

<b>Accessibility</b>	RW
<b>Type</b>	integer
<b>Unit</b>	Wh
<b>Description</b>	Maximum energy in Wh delivered when an identifier is invalidated by the Central System after start of a transaction.

### 9.1.15. MeterValuesAlignedData

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	CSL
<b>Description</b>	Clock-aligned measurand(s) to be included in a <code>MeterValues.req</code> PDU, every <code>ClockAlignedDataInterval</code> seconds

### 9.1.16. MeterValuesAlignedDataMaxLength

<b>Required/optional</b>	optional
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of items in a <code>MeterValuesAlignedData</code> Configuration Key.

### 9.1.17. MeterValuesSampledData

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	CSL
<b>Description</b>	<p>Sampled measurands to be included in a <code>MeterValues.req</code> PDU, every <code>MeterValueSampleInterval</code> seconds. Where applicable, the <code>Measurand</code> is combined with the optional <code>phase</code>; for instance: Voltage.L1</p> <p>Default: "Energy.Active.Import.Register"</p>

### 9.1.18. MeterValuesSampledDataMaxLength

<b>Required/optional</b>	optional
<b>Accessibility</b>	R

<b>Type</b>	integer
<b>Description</b>	Maximum number of items in a <a href="#">MeterValuesSampledData</a> Configuration Key.

### 9.1.19. MeterValueSampleInterval

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	integer
<b>Unit</b>	seconds
<b>Description</b>	Interval between sampling of metering (or other) data, intended to be transmitted by "MeterValues" PDUs. For charging session data (ConnectorId>0), samples are acquired and transmitted periodically at this interval from the start of the charging transaction. A value of "0" (numeric zero), by convention, is to be interpreted to mean that no sampled data should be transmitted.

### 9.1.20. MinimumStatusDuration

<b>Required/optional</b>	optional
<b>Accessibility</b>	RW
<b>Type</b>	integer
<b>Unit</b>	seconds
<b>Description</b>	The minimum duration that a Charge Point or Connector status is stable before a <a href="#">StatusNotification.req</a> PDU is sent to the Central System.

### 9.1.21. NumberOfConnectors

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	The number of physical charging connectors of this Charge Point.

### 9.1.22. ResetRetries

<b>Required/optional</b>	required
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<b>Accessibility</b>	RW
<b>Type</b>	integer
<b>Unit</b>	times
<b>Description</b>	Number of times to retry an unsuccessful reset of the Charge Point.

### 9.1.23. StopTransactionOnEVSideDisconnect

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	boolean
<b>Description</b>	When set to <i>true</i> , the Charge Point SHALL administratively stop the transaction when the cable is unplugged from the EV.

### 9.1.24. StopTransactionOnInvalidId

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	boolean
<b>Description</b>	whether the Charge Point will stop an ongoing transaction when it receives a non- <i>Accepted</i> authorization status in a <a href="#">StartTransaction.conf</a> for this transaction

### 9.1.25. StopTxnAlignedData

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	CSL
<b>Description</b>	Clock-aligned periodic measurand(s) to be included in the TransactionData element of <a href="#">StopTransaction.req</a> <a href="#">MeterValues.req</a> PDU for every <a href="#">ClockAlignedDataInterval</a> of the Transaction

### 9.1.26. StopTxnAlignedDataMaxLength

<b>Required/optional</b>	optional
<b>Accessibility</b>	R

<b>Type</b>	integer
<b>Description</b>	Maximum number of items in a <a href="#">StopTxnAlignedData</a> Configuration Key.

### 9.1.27. StopTxnSampledData

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	CSL
<b>Description</b>	Sampled measurands to be included in the TransactionData element of <a href="#">StopTransaction.req</a> PDU, every <a href="#">MeterValueSampleInterval</a> seconds from the start of the charging session

### 9.1.28. StopTxnSampledDataMaxLength

<b>Required/optional</b>	optional
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of items in a <a href="#">StopTxnSampledData</a> Configuration Key.

### 9.1.29. SupportedFeatureProfiles

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	CSL
<b>Description</b>	A list of supported <a href="#">Feature Profiles</a> . Possible profile identifiers: Core, FirmwareManagement, LocalAuthListManagement, Reservation, SmartCharging and RemoteTrigger.

### 9.1.30. SupportedFeatureProfilesMaxLength

<b>Required/optional</b>	optional
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of items in a <a href="#">SupportedFeatureProfiles</a> Configuration Key.

### 9.1.31. TransactionMessageAttempts

Required/optional	required
Accessibility	RW
Type	integer
Unit	times
Description	How often the Charge Point should try to submit a transaction-related message when the Central System fails to process it.

### 9.1.32. TransactionMessageRetryInterval

Required/optional	required
Accessibility	RW
Type	integer
Unit	seconds
Description	How long the Charge Point should wait before resubmitting a transaction-related message that the Central System failed to process.

### 9.1.33. UnlockConnectorOnEVSideDisconnect

Required/optional	required
Accessibility	RW
Type	boolean
Description	When set to <i>true</i> , the Charge Point SHALL unlock the cable on Charge Point side when the cable is unplugged at the EV.

