CDL Project Status Update

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Seung-Hyun Yun

Senior Research Engineer, IVIS

CDL Project Status Overview

CDL Project Status Overview

- Registered as P2-PC in Miranda release (11.0)
- CDL concept demo is integrated into GDP12

- Focusing on implementing proof of concept for AC

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CDL Project Status Overview

Integrate CDL Into GDP12

- CDL concept demo code is integrated into GDP12

- Source code is available :
  - https://github.com/GENIVI/car-data-logger/tree/proof-of-concept

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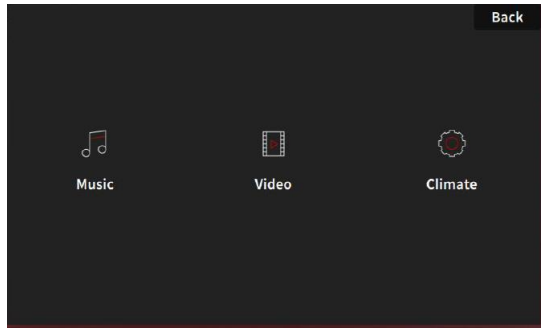
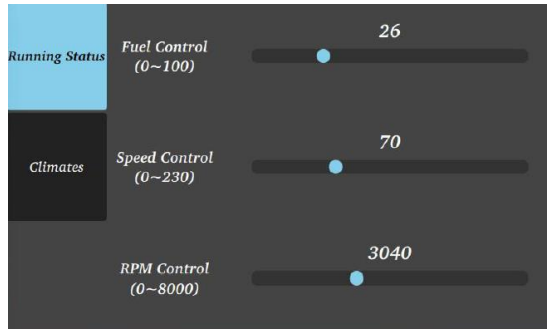
Integrate CDL Into GDP12

- CDL concept demo is designed to run on 3 GDP devices



AV Unit

CDL / Cluster Unit



Vehicle Data Generator Unit

- It is available run with:
  - Desktop (X86, All units together)
  - 2 GDP devices (CDL/Cluster, AV) + Desktop (Vehicle Data Generator)

Details of PoC Implementation

Goal

- Is to integrate as many GENIVI components as possible into CDL

- PoC of CDL is implemented using:
  - Vehicle Simulator
  - VSS / VSI
  - RVI_Core
  - CommonAPI DBus/SomeIP

