

Global V2C Design Guide

High Level API Design Guide

Fiat Chrysler Automobiles

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1 Purpose

The purpose of this document is to more clearly define the design requirements and principles for the implementation of the Global V2C API, for all standard MQTT API's in both the vehicle and back office.

1.1 Global V2C API Owner

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1.2 Revision notes

Date	Author	Description
-03- /06/2018	James Simon Steve Malson	Initial Draft

1.3 FCA RASIC

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2 Description

The FCA Uconnect Global API's define a standard data communication protocol for the Telematics Unit in the vehicle to interface with the cloud based Service Delivery Platform (SDP). The in-vehicle unit consists of either a Telematics Box Module (TBM) or Head Unit (HU), while the SDP can be hosted in any one of many cloud based infrastructures including Amazon Web Services (AWS).

The primary objective of this API is to create interoperability between the FCA regions including APAC, EMEA, LATAM, and NAFTA which with proper adoption will result in efficiency improvements and cost reductions as

platforms become more global. Additionally, the API will improve the FCA Connected Vehicle Platform design for performance, scalability, flexibility, security, maintainability, and cost effectiveness.

The API is based on industry best-practices for the Internet of Things (IoT) including the use of the secure MQTT and HTTP communication protocols. The need to minimize costly wireless network traffic has also lead to the use of Protocol Buffers for efficiently formatting the data into messages between the client (TBM or HU) and the services (SDP).Scope

2.1 Out of Scope

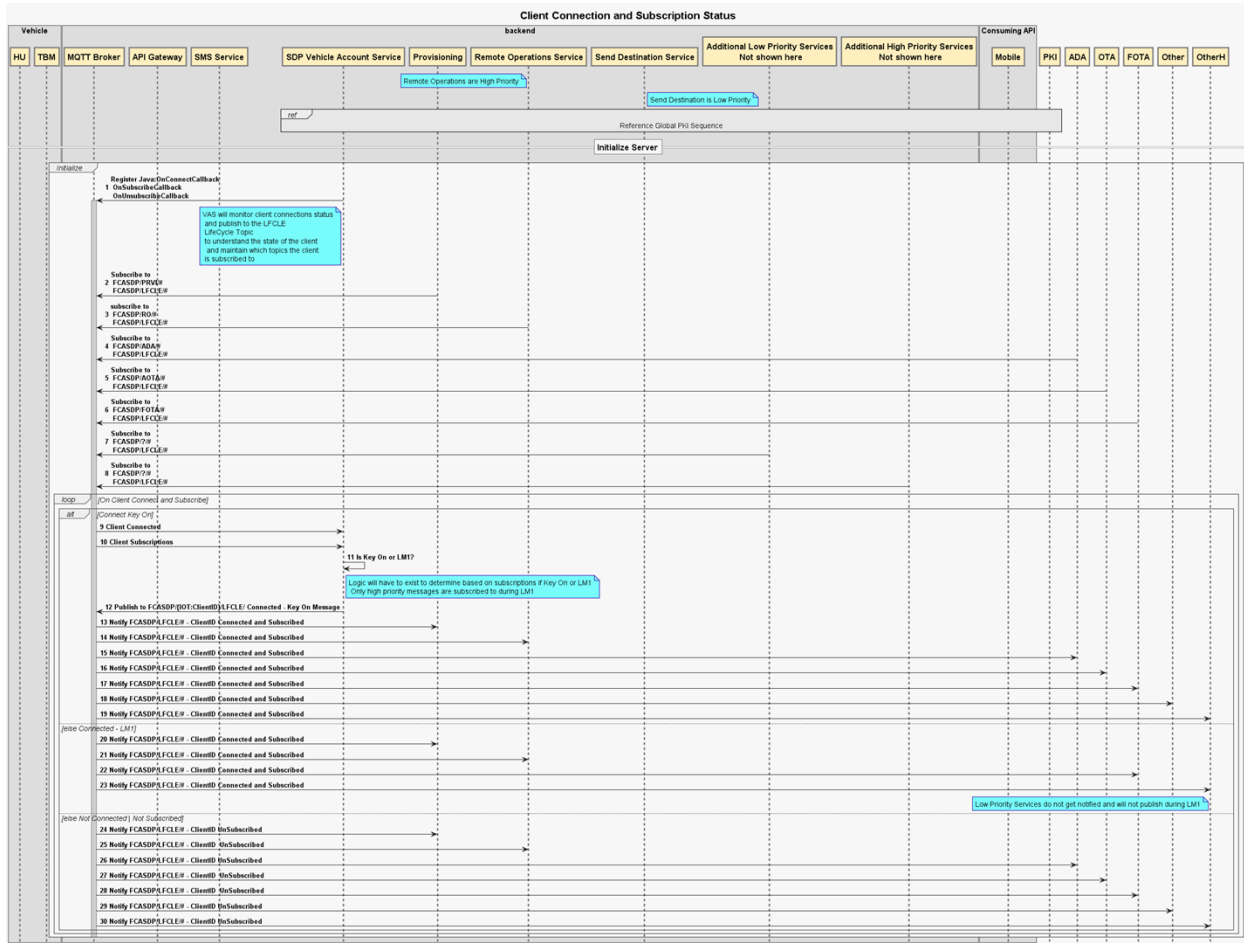
HTTP Restful services for content delivery such as FOTA, MOTA, IVH.

