THE UNIVERSITY OF TEXAS AT EL PASO

CAN Bus Visualizer System

Team 4 - Tech Cats

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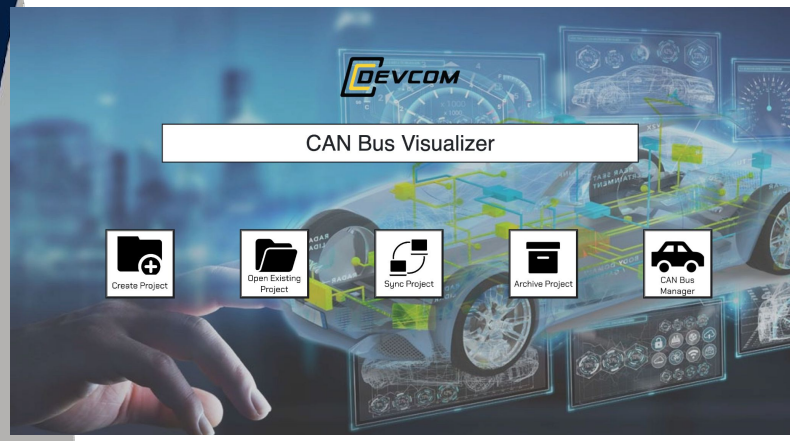
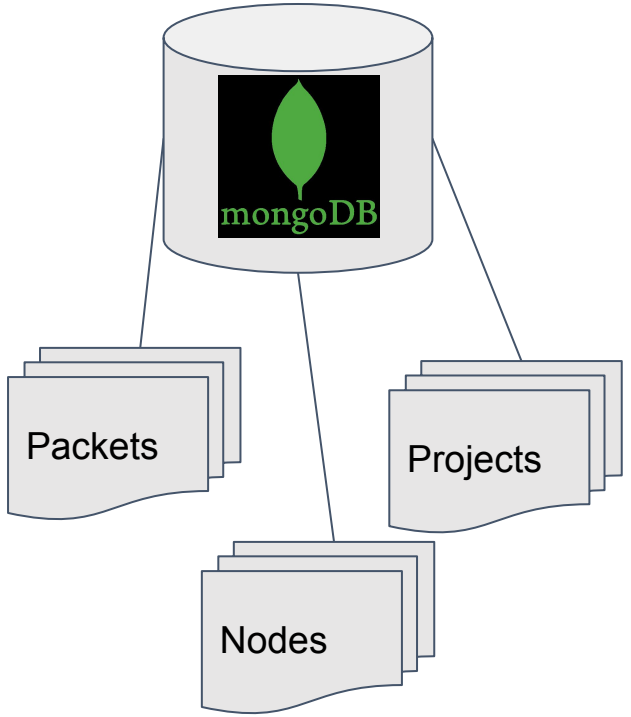
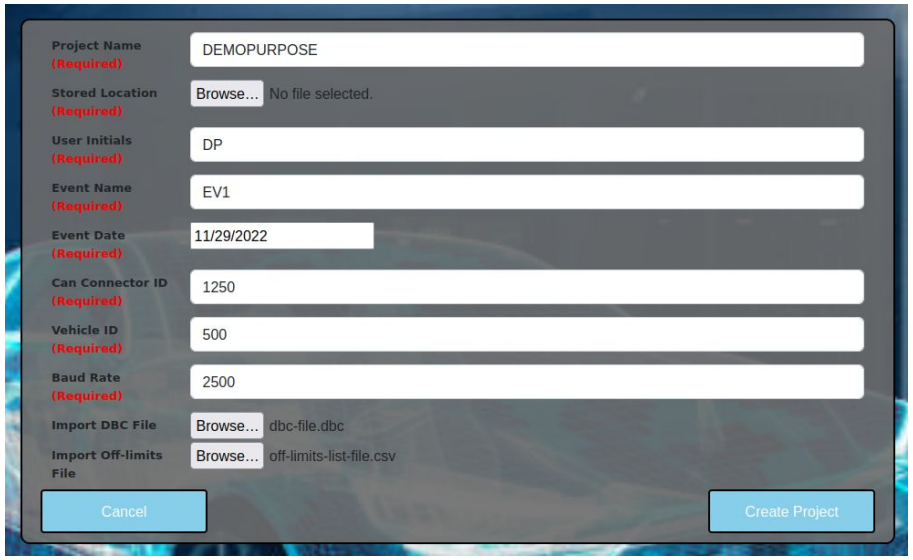
GUI, Database Integration, Project Configuration Page, Open Existing Project

