Automotive Media Service Model

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1. Abstract

Nowadays, one of the biggest issues in vehicle technology gradually moves from mechanics to electronics, in-vehicle network also has been developed with this trend of vehicle system. The outstanding point in this paper is that the change of features of vehicles as an electronic devices or multi-media system beyond existed media system served from playing music only. This paper shows that how can transmit the multi-media data such as sounds, images and movie clips from Media Oriented System Transport (MOST) and how can interfacing between MOST to wireless network services that people transmit and receive media data employing mobile terminals

2. Introduction

Recently the requirements as the information and entertainment application for automobiles are increasing dramatically, new in-vehicle network called MOST has been introduced [1]. MOST is the automotive high-speed network to support multimedia data transfer. Because MOST can provide high bandwidth from 25Mbps to 150Mbps and network Quality of Service (QoS), users are satisfied with usage of service in car. Today's automobile research area has been changed to offering convenience, reliability and safety. In accordance with recent trends, this paper presents that how far we know the automotive services served by MOST network utilization. This paper is organized into five sections. In section 3, it is introduced with description of MOST network Through the description of system structure, it is represented the method interfacing MOST to different network such as wireless or streaming service network implemented by embedded operation system. in Section 4. Section 5 explains the service model which shows and proposes how many applications to be utilizable for drivers and passengers. The services shown in this paper are below

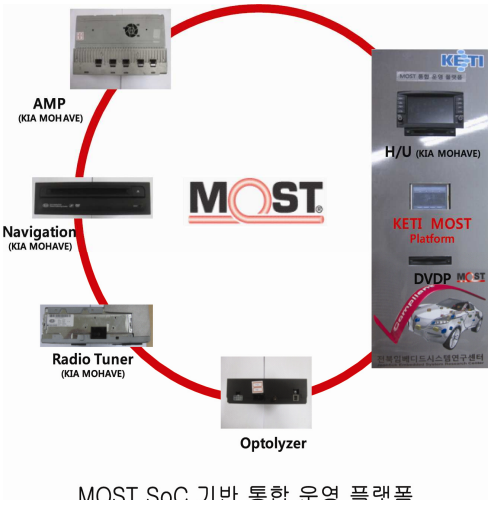
Camera data transmission application as role of black box and around viewer

MOST to mobile terminal service

In section 6, it is evaluated sides on weight and wiring harness compare to services based on Ethernet network and concludes this paper.

3. MOST System

3.1 General MOST Technology



MOST SoC 기반 통합 운영 플랫폼

Figure 1: MOST Network Ring Topology

The MOST cooperation was founded in 1988 by automotive manufactures and several system vendors to establish and refine a common standard for future needs of automotive multimedia network [2]. In figure 1 Network and of which connected devices are organized of ring network topology

3.2 Introduction of MOST System Layers

MOST system layer has basic factor that it is possible to design simple function blocks which are being the essential framework. Function blocks incorporate all properties and methods of a MOST device, which are necessary to control the device. Communication with these function blocks takes place over the application protocol, which consists of a self-explanatory mnemonic and does not require an address of the MOST device [3].

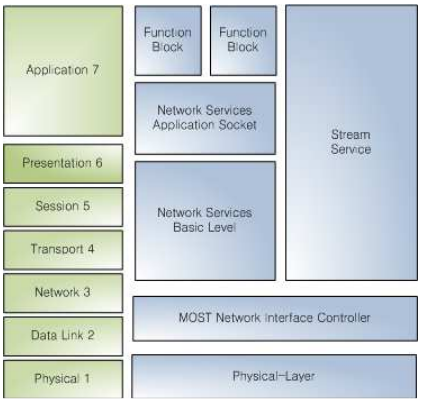


Figure 2: MOST Layer Model

4. System Architecture

4.1 SRAM and MediaLB (MLB) interface

In order to connect SRAM interface with mobile processor which has the 16 bit data bus architecture and MLB port it makes a path for INIC data communication, in this paper, SRAM-MLB interface technology is introduced. MLB is an on-PCB or inter-chip communication bus, specially designed to standardized a common hardware interface. And, MLB supports all the MOST

network data transport methods: synchronous stream data, asynchronous packet data, and control message data. Thus, it is provided inter-connection port from EHC to INIC and from INIC to EHC. If data frame goes into from INIC which converts electronic data from optical information and mapping address using the routing table where data destination is pointed out, destination mapped data is stored into SRAM interface and transferred MOST data frame helped by and fit in MLB interface [4]

In Figure 3 is shown that hardware of proposed architecture includes property of SRAM interface and MLB pin mode in ALTERA FPGA. Also, MOST physical module is loaded on the FPGA board and validates connection of MLB to INIC communication.

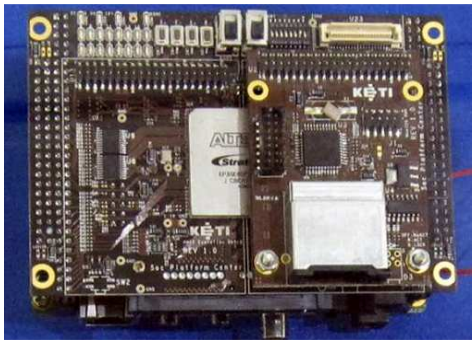


Figure 3: Proposed hardware platform including MOST INIC, SRAM-MLB and EHC based on RISC process

5. Automotive Media Services

5.1 Camera Data Transmission

As shown in Figure, camera data they have to be changed into synchronous data frame for data transmission in MOST network goes through SRAM-MLB interface area from S3C6410 main control board embedded Windows CE operating system and connected MOST network device as a node. As seen in Table Ⅰ, If the realization of total around viewer system in vehicle as we proposed, it shown that is needed higher data rate network system. Through proposed media service system, it is estimated that MOST network data rate has to be implemented over 150MBis/s.

Table 1: The bandwidth of camera data transmission

Resolution	Size (YUY)	Bit/s (15 frames) per unit camera	Total required Bit/s (4 camera)
160*120	160*120*2 = 38,400	160*120*2*15* 8= 4,608,000 (4.6Mbps)	4608000*4 = 18,432,000 (18.4Mbps)
320*240	320*240*2 = 153,600	320*240*2*15* 8= 18,432,000 (18.4Mbps)	18432000*4 = 73,728,000 (73.728Mbps)
640*480	640*480*2 = 614,400	640*480*2*15* 8= 73,728,000 (73.728Mbps)	73728000 *4 = 294,912,000 (294.9Mbps)

5.2 MOST to mobile terminal service

Through the proposed platform solution, mobile connectivity with MOST system is executed by interfacing board. S3C6410 platform has wireless local area network (WLAN) adaptor

and data moves into SRAM-MLB interface, then, data converted MOST packet frame are delivered to MOST device. In same manner, MOST packet message conveyed to the S3C6410 framework.

Figure 4: MOST to Mobile Communication Services

6. Conclusion

MOST Network system is very much attractive from cost, weight, and performance perspectives compared to common electrical network service. For characteristics of based on optical communication network, it is preferred on EMI immune, low weight and high bandwidth to reliable data in automotive environment. Interestingly, today more than dozens of device for entertainment and driver's assistance is used in car. As demand of these trends, MOST to hetero-network service is needed

References

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Acknowledgments

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