### 9.1.34. WebSocketPingInterval

Required/optional	optional
Accessibility	RW
Type	integer
Unit	seconds

<b>Description</b>	Only relevant for websocket implementations. 0 disables client side websocket Ping/Pong. In this case there is either no ping/pong or the server initiates the ping and client responds with Pong. Positive values are interpreted as number of seconds between pings. Negative values are not allowed. ChangeConfiguration is expected to return a REJECTED result.
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## 9.2. Local Auth List Management Profile

### 9.2.1. LocalAuthListEnabled

<b>Required/optional</b>	required
<b>Accessibility</b>	RW
<b>Type</b>	boolean
<b>Description</b>	whether the <a href="#">Local Authorization List</a> is enabled

### 9.2.2. LocalAuthListMaxLength

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of identifications that can be stored in the <a href="#">Local Authorization List</a>

### 9.2.3. SendLocalListMaxLength

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of identifications that can be send in a single <a href="#">SendLocalList.req</a>

## 9.3. Reservation Profile

### 9.3.1. ReserveConnectorZeroSupported

<b>Required/optional</b>	optional
<b>Accessibility</b>	R
<b>Type</b>	boolean

<b>Description</b>	If this configuration key is present and set to <i>true</i> : Charge Point support <a href="#">reservations</a> on connector 0.
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## 9.4. Smart Charging Profile

### 9.4.1. ChargeProfileMaxStackLevel

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Max StackLevel of a ChargingProfile. The number defined also indicates the max allowed number of installed charging schedules per <a href="#">Charging Profile Purposes</a> .

### 9.4.2. ChargingScheduleAllowedChargingRateUnit

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	CSL
<b>Description</b>	A list of supported quantities for use in a <a href="#">ChargingSchedule</a> . Allowed values: 'Current' and 'Power'

### 9.4.3. ChargingScheduleMaxPeriods

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of periods that may be defined per <a href="#">ChargingSchedule</a> .

### 9.4.4. ConnectorSwitch3to1PhaseSupported

<b>Required/optional</b>	optional
<b>Accessibility</b>	R
<b>Type</b>	boolean
<b>Description</b>	If defined and true, this Charge Point support switching from 3 to 1 phase during a Transaction.

### 9.4.5. MaxChargingProfilesInstalled

<b>Required/optional</b>	required
<b>Accessibility</b>	R
<b>Type</b>	integer
<b>Description</b>	Maximum number of Charging profiles installed at a time



# Appendix A: New in OCPP 1.6

The following changes are made in OCPP 1.6 compared to OCPP 1.5 [OCPP1.5]:

- Smart Charging is added
- A binding to JSON over WebSocket as a transport protocol is added, reducing data usage and enabling OCPP communication through NAT routers, see: [OCPP JSON Specification](#)
- Extra statuses are added to the [ChargePointStatus](#) enumeration, giving the CPO and ultimately end-users more information about the current status of a Charge Point
- Structure of MeterValues.req is changed to eliminate use of XML Attributes, this is needed for support of JSON (no attribute support in JSON).
- Extra values are added to the [Measurand](#) enumeration, giving Charge Point manufacturers the possibility to send new information to a Central System, such as the State of Charge of an EV
- The [TriggerMessage](#) message is added, giving the Central System the possibility to request information from the Charge Point
- A new *Pending* member is added to the [RegistrationStatus](#) enumeration used in [BootNotification.conf](#)
- More and clearer configuration keys are added, making it clearer to the CPO how to configure the different business cases in a Charge Point
- The messages and configuration keys are split into profiles, making it easier to implement OCPP gradually or only in part
- Known ambiguities are removed (e.g. when to use [UnlockConnector.req](#), how to respond to [RemoteStart/Stop](#), Connector numbering)

## A.1. Updated/New Messages:

- [BootNotification.req](#)
  - Change `lcId` and `imsi` to `CiString[]` to enforce maximum lengths.
- [BootNotification.conf](#)
  - `heartbeatInterval` to `interval`, `interval` now also used for other purposes than heartbeat, need to fix in spec
  - Added status `Pending`
- [ChargePointErrorCode](#)
  - Added enum values: `InternalError`, `LocalListConflict` and `UnderVoltage`
  - Renamed enum value `Mode3Error` to `EVCommunicationError`
- [ChargePointStatus](#)
  - Replaced enum value `Occupied` with the more detailed values: `Preparing`, `Charging`, `SuspendedEVSE`, `SuspendedEV` and `Finishing`
- [ChargingRateUnitType](#)
  - New

- [ConfigurationStatus](#)
  - Added enum `RebootRequired`
- [ClearChargingProfile.req](#)
  - New
- [ClearChargingProfile.conf](#)
  - New
- [DiagnosticsStatus](#)
  - Added enum `Uploading` and `Idle`
- [FirmwareStatus](#)
  - Added enum `Downloading`, `Installing` and `Idle`
- [GetCompositeSchedule.req](#)
  - New
- [GetCompositeSchedule.conf](#)
  - New
- [Location](#)
  - Added enum `Cable` and `EV`
- [Measurand](#)
  - Added enum `Current.Offered`, `Frequency`, `Power.Factor`, `Power.Offered`, `RPM` and `SoC`
- [MeterValues.req](#)
  - overhaul of complex data structures
  - Added 'phase' field
- [ReadingContext](#)
  - Added enum `Trigger` and `Other`
- [RemoteStartTransaction.req](#)
  - Added [ChargingProfile](#) optional
- [SendLocalList.req](#)
  - removed hash
- [SendLocalList.conf](#)
  - removed hash
- [SetChargingProfile.req](#)
  - New
- [SetChargingProfile.conf](#)
  - New

- [StatusNotification.req](#)
  - Overhaul of states
  - New error codes
  - Connector id 0 can only have status: Available, Unavailable and Faulted.
- [StopTransaction.req](#)
  - added explicit and required stop reason
- [TriggerMessage.req](#)
  - New
- [TriggerMessage.conf](#)
  - New
- [UnlockConnector.conf](#)
  - overhaul of [UnlockStatus](#) enum
- [UnitOfMeasure](#)
  - Added Fahrenheit, K, Percent, VA, kVA
  - Rename Volt to V, Amp to A