- React - Javascript library for UI based on components for an interactive and efficient web application. (Pages, Forms, Navigation bar and Buttons)
- React-Bootstrap - CSS framework to style React components.
- React Flow - a react library for node based diagrams. (CAN Map)



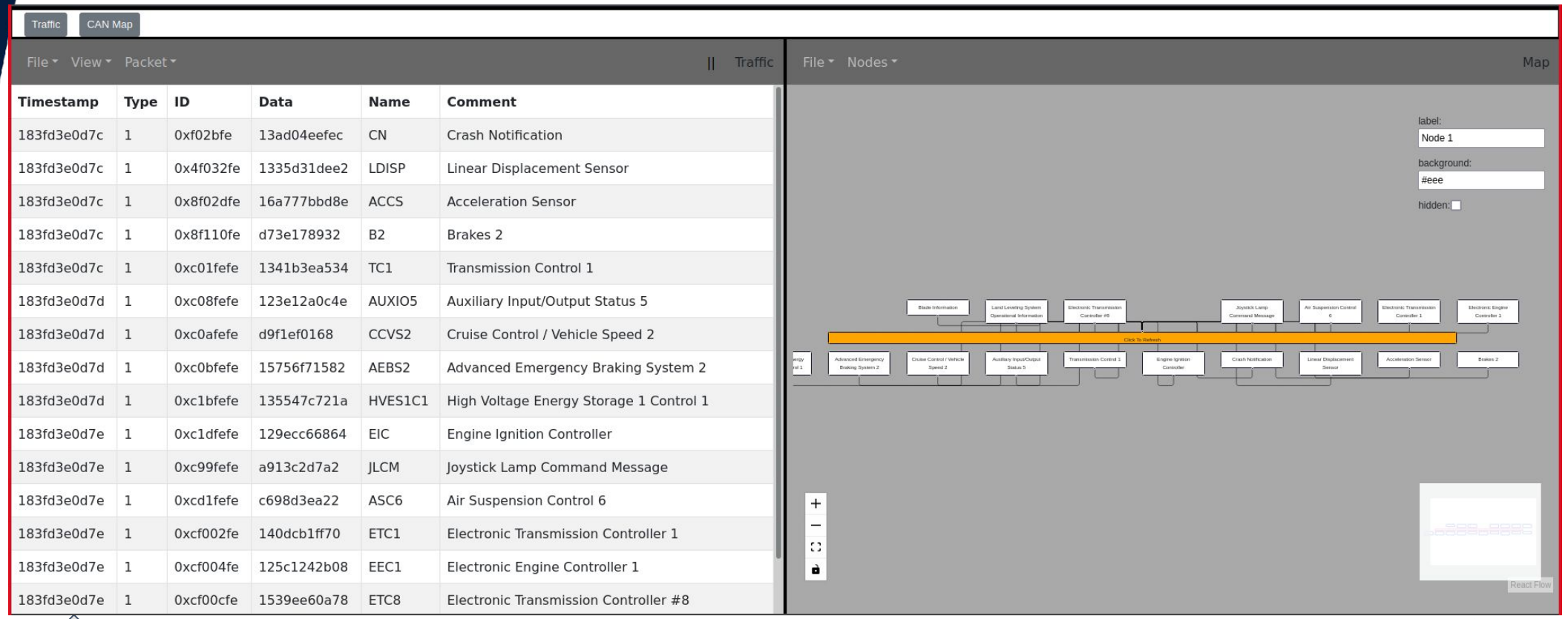


- Python Flask (POST and GET)
- Javascript (POST and GET)



- React to generate UI, receive User Input, and post to backend.
- Python Flask to receive requests from User Input and Post to MongoDB.

