

# EVCHONG Web Service 说明

V 1.2

## 版本信息

2015/02/10	1.0	Stephen	目前版本不包含 WSDL 描述,将在后续版本中加入。
2015/02/12	1.1	Stephen	加入 WSDL, 加入部分约定
2015/03/02	1.2	Stephen	放弃 SOAP 协议的 WS, 改用 RESTful WS。因此删除了 WSDL 接口描述文件。 加入开发约束及接口示例

## 目录

1. 服务 Interface 列表.....	5
1.1 启动通知.....	7
1.2 充电授权.....	9
1.3 心跳包.....	10
1.4 开始充电.....	11
1.5 在线通知.....	13
1.6 结束充电.....	15
1.7 状态通知.....	17
2. 接口字段元类型 .....	19
2.1 IdToken.....	19
2.2 IdTagInfo .....	19
2.3 AuthorizationStatus（枚举类） .....	19
2.4 MeterValue .....	19
2.5 Measurand（枚举类） .....	19

2.6	UnitOfMeasure（枚举类） .....	20
2.7	TransactionData .....	21
2.8	ChargePointErrorCode（枚举类） .....	21
2.9	ChargePointStatus（枚举类） .....	22
2.10	RegistrationStatus（枚举类） .....	22
3.	充电桩对接实现说明 .....	23

