Automotive Ethernet (16 Hrs)

Automotive Ethernet Course Agenda from ANCIT

Delivery Format	:	This Course is offered in Classroom or Online Format
Duration	:	16 Hours (2 Days)
Target Group	:	Automotive Ethernet Users in vehicles
Prerequisites	:	Embedded Engineers with working experience on AUTOSAR stack
Outcome	:	ISO/OSI Model Automotive Ethernet-Physical Layer Ethernet, IP, TCP and UDP, Security and VLANs Automotive Ethernet application protocols, DoIP, SOME IP, TSN Protocols

Day 1.

1. Introduction

- Automotive Protocols and their implementation
- Ethernet architecture, Operation and Hardware
- Traditional Ethernet vs Automotive Ethernet
- Motivation for Automotive Ethernet- Advantages and Opportunities

2. Layered Architecture - Physical Layer

- OSI/ISO layer model
- Physical layer architectures and topologies
- Automotive Ethernet: IEEE 100BASE-T1(BroadR-Reach) and IEEE 1000BASE-T1
- Traditional Ethernet: IEEE 100BASE-TX and IEEE 1000BASE-T

3. IEEE 802.3 and MAC Layer

- Ethernet Media Access Control (MAC) Addresses
- Addressing
- Transmission Methods
- Frame Formats
- Special Features

4. Ethernet Fundamentals

- Understanding the working of the Ethernet Protocol
- Basic MAC frame and Tagged Frame
- LAN and VLAN Implementation
- Unicast, Multicast and Broadcasting
- Networking Topology and Requirements

5. Networking Layer Protocols

- Overview of TCP/IP Protocol Suite and Architecture
- Address Resolution and the TCP/IP Address Resolution Protocol (ARP)
- Introduction to Networking Layer Protocols- IPv4 and IPv6
- IPv4 and IPv6 addressing
- Network Address Translation protocol
- Internet Control message Protocol (ICMP)
- Dynamic Host Configuration Protocol(DHCP)

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6. Transport Layer Protocols

- Overview of TCP/IP Transport Layer Protocols and Addressing (Ports and Sockets)
- UDP
- TCP
- UDP packet and TCP segment
- Socket Adapter

Day 2.

1. DoIP

- Introduction to DoIP
- DoIP Entity gateway and Node
- Diagnostic Process
- DoIP Frame Format
- How does DoIP work-Different Phases
- DoIP Payload Types

2. SOME/IP

- SOME/IP Header Format
- Specification of the SOME/IP Protocol
    a) Transport Protocol Bindings
    b) Request Response Communication
    c) Notification
    d) Fields

3. Time Synchronization Protocol

- PTP
- GPTP

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