Packet Reader Functionality



Timestamp	Type	ID	Data	Name	Comment
183fd3e0d7c	1	0xf02bfe	13ad04eefec	CN	Crash Notification
183fd3e0d7c	1	0x4f032fe	1335d31dee2	LDISP	Linear Displacement Sensor
183fd3e0d7c	1	0x8f02dfe	16a777bbd8e	ACCS	Acceleration Sensor
183fd3e0d7c	1	0x8f110fe	d73e178932	B2	Brakes 2
183fd3e0d7c	1	0xc01fefe	1341b3ea534	TC1	Transmission Control 1
183fd3e0d7d	1	0xc08fefe	123e12a0c4e	AUXIO5	Auxiliary Input/Output Status 5
183fd3e0d7d	1	0xc0afefe	d9f1ef0168	CCVS2	Cruise Control / Vehicle Speed 2
183fd3e0d7d	1	0xc0bfefe	15756f71582	AEBS2	Advanced Emergency Braking System 2
183fd3e0d7d	1	0xc1bfefe	135547c721a	HVES1C1	High Voltage Energy Storage 1 Control 1
183fd3e0d7e	1	0xc1dfefe	129ecc66864	EIC	Engine Ignition Controller
183fd3e0d7e	1	0xc99fefe	a913c2d7a2	JLCM	Joystick Lamp Command Message
183fd3e0d7e	1	0xcd1fefe	c698d3ea22	ASC6	Air Suspension Control 6
183fd3e0d7e	1	0xcf002fe	140dcb1ff70	ETC1	Electronic Transmission Controller 1
183fd3e0d7e	1	0xcf004fe	125c1242b08	EEC1	Electronic Engine Controller 1
183fd3e0d7e	1	0xcf00cfe	1539ee60a78	ETC8	Electronic Transmission Controller #8

Packets being read via our own simulation.

Dummy test data with a DBC file in decoding packet information and decoded information.

Nodes are being populated with Decoded Information as live traffic flows.

Nodes do not update automatically.

Visualization Functionality

Supported Features

- Ability to Drag Nodes to desired position
- Ability to Export the CAN Bus Map via PNG
- Ability to Export CAN Bus Nodes via CSV, JSON, or XML
- Ability to Export Packets via CSV
- Ability to Export Off-limits List (OLL) via CSV
- Ability to Pause and Play Traffic
- Ability to View Off-Limits List

Features In Development

- Replaying Packets (No Real Hardware or CAN Bus Used)
- Modify Off-Limits (Adding and Removing in the works)
- Edit Packets (No Real Hardware or CAN Bus used)
- Sorting & Filtering Table (UI and Backend not connected)

Sync Functionality (Setup)

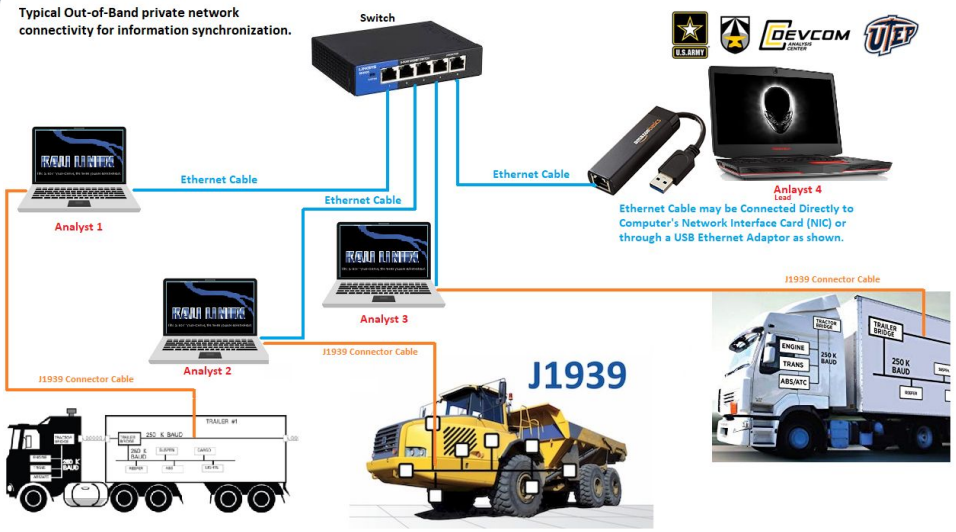


Figure 1. Ideal Setup

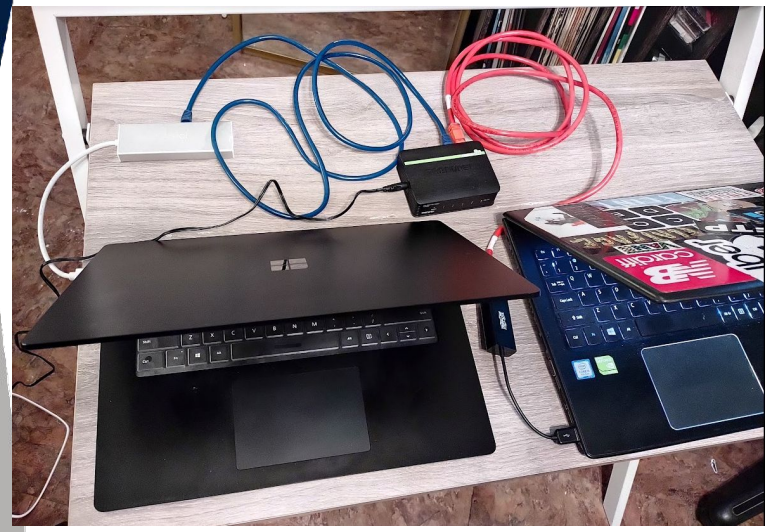


Figure 2. Emulated Setup

VMWare Settings (BOTH MACHINES)