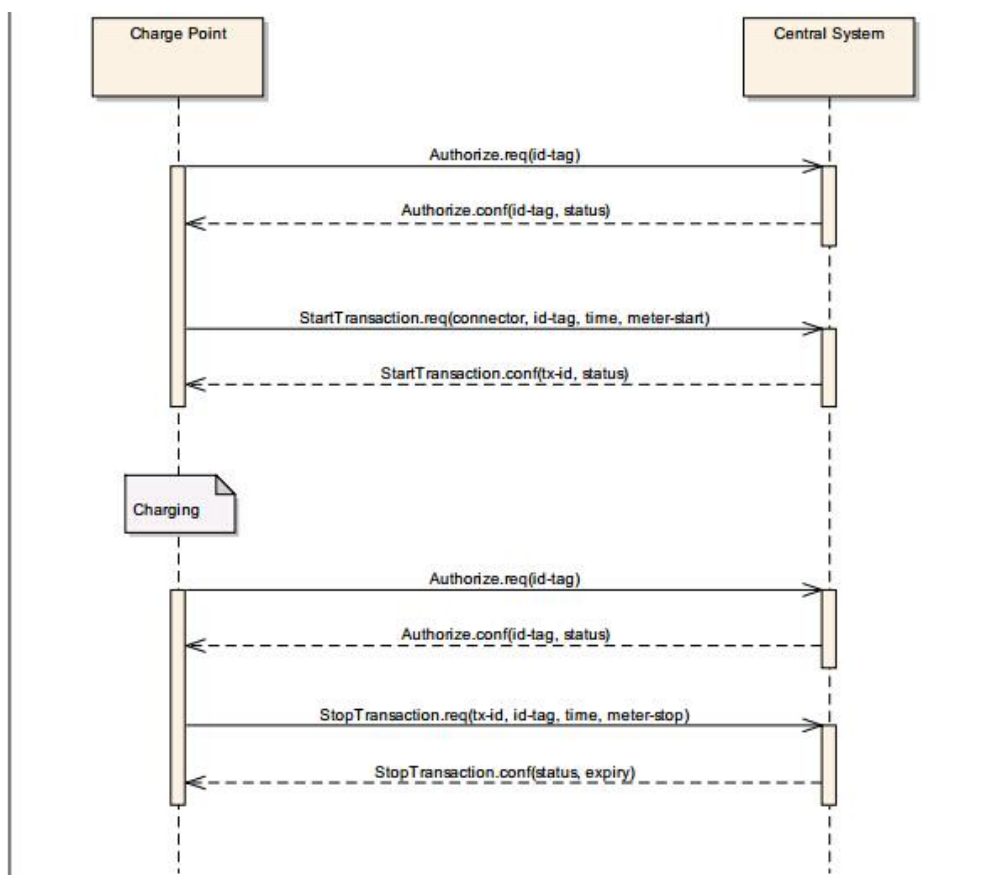
## 1. 服务 Interface 列表

服务编号	服务名称	描述
1	Boot (启动通知)	After start-up a Charge Box sends a notification to the EVCHONG System with information about its configuration (e.g. version, vendor, etc.). The EVCHONG System will only accept Charge Boxes that are registered with the EVCHONG System.
2	Authorization ( 充电授权 )	Before the owner of an electric vehicle can start or stop charging, the Charge Box needs to be able to authorize the operation. Only after authorization will Charge Box unlock the connector.
3	Heartbeat ( 心跳包 )	To let the EVCHONG System know that a Charge Point is still connected, a Charge Box sends a heartbeat after a configurable time interval.
4	Start Transaction ( 开始充电 )	When an electric vehicle is allowed to start charging, the Charge Box needs to inform the EVCHONG System about this.
5	Meter Values ( 在线通知 )	A Charge Box MAY sample the electricity meter or other sensor/transducer hardware to provide extra information about its meter values. It is up to the Charge Box to decide when it will send meter values. In this project, we decide to send the meter values <b>only when charging is on process.</b>
6	Stop Transaction ( 结束充电 )	When an electric vehicle is allowed to stop charging; the Charge Box needs to be able to inform the EVCHONG System about this in order to process the pricing.
7	Status Notification ( 状态通知 )	A Charge Box sends a notification to the EVCHONG System to inform the Central System about a status or error condition within the Charge Box.

开发约束条件：

- 1.所有接口走 HTTPS 协议，即 SSL 协议（但暂时不要求数字签名）
- 2.所有接口使用 Restful 接口技术实现
- 3.所有接口均为 HTTP POST 请求，请求参数为 JSON 格式。
- 4.所有接口 Encoding 采用 UTF-8

充电通信序列图：



## 1.1 启动通知

目的：充电盒启动时，通知 EVCHONG System。获取 EVCHONG SYSTEM 认证才可提供充电服务。

方法名称：deviceBoot

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序号
chargePointModel	String[20]	N	充电站型号
chargePointSerialNumber	String[25]	Y	充电站点序号（虚拟由 EVCHONG 提供）
chargePointVendor	String[20]	Y	供货商名称
firmwareVersion	String[50]	N	充电盒的固件版本号
iccid	String[20]	N	集成电路卡标识符
imsi	String[20]	N	国际移动用户标识符
meterSerialNumber	String[25]	N	电量计量器序号
meterType	String[25]	N	电量计量器类型

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
currentTime	dateTime	Y	当前时间
heartbeatInterval	integer	Y	心跳包间隔(秒)
status	RegistrationStatus (Enumeration)	Y	注册状态： Accepted/Rejected 如果充电桩 ID 没有注册过， 返回 rejected。充电桩启动失败，断电。

■ Restful 接口示例

■ **服务 URL:** [https://服务主机域名或 ip/evchong-api/cperent/v1/deviceBoot](https://服务主机域名或ip/evchong-api/cperent/v1/deviceBoot)

■ **Request:**

```
data={"bootReq":{"iccid":{"iccid":"xxxxx"},"chargePointModel":{"chargePointModel":"Keli-0001"},"chargePointVendor":{"chargePointVendor":"mmmmm"},"chargeBoxSerialNumber":{"chargeBoxSerialNumber":"mmmmm"},"chargePointSerialNumber":{"chargePointSerialNumber":"mmmmm"},"imsi":{"imsi":"xxxxx"},"meterType":{"meterType":"xxxxx"},"firmwareVersion":{"firmwareVersion":"xxxxx"},"meterSerialNumber":{"meterSerialNumber":"xxxxx"}}
```

■ **Response:**

```
data={"bootRes":{"heartbeatInterval":5,"currentTime":1425285444696,"status":"Accepted"}}
```



## 1.2 充电授权

目的：在使用者刷卡后，充电盒需要将用户身份信息传送给 EVCHONG 系统，由系统检查用户身份信息和卡内余额，决定是否允许充电。time interval：用户刷卡后 1s 通知。

方法名称：authorize

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序号
IdToken	IdToken	Y	充值身份 ID（如 RFID）

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
IdTagInfo	IdTagInfo	Y	身份验证结果

