263e-4601-8de3-589ce1e73a75",
        "X-Correlation-ID": "16dcd32a-1c6f-4aa7-81e3-e7feaa754886"
    },
    "queryParams": {},
    "pathParams": {},
    "response": {
```

```
"status_code": 1000,

"status_message": null,

"data": {

    "token": "8f9d37088a4c3b5c1f3170a4470ae6a4bc74382b8ab097b3cb0755648143d1b8",

    "url": "https://pgm.mobie.pt/ocpi/hub/versions",

    "roles": [

      {

        "role": "CPO",

        "country_code": "PT",

        "party_id": "MOB",

        "business_details": {

          "name": "Mobie",

          "website": "http://www.mobie.pt/"

        }

      },

      {

        "role": "EMSP",

        "country_code": "PT",

        "party_id": "MOB",

        "business_details": {

          "name": "Mobie",

          "website": "http://www.mobie.pt/"

        }

      }

    ]

  },

  "timestamp": "2024-04-10T14:24:45Z"

  }

}
```

3.4 Locations module

3.4.1 Technical considerations

As mentioned, "when a CPO creates Location objects, it pushes them to connected EMSP by calling PUT on the Receivers Locations endpoint." For Phase 1, MOBI.E fully controls this process and charging and MOBI.E shall implement a process for EMSP to be able to subscribe to the following events:

- Charging Station creation [PUT method]
- EVSE status update [PATCH method]

The number of GET request will be limited per requesting party (eg. One FULL request per 5 minutes), and it will be cached (1 minute).

For Phases 2 and 3, the CPOS are autonomous in the creation of locations in the MOBI.E HUB platform. The MOBI.E HUB will ensure that this data is routed to all EMSPs.

All locations shall be created in the HUB regardless of whether they are public or private. Private charging locations will not be published by the HUB to the EMSPs. As mentioned, "(…) reimbursement via eMSP is still possible by sending CDRs to eMSP." In addition, even if they may not be published, any request to an existing charging station (regardless of whether it is private or public), should be accepted.

For OCPI purposes a Location shall be the equivalent of a charging station. Pools may be used in the future, but not at this moment.

For CPOs with the Locations module it is mandatory to also have the Tariffs module, since a tariff must be created first.

In the case of optional OCPI fields, MOBI.E does not ensure that they will be handled and shared with all parties.

For locations update timestamps please consider the latest update from any of the underlying EVSEs.

MOBI.E shall support "date_from" and "date_to" options on GET requests have to be supported.

3.4.2   Methods to be implemented.

3.4.2.1   EMSP (and MOBI.E HUB)

Method	Direction	Description of usage
GET	Request	Responding with the status of a charging station
PUT	Response	Pushing the creation of a new charging station
PATCH	Response	Updating the status of an EVSE (including EOL or REMOVED)

3.4.2.2   CPO (and MOBI.E HUB)

Method	Direction	Description of usage
GET	Response	Receiving requests from external parties
PUT	Request	Pushing the creation of a new charging station
PATCH	Request	Updating the status of an EVSE (including EOL or REMOVED)

The CPO must ensure the correct update of the status in real time.

Noted that for the UNKNOW status, the CPO must consider the cases where there are no heartbeats in the last 5 minutes and immediately after that, send a PATCH with the status update.

3.4.3   Objects Definition

3.4.3.1   Location

Only the following properties shall be communicated:

Table 5

Property	Values	Mandatory	Comments
country_code	PT	TRUE	Alpha-2
party_id		TRUE	ISO-15118 Codes to be defined by MOBI.E. [OPC]
id		TRUE	To be validated and issued by MOBI.E according to 0.
publish	true / false	TRUE	Please refer to paragraph 3.4.3.5
name		FALSE	The CPO is free to create a representative name for the location. Names will be shown in Portuguese.
address		TRUE	Street and house number
city		TRUE	City/municipality. Names shall be provided in Portuguese
country	PRT	TRUE	Alpha-3. Roaming is not supported within the interface as of Phase 1.
postal_code		FALSE	
coordinates		TRUE	
parking_type	ALONG_MOTORWAY PARKING_GARAGE	FALSE	

Property	Values	Mandatory	Comments
	PARKING_LOT ON_DRIVEWAY ON_STREET UNDERGROUND_GARAGE		
evses		TRUE	
operator	Only if OPC exists. Otherwise use generic name.	TRUE	
facilities	(See List)	FALSE	
time_zone	Europe/Lisbon Atlantic/Azores	TRUE	
mobie_voltage_level	BTN / BTE / MT	TRUE	Include value "NONE" for the REMOVED and PLANNED locations that don't have a value.
mobie_access_type	Public / Private	TRUE	
mobie_cpe		TRUE (for CPO) ; FALSE (for eMSP)	Delivery point code as per PT convention
last_updated		TRUE	

3.4.3.2   EVSE

Table 6

Property	Values	Mandatory	Comments
uid		TRUE	It is advisable to follow the common practice for MOBI.E with the concatenation of the EVSE number to the location name.
evse_id		TRUE	Please refer to paragraph 4.1.3
Status	PLANNED [ToInstall] AVAILABLE [Idle]	TRUE	

Property	Values	Mandatory	Comments
	CHARGING [InUse] INOPERATIVE [InMaintenance] OUTOFORDER [OutOfService] RESERVED [Reserved] UNKNOWN [Unknown] REMOVED [EndOfLife]		
Capabilities	REMOTE_START_STOP_CAPABLE RFID_READER	TRUE	A CPO SHOULD always create an EVSE with the correct capabilities (to ensure that the charging station will be correctly used).
Connectors		TRUE	
last_updated		TRUE	

Please note that status "REMOVED" EVSE SHALL NOT be displayed by the EMSP to end-users.

3.4.3.3   Connector

Table 7

Property	Values	Mandatory	Comments
id		TRUE	LSB-000175-01-01
standard	CHADEMO IEC_62196_T2 IEC_62196_T2_COMBO	TRUE	
format	SOCKET CABLE	TRUE	
power_type	AC_1_PHASE AC_3_PHASE DC	TRUE	
max_voltage	400 (example)	TRUE	In V
max_amperage	16 (example)	TRUE	In A
max_electric_power	22000	FALSE	In W

Property	Values	Mandatory	Comments
tariff_ids		TRUE	To be defined in the Tariffs Module
terms_and_conditions		TRUE	In particular, the terms and conditions shall include the precision level for DC measurement, if applicable.
last_updated		TRUE	

3.4.3.4   Getting a location Id

MOBI.E has implemented a customized POST method "MobieGetLocationId" that must be invoked in order to retrieve a location id. This request is similar to the PUT Locations, but in this case the only mandatory fields are the ones inside the main location object, except "id", that cannot be included. EVSE and Connector objects are optional for this step, but in the case of inclusion, both EVSE and Connector "id" cannot be shared in the request.

Example of a POST "MobieGetLocationId":

```
{
    "publish": true,
    "name": "tst",
    "address": "Rua de Vinhais",
    "city": "Vinhais",
    "country": "PRT",
    "coordinates": {
        "latitude": "41.83484",
        "longitude": "-7.002483"
    },
    "evses": [
        {
            "status": "BLOCKED",
            "capabilities": [
                "REMOTE_START_STOP_CAPABLE"
            ],
            "connectors": [
                {
                    "standard": "IEC_62196_T2",
                    "format": "SOCKET",
                    "last_updated": "2023-03-09T14:35:02.563Z",
                    "power_type": "DC",
                    "max_voltage": 240,
                    "max_amperage": 32,
                    "max_electric_power": 7200,
                    "tariff_ids": [
                        "tariff"
                    ],
                    "terms_and_conditions": "https://example.com"
                }
            ],
```

```
      "last_updated": "2023-03-09T15:47:09.000Z"
    }
  ],
  "operator": {
    "name": "mobie"
  },
  "country_code": "PT",
  "party_id": "MOB",
  "last_updated": "2023-03-09T15:47:09.000Z",
  "postal_code": "4000-056",
  "time_zone": "Europe/Lisbon",
  "mobie_voltage_level": "BTE",
  "mobie_access_type": "Public",
  "mobie_cpe": "mobie_cpe_example"
}
```

Example of a Response to a "MobieGetLocationId":