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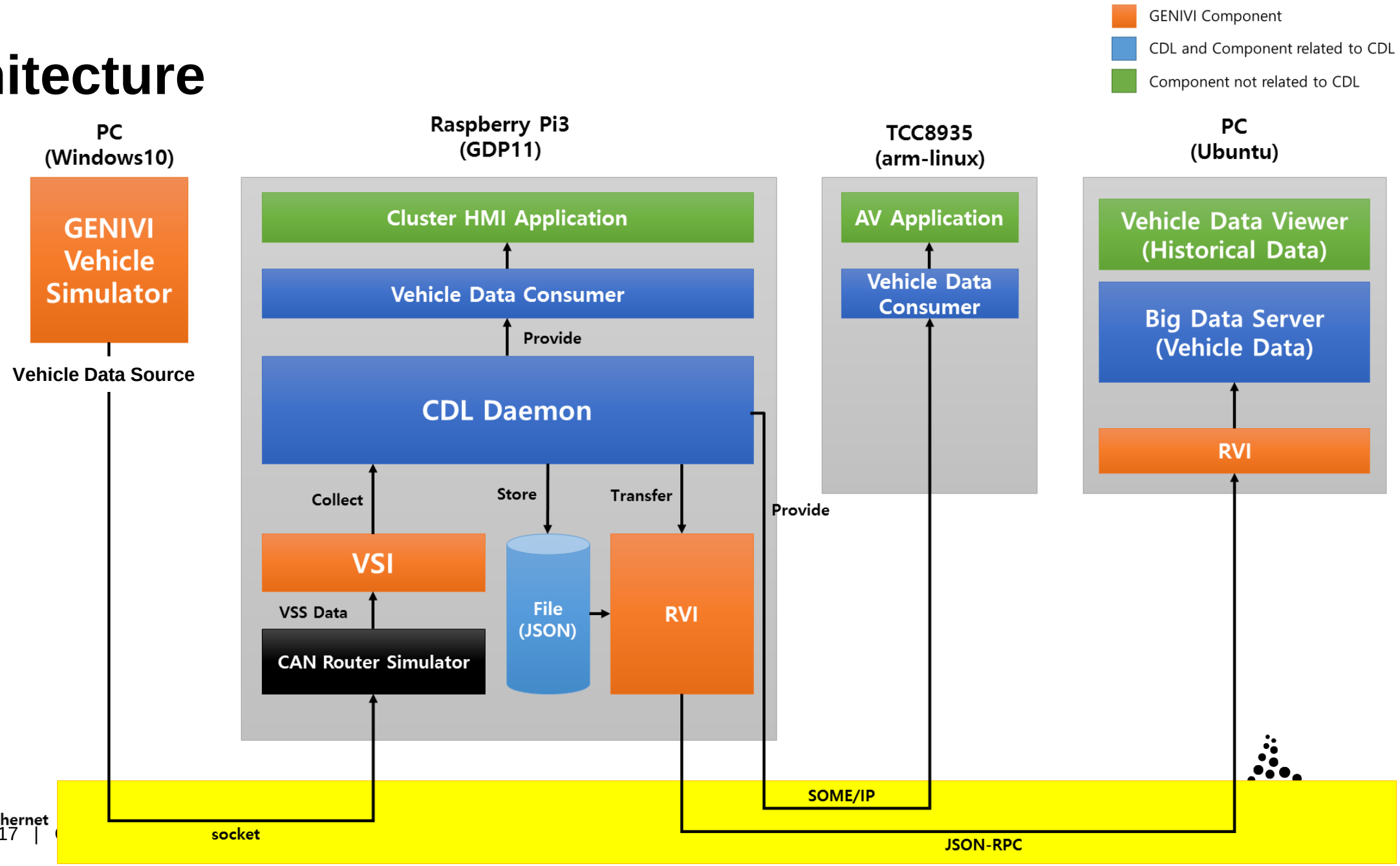
Architecture



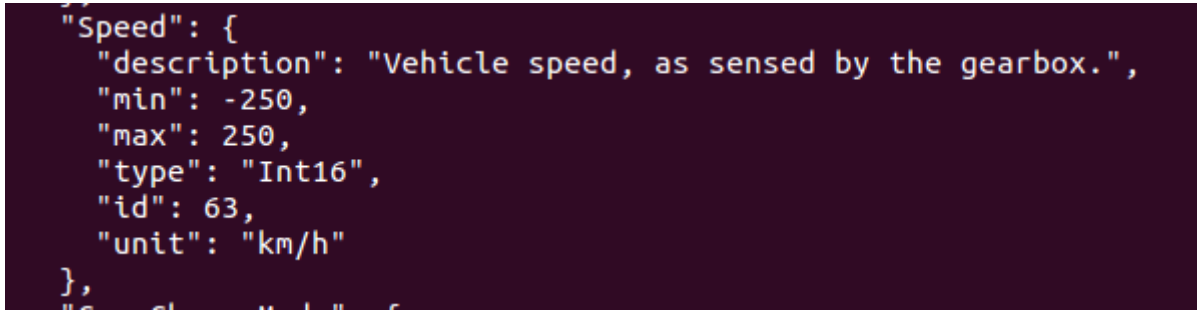
GENIVI Vehicle Simulator

- Vehicle Simulator as a vehicle data source

- Data Example
  - "EMSSetSpeed, 0.0000, 29.36198\n**EngineSpeed, 800.0001**, 29.36198\nGearPosActual, 1.00, 29.36198\nGearPosTarget, 1.00, 29.36198\nAcceleratorPedalPos, 0.0000, 29.36198\nDeceleratorPedalPos, 0.0000, 29.36198\nRollRate, 0.0693, 29.36198\nSteeringWheelAngle, 0.0000, 29.36198\n**VehicleSpeed, 0.0038**, 29.36198\nVehicleSpeedOverGnd, 0.0038, 29.36198\nWheelSpeedFrL, 12.9269, 29.36198\nWheelSpeedFrR, 11.8869, 29.36198\nWheelSpeedReL, -1.4984, 29.36198\nWheelSpeedReR, -2.5402, 29.36198\nYawRate, 0.0014, 29.36198\n"