### ■ Restful 接口示例

- 服务 URL:

<https://服务主机域名或 ip/evchong-api/cperent/v1/authorize>
- Request:

data={"authReq":{"idToken":{"idToken":"mmmmm"},"chargeBoxSerialNumber":{"chargeBoxSerialNumber":"mmmmm"}}}
- Response:

data={"authRes":{"idTagInfo":{"expiryDate":1425288390010,"parentIdTag":{"idToken":"xxxxxx"},"status":"Accepted"}}}

### 1.3 心跳包

目的：充电盒需要定期发送心跳包给 EVCHONG 系统，以便于系统监控充电盒

是否在线。time interval : 10s

方法名称：heartbeat

#### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargePointSerialNumber	String[25]	N	充电站序列号
chargeBoxSerialNumber	String[25]	Y	充电盒序列号

#### ■ 输出结果

Elements	Type	Is Mandatory	Remark
currentTime	dateTime	Y	当前时间

#### ■ Restful 接口示例

- 服务 URL: https://服务主机域名或 ip/evchong-api/cperent/v1/heartbeat

■ Request:  
data={"heartbeatReq":{"chargePointSerialNumber":{"chargePointSerialNumber":"xxxxxx"},"chargeBoxSerialNumber":{"chargeBoxSerialNumber":"mmmmm"}}}

■ Response:  
data={"heartbeatRes":{"currentTime":1425287749420}}

## 1.4 开始充电

目的：使用者充电开始时，需要将用户身份及充电桩信息发送到 EVCHONG 系统。

方法名称：startTrans

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序列号
connectorId	integer	Y	充电插座号
idTag	IdToken	Y	充电身份 ID
meterStart	integer	Y	充电开始时的累积电量，如果没有累积电表则填 0
reservationId	integer	N	预约 ID
timestamp	dateTime	Y	当前时间戳

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
idTagInfo	IdTagInfo	Y	身份验证结果
transactionId	integer	Y	事务 ID

### ■ Restful 接口示例

- **服务 URL:** https://服务主机域名或 ip/evchong-api/cperent/v1/startTrans
- **Request:**  
data={"startTransactionReq":{"idToken":{"idToken":"ooooo"},"connectorId":1,"meterStart":1,"reservationId":1,"chargeBoxSerialNumber":{"chargeBoxSerialNumber":"ooooo"},"timestamp":1425289031076}}
- **Response:**

```
data={"startTransactionRes":{"idTagInfo":{"expiryDate":1425289223245,"parentIdTag":{"idToken":"xxxxx"},"status":"Accepted"},"transactionId":1}}
```

## 1.5 在线通知

目的：用户充电时，需要定时向 EVCHONG 系统发送充电盒的电流/电压/电量

等在线信息。time interval : 10s

方法名称：meterValues

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序列号
connectorId	integer	Y	充电插座号
transactionId	integer	Y	事务 ID
values	List of <MeterValue>	Y	计量值（需要电流（A） /电压（V）/电量 （KWH），精度保留 2 位小数）

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
transactionId	integer	Y	事务 ID
timestamp	dateTime	Y	当前时间戳

### ■ Restful 接口示例

- **服务 URL:** <https://服务主机域名或ip/evchong-api/cperent/v1/meterValues>
- **Request:**  
data={"meterValuesReq":{"connectorId":1,"transactionId":1,"chargeBoxSerialN  
umber":{"chargeBoxSerialNumber":"xxxxx"},"values":[{"measurand":"Energy\_  
Active\_Import\_Register","unit":"kWh","value":"xxxxx","location":"Outlet","con  
text":"Sample\_Periodic","format":"Raw","timestamp":1425289652130},{ "meas  
urand":"Current.Import","unit":"Amp","value":"xxxxx","location":"Outlet","conte

```
xt":"Sample_Periodic","format":"Raw","timestamp":1425289652130},{ "measur  
and":"Voltage","unit":"Volt" ,"value":"xxxxx","location":"Outlet","context":"Sam  
ple_Periodic","format":"Raw","timestamp":1425289652130}}}] }
```

■ **Response:**

```
data={ "meterValuesRes":{ "transactionId":1,"timestamp":1425289843542} }
```