```
{
  "data": {
    "id": "VNH-00010"
  },
  "status_code": 1000,
  "status_message": "Success",
  "timestamp": "2023-06-21T10:24:56.341Z"
}
```

A CPO SHALL NOT create a location with an ID not previously provided via this method.

3.4.3.5   Considerations on "publish" property

The following considerations apply for MOBI.E

- Public locations (with mobie_access_type="Public") MUST always be publish = true;
- If publish = false
  - Fields "address", "postal_code" and "coordinates" will be encrypted;
  - "address" and "postal_code" will be encrypted with "-";
  - "coordinates" will be encrypted with "0.0";
- If publish = true all properties will be shared regardless of the mobie_access_type,

Noted that PLANNED and REMOVED locations MUST NOT be shown in any time by the EMSP regardless of their publish property.

3.4.3.6   MOBI.E override capabilities

Due to its regulatory nature, MOBI.E must be able to autonomously set the value of a reduced number of properties so as to enforce compliance to rules and guidelines. In particular, MOBI.E has the capability to override the status of a given location.

- Whenever MOBI.E sets this status (OCPI values) it will override all EVSE status sent by the CPO.

3.4.4 Location Request and Response Examples

3.4.4.1 Location PUT Request

```json
{
    "headers": {
        "X-Request-ID": "9c3f0e0f-2253-4f47-9e39-a1fb5172ad29"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "PT",
        "party_id": "MOB",
        "location_id": "ETR-00016"
    },
    "body": {
        "id": "ETR-00016",
        "publish": true,
        "name": "ETR-00016",
        "address": "R. Alexandre Miranda, 1 ",
        "city": "Estarreja",
        "country": "PRT",
        "coordinates": {
            "latitude": "40.764622",
            "longitude": "-8.568518"
        },
        "evses": [
            {
                "status": "AVAILABLE",
                "uid": "ETR-00016-01",
                "capabilities": [
                    "REMOTE_START_STOP_CAPABLE",
                    "RFID_READER"
                ],
                "connectors": [
                    {
                        "id": "ETR-00016-01-01",
                        "standard": "IEC_62196_T2_COMBO",
                        "format": "SOCKET",
                        "last_updated": "2024-03-21T10:40:39.158Z",
```

```
            "power_type": "AC_3_PHASE",

            "max_voltage": 400,

            "max_amperage": 32,

            "max_electric_power": 43000,

            "tariff_ids": [

                "9AAC5342-4D11-495D-AD06-1CFDAEDC5429"

            ],

            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions"

        }

    ],

    "last_updated": "2024-03-21T10:40:39.158Z",

    "evse_id": "PT*MOB*EETR*00016*01",

    "physical_reference": "ETR-00016-01"

},

{

    "status": "AVAILABLE",

    "uid": "ETR-00016-03",

    "capabilities": [

        "REMOTE_START_STOP_CAPABLE",

        "RFID_READER"

    ],

    "connectors": [

        {

            "id": "ETR-00016-03-01",

            "standard": "IEC_62196_T2_COMBO",

            "format": "SOCKET",

            "last_updated": "2024-03-21T10:40:39.158Z",

            "power_type": "DC",

            "max_voltage": 400,

            "max_amperage": 32,

            "max_electric_power": 50000,

            "tariff_ids": [

                "A6F275E9-68F7-4D79-8357-2E650080E45D"

            ],

            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions"

        }

    ],

    "last_updated": "2024-03-21T10:40:39.158Z",
```

SUPPORT DOCUMENT

DAMOS VIDA AO FUTURO

AV. ENG. DUARTE PACHECO Nº 19, 6º
1070-100 LISBOA PORTUGAL

T: +351 212 699 830
GERAL@MOBIE.PT

WWW.MOBIE.PT

```
      "evse_id": "PT*MOB*EETR*00016*03",

      "physical_reference": "ETR-00016-03"

   },

   {

      "status": "AVAILABLE",

      "uid": "ETR-00016-02",

      "capabilities": [

         "REMOTE_START_STOP_CAPABLE",

         "RFID_READER"

      ],

      "connectors": [

         {

            "id": "ETR-00016-02-01",

            "standard": "CHADEMO",

            "format": "SOCKET",

            "last_updated": "2024-03-21T10:40:39.158Z",

            "power_type": "DC",

            "max_voltage": 400,

            "max_amperage": 32,

            "max_electric_power": 50000,

            "tariff_ids": [

               "D7854480-47F1-4228-8FD3-F44CB64B47ED"

            ],

            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions "

         }

      ],

      "last_updated": "2024-03-21T10:40:39.158Z",

      "evse_id": "PT*KLS*EETR*00016*02",

      "physical_reference": "ETR-00016-02"

   }

],

"operator": {

   "name": "mobie"

},

"owner": {

   "name": "MOB"

},

"country_code": "PT",
```

SUPPORT DOCUMENT

```
        "party_id": "MOB",
        "last_updated": "2024-03-21T10:40:39.155Z",
        "postal_code": "3860-363",
        "parking_type": "PARKING_LOT",
        "time_zone": "Europe/Lisbon",
        "mobie_voltage_level": "MT",
        "mobie_access_type": "Public",
        "mobie_cpe": "PT0002000073216055WC",
        "mobie_is_dpc": false
    }
}
```

3.4.4.2 Location PUT Response

```
{
    "status": 200,
    "headers": {
        "X-Request-ID": "9c3f0e0f-2253-4f47-9e39-a1fb5172ad29"
    },
    "response": {}
}
```

3.4.4.3 Location PATCH Request

```
{
    "headers": {
        "X-Request-ID": "4182e558-8f8e-445f-a834-50efb0d616a4"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "PT",
        "party_id": "MOB",
        "location_id": "ETR-00016",
        "evse_uid": "ETR-00016-01"
    },
    "body": {
        "status": "AVAILABLE",
        "uid": "ETR-00016-01",
        "last_updated": "2024-03-21T11:36:10.793Z"
    }
}
```

3.4.4.4   Location PATCH Response

```
{
    "status": 200,
    "headers": {
        "X-Request-ID": "4182e558-8f8e-445f-a834-50efb0d616a4"
    },
    "response": {}
}
```

3.4.4.5   Broadcast Location PATCH Request

```
{
    "headers": {
        "X-Request-ID": "5f3db788-6146-42ea-99bb-c4d85deff724"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "PT",
        "party_id": "KLS",
        "location_id": "VFR-00083"
    },
    "body": {
        "evses": [
            {
                "uid": "VFR-00083-01",
                "evse_id": "PT*KLS*E*VFR*00083*01",
                "status": "CHARGING",
                "last_updated": "2024-04-15T08:35:09.913Z",
                "connectors": [
                    {
                        "format": "CABLE",
                        "standard": "CHADEMO",
                        "power_type": "DC",
                        "tariff_ids": [
                            "KLS-48476b6a503f475b862f888f991ba123"
                        ],
                        "max_voltage": 500,
                        "max_amperage": 125,
                        "max_electric_power": 50000,
```

```
            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions",

            "last_updated": "2023-12-14T11:01:51.242Z",

            "id": "VFR-00083-01-01"

        },

        {

            "format": "CABLE",

            "standard": "IEC_62196_T2_COMBO",

            "power_type": "DC",

            "tariff_ids": [

                "KLS-48476b6a503f475b862f888f991ba123"

            ],

            "max_voltage": 500,

            "max_amperage": 125,

            "max_electric_power": 50000,

            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions",

            "last_updated": "2023-12-14T11:01:51.242Z",

            "id": "VFR-00083-01-02"

        }

    ],

    "capabilities": [

        "RFID_READER",

        "REMOTE_START_STOP_CAPABLE"

    ]

},

{

    "uid": "VFR-00083-02",

    "evse_id": "PT*KLS*E*VFR*00083*02",

    "status": "AVAILABLE",

    "last_updated": "2024-04-15T09:17:21.649Z",

    "connectors": [

        {

            "format": "CABLE",

            "standard": "IEC_62196_T2",

            "power_type": "AC_3_PHASE",

            "tariff_ids": [

                "KLS-48476b6a503f475b862f888f991ba123"

            ],

            "max_voltage": 400,
```

```
            "max_amperage": 63,

            "max_electric_power": 43000,

            "terms_and_conditions": "https://tinyurl.com/mobietermsandconditions",

            "last_updated": "2023-12-14T11:01:51.242Z",

            "id": "VFR-00083-02-01"

          }

        ],

        "capabilities": [

          "REMOTE_START_STOP_CAPABLE",

          "RFID_READER"