VSS (Vehicle Signal Specification)

- Specifies vehicle signals



- CDL daemon collects vehicle data and validates collected data referring VSS information (min/max value ranges)

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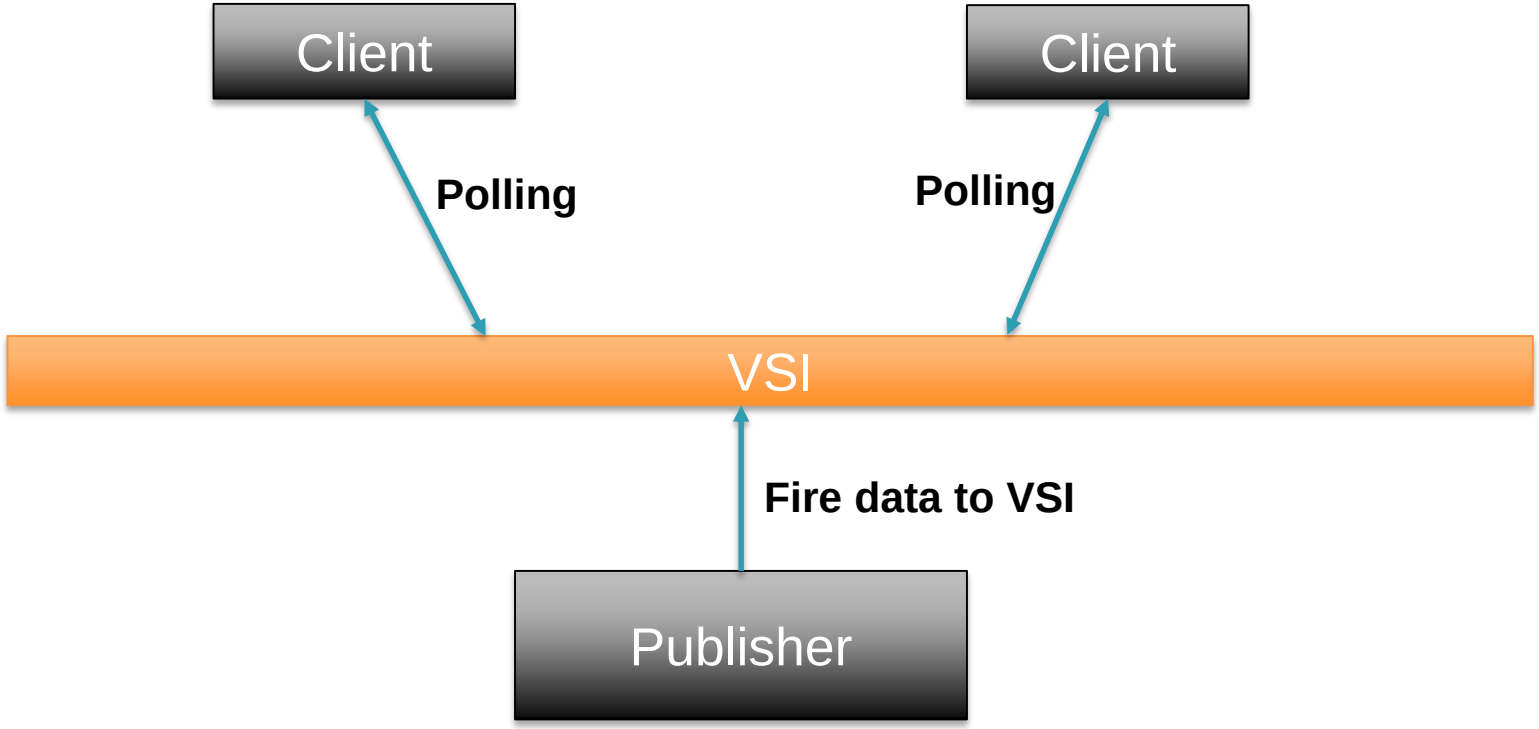
VSI (Vehicle Signal Interface)