## 1.6 结束充电

目的：使用者充电结束时，需要将使用者身份及充电桩电量信息发送到

EVCHONG 系统。

方法名称：stopTrans

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序列号
idTag	IdToken	N	充电身份 ID
meterStop	integer	Y	充电结束时的累积电量，如果没有累积电表则填 0
transactionId	integer	Y	事务 ID
transactionData	TransactionData	Y	事务信息（消耗电量 KWH, 精度 2 位小数）
timestamp	dateTime	Y	当前时间戳

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
idTagInfo	IdTagInfo	Y	身份验证结果
transactionId	integer	Y	事务 ID

### ■ Restful 接口示例

- 服务 URL: [https://服务主机域名或 ip/evchong-api/cperent/v1/stopTrans](https://服务主机域名或ip/evchong-api/cperent/v1/stopTrans)
- Request:
- data={ "stopTransactionReq":{ "idTag":{ "idToken":"xxxxx"}, "transactionId":1, "transactionData":{ "values":[ { "measurand":"Energy\_Active\_Import\_Register", "unit":"Wh", "value":"xxxxx", "location":"Outlet", "context":"Sample\_Periodic", "form

```
at:"Raw","timestamp":1425289652130}},"chargeBoxSerialNumber":{"chargeBoxSerialNumber":"ooooo"},"meterStop":1,"timestamp":1425290113204}}
```

■ **Response:**

```
data={"stopTransactionRes":{"idTagInfo":{"expiryDate":1425290303174,"parentIdTag":{"idToken":"ooooo"},"status":"Accepted"},"transactionId":1}}
```



## 1.7 状态通知

目的 : 充电盒在遇到异常或状态变更时 , 需要发送状态信息给后端的 EVCHONG

系统 , 以便后台运维人员对充电盒的状态实时监控。

方法名称 : statusNotify

### ■ 输入参数

Elements	Type	Is Mandatory	Remark
chargeBoxSerialNumber	String[25]	Y	充电盒序列号
connectorId	integer	Y	充电插座号
errorCode	ChargePointErrorCode	Y	错误码
info	string[50]	N	额外错误信息
status	ChargePointStatus	Y	设备状态
timestamp	dateTime	Y	当前时间戳
vendorId	string[255]	Y	厂商 ID
vendorErrorCode	string[50]	Y	厂商错误码

### ■ 输出结果

Elements	Type	Is Mandatory	Remark
timestamp	dateTime	Y	当前时间戳

### ■ Restful 接口示例

- 服务 URL: [https://服务主机域名或 ip/evchong-api/cperent/v1/statusNotify](https://服务主机域名或ip/evchong-api/cperent/v1/statusNotify)
- Request:
- data={ "statusNotificationReq": { "connectorId": 1, "vendorErrorCode": "00000", "chargeBoxSerialNumber": { "chargeBoxSerialNumber": "00000" }, "errorCode": "GroundFailure", "vendorId": "00000", "info": "xxxxx", "timestamp": 1425290540330, "status": "Available" } }
- Response:



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data={ "statusNotificationRes":{ "timestamp":1425290699956} }

## 2. 接口字段元类型

### 2.1 IdToken

字段名	字段类型	Is Mandatory
IdToken	String[20]	Y

### 2.2 IdTagInfo

字段名	字段类型	Is Mandatory
expiryDate	dateTime	N
parentIdTag	IdToken	N
status	AuthorizationStatus(枚举类)	Y

### 2.3 AuthorizationStatus（枚举类）

字段值	说明
Accepted	接受
Blocked	卡被阻止（例如没有余额）
Expired	卡过期

### 2.4 MeterValue

字段名	字段类型	Is Mandatory
timestamp	dateTime	Y
value	string	Y
measurand	Measurand	Y

### 2.5 Measurand（枚举类）

字段值	说明
Energy.Active.Export.Register	Energy exported by EV (Wh or kWh)