        ]

      }

    ],

    "last_updated": "2024-04-15T09:20:27.603Z"

  }

}
```

3.4.4.6   Broadcast Location PATCH Response

```
{

  "status": 200,

  "headers": {

    "X-Request-ID": "89dfae0d-5db9-4a50-8a8a-c75b62dc2ccb"

  },

  "response": {

    "status_code": 1000,

    "status_message": "Success",

    "timestamp": "2024-04-15T09:20:27Z"

  }

}
```

3.5   Sessions module

3.5.1   Technical considerations

Regardless of the phase the implementation shall take into consideration the following:

- No charging preferences to be considered.
- No reservations to be considered.
- All sessions originating in the CPO (e.g. via an RFID card) SHOULD be authorized by MOBI.E via the POST Authorize request to be implemented on the MOBI.E HUB and called by the CPO. The EMSP platform will not be involved in this process.

- If a PUT request presents an invalid card, that request will be rejected by the MOBI.E HUB (the information will still be integrated but no CDR will be generated). It is recommended that in these cases, the session is aborted by the CPO.
- It is mandatory that the CPOs provide session updates with a period of at least 5 minutes.

3.5.2 Methods to be implemented

3.5.2.1 EMSP (and MOBI.E HUB)

Method	Direction	Description of usage
GET	Request	Getting sessions of charging sessions last updated
PUT	Response	Send a new/updated session object to the EMSP
PATCH	Response	Update the session object

3.5.2.2 CPO (and MOBI.E HUB)

Method	Direction	Description of usage
GET	Response	Getting sessions of charging sessions last updated
PUT	Request	Send a new/updated session object to the EMSP
PATCH	Request	Update the session object

3.5.3 Objects description

3.5.3.1 Sessions

Table 8

Property	Mandatory	Value	Comments
country_code	TRUE	PT	
party_id	TRUE		
id	TRUE		Provided by MOBI.E for OCPP connections or generated by the CPO for OCPI connections.
start_date_time	TRUE		
end_date_time	FALSE		Optional due to the start object
kwh	TRUE		
cdr_token	TRUE		
auth_method	TRUE	AUTH_REQUEST	

Property	Mandatory	Value	Comments
		COMMAND WHITELIST	
location_id	TRUE		
evse_uid	TRUE		
connector_id	TRUE		
currency	TRUE	EUR	
charging_periods	FALSE		Optional due to the start object
status	TRUE	ACTIVE COMPLETED INVALID PENDING	Status INVALID to be considered for charging sessions with errors (not to be billed). PENDING could potentially be used for remote start request that have already acknowledged the initial response but not yet the result.
last_updated	TRUE		

3.5.4   Session Request and Response Examples

3.5.4.1   Session PUT Request

```
{
    "headers": {
        "X-Request-ID": "384692ac-9e24-4e85-8a93-6633516d1c7d"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "PT",
        "party_id": "MOB",
        "session_id": "ETR-00016-02-1711020854"
    },
    "body": {
        "id": "ETR-00016-02-1711020854",
        "status": "ACTIVE",
        "country_code": "PT",
        "party_id": "MOB",
        "last_updated": "2024-03-21T11:34:15.009Z",
        "start_date_time": "2024-03-21T11:34:13.000Z",
        "kwh": 0,
        "cdr_token": {
            "uid": "3453129150",
            "type": "RFID",
            "contract_id": "PT-MOB-C99999999-9"
        },
        "auth_method": "WHITELIST",
        "location_id": "ETR-00016",
        "evse_uid": "ETR-00016-02",
        "connector_id": "ETR-00016-02-01",
        "currency": "EUR"
    }
}
```

3.5.4.2   Session PUT Response

```
{
    "status": 200,
```

```
    "headers": {

        "X-Request-ID": "384692ac-9e24-4e85-8a93-6633516d1c7d"

    },

    "response": {}

}
```

3.5.4.3   Session PATCH Request

```
{

    "headers": {

        "X-Request-ID": "70bd5881-5cf3-40c2-9dcc-64c02d33f23f"

    },

    "queryParams": {},

    "pathParams": {

        "country_code": "PT",

        "party_id": "MOB",

        "session_id": "ETR-00016-02-1711020854"

    },

    "body": {

        "id": "ETR-00016-02-1711020854",

        "country_code": "PT",

        "party_id": "MOB",

        "last_updated": "2024-03-21T11:35:13.861Z",

        "kwh": 0.39,

        "charging_periods": [

            {

                "dimensions": [

                    {

                        "type": "ENERGY",

                        "volume": 0.39

                    },

                    {

                        "type": "STATE_OF_CHARGE",

                        "volume": 41

                    }

                ],

                "start_date_time": "2024-03-21T11:34:13.000Z"

            }

        ]
```

```
      }
   }
```

3.5.4.4 Session PATCH Response

```
{
   "status": 200,
   "headers": {
      "X-Request-ID": "70bd5881-5cf3-40c2-9dcc-64c02d33f23f"
   },
   "response": {}
}
```

3.5.4.5 Broadcast Session Request

```
{
   "headers": {
      "X-Request-ID": "2d56505c-8c12-4cc8-8c44-d2ceb947b14a"
   },
   "queryParams": {},
   "pathParams": {
      "country_code": "PT",
      "party_id": "EDP",
      "session_id": "LLE-90001-02-1713172511"
   },
   "body": {
      "kwh": 0.99,
      "charging_periods": [
         {
            "start_date_time": "2024-04-15T09:15:11.051Z",
            "dimensions": [
               {
                  "type": "ENERGY",
                  "volume": 0.99
               }
            ],
            "tariff_id": "EDP-53aca1cf137e46688d91c6d6fc047e5f"
         }
      ],
      "last_updated": "2024-04-15T09:20:33.218Z"
   }
```

```
}
```

3.5.4.6   Broadcast Session Response

```
{
    "status": 201,
    "headers": {
        "X-Request-ID": "2d56505c-8c12-4cc8-8c44-d2ceb947b14a"
    },
    "response": {
        "status_code": 1000,
        "status_message": "Success",
        "timestamp": "2024-04-15T09:20:33Z"
    }
}
```

3.6   CDRs Module

3.6.1   Technical considerations

The CDR is to be considered as in a concluded event.

CDRs can only be sent by MOBI.E.

3.6.2   Methods to be implemented

3.6.2.1   MOBI.E – Sender

Method	Direction	Description of usage
GET	Response	Respond with CDRs
POST	Request	Send a new CDR

3.6.2.2   EMSP and CPO - Receiver

The following methods are to be implemented:

Method	Direction	Description of usage
GET	Request	Retrieve CDRs for a given period
POST	Response	Receive a new CDR

3.6.3   Objects description

3.6.3.1   CDR

Table 9

Property	Mandatory	Value	Comments
country_code	TRUE	PT	
party_id	TRUE		
id	TRUE		Always provided by MOBI.E
start_date_time	TRUE		
end_date_time	TRUE		
session_id	TRUE		
cdr_token	TRUE		
auth_method	TRUE	WHITELIST	The EMSPs must implement the
cdr_location	TRUE		See remarks below concerning private charging stations.
currency	TRUE	EUR	
tariffs	TRUE		
charging_periods	FALSE		
total_cost	TRUE		
total_fixed_cost	TRUE		
total_energy	TRUE		
total_energy_cost	TRUE		
total_time	TRUE		
total_time_cost	TRUE		
total_parking_time	TRUE		
total_parking_cost	TRUE		
remark	FALSE		
credit	FALSE		
credit_reference_id	FALSE		
mobie_cdr_extension	TRUE		This is a new type customized to include all the remaining billing aspects not considered within the framework of OCPI.

Property	Mandatory	Value	Comments
Last_updated	TRUE		

The following CdrDimensionType may be received:

- ENERGY
- ENERGY_EXPORT
- ENERGY_IMPORT
- MAX_POWER
- MIN_POWER
- PARKING_TIME
- POWER
- TIME

For the CdrLocation class, since there are specific considerations to take concerning the access type for the charging stations, the following rule shall apply:

Table 10

Property	Mandatory per Access Type		Comments
	Private	**Public**	
id	TRUE	TRUE	
name	TRUE	FALSE	
address	FALSE	TRUE	Shared as "-" for private locations
city	TRUE	TRUE	
postal_code	FALSE	FALSE	Shared as "-" for private locations
country	TRUE	TRUE	
coordinates	FALSE	TRUE	Shared as "0.0" for private locations
evse_uid	TRUE	TRUE	
evse_id	TRUE	TRUE	
connector_id	TRUE	TRUE	
connector_standard	TRUE	TRUE	
connector_format	TRUE	TRUE	
connector_power_type	TRUE	TRUE	
mobie_voltage_level	TRUE	TRUE	

3.6.4 CDRs Request and Response Examples

3.6.4.1 CDR Broadcast POST Request

