

Bridging MOST to IEEE Standards

IEEE 802 Plenary Meeting July 2012 San Diego, California USA



Agenda

- Introduction to MOST
- Motivation for Automotive Networking
- Technical Overview of MOST
- Proposed Bridging to IEEE Standards
- Discussion



MOST – Media Oriented Systems Transport





Motivation: More Components per Vehicle

	PLOTULE		
1979	1991	1998	2002
1. Radio 2. Amplifier	 Radio Amplifier CD Telephone 	 Radio Amplifier CD Telephone Microphone E911 Navigation 	 Radio Amplifier CD Telephone Microphone Emergency Call Navigation PDA Interface TV-Tuner DVD DVD Displays Headphones

Increasing Number of Multimedia Components in each Vehicle

- Increasingly interfere with each other
- Produce EMC issues



Motivation: Increasing component networking



Increasing numbers of Multimedia Components to be connected means:

- Communication paths become more complex
- Costs of required cable connections grows exponentially
- Space/volume grows
- Shared user interfaces (display, audio, controls)



Motivation: Simplified Cabling

2.5x

Conventional Cabling



Number of cables	6
Total cable length	12 m
Conductors per cable	3
Total conductor length	36 m
Number of contacts	36

Total cable cost	2.5x
Total weight	1700 g



MOST Technology



Number of cables	4
Total cable length	9 m
Conductors per cable	1
Total conductor length	9 m
Number of contacts	8

Total cable costs Total weight 123 g



Data transport with MOST

- Reduced susceptibility to interference
- Less cables
- Less connectors
- Higher reliability
- Lower weight 1x
 - Lower volume/space requirements
 - Lower cost
 - Easier recycling



MOST Cooperation – Guiding MOST Technology



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Manufacturers using MOST – Europe 1





Manufacturers using MOST – Europe 2



COOPERATION

Manufacturers using MOST – Asia and America





MOST - The Multimedia Network

Supports

- Synchronous streaming data (audio and video)
- Isochronous streaming data (audio, video and packet)
- Real-time control communication
- 10/100 Ethernet communication
- High speed asynchronous data transport

Physical Layers

- Plastic fiber (POF)
- Glass fiber (PCS)
- Copper cables, for example Shielded (STP) or Unshielded Twisted Pair (UTP)



MOSTxxx - Generic Frame Structure



- MOST has a generic frame structure
- Frames are repeated with 48 kHz rate
- Scaleable number of bytes in frame determines total network bandwidth
- Each byte in frame can be assigned individually to a transport channel (TC)
- Several bytes can be clustered into one transport channel
- Assignment and clustering can even be done dynamically
- Specific content protection mechanisms (e.g. DTCP) can be put on top of each transport channel individually
- Number of different transport channels just depends on capabilities of interface chip
- Extreme: each byte is a different transport channel that runs its own transport protocol
- Example: MOST150 has transport protocols
 - Synchronous/isochronous
 - Control
 - Asynchronous
 - Ethernet (MEP)





Acronyms:

I²C: Inter Integrated Circuit - a serial interface used for low speed communications between ICs

I²S: Inter IC Sound – a serial interface typically used for audio interfaces

MLB: Media Local Bus - a very high speed serial interface used to connect to INICs and other MOST peripheral devices

SPDIF: Sony/Philips Digital Interface – a digital audio interconnect used in consumer products

SPI: Serial Peripheral Interface - a synchronous serial data link used between ICs

TSI: Transport Stream Interface – an interface used to transport video in and out of various codecs







IP Architecture

Provides

- IP-based protocols and services
- Internet access
- IP communication
- Security mechanisms
- Access to IT infrastructure outside the vehicle:
 - Over many interfaces: LTE, 3G, Ethernet, WiFi/WLAN, etc.

Defines

- IP-related settings
- Possible connections to the world outside the vehicle
- Access rights



ISO/OSI LayeringEthernet





ISO/OSI Layering MOST Ethernet Packets and MOST High Protocol





Proposed Bridging to IEEE Standards

- Sponsored by MOST Cooperation representing its member companies
 - Looking to have standardized bridging to in-vehicle network



IEEE 802.3 layer diagram





MOST

- MOST Ethernet Packets (MEP) support Ethernet Frames
- MOST MAC supports standard 48-Bit Ethernet MAC addressing











Bridge architecture IEEE 802.3 to IEEE 802.3 example



COOPERATION

Bridge architecture IEEE 802.3 to MOST example



Bridge architecture IEEE 802.3 to MOST example





 Motion to work on a PAR during Santa Cruz Interim Meeting, September 10-13