Energy.Active.Import.Register	Energy imported by EV (Wh or kWh)
Energy.Reactive.Export.Register	Reactive energy exported by EV (varh or kvarh)
Energy.Reactive.Import.Register	Reactive energy imported by EV (varh or kvarh)
Energy.Active.Export.Interval	Energy exported by EV (Wh or kWh)
Energy.Active.Import.Interval	Energy imported by EV (Wh or kWh)
Energy.Reactive.Export.Interval	Reactive energy exported by EV. (varh or kvarh)
Energy.Reactive.Import.Interval	Reactive energy imported by EV. (varh or kvarh)
Power.Active.Export	Instantaneous active power exported by EV. (W or kW)
Power.Active.Import	Instantaneous active power imported by EV. (W or kW)
Power.Reactive.Export	Instantaneous reactive power exported by EV. (var or kvar)
Power.Reactive.Import	Instantaneous reactive power imported by EV. (var or kvar)
Current.Export	Instantaneous current flow from EV
Current.Import	Instantaneous current flow to EV
Voltage	AC RMS supply voltage
Temperature	Temperature reading inside charge point.

## 2.6 UnitOfMeasure（枚举类）

字段值	说明
Wh	Watt-hours (energy). Default.
kWh	kiloWatt-hours (energy).

varh	Var-hours (reactive energy).
kvarh	kilovar-hours (reactive energy).
W	Watts (power).
kW	kilowatts (power).
var	Vars (reactive power).
kvar	kilovars (reactive power).
Amp	Amperes (current).
Volt	Voltage (r.m.s. AC).
Celsius	Degrees (temperature).

## 2.7 TransactionData

字段名	字段类型	Is Mandatory
values	List of MeterValue	Y

## 2.8 ChargePointErrorCode (枚举类)

字段值	说明
ConnectorLockFailure	Failure to lock or unlock connector.
GroundFailure	Ground fault circuit interrupter has been activated.
HighTemperature	Temperature inside charge point is too high.
Mode3Error	Problem with Mode 3 connection to vehicle.
NoError	No error to report.
OtherError	Other type of error. More information in vendorErrorCode.
OverCurrentFailure	Over current protection device has tripped.
PowerMeterFailure	Failure to read power meter.
PowerSwitchFailure	Failure to control power switch.
ReaderFailure	Failure with ID tag reader.

ResetFailure	Unable to perform a reset.
UnderVoltage	Voltage has dropped below an acceptable level.
WeakSignal	Wireless communication device reports a weak signal.

## 2.9 ChargePointStatus（枚举类）

字段值	说明
Available	Charge point: At least one connector is available for charging. Connector: Connector is available for charging. (Operative).
Occupied	Charge point: All connectors of charge point are occupied. Connector: Connector is occupied. (Operative).
Reserved	Charge point: All connectors of charge point are reserved. Connector: Connector is reserved. (Operative).
Unavailable	Charge point or connector is not available for charging. It has been explicitly set to unavailable. (Inoperative).
Faulted	Charge point or connector has reported an error

## 2.10 RegistrationStatus（枚举类）

字段值	说明
Accepted	如果充电桩注册过，返回 Accepted。充电桩启动成功，等待刷卡充电。
Rejected	如果没有注册过， rejected。

	充电桩启动失败，断电。
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### 3. 充电桩对接实现说明

接口对象	对等实体	对接说明
ChargePointSerialNumber	站点	EVCHONG 后台新建站点时会生成一个充电站点序号，提供给充电桩供货商。充电桩供货商必须保证在充电盒启动时必须发送站点编号给 EVCHONG 后台系统。如果供货商通过其后台系统连接 EVCHONG 后台则考虑在其后台维护设备和 ChargePointSerialNumber 关系。 如果供货商通过充电桩直连 EVCHONG 后台，则建议 ChargePointSerialNumber 设置在充电盒固件中。
ChargeBoxSerialNumber	充电盒	厂商的设备编号，必须保证不同厂家的设备号唯一
ConnectorID	充电盒上的充电插座	充电厂商自行编号，如果一个充电盒只有一个插座，则默认为 1
ChargePointErrorCode 和 vendorErrorCode	充电盒设备错误码	充电供货商需要将厂商的设备错误码，转换成 EVCHONG 后台的错误码。在错误发生时，同时发 ChargePointErrorCode 和 vendorErrorCode。
VendorId	厂商编号	EVCHONG 后台会提供给充电盒供货商厂商编号，允许在错误发生时发送 VendorId 给到 EVCHONG 后台。

