

CCS ANALYZER

Anomaly Detection Snapshot

Over the past 6 months QualityLogic has obtained captured CCS charge session traffic from a wide variety of sources to aid in development of the QualityLogic CCS Analyzer. These Wireshark PCAP files contained a mixture of DIN and 15118-2 traffic with both EIM and PnC authentication from various pairings of over 30 EVs and EVSEs.

While a small number of the PCAP files were provided due to some known anomalous behavior, most capture sessions were random snapshots collected during various vendor and industry testing activities.

We thought it might be interesting to share a snapshot of the types of anomalies identified with CCS Analyzer in the PCAP files. Note that some of the anomalies reported were the result of intentional test scenarios and aborts of charging session during testing.

The Snapshot below shows the types of CCS Charging Session Anomalies that the QualityLogic CCS Analyzer has reported from PCAP files through December, 2023.

- ECCC ID - Unexpected EVCCID in SessionSetpReq
- EVSE ID - Invalid character in EVSEID
- Fault Code - FAILED_UnknownSession contains FaultCode: ParsingError
- Fault Code - -ParsingError Fault code in ChargeParameterDiscoveryRes
- Isolation - EVSE Isolation Error element is Invalid, expected Valid
- Message Elements - CableCheckRes EVSEStatusCode: EVSE_Ready (expected EVSE_IsolationMonitoringActive)
- Message Elements - CurrentDemandRes elements should be excluded: MeterID, MeterReading, TMeter
- Message Elements - CurrentDemandRes, ReceiptRequired elements should be excluded.
- Message Elements - EVSEEnergyToBeDelivered reports units of W rather than Wh
- Message Elements - Failed SupportedAppProtocolRes should exclude SchemalD element
- Message Elements - SchemalD should not appear in SupportedAppProtocolRes
- Message Elements - ServiceDiscoveryRes: ServiceID, ServiceName, ServiceCatagory, and FreeService elements should have been excluded.
- Pmax - CurrentdemandReq outside the available schedule charging intervals

- Pmax - PowerDeliveryReq ChargingProfileEntryStart: before allowed pmax schedule start
- Power - CurrentDemand requests more power than what is available:
- Response Code - CableCheckRes FAILED ResponseCode
- Response Code - CurrentDemandRes: FAILED_UnknownSession ResonseCode
- Response Code - Failed_NoNegotiation ResponseCode
- Response Code - PaymentDetailRes Response Code: FAILED_NoCertificateAvailable
- Response Code - PaymentDetailsRes FAILED ResponseCode
- Response Code - PowerDeliveryRes FAILED_WrongEnergyTransferType ResponseCode
- Response Code - PreChargeRes Response Code: FAILED_WrongChargeParameter
- Session ID - Unknown SessionID
- SLAC - Reused run id too many times
- SLAC - Sent a CM_MNBC_SOUND.IND with a different run id
- SLAC - Sent a CM_MNBC_SOUND.IND without decrementing sounds
- SLAC - Sent a CM_SLAC_MATCH.REQ prior to a CM_ATTEN_CHAR.RSP
- SLAC State Transitions - Validate the state transitions of the SLAC matching process
- State Error - ChargingStatusReq without corresponding response
- State Error - CurrentDemandReq without corresponding response
- State Error - Never transitioned past SessionSetupRes
- State Error - No supportedAppProtocolReq in traffic
- Timing - AuthorizationRes EVSEPPreProcessing status not marked Finished before 60 second timeout
- Timing - CableCheck exceeded 40 second timeout
- Timing - PrechargeRes timeout exceeded 7 seconds
- Welding - WeldingDetectionRes EVSEPresentVoltage outside min.max range

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