Task Name: PCAN Basic API Installation on Raspberry Pi

Brief: This task involves installing and configuring the PCAN Basic API on a Raspberry Pi to enable seamless communication with CAN open devices. The PCAN API will facilitate real-time message transmission and reception, ensuring reliable integration with defence system operations. The goal is to establish a stable CAN communication interface on Raspberry Pi, allowing further development of CAN-based applications.

Infrastructure Requirements:

1. Compatible Raspberry Pi Board

* Ensure Raspberry Pi hardware supports CAN communication via external PCAN adapters.

2. PCAN Adapter and Drivers

* Install necessary drivers to enable communication between Raspberry Pi and PCAN hardware.

3.Linux Kernel Support for CAN

* Verify and enable CAN support in the Raspberry Pi OS kernel.

4.PCAN-Basic API Installation

* Download and install the PCAN-Basic API from PEAK-System.
* Ensure compatibility with Raspberry Pi OS and Python/C++ development environments.

Configuration and Housekeeping Requirements:

1. Library Installation & Setup

* Install dependencies for integrating PCAN Basic API with Raspberry Pi.
* Configure system paths and permissions for CAN communication.

2. CAN Interface Initialization

* Enable and configure the CAN interface using PCAN tools.
* Ensure proper baud rate for seamless communication.

3.Logging & Debugging

* Maintain logs of CAN communication for troubleshooting.
* Implement error handling to detect failed connections and message loss.

Functional Use Case Requirements:

### 1. **API Installation & Verification**

* **User Action:** Execute installation commands to set up PCAN Basic API.
* **System Response:** Confirms successful installation and library availability.

### **2. CAN Interface Initialization**

* **User Action:** Run initialization commands to activate the CAN bus.
* **System Response:** Enables CAN interface and confirms status.

### 3. **Testing CAN Communication**

* **User Action:** Send and receive test messages via the PCAN adapter.
* **System Response:** Displays transmitted and received CAN messages.