



# Multiple Connectors per EVSE in a OCPP 1.x implementation

v1.0 Final, 2016-03-05

## **OCA Application Note:**

### **Multiple Connectors per EVSE in a OCPP 1.x implementation.**

Relevant for OCPP version: 1.2, 1.5 and 1.6.

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## Version History

Version	Date	Author	Description
1.0	2016-03-05	Robert de Leeuw <i>IHomer</i>  Brendan McMahon <i>ESB</i>	Final version, review and updated.

# 1. Scope

This document contains advice on how to implement OCPP 1.2, 1.5 or 1.6 on a Charge Point that has multiple connectors per EVSE. This Application Note contains the view of the OCA TWG (Technology Working Group).

## 2. 2-Tier Model

OCPP versions 1.2, 1.5 and 1.6 were developed for a "2-tier" Charge Point model. They implicitly assume that a Charge Point can independently charge one EV per Connector. This is called 2-tier because it consists of 2 tiers: Charge Point (overall/top), and a second tier with one or more connectors.

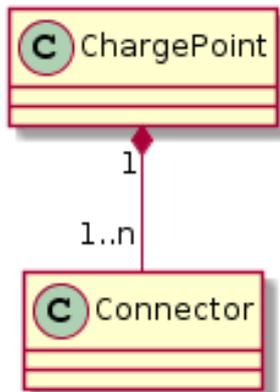


Figure 1. 2-tier Charge Point model

## 3. 3-Tier model

The part of a Charge Point that can charge one EV is called an EVSE (Electric Vehicle Supply Equipment). EVSEs are expensive parts in a Charge Point, especially for DC Fast Chargers.

To support different charging protocols, EVSEs are now often equipped with multiple connectors (of different types) per EVSE.

To make a distinction between connector and EVSE, future versions of OCPP will support a 3-tier model: one Charge Point can have one or more EVSEs, and each EVSE can have one or more Connectors.

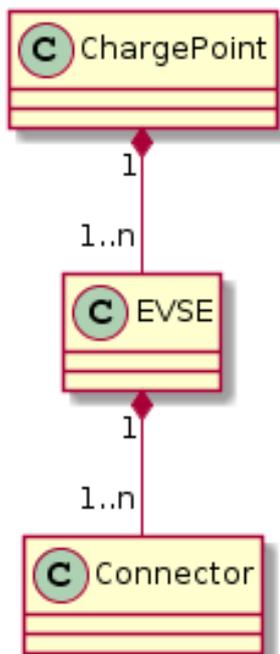


Figure 2. 3-tier Charge Point model

It is an implicit part of this model that there is/are logical and/or physical interlocks that ensure that at most one connector can be in use at any time.

## 4. Proposed Workaround: One (real or "shared/virtual") EVSE per Connector

The TWG's advice is to implement each connector as if it has its own EVSE.

As normal, the charge point should report the physical amount of connectors over OCPP, but the charge point must also report all the changes to the availability status of the all connectors on each "real" EVSE due to the "interlock" mechanism.

- If one of the physical connectors of the EVSE becomes 'Occupied' (OCPP 1.6: 'Preparing', 'Charging', 'SuspendedEVSE', 'SuspendedEV', 'Finishing') or 'Reserved', all the other connectors should be reported to the Central System as 'Occupied' ('Preparing' in OCPP 1.6)
- If a connector is broken/defective, but the other connector of the same EVSE can still be used: set the first connector to 'Faulted', the other should still report 'Available'.
- If the real EVSE is defective, all connectors connected to that EVSE should report: 'Faulted'

Advantages:

- All connectors have their own status.
- It is possible to gather statistics about the usage of the different connectors.
- Makes it possible to select the correct connector for `UnlockConnector.req`, `ReserveNow.req` and `RemoteStartTransaction.req`.
- Charge points can report faults relating to single connectors by individual `StatusNotification`, or to an EVSE overall by sending multiple `Faulted StatusNotifications` for every Connector on the EVSE
- Individual connectors can be commanded "Unavailable" (e.g. reported damaged connector/cable).

An EV Driver expects to access or reserve a connector compatible with the EV, not an EVSE. The EV Driver is unaware of EVSE, they are not visible on the outside.

This document is only valid for connectors that are individually managed (connectors/sockets that have an in-use detection and/or locking mechanism).

Central System implementations are advised: to be able to handle Charge Points that have implemented a different solution.