```
{
    "headers": {
        "X-Request-ID": "9b5ea6ed-290f-4621-8277-d6d853838313"
    },
    "queryParams": {},
    "body": {
        "country_code": "PT",
        "party_id": "MOB",
        "id": "3d6b1e28-1f2e-46ce-b33d-443ab2d5e825",
        "start_date_time": "2024-04-16T08:27:54.810Z",
        "end_date_time": "2024-04-16T08:59:34.731Z",
        "session_id": "VLG-00029-03-1713256075",
        "cdr_token": {
            "uid": "36153982871123460",
            "type": "RFID",
            "contract_id": "PT-MOB-C00005I34"
        },
        "auth_method": "AUTH_REQUEST",
        "cdr_location": {
            "id": "VLG-00029",
            "address": "R. Ciclo Preparatório nº 200",
            "city": "Valongo",
            "postal_code": "4445-067",
            "country": "PRT",
            "coordinates": {
                "latitude": "41.238275",
                "longitude": "-8.531990"
            },
            "evse_uid": "VLG-00029-03",
            "evse_id": "PT*MOB*E*VLG*00029*03",
            "connector_id": "VLG-00029-03-01",
            "connector_standard": "IEC_62196_T2_COMBO",
            "connector_format": "CABLE",
            "connector_power_type": "DC",
```

```
        "name": "Intermarche Alfena",
        "mobie_voltage_level": "BTE"
    },
    "currency": "EUR",
    "tariffs": [
        {
            "country_code": "PT",
            "party_id": "MOB",
            "currency": "EUR",
            "type": "REGULAR",
            "tariff_alt_text": [
                {
                    "language": "pt",
                    "text": "S0.3T0.02E0.25"
                }
            ],
            "min_price": {
                "excl_vat": 0
            },
            "elements": [
                {
                    "price_components": [
                        {
                            "type": "FLAT",
                            "price": 0.3,
                            "vat": 23,
                            "step_size": 1
                        },
                        {
                            "type": "TIME",
                            "price": 0.02,
                            "vat": 23,
                            "step_size": 1
                        },
                        {
                            "type": "ENERGY",
                            "price": 0.25,
                            "vat": 23,
```

SUPPORT DOCUMENT

```json
          "step_size": 1
        }
      ]
    }
  ],
  "start_date_time": "2023-07-26T11:31:23.000Z",
  "last_updated": "2023-10-19T15:31:05.548Z",
  "id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"
}
],
"charging_periods": [
  {
    "start_date_time": "2024-04-16T08:27:54.810Z",
    "dimensions": [
      {
        "type": "ENERGY",
        "volume": 9.45
      },
      {
        "type": "TIME",
        "volume": 0.08375388888888889
      }
    ],
    "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"
  },
  {
    "start_date_time": "2024-04-16T08:32:56.324Z",
    "dimensions": [
      {
        "type": "ENERGY",
        "volume": 10.44
      },
      {
        "type": "TIME",
        "volume": 0.08333333333333333
      }
    ],
    "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"
```

```json
    },
    {
        "start_date_time": "2024-04-16T08:37:56.324Z",
        "dimensions": [
            {
                "type": "ENERGY",
                "volume": 9.24
            },
            {
                "type": "TIME",
                "volume": 0.08333333333333333
            }
        ],
        "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"
    },
    {
        "start_date_time": "2024-04-16T08:42:56.324Z",
        "dimensions": [
            {
                "type": "ENERGY",
                "volume": 7.64
            },
            {
                "type": "TIME",
                "volume": 0.08333333333333333
            }
        ],
        "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"
    },
    {
        "start_date_time": "2024-04-16T08:47:56.324Z",
        "dimensions": [
            {
                "type": "ENERGY",
                "volume": 6.65
            },
            {
                "type": "TIME",
```

```
        "volume": 0.08333333333333333

      }

    ],

    "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"

  },

  {

    "start_date_time": "2024-04-16T08:52:56.324Z",

    "dimensions": [

      {

        "type": "ENERGY",

        "volume": 5.79

      },

      {

        "type": "TIME",

        "volume": 0.08333333333333333

      }

    ],

    "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"

  },

  {

    "start_date_time": "2024-04-16T08:57:56.324Z",

    "dimensions": [

      {

        "type": "ENERGY",

        "volume": 1.68

      },

      {

        "type": "TIME",

        "volume": 0.027335277777777778

      }

    ],

    "tariff_id": "MOB-d1e6218be07c452eb6244d2b3551d7dd"

  }

],

"total_cost": {

  "excl_vat": 13.6558

},

"total_fixed_cost": {
```

```
      "excl_vat": 0.3
   },
   "total_energy": 50.89,
   "total_energy_cost": {
      "excl_vat": 12.7225
   },
   "total_time": 0.5278,
   "total_time_cost": {
      "excl_vat": 0.6333
   },
   "last_updated": "2024-04-16T08:59:35.308Z",
   "mobie_cdr_extension": {
      "usage": {
         "idUsage": "VLG-00029-03-1713256075",
         "idContract": "CT_M044BOS481F4FJ65HAOFT56C4Q",
         "idServiceProvider": "MOBI",
         "idExternalNumber": "PT-B-0011842-1",
         "idInternalNumber": "36153982871123460",
         "idNetworkOperator": "MOBI",
         "idChargingStation": "VLG-00029",
         "idEVSE": "VLG-00029-03",
         "evse_max_power": 150,
         "startTimestamp": "20240416092754",
         "stopTimestamp": "20240416095934",
         "totalDuration": 31.67,
         "energia_total_transacao": 50.89,
         "opcao_horaria_ciclo": "DIA_BI",
         "nivel_tensao_transacao": "BTE",
         "nivel_tensao_ponto_entrega": "BTE",
         "idCSE": "GALPW",
         "idORD": "PT00002",
         "nuts_1": "PT1",
         "apoio_mobilidade_eletrica_ceme": 0.1684
      },
      "subUsages": [
         {
            "idSubUsage": "VLG-00029-03-1713256075-1",
            "idDay": "20240416",
```

SUPPORT DOCUMENT

"periodDuration": 31.67,

"preco_opc": 13.6558,

"preco_unitario_opc_tempo": 0.02,

"preco_unitario_opc_energia": 0.25,

"preco_unitario_opc_ativacao": 0.3,

"preco_opc_tempo": 0.6333,

"preco_opc_energia": 12.7225,

"preco_opc_ativacao": 0.3,

"duracao_ponta": 0,

"duracao_cheias": 0,

"duracao_vazio": 0,

"duracao_fora_vazio": 31.67,

"duracao_vazio_normal": 0,

"duracao_super_vazio": 0,

"energia_ponta": 0,

"energia_cheias": 0,

"energia_vazio": 0,

"energia_fora_vazio": 50.89,

"energia_vazio_normal": 0,

"energia_super_vazio": 0,

"energia_total_periodo": 50.89,

"preco_unitario_acesso_redes_ponta": 0,

"preco_unitario_acesso_redes_cheias": 0,

"preco_unitario_acesso_redes_vazio": 0.0175,

"preco_unitario_acesso_redes_fora_vazio": 0.078,

"preco_unitario_acesso_redes_vazio_normal": 0,

"preco_unitario_acesso_redes_super_vazio": 0,

"desconto_unitario_acesso_redes_ponta": 0,

"desconto_unitario_acesso_redes_cheias": 0,

"desconto_unitario_acesso_redes_vazio": 0,

"desconto_unitario_acesso_redes_fora_vazio": 0,

"desconto_unitario_acesso_redes_vazio_normal": 0,

"desconto_unitario_acesso_redes_super_vazio": 0,

"preco_unitario_com_desconto_acesso_redes_ponta": 0,

"preco_unitario_com_desconto_acesso_redes_cheias": 0,

"preco_unitario_com_desconto_acesso_redes_vazio": 0.0175,

"preco_unitario_com_desconto_acesso_redes_fora_vazio": 0.078,

"preco_unitario_com_desconto_acesso_redes_vazio_normal": 0,

SUPPORT DOCUMENT