- **Dongles routed to Kali**
- **VMWare Setting > Network adapter > Custom > Host Only**

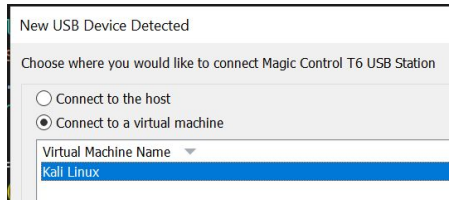


Figure 3. VMWare USB Prompt

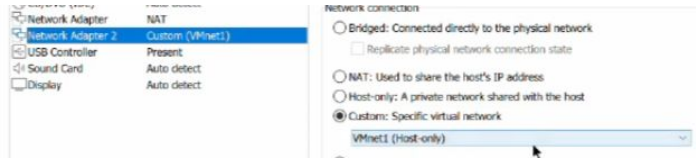


Figure 4. VMWare Network Connection

Kali Network Settings (BOTH MACHINES)

- **Right click connection > Create new "Ethernet" connection > Modify "Ethernet" (shown below) > Modify "IPv4 Settings" (shown below)**

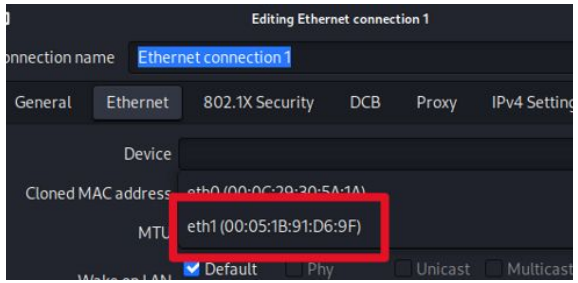


Figure 5. Ethernet settings

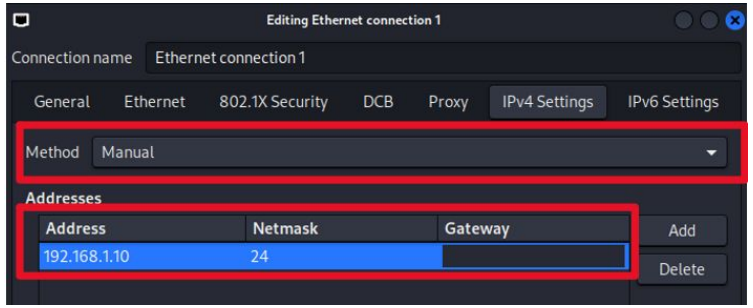


Figure 6. IPv4 settings