3 Use Case Sequence Diagrams

3.1 Client and Subscription Status

3.1.1 Prerequisites

- TU Feeds
- Vehicle Factory Feeds
- PKI Certificate Process Complete
- Server Initializtion



[Correlates to content from the FFS]

[Shoud include the various vehicle power modes the use case should work in]

3.1.2 Use Case Sequence Description (Repeated Per Use Case)

Sequence No	Protocol	Topic	Operation/Object name	Description
1	Java		OnConnectCallBack OnSubscribeCallBack OnUnSubscribeCallBack	VAS registers to monitor client connections status and publish to the LFCLE LifeCycle Topic to understand the state of the client and maintain which topics the client is subscribed to activate broker
2 -8	MQTT	FCASDP/{ServiceTopic}/# FCASDP/LFCLE/#	Subscribe	Each microservice subscribes to the topic(s) relevant to it's operations and the Client Lifecycle topic
9	Java	N/A	OnConnectCallBack	The client is connected and the VAS is informed via the call back

10	Java	N/A	OnSubscribeCallBack	The connected client subscribes to all topics
11	N/A	N/A	Determine Veh State	Infers vehicle state by requested topics
12	MQTT	FCASDP/{IOT: ClientID}/LFCLE/#	Publish LifeCycle Message Connection and Subscriptions	Publishes to LFCLE topic the client connection and subscription information. This is read by the other services
13-23	MQTT	FCASDP/LFCLE/{TopicName}	Notify client is connected and subscribed	Each microservice is notified about the client connection and subscription status For Key On, all services are subscribed to. For LM1 – only High Priority services are subscribed to.
24-30	MQTT	FCASDP/LFCLE/{TopicName}	Notify when a client disconnects or unsubscribes	Each microservice is notified about the client connections and subscription status, when the client unsubscribes. i.e. moving from Key On to LM1

3.1.3 Exit Conditions

This sequence is complete when the backend microservices are updated with latest information about client connection and subscription status. This information should be maintained in a record store or db for fast lookup.