```
        "preco_unitario_com_desconto_acesso_redes_super_vazio": 0,

        "preco_sem_desconto_acesso_redes_ponta": 0,

        "preco_sem_desconto_acesso_redes_cheias": 0,

        "preco_sem_desconto_acesso_redes_vazio": 0,

        "preco_sem_desconto_acesso_redes_fora_vazio": 3.9694,

        "preco_sem_desconto_acesso_redes_vazio_normal": 0,

        "preco_sem_desconto_acesso_redes_super_vazio": 0,

        "desconto_acesso_redes_ponta": 0,

        "desconto_acesso_redes_cheias": 0,

        "desconto_acesso_redes_vazio": 0,

        "desconto_acesso_redes_fora_vazio": 0,

        "desconto_acesso_redes_vazio_normal": 0,

        "desconto_acesso_redes_super_vazio": 0,

        "preco_com_desconto_acesso_redes_ponta": 0,

        "preco_com_desconto_acesso_redes_cheias": 0,

        "preco_com_desconto_acesso_redes_vazio": 0,

        "preco_com_desconto_acesso_redes_fora_vazio": 3.9694,

        "preco_com_desconto_acesso_redes_vazio_normal": 0,

        "preco_com_desconto_acesso_redes_super_vazio": 0,

        "preco_sem_desconto_acesso_redes": 3.9694,

        "desconto_acesso_redes": 0,

        "preco_com_desconto_acesso_redes": 3.9694
      }
    ]
  }
 }
}
```

3.6.4.2   CDR Broadcast POST Response

```
{
    "status": 201,
    "headers": {
        "X-Request-ID": "9b5ea6ed-290f-4621-8277-d6d853838313"
    },
    "response": {
        "status_code": 1000,
        "status_message": "Success",
        "timestamp": "2024-04-16T08:59:35Z"
```

```
    }
}
```

3.7 Tariffs Module

3.7.1 Technical considerations

For Phases 2 and 3, tariffs can be changed by CPO. For Phase 1 integrations, tariffs are still shared as per MOBI.E internal processes.

This section is INFORMATIVE. Even though this information could/should be used by an EMSP for billing purposes, MOBI.E shall provide the billable CDR to be used by the EMSP. An EMSP MAY NOT use the tariffs information as an alternative source of data for billing. As such, for integration testing

It is recommended that EMSPs retrieve daily the value of the tariffs and should perform a (near) real-time request whenever one of its users is about to charge.

Note that within OCPI tariffs may be defined at the connector (EVSE) level.

Unlike what is mentioned in the Ad-Hoc example provided in the OCPI document, an EMSP is ALWAYS involved in the process, and the CDR is sent to an EMSP. However, a CPO may choose to use this interface to advertise their default tariffs only and only if they provide an assisted operation (eg. in a service station) or the charging stations have an embedded payment card processor. In this case, the CPO must clearly advertise their "default" EMSP.

Please note that while MOBI.E will not perform any validation of the tariffs structure (other than OCPI structure validation), only tariffs structures advertised by MOBI.E can be submitted by the CPO. It is the CPO's responsibility to ensure that the tariffs are correctly structured.

While it is constantly evolving, MOBI.E currently supports the following tariff structures:

- Pricing components:
    - EUR/min, EUR/kWh, EUR/transaction
    - Duration restrictions
    - Time of day restrictions
- Most common tariffs today per charge:
    - EUR/min
    - EUR/kWh
    - fixed EUR + EUR/min
    - fixed EUR + EUR/min + EUR/kWh
    - fixed EUR + EUR/kWh
    - With duration restrictions (example, up to n elements):
        - fixed EUR + x EUR/min, t<=z min
        - fixed EUR + y EUR/min, t>z min
    - With time restrictions (example, up to n elements):

- fixed EUR + x EUR/min, AAh-BBh
- fixed EUR + y EUR/kWh, BBh-AAh

3.7.2 Methods to be implemented

3.7.2.1 CPO (and MOBI.E HUB) – Sender

Method	Direction	Description of usage
GET	Response	Getting current and/or historical tariffs (please check!)
PUT	Request	Sending new or updated tariff
DELETE	Request	Deleting a tariff

3.7.2.2 EMSP (and MOBI.E HUB) - Receiver

The following methods are to be implemented:

Method	Direction	Description of usage
GET	Request	Getting current and/or historical tariffs (please check!)
PUT	Response	Receiving new or update tariff
DELETE	Response	Acknowledging the deletion of a tariff

3.7.3 Objects description

3.7.3.1 Tariffs

The following table describes the Tariffs object.

Table 11

Property	Mandatory	Value	Comments
country_code	TRUE	PT	
party_id	TRUE		
id	TRUE		Tariff ID (UUID format)
currency	TRUE	EUR	
type	TRUE	REGULAR AD_HOC_PAYMENT	Not sure whether ad_hoc_payment makes sense

Property	Mandatory	Value	Comments
tariff_alt_text	FALSE		This field may be used by the CPO to communicate any relevant discounts.
min_price	TRUE		This field should be set to zero in most cases.
elements	TRUE		
start_date_time	FALSE		
stop_date_time	FALSE		
last_updated	TRUE		

The following TariffDimensionType values are allowed:

- ENERGY,
- FLAT,
- PARKING_TIME,
- TIME.

The following TariffRestrictions properties can be used:

- start_time
- end_time
- start_date
- end_date
- min_kwh
- max_kwh
- min_duration
- max_duration
- day_of_week

It is mandatory to include "vat" as per Portuguese regulation. While the OCPI interface will not perform the validation, CPOs should make sure the applicable VAT rate is included in the "PriceComponent".

3.7.4 Tariffs Request and Response Examples

3.7.4.1 Tariff PUT Request

```
{
    "headers": {
        "X-Request-ID": "810b2568-c8ef-4e68-b52a-e879e05d6529"
    },
    "queryParams": {},
```

```json
"pathParams": {
    "country_code": "PT",
    "party_id": "MOB",
    "tariff_id": "E50C6627-10FC-4B02-AE91-20F73EF0DCF1"
},
"body": {
    "id": "E50C6627-10FC-4B02-AE91-20F73EF0DCF1",
    "type": "REGULAR",
    "elements": [
        {
            "price_components": [
                {
                    "type": "TIME",
                    "price": 0.08,
                    "vat": 23,
                    "step_size": 1
                }
            ]
        },
        {
            "price_components": [
                {
                    "type": "FLAT",
                    "price": 0,
                    "vat": 23,
                    "step_size": 1
                }
            ]
        },
        {
            "price_components": [
                {
                    "type": "ENERGY",
                    "price": 0,
                    "vat": 23,
                    "step_size": 1
                }
            ]
```

```
            }
        ],
        "country_code": "PT",
        "party_id": "MOB",
        "last_updated": "2024-04-11T09:46:31.042Z",
        "currency": "EUR",
        "min_price": {
            "excl_vat": 0
        },
        "start_date_time": "2024-04-11T09:46:28.926Z",
        "end_date_time": "2099-12-31T23:59:59.999Z"
    }
}
```

SUPPORT DOCUMENT

3.7.4.2   Tariff PUT Response

```
{
    "status": 200,
    "headers": {
        "X-Request-ID": "810b2568-c8ef-4e68-b52a-e879e05d6529"
    },
    "response": {}
}
```

3.7.4.3   Broadcast Tariff PUT Request

```
{
    "headers": {
        "X-Request-ID": "1889d57c-6668-4a42-86be-3e1be2cb1f8b"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "PT",
        "party_id": "MOB",
        "tariff_id": "MOB-77a813ae727742eea376d538e3fefa09"
    },
    "body": {
        "country_code": "PT",
        "party_id": "MOB",
        "currency": "EUR",
        "type": "REGULAR",
        "tariff_alt_text": [
            {
                "language": "pt",
                "text": "Lotes tarifa 3,7 kWh"
            }
        ],
        "min_price": {
            "excl_vat": 0
        },
        "elements": [
            {
                "price_components": [
```

```
            {
                "type": "TIME",
                "price": 0.01,
                "vat": 23,
                "step_size": 1
            }
        ]
    }
  ],
  "start_date_time": "2023-09-25T08:43:32.000Z",
  "last_updated": "2024-04-15T17:12:03.163Z",
  "id": "MOB-77a813ae727742eea376d538e3fefa09"
 }
}
```

3.7.4.4 Broadcast Tariff PUT Response

