SCIoT Project Proposal

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Tyre Pressure Detection

Application Goal

The application allows to monitor the pressure of a car's tyre, in order to alert the driver in case a tyre puncture occurs or only to report low tyre pressure.

Scenario

The system elaborates data recorded by a simulated sensor and sends back to the console a specific message, which will be:

1. "**Low tyre pressure registered!**": if the recorded pressure is slightly lower than the standard one;
2. "**Warning, possible tyre puncture!**": if the sensor records a continuous drop in pressure during a small period of time.
   Note: we will suppose to record **5 tyre pressure decreasing values** in a period of time of **1 minute**.

Architecture

The system is composed by several functions:

Simulate Low Tyre Pressure: it simulates a **drop** in tyre pressure by sending a message to topic "iot/tyre/pressure" with a pressure value **lower** than the standard one.

Simulate Tyre Puncture: it simulates a **puncture** by sending **5 decreasing pressure messages** to topic "iot/tyre/pressure".
Note: each of these 5 pressure value is lower than the one recorded before, and always lower than the standard value one.

Restore Tyre Pressure: it simulates the act of **inflating** the tyre by sending a message to topic "iot/tyre/pressure" with a pressure value **greater or equals** than the standard one.

Consume Tyre Pressure: it is triggered by an incoming message on the topic "iot/tyre/pressure", and **insert** into a Relational Database a record composed by the **pressure value** and the associated **timestamp**.

Interpreter: a function which **retrieves** the **last 5 records** from Database and **interprets** the **data**:

1. if timestamps **fit** into a period of time of **1 minute**, and the pressure values are **sorted** in **decreasing order**, then the function will send a message to topic "iot/console" reporting the following message: "**Warning, possible tyre puncture!**";
2. if timestamps **don't fit** into a period of time of **1 minute**, or **only** the **last pressure value** is **lower** than the standard one, then the function will send a message to topic "iot/console" reporting the following message: "**Low tyre pressure registered!**";
3. if the **last pressure value** is **greater** or **equals** to the **standard one**, while the second-last pressure value is lower than the standard one, the function will send a message to topic "iot/console" reporting: "**Tyre pressure restored!**".

Logger: it logs the incoming message on topic "iot/console".

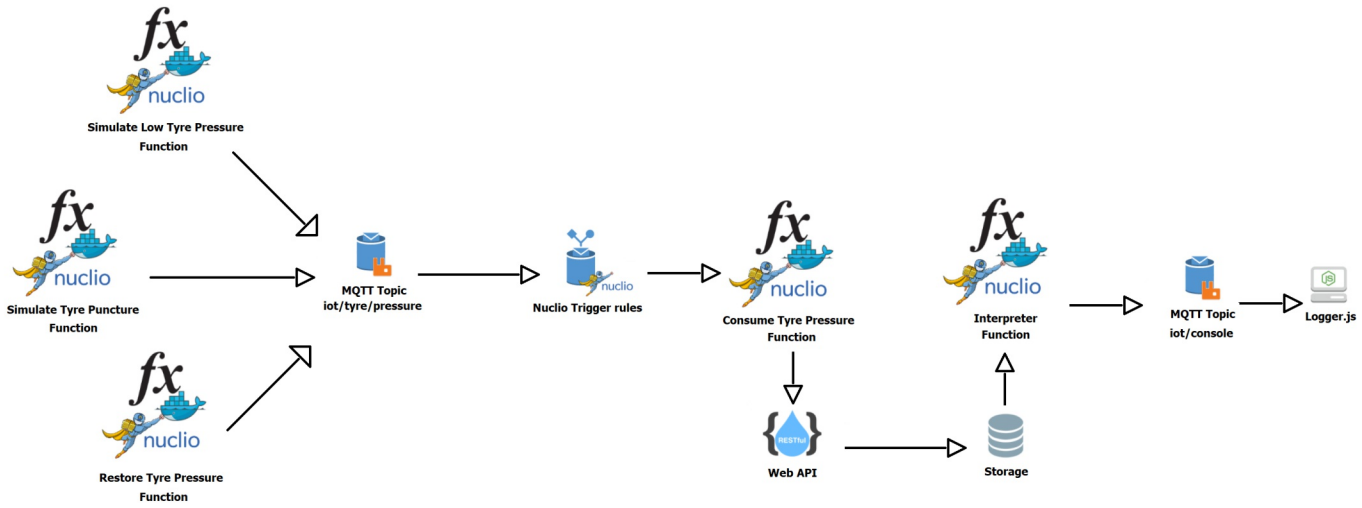

Figure 1: System Architecture.