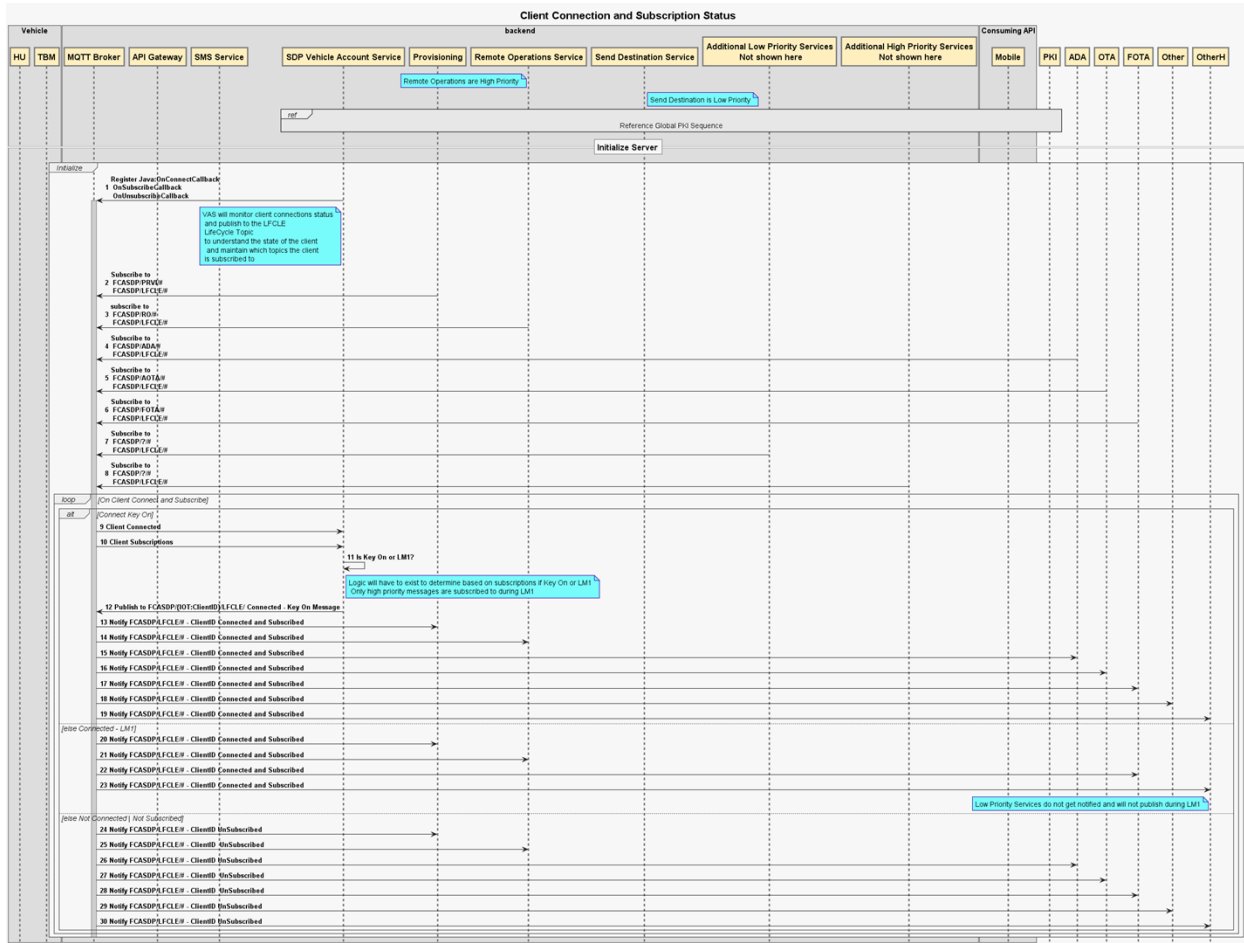
3.1.4 Error Handling and Recovery

TBD

3.2 High Priority Messages

3.2.1 Prerequisites

- Server Initialization
- Client Connection and Subscription Status Flow
- User Enrollment and Subscription Activation
-



[Correlates to content from the FFS]

[Should include the various vehicle power modes the use case should work in]

3.2.2 Use Case Sequence Description (Repeated Per Use Case)

Sequence No	Protocol	Topic	Operation/Object name	Description
1	Java		OnConnectCallBack OnSubscribeCallBack OnUnSubscribeCallBack	VAS registers to monitor client connections status and publish to the LFCLE LifeCycle Topic to understand the state of the client and maintain which topics the client is subscribed to activate broker
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3.2.3 Exit Conditions

This sequence is complete when the backend microservices are updated with latest information about client connection and subscription status. This information should be maintained in a record store or db for fast lookup.

3.2.4 Error Handling and Recovery

TBD