```
{
  "status": 200,
  "headers": {
    "X-Request-ID": "1889d57c-6668-4a42-86be-3e1be2cb1f8b"
  },
  "response": {
    "timestamp": "2024-04-15T17:12:03.355Z",
    "data": {
      "id": "MOB-77a813ae727742eea376d538e3fefa09",
      "type": "REGULAR",
      "elements": [
        {
          "price_components": [
            {
                "type": "TIME",
                "price": 0.01,
                "vat": 23,
                "step_size": 1
            }
          ]
        }
      ],
```

```
    "country_code": "PT",

    "party_id": "MOB",

    "last_updated": "2024-04-15T17:12:03.163Z",

    "currency": "EUR",

    "tariff_alt_text": [

        {

            "text": "Lotes tarifa 3,7 kWh",

            "language": "pt"

        }

    ],

    "min_price": {

        "excl_vat": 0

    },

    "start_date_time": "2023-09-25T08:43:32.000Z"

    },

    "status_code": 1000,

    "status_message": "Success"

    }

}
```

3.8 Tokens Module

3.8.1 Technical considerations

The EMSP must make sure that the tokens have been correctly synced with MOBI.E.

There will be no real-time authorization with external systems. For the sake of OCPI all tokens shall be whitelisted and managed within the MOBI.E platform.

MOBI.E MAY perform a GET request on the full list of tokens for a given EMSP. However, it is not the obligation of MOBI.E to do that and the EMSP should make sure that their list of tokens is up-to-date on MOBI.E's side.

Token creation or updates will not be routed to the CPOs and, as such, their platforms will not be informed of token-related evens (all authorizations are centrally managed). Tokens will be obfuscated when sent/retrieved by CPOs in the following cases:

- CPO to HUB requests: Real-time authorization response and Sessions request "cdr_token" will include the Token object with the valid "uid" and remaining field obfuscated with "-";
   - o   in the AuthorizationInfo (Authorize response) we will send a obfuscated Token (not a CdrToken);

- HUB to CPO requests: START_SESSION request and CDRs request cdr_token will include the Token object with the valid "uid" and remaining field obfuscated with "-".
    - o   in the CDR, the cdr_token will be sent complete;

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WWW.MOBIE.PT

o   in the START_SESSION we will send a obfuscated Token (not a CdrToken).

3.8.2   Methods to be implemented

3.8.2.1   MOBI.E HUB – Receiver

Method	Direction	Description of usage
GET	Response	The EMSP shall be able to retrieve its tokens as they are defined on MOBI.E.
PUT	Response	The EMSP shall be able to create a new or update an existing token
PATCH	Response	Partially update the token

3.8.2.2   EMSP – Sender

Method	Direction	Description of usage
GET	Request	The EMSP shall be able to retrieve its tokens
PUT	Request	The EMSP shall be able to create a new or update an existing token
PATCH	Request	Partially update the token

3.8.3   Objects description
Description of the Token object:

Property	Mandatory	Value	Comments
country_code	TRUE	PT	
party_id	TRUE		
uid	TRUE		internal_number if type=RFID. In this case, the direct decimal format should be considered. If type is AD_HOC_USER or APP_USER, then it is advisable that an integer with less than 19 digits is used. So as to ensure unicity it is recommended that the following format be used: concatenations between current time in milliseconds (13 digits) and 5 random digits. This is not mandatory. In case a uid already exists and does not belong to the EMSP, MOBI.E will respond with an error message.

Property	Mandatory	Value	Comments
type	TRUE	AD_HOC_USER APP_USER RFID	
contract_id	TRUE		Current PT*<S>[CEME]*. To be adapted according to eMA ID (refer to paragraph 4.1.4). Please note that the inclusion of the check digit is mandatory.
issuer	TRUE		Card/token issuer name. Can be freely defined by the EMSP.
valid	TRUE		
whitelist	TRUE	ALWAYS	
energy_contract	TRUE		In this case, this shall be the current contract defined per CEME with MOBI.E (typically at least 4 contracts are automatically created per CEME). These contracts uniquely refer to the electricity retailer AND the tariff type ("Bi-Horário" or "Tri-Horário") and tariff cycle ("Weekly" or "Daily") supplier_name = CSE code (according to paragraph **Error! Reference source not found.**. Please be aware that this information is not formally validated and it cannot be used to inform MOBI.E of an electricity retailer change, and it is embedded into the contract creation process) contract_id= (typically in the format of CT_*)
last_updated	TRUE		

3.8.4 Tokens Request and Response Examples

3.8.4.1 Token PUT Request

```json
{
    "headers": {
        "X-Request-ID": "0a677c89068cd2ef429d12c09465a20a"
    },
    "queryParams": {},
    "pathParams": {
        "country_code": "DE",
        "party_id": "MOB",
        "token_uid": "90134102213704"
    },
    "body": {
        "country_code": "DE",
        "party_id": "MOB",
        "uid": "90134102213704",
        "type": "RFID",
        "contract_id": "DE-MOB-C0009EIB3",
        "visual_number": "DE-MF-0034862-0",
        "issuer": "MOB",
        "valid": true,
        "whitelist": "ALWAYS",
        "energy_contract": {
            "supplier_name": "MOBIE",
            "contract_id": "CT_M044BOS481F4FJ65HAOFT56C4Q"
        },
        "last_updated": "2024-04-16T08:46:07Z"
    }
}
```

3.8.4.2 Token PUT Response