Sync Functionality

Sync Prerequisites

- **Both machines must have surpassed “fingerprint” verification**

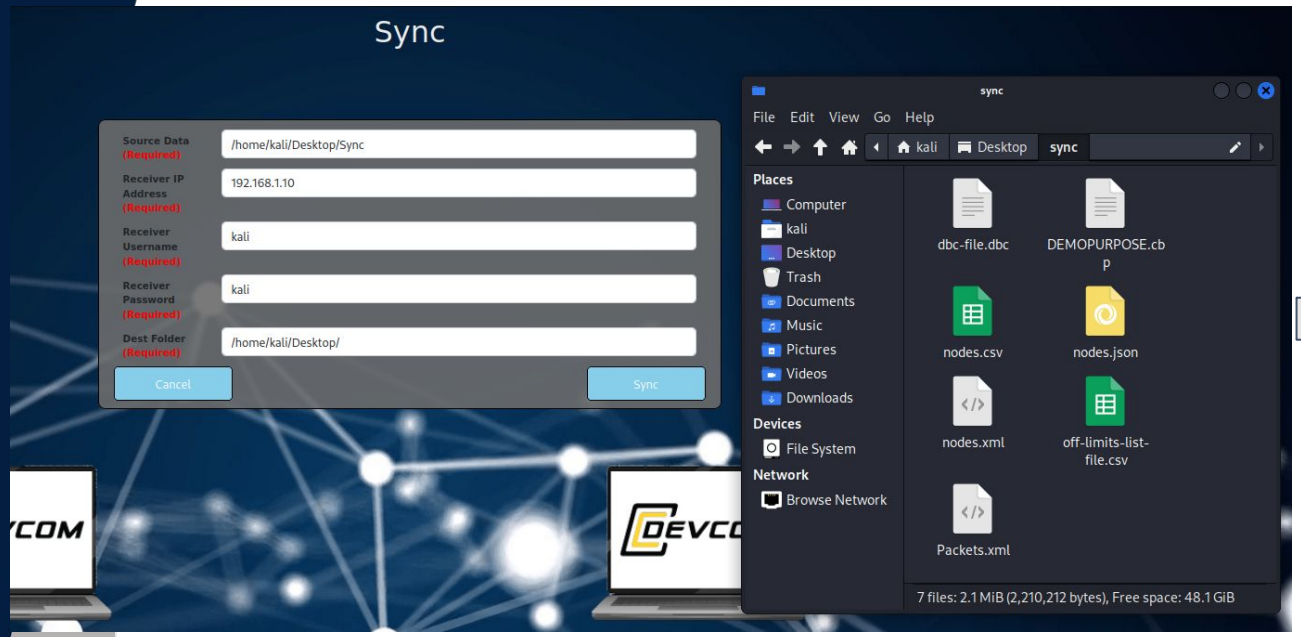


Figure 1: Sender view

Sync

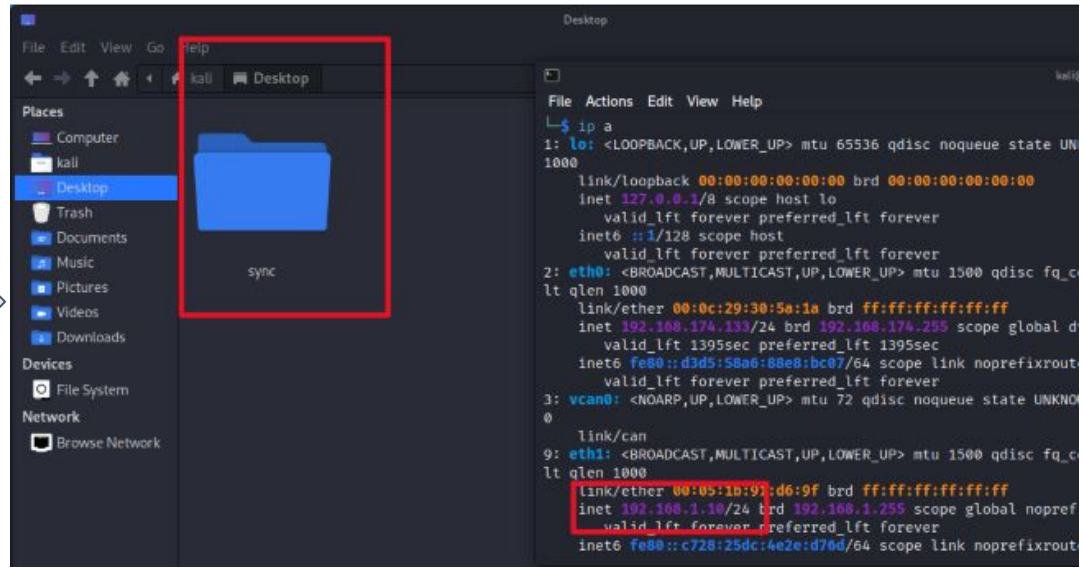


Figure 2. Receiving View

Export Functionality

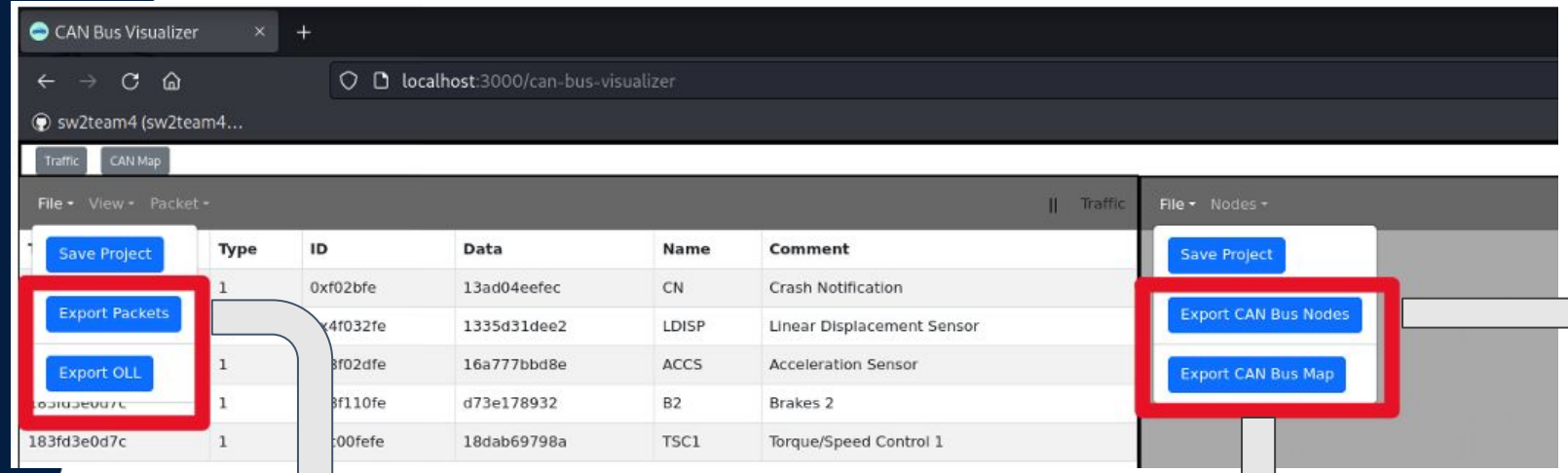


Figure 1. CAN Bus Visualizer file tabs expanded

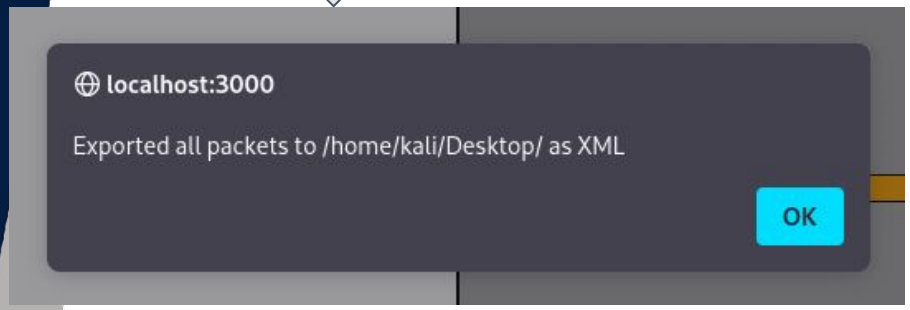


Figure 2. Export packets popup

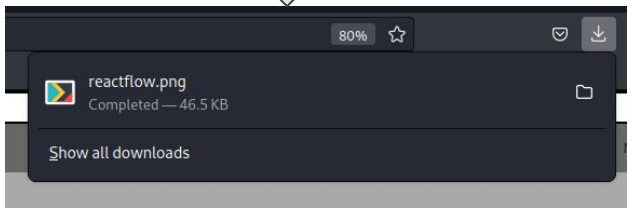


Figure 3. Export map popup

Figure 4. Export nodes prompt

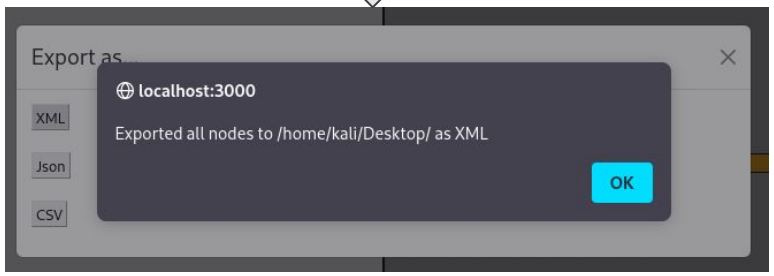


Figure 5. Export nodes completed popup

- **Packets** > Saved to *Desktop* as XML
- **Off Limits List (OLL)** > Saved to *Desktop* as CSV
- **Nodes** > Saved to *Desktop* as specified format
- **CAN Bus Map** > Saved to *Downloads* as PNG

Unsupported Functionalities & Explanations

- **Reading Network Traffic**
- Auto Recovery
- Archive Management
- Can Bus Manager

References

[1] 4310 Class - Spring 2022 - Guidance Team., “CAN Bus Visualizer Software Requirements Specification”, The University of Texas at El Paso, Version 1.29, Dec. 2022.