- Framework for data sharing using shared memory



Configuration File for Data Collection

- Specify data collection cycle or by event

```
{
    "Cycle":
    {
        "200":
        [
            "Signal.Drivetrain.Transmission.Speed"
        ],
        "100":
        [
            "Signal.Drivetrain.InternalCombustionEngine.RPM"
        ]
    },
    "Event":
    [
        "Signal.Cabin.HVAC.IsAirConditioningActive",
        "Signal.Cabin.HVAC.Row1.Recirculation",
        "Signal.Cabin.HVAC.IsFrontDefrosterActive",
        "Signal.Cabin.HVAC.Row1.LeftTemperature",
        "Signal.Cabin.HVAC.Row1.RightTemperature",
        "Signal.Cabin.HVAC.IsDualModeActive",
        "Signal.Cabin.HVAC.Row1.AirDistribution",
        "Signal.Cabin.HVAC.Row1.FanSpeed"
    ]
}
```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Store Data to File

- It can be stored various format
- For this PoC, because of ease of debugging, stores collected data to JSON format

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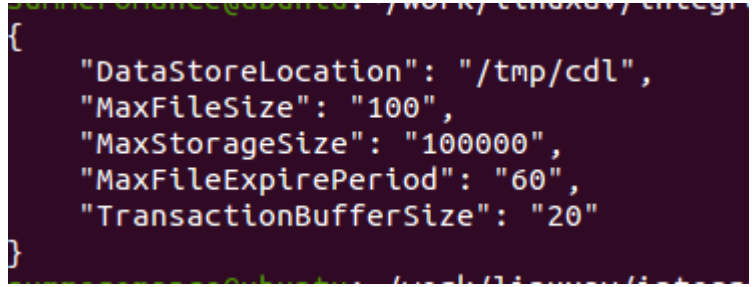
Configuration File for Data Store

- Data store location
- Maximum file size
- Storage usage size
- Storage management period
- Transaction size



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Provide Data to On-board Components

- Component that wants to use vehicle data can receive desired data using CDL Client API
- CDL provides vehicle data through DBus or SOME/IP using CommonAPI
- The client can register the data that it wants to receive so that it can receive data when the value is updated or changed.

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CDL Client API (FIDL)

```
<**
    @description : register and authenticate client
**>
method registerClient {
    in {
        <**
            @description : key for authentication. key could be private ssh key, password, ...
        **>
        String key
    }
    out {
        <**
            @description : handle for client. the value of handle is 0, when registration and authentication failed
        **>
        ClientAPITypes.Handle handle

        <**
            @description : registration result authentication
        **>
        ClientAPITypes.ResultCode result
    }
}
```


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CDL Client API (FIDL)

```
<**
    @description : set id list for listen. only specified data will notified to client
**>
method setListenData {
    in {
        <**
            @description : handle obtained when registering client
        **>
        ClientAPITypes.Handle handle

        <**
            @description : signal name list to listen
        **>
        String [] signalNameList

        <**
            @description : updated = notify data when data is updated.
                           changed = notify data when data is changed only
        **>
        ClientAPITypes.NotifyType type
    }
    out {
        <**
            @description : result for request
        **>
        ClientAPITypes.ResultCode result
    }
}
```


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CDL Client API (FIDL)

```
<**
    @description : get single data instantly
**>
method getData {
    in {
        <**
            @description : handle obtained when registering client
        **>
        ClientAPITypes.Handle handle

        <**
            @description : name of data
        **>
        String signalName
    }
    out {
        <**
            @description : result of request
                           data will be notified to client via broadcasting
        **>
        ClientAPITypes.ResultCode result
    }
}
```


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CDL Client API (FIDL)

```
<**
    @description : notify data to client
**>
broadcast notifyData selective {
    out {
        <**
            @description : name of data
        **>
        String signalName

        <**
            @description : type of data
        **>
        ClientAPITypes.Types type

        <**
            @description : unit of data
        **>
        String unit

        <**
            @description : value of data
        **>
        ClientAPITypes.CDLValue value

        <**
            @description : timestamp of data
        **>
        UInt64 timeStamp
    }
}
```