```json
{
    "status": 201,
    "headers": {
        "X-Request-ID": "0a677c89068cd2ef429d12c09465a20a"
    },
    "response": {}
```

}

3.9 Commands Module

3.9.1 Technical considerations

The following commands shall be supported:

- START_SESSION
- STOP_SESSION
- UNLOCK_CONNECTOR

All processes are asynchronous. Therefore, it is MANDATORY for the EMSP to provide a unique identifier in the response_url.

For the unlock connector, it is important to note that the EMSP should not be authorized to use this functionality lightly. It is forbidden for EMSP to create apps that allow this command to be executed without validation.

An EMSP SHOULD NOT send commands to an EVSE that is not REMOTE_START_STOP_CAPABLE.

3.9.2 Methods to be implemented

3.9.2.1 CPO (and MOBI.E HUB) - Receiver

Table 12

Method	Direction	Description of usage
POST	Response	Acknowledgement of the initial command execution request.
POST	Request	Asynchronously respond to the EMSP request concerning its execution.

3.9.2.2 EMSP (and MOBI.E HUB) - Sender

Table 13

Method	Direction	Description of usage
POST	Request	The EMSP sends a command to MOBI.E
POST	Response	Receive execution confirmation from MOBI.E

3.9.3 Commands and Objects Description

3.9.3.1 START_SESSION

MOBI.E shall verify that the token exists and authorize it prior to sending the request to the charging station.

Typically, all charging stations should perform OCPP Authorization prior to starting a new transaction. If allowed by the firmware, charging stations will be configured not to authorize transactions following a remote start, so as to improve overall validation time.

The status of the EVSE shall not be considered for the CommandResponse as a charging station may not have communicated all the required status changes.

The following table describes the START_SESSION object:

Table 14

Property	Mandatory	Value	Comment
response_url	TRUE		URL for later result
token	TRUE	APP_USER / AD_HOC_USER	Token needs to have been previously created with MOBI.E (even if only a few seconds/minutes earlier).
		RFID	Token needs to have been previously created with MOBI.E. This token is to be used in case the EMSP wants to make sure that the user will be able to start or stop the transaction at the charging station. In case any of the RFID parameters are not correct then the request shall be rejected (e.g. this is not a way of patching the token).
location_id	TRUE		
evse_uid	TRUE		Value should be mandatory as MOBI.E cannot ensure that all charging stations support a request at the charging station level with local selection.
authorization_reference	FALSE		A UUID-type shall be implemented.

For the corresponding CommandResponse, please consider the following matrix.

Table 15

Condition			CommandResponse - result	Message (if applicable)
Token is Valid	EVSE UID exists in location	Charging Station is Online		
TRUE	TRUE	TRUE	ACCEPTED	N/A
*	*	FALSE	REJECTED	The requested charging station is currently offline.
FALSE	*	TRUE	REJECTED	The requested token is invalid.
TRUE	FALSE	TRUE	REJECTED	The requested EVSE UID does not exist in the location.

The token validity check shall consider the following:

- If the token exists, then:
  - It must have the same properties.
  - It must belong to the requesting party.

Finally, for the CommandResult the following table applies. Please note that unlike what is stated in the reference document, CommandResult result cannot be ACCEPTED if no StartTransaction.req has been received.

Table 16

Condition						Command Execution Timeout	Command Result - result	Message (if applicable)
RemoteStartTransaction.conf received	RemoteStartTransaction.conf status	StartTransaction.req received	Session active with the same token	Session active with differed token	EVSE is OutOf Service			
TRUE	ACCEPTED	TRUE	*	*	*	FALSE	ACCEPTED	N/A
TRUE	ACCEPTED	TRUE	*	*	*	FALSE	ACCEPTED	[StartTransaction.req Reason]
FALSE	N/A	TRUE	*	*	*	FALSE	ACCEPTED	WARNING! Original ack not received.
TRUE	ACCEPTED	FALSE	*	*	*	TRUE	FAILED	The charging station has not confirmed that it started the transaction.
TRUE	REJECTED	FALSE	TRUE	FALSE	N/A	FALSE	EVSE_OCCUPIED	The current user has an active transaction on the EVSE.
TRUE	REJECTED	FALSE	FALSE	FALSE	TRUE	FALSE	EVSE_INOPERATIVE	The requested EVSE is out of service.
TRUE	REJECTED	FALSE	FALSE	TRUE	N/A	FALSE	EVSE_OCCUPIED	The EVSE is currently occupied.
FALSE	N/A	FALSE	*	*	*	TRUE	TIMEOUT	

3.9.3.2 STOP_SESSION

Property	Value	Mandatory	
response_url		TRUE	URL for later result
session_id		TRUE	

If the given charging station does not support remotely stopping a session, then the following CommandResponse result shall be given: NOT_SUPPORTED.

For the corresponding CommandResponse, please consider the following matrix.

Table 17

Condition				CommandResponse - result	Message (if applicable)
Session Exists	**Session is Active**	**Session is owned by the EMSP**	**Charging Station is Online**		
TRUE	TRUE	TRUE	TRUE	ACCEPTED	N/A
TRUE	TRUE	TRUE	FALSE	REJECTED	The requested session is currently offline.
TRUE	TRUE	FALSE	*	REJECTED	The requested session is not owned by the requesting party.
TRUE	FALSE	TRUE	*	REJECTED	The requested session is no longer active.
TRUE	FALSE	FALSE	*	REJECTED	The requested session is not owned by the requesting party.
FALSE	N/A	N/A	*	UNKNOWN_SESSION	N/A

For the CommandResult please consider the following table:

Table 18

Condition				Command Execution Timeout	Command Result - result	Message (if applicable)
RemoteStopTransaction.conf received	**RemoteStopTransaction.conf status**	**StopTransaction.req received**	**StopTransaction.req Reason**			
TRUE	ACCEPTED	TRUE	Remote OR OCPP 1.5 Charging Station	FALSE	ACCEPTED	N/A
TRUE	ACCEPTED	TRUE	(other than Remote in OCPP 1.6 Charging Stations)	FALSE	ACCEPTED	[StopTransaction.req Reason]
FALSE	N/A	TRUE	*	FALSE	ACCEPTED	Concatenation between: WARNING! Original ack not received + [StopTransaction.req Reason].
TRUE	ACCEPTED	FALSE	N/A	TRUE	FAILED	The charging station has not confirmed that it stopped the transaction.

Condition				Command Execution Timeout	Command Result - result	Message (if applicable)
RemoteStopTransaction.conf received	**RemoteStopTransaction.conf status**	**StopTransaction.req received**	**StopTransaction.req Reason**			
TRUE	REJECTED	FALSE	N/A	FALSE	FAILED	The charging station has rejected the request.
FALSE	N/A	FALSE	N/A	TRUE	TIMEOUT	

3.9.3.3   UNLOCK_CONNECTOR

The object can be described by the following properties:

Table 19

Property	Value	Mandatory	
response_url		TRUE	URL for later result
location_id		TRUE	
evse_uid		TRUE	
connector_uid		TRUE	

Table 20

Condition			CommandResponse - result	Message (if applicable)
Active Session with EMSP User	**No Active Session but Last User belongs to EMSP (less than 24h)**	**Charging Station is Online**		
TRUE	N/A	TRUE	ACCEPTED	N/A
TRUE	N/A	FALSE	REJECTED	Impossible to perform the requested command as the charging station is offline.
FALSE	TRUE	TRUE	ACCEPTED	Warning: the charging session had ended at [stop_timestamp]
FALSE	TRUE	FALSE	REJECTED	Impossible to perform the requested command as the charging station if offline. Warning: the charging session had ended at [stop_timestamp]
FALSE	FALSE	*	REJECTED	There is no valid session owned by the EMSP on the charging station

For the CommandResult please consider the following table for OCPP 1.6 stations:

Table 21

Condition		Command Execution Timeout	CommandResult - result	Message (if applicable)
UnlockConnector.conf received	**UnlockConnector.conf status**			
TRUE	Unlocked (OCPP 1.6) or Accepted (OCPP 1.5)	FALSE	ACCEPTED	N/A
TRUE	Rejected (OCPP 1.5)	FALSE	REJECTED	N/A
TRUE	UnlockFailed (OCPP 1.6)	FALSE	FAILED	N/A
TRUE	NotSupported (OCPP 1.6)	FALSE	NOT_SUPPORTED	N/A
FALSE	N/A	TRUE	TIMEOUT	N/A

3.9.4   Commands Request and Response Examples

3.9.4.1   Commands START_SESSION POST Request

```
{
    "headers": {
        "X-Request-ID": "b473be51-d07f-4f88-a960-4c78a9a7b02f",
        "X-Correlation-ID": "32b1adfa-e78b-4aac-bad9-b33ebea0b696"
    },
    "queryParams": {},
    "pathParams": {
        "command": "START_SESSION"
    },
    "body": {
        "token": {
            "energy_contract": {
                "contract_id": "CT_SAIR935LI9KCKHCPBGOG0KR4S6",
                "supplier_name": "EZURI"
            },
            "group_id": null,
            "language": "pt",
            "default_profile_type": null,
            "visual_number": "PTMUVE0000000000322801",
            "country_code": "PT",
            "party_id": "MUV",
            "uid": "1402506716",
            "type": "RFID",
            "contract_id": "PT-MUV-C00000001-2",
            "issuer": "MUVEXT CEME",
            "valid": true,
            "whitelist": "NEVER",
            "last_updated": "2024-02-15T15:54:12.000Z"
        },
        "evse_uid": "ETR-00016-02",
        "response_url":      "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/commands/START_SESSION/f4036031-4987-
4657-b9e2-863810996699",
        "location_id": "ETR-00016",
        "authorization_reference": "3d10e0de-fe63-442c-8d70-9c75194f4e34",
        "command_response": null
```

```
        }
    }
```

3.9.4.2 Commands START_SESSION POST Response

```
{
    "status": 200,
    "headers": {
        "X-Request-ID": "b473be51-d07f-4f88-a960-4c78a9a7b02f",
        "X-Correlation-ID": "32b1adfa-e78b-4aac-bad9-b33ebea0b696"
    },
    "response": {
        "timestamp": "2024-03-31T11:25:46.908Z",
        "data": {
            "result": "ACCEPTED",
            "timeout": 70
        },
        "status_code": 1000,
        "status_message": "Success"
    }
}
```

3.9.4.3 Commands STOP_SESSION POST Request

```
{
    "headers": {
        "X-Request-ID": "4418e900-d486-4af2-a814-38be7a9a8a4c",
        "X-Correlation-ID": "73ae4e1a-a812-48f7-8d1c-d25910d17505"
    },
    "queryParams": {},
    "pathParams": {
        "command": "STOP_SESSION"
    },
    "body": {
        "response_url":  "https://pgm.mobie.pt/ocpi/hub/emsp/2.2/commands/STOP_SESSION/7cef9326-4b1a-4623-
a6d0-9cdbec26f62f",
        "session_id": "ETR-00016-02-1711843344",
        "command_response": null
    }
}
```

3.9.4.4 Commands STOP_SESSION POST Response

