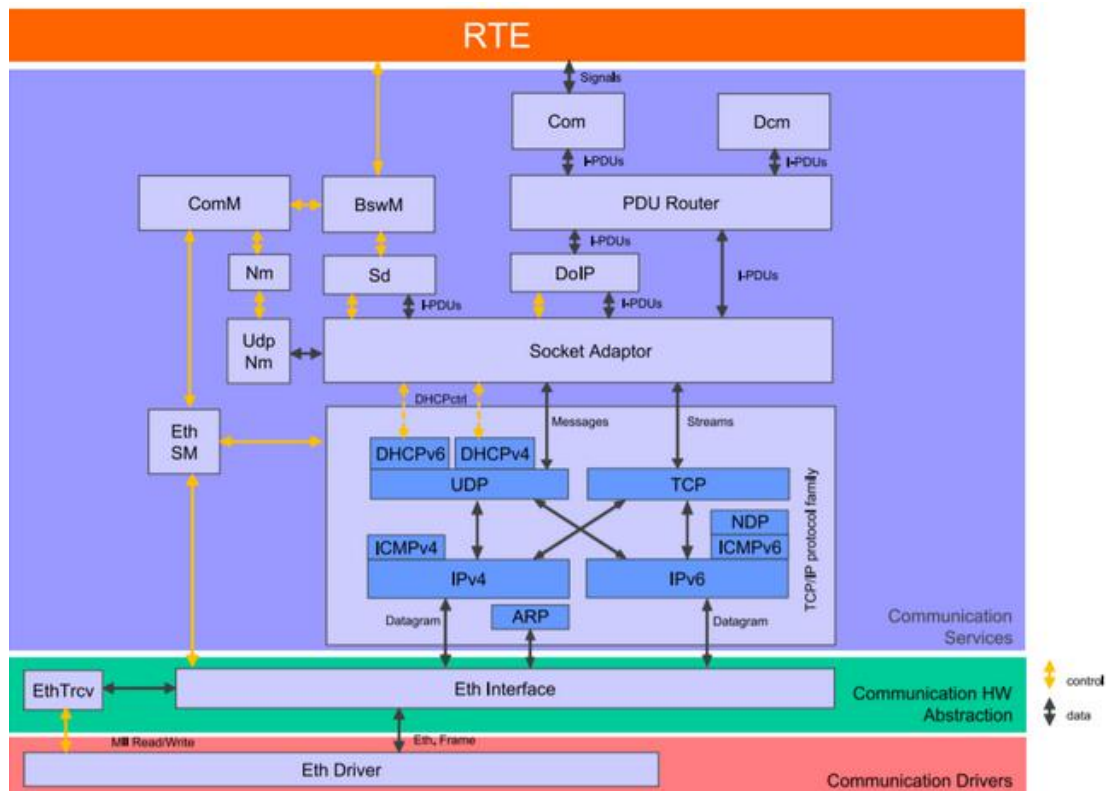# AUTOSAR Ethernet Stack

Why ethernet stack?

✧ 10 years ago most of the ECU were present in cars such as power window, Airbag, Throttle control, lightning control, etc need low bandwidth for communication and by using CAN communication protocol it can be done.

✧ But due to rapidly increasing no of ECU in car and need of more bandwidth to transmit and compute huge data to perform task like autonomous driving, Automatic car parking, Connected car ,It pushed manufactures to go for another best option available for automotive communication that is Ethernet.

Modules of Ethernet Stack

✧ Ethernet stack has various modules to accomplish its functionalities.

Functions Of various modules of Ethernet Stack:

✧ **COM:**

     This is the topmost module in Autosar BSW service layer and specifically ethernet com stack.The Function of the COM module is to provide access to PDU and signal/group signal to application module to perform its task.An application shall call COM module Autosar API to receive or transmit the signal/PDU and it should not call lower level

modules directly.The COM module can interact with the PduR module, which is the next lower level module of the Autosar COM stack.

PduR:

It is a PDU router.It's functionality is routing the PDU to its correct destination from the source module.It is second top most module of Autosar com stack.It will interact with the COm DCM upper layer modules and DoIP and SoAD lower layers.

DOIP:

DOIP stands for Diagnostic over Internet Protocol.Main functionalities are who is participating in the DoIP communication,Used to maintain different tester connections.Using DoIP we can achieve high speed diagnostics and also handle large data and also possible to connect mutiple tests at a time with different security levels to avoid any security breach.

SoAD:

A paradigm upon which the TCP/IP protocol family is based is the use of sockets.A socket is uniquely identified by the combination of IP address and port of the remote and local end nodes. Via a socket, packet-oriented UDP and connection-oriented TCP user data are routed from the TCP/IP stack to the application or in the opposite direction.This prototype is incompatible with the PDU concept of AUTOSAR. Transformation of socket-based communication into PDU based communication and in reverse is the task of the Socket Adapter Module.

TCP/IP:

The TCP/IP stack is located between the socket Adapter and the Ethernet interface modules.It contains various modules to perform different functionalities.They are Address Resolution Protocol, Internet Protocol, Dynamic Host Configuration Protocol,Transmission Control Protocol.Configuration of IP will be done in this module.

EthIf:

The Ethernet Interface belongs to the ECU abstraction layer in AUTOSAR layered software architecture.It provide to upper layers a hardware independent Communication System.This interface is uniform for all Ethernet Controllers and transceivers.The Ethernet Interface does not directly access the Ethernet hardware, to send and receive the data

it will call the Ethernet driver module.There can be multiple Ethernet driver modules in the same ECU accessing multiple transceiver drivers.

Eth Driver:

It belongs to the micro controller Abstraction Layer.It provides hardware independent interface to the upper layer for the same type of multiple controllers.For each different of Ethernet controller, a different Ethernet driver is needed. However the same type of Ethernet controller can be controlled with one ethernet driver of that type.

Eth Transceiver Driver:

It also belongs to MCA layer.It provide hardware independent interface to the layer for the same type of multiple transceivers and different type of transceivers need different transceiver driver.