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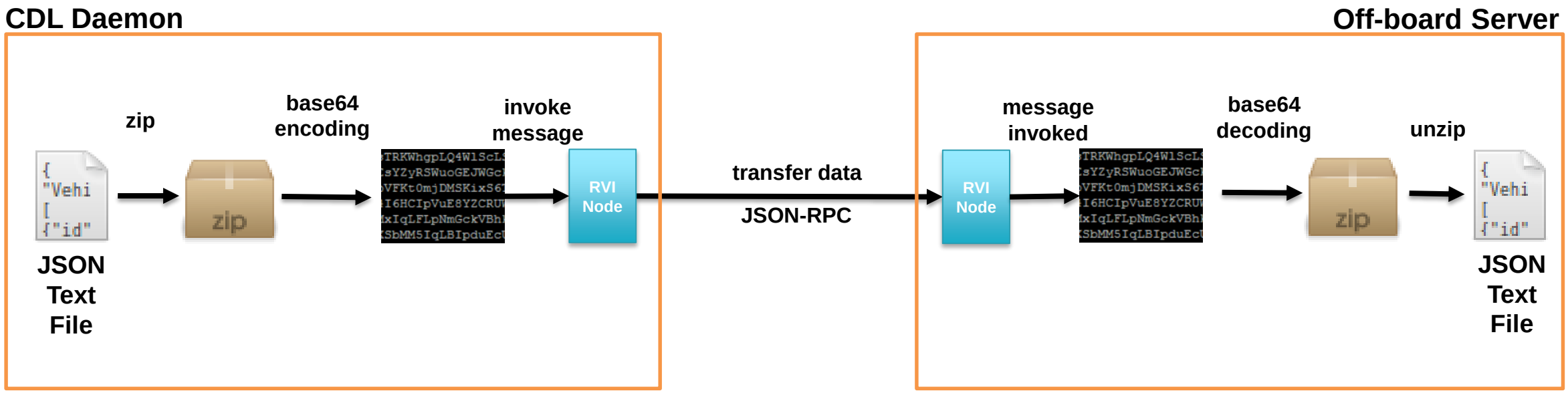
Provide Data to Off-board Server

- Using RVI_Core, transfers stored data to off-board server



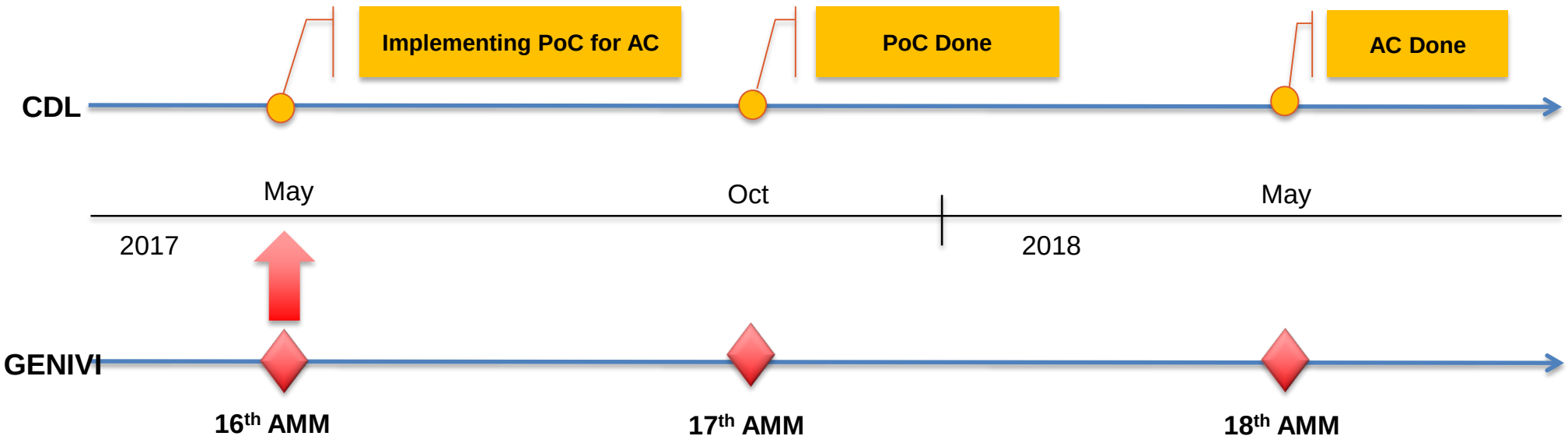
Further Implementation

To complete PoC for AC

- Collect event data using VSI
- Regular expression on data collect configuration
- Client authentication of CDL Client API
- Transfer data using RVI_Lib (written in C)
- Data encryption
- Improve performance