```
{
    "status": 200,
    "headers": {
        "X-Request-ID": "4418e900-d486-4af2-a814-38be7a9a8a4c",
        "X-Correlation-ID": "73ae4e1a-a812-48f7-8d1c-d25910d17505"
    },
    "response": {
        "timestamp": "2024-03-31T00:38:55.671Z",
        "data": {
            "result": "ACCEPTED",
            "timeout": 70
        },
        "status_code": 1000,
        "status_message": "Success"
    }
}
```

4 Miscellaneous

4.1 OCPI IDs and current compatibility

4.1.1 General remarks

MOBI.E is to be considered as the national issuing authority for all IDs concerning e-mobility.

All the OCPI IDs considered below are to be adopted for OCPI-related data exchanges only. All other interfaces shall continue to use the MOBI.E code.

4.1.2 Party ID (according to ISO/IEC-15118)

In addition, to its MOBI.E 4-letter code, an EMSP/CPO shall be assigned an OCPI party_id that follows a 3 (ALPHA/DIGIT) rule. An equivalence table is provided below between these IDs:

Table 22 Tentative equivalency list between MOBI.E codes and OCPI party IDs

Codigo	OCPI_Party_ID	NomeEntidade
ACOR	ACR	Açorcabos, Telecomunicações e Electricidade, Lda.
BLUE	BLU	Blue Charge
BLUW	BLW	Bluewalk
BPPT	BPP	BP Portugal
CABL	CAB	Cable Exanergia Portugal
CAPW	CAP	CAPWATT Services, S.A.

CARB	CRB	Carbonex - Soluções de Mobilidade e Eficiência Energética
CARG	CGG	Cargga Inteligente
CEPS	CPS	Cepsa Portuguesa Petroleos
CEVE	CEV	Cooperativa Elétrica de Vale d´Este
CIRC	CIR	Circuitos de Inovação
CMEL	CME	CME
CSCP	CSC	Cascais Próxima – Gestão de Mobilidade, Espaços Urbanos e Energias, E.M. S.A
DAPE	DAP	DAPE
DCSO	DCS	Digital Charging Solutions GMBH
DOUR	DOU	Douromobe – Comercializadora de Energia, S.A.
DTEI	DTE	DTE, Instalacoes Especiais
ECOC	ECO	Ecochoice
ECOI	ECI	ECOINSIDE – Soluções em Ecoeficiência e Sustentabilidade
EDPC	EDP	EDP Comercial
EDPC	ED8	EDP Comercial
EDPM		EDP MOP
ELET	ELE	Eletec, Unipessoal
ELMP	ELM	Electromaps S.I.
EMAC	EMA	EMACOM
EMEL	EML	EMEL
EMOB	EMT	Emobtec - Tecnologia para a mobilidade eléctrica, Lda.
ENDS	END	Endesa
ENER	ENE	Enercom
ENGI	ENG	Engie S.A
EVCE	EVC	EVCE Power
EVIO	EVI	EVIO - Electrical Mobility
EVPW	EVP	EV Power
EZC3	EZC	Ez-Charg3
EZUE	EZU	EZU Energia
FACT	FAC	Factor Energia
GASF	GSF	GASFOMENTO - Sistemas e Instalações de Gás, S.A.
GENJ	GEN	Generation Journey
GLPG	GLG	Galpgeste
GLPP	GLP	Galp Power
GOLD	GLD	Goldenergy
GRCA	GRC	GRCApp
GREE	GRN	Green Charge - Mobilidade Eletrica
HELX	HLX	Helexia II Energy Services, Lda.
HEXA	HEX	Hexagonal Ocean
HIGH	HGP	High Green Power
HORZ	HRZ	Horizondistance, Unipessoal Lda
HTBE	HTB	Has to Be
HUBJ	HBJ	Hubject
IBRD	IBD	Iberdrola

IHOM	IHM	IHOME
IMAG	IMG	Image 4 all – Eficiência Energética, Comunicação e Imagem,Lda
INFO	INF	Infosistema
IONI	ION	IONITY
JHOR	JHO	JH Ornelas
JJTM	JJT	JOÃO JACINTO TOMÉ, AS
KLCO	KLC	Kilometer Low Cost
KLCS	KLS	Kilometer LowCost Serviços, S.A
LESS	LSS	Less kW
LOGI	LOG	Logical Gravity
LOUL	LCG	Loulé Concelho Global
LUSI	LUS	Lusiadaenergia, S.A.
LUZI	LUZ	Luzigás
MAKS	MAK	Maksu
MEOE	MEO	MEO Energia
MLTR	MLT	Mobiletric
MOBA	MOA	MOBI A - Mobilidade e Ambiente, Lda
MOBI	MOB	MOBI.E (sem operador) / DPCs
MOON	MOO	Moon Power
MOTA	MOT	Mota-Engil Renewing, S.A.
MUVE	MUV	MUVEXT
MUVE	GCE	Hubject
NEUR	NEU	Neureifen – Electric Mobility
NRGS	NRG	NRG - Sistemas de Energia Renováveis, Lda.
PETR	PET	Petroassist
PLUG	PLG	E-Plug, Lda
PRIO	PRI	Prio Energias Top Low Cost
PROP	PRP	Propel
PTER	PTE	Petrotermica Energia S.A.
REPS	REP	Repsol Portuguesa
ROLE	ROL	Rolear - Automatizações, Estudos e Representações
SCRZ	SCR	Município de Santa Cruz
SEGM	SEG	Segma
SFAF	SFF	Superfafe - Supermercados, Lda.
SGMR	SGM	Superguimarães - Supermercados, Lda.
SILV	SLV	Silver Ridge - Asset Management
SINA	SIN	Sinalcabo – Sistemas de Comunicação AS
SDBR	SDB	Sodibraga - Supermercados Lda
SOLX	SLX	SOLX
TROF	TRF	InterTrofa Supermercados
TRUE	TRK	True-Kare
VEIM	VEI	Veimonte – Comércio de Veículos de Montemor, Lda
VISA	VIS	VISACASA - Serviços de Assistencia e Manutençao Global AS
ZUND	ZND	Zunder (Grupo Easycharger, SL)
WENE	WEN	Wenea Services

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Please note that this table is only accurate at the date of publishing, and the information shall be continuously updated on MOBI.E's website.

4.1.3 EVSE ID (according to eMI3)

For all MOBI.E charging stations, the following structure applies:

<EVSE ID> = <Country Code> <S> <Spot Operator ID> <S> <ID Type> <Power Outlet ID>

- <Country Code> = "PT"
- <Spot Operator ID> is the 3 (ALPHA/DIGIT) party_id mentioned in the previous paragraph
- <S> = "*"
- <ID Type> = "E"
- <Power Outlet ID> = Up to 30 characters (alphanumeric)

We recommend that the power outlet ID shall correspond to the naming standard currently used by MOBI.E. Note that all non-alphanumeric characters used in current MOBI.E EVSE naming standards, shall be replaced with "*". EVSE MOBIE-00001-01 managed by CPO "MOB" should be referred to as: PT*MOB*EMOBIE0000101. This recommendation is to maintain the coherence, because MOBI.E is the issuer of the location ID. Even though, the CPOs are free to define the power outlet ID, as long as they comply with the structure defined above.

4.1.4 Contract ID (according to eMI3)

<eMA ID> = <Country Code> <S> <Provider ID> <S> <ID Type> <eMA Instance> <S> <Check Digit>

- <Country Code> = "PT"
- <Provider ID> is the 3 (ALPHA/DIGIT) party_id mentioned in 4.1.2
- <S> = "-"
- <ID Type> = "C"
- <eMA Instance> = 8 (ALPHA / DIGIT)
- The check-digit should be calculated according to http://www.ochp.eu/id-validator/.

Each EMSP is completely free to define its 8 alphanumeric structures for its e-mobility contracts.

As an example, an EDP e-mobility contract coded with "1234ABCD" would have a corresponding eMA ID of: PT-EDP-C1234ABCD-J.

4.2 Energy Supplier Codes

The Energy supplier codes follow the Iberian Market codes that can be found in:

SUPPORT DOCUMENT

https://www.mercado.ren.pt/pt/electr/infomercado/infstructmerc/paginas/agentesmerc.aspx

4.3 IP Whitelisting

To integrate with MOBI.E some partners may require whitelisting MOBI.E's IPs:

- Quality (for testing): 141.144.245.155
- Production (live): 141.147.12.143