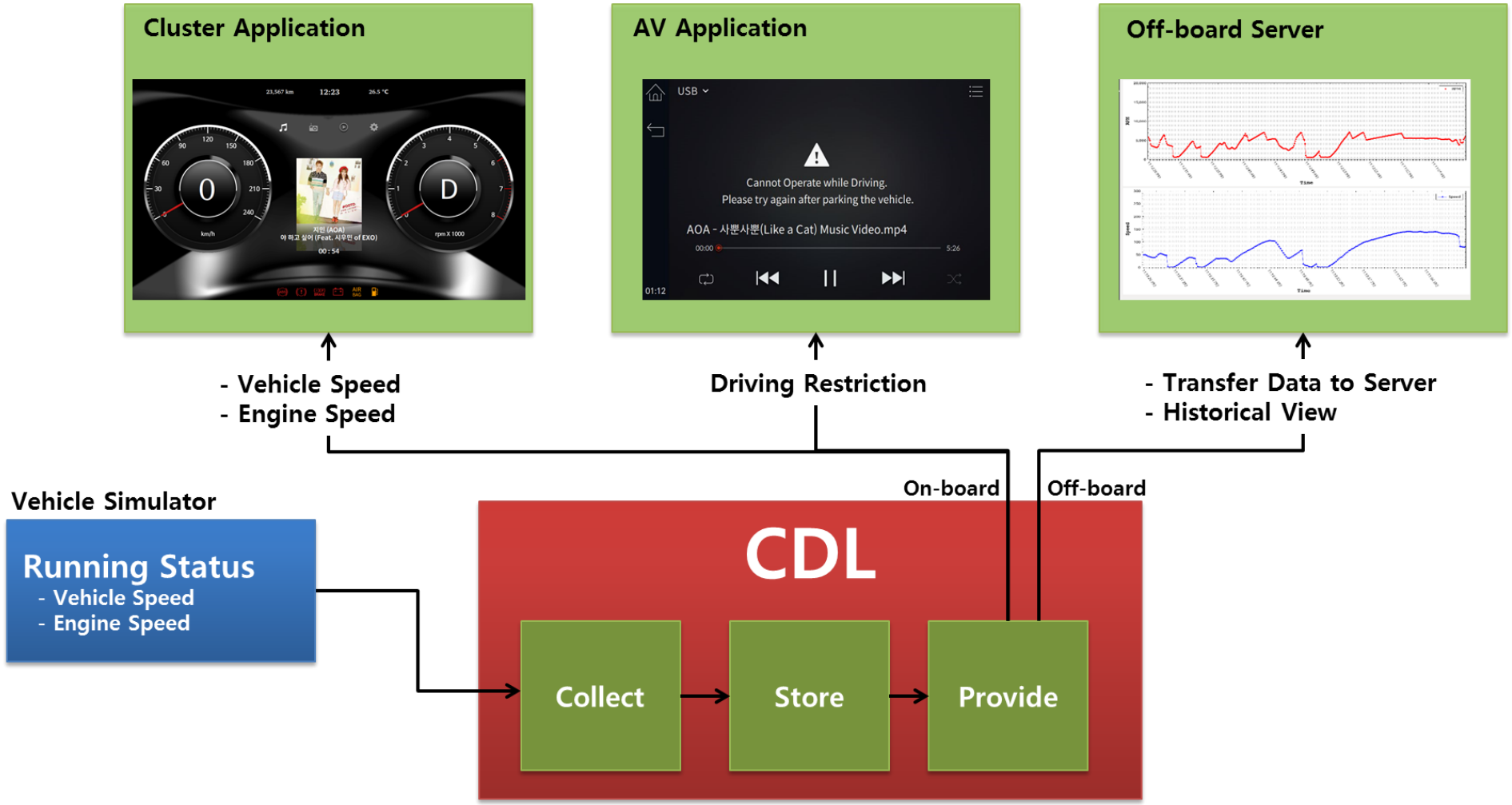
Roadmap

CDL Project Roadmap



CDL Showcase for 2017 Spring AMM

Use Cases



Thank you!

Visit GENIVI at http://www.genivi.org or http://projects.genivi.org

Contact us: help@genivi.org