

High Performance Audio Streaming Framework for MOST



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Introduction

High Performance Audio Streaming Framework for MOST

- A common solution for the diverse OEM specific requirements
- Handles Synchronous / Isochronous Data through MOST
- Sources
 - From MOST
 - Storage Media
- Sink
 - Speakers / Headphones
 - To MOST
 - Storage Media

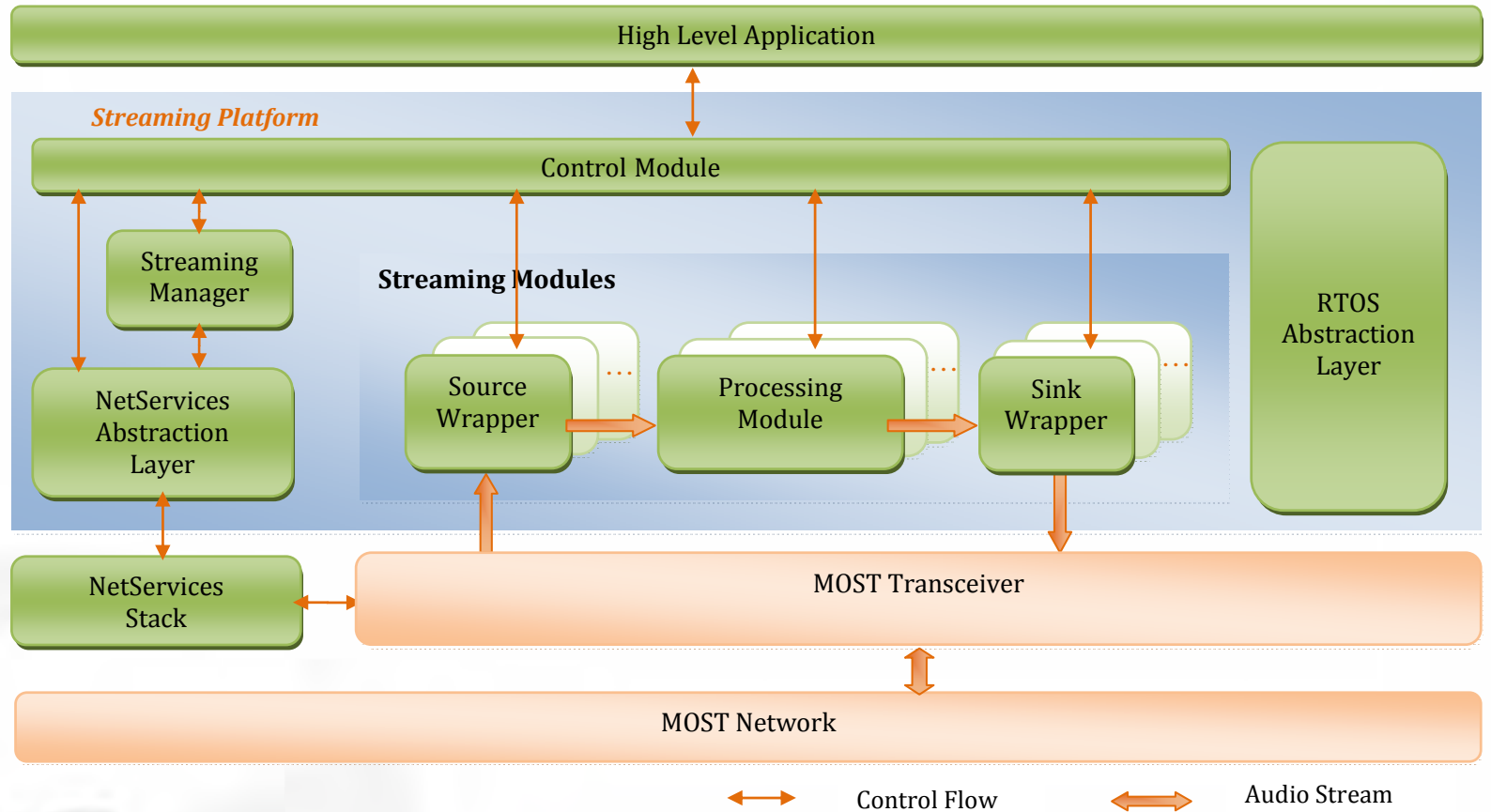
Why this framework?

- To overcome implementation issues related with Third Party Audio Streaming Platform we have chosen
- Why we went for Third Party Solution initially?
 - Fast Development
 - Tested and Proven

Why this framework-Continued

- **Issues faced with the selected third party module**
 - Less Flexible when
 - Ported to new platform
 - Feature enhancements
 - Performance Issues
 - MIPS and Memory
 - Tightly Coupled to NSL and RTOS
 - Requires major code changes to integrate to different NSL and RTOS.
 - Source Code management became tedious.

NeST Proposed Solution



NeST

Architecture – Major Components

Control Module	<ul style="list-style-type: none"> Processing Audio Player Commands to application Callback and events to the application Connection Establishment Controlling the Streaming modules NetServices Management
Streaming Manager	<ul style="list-style-type: none"> Connection establishment Allocation and deallocation of channels Resource Management
NetServices Abstraction Layer	<ul style="list-style-type: none"> To realize the common interface to NetServices independent of the implementation. All the requests to the NetServices are routed through this module.
RTOS Abstraction Layer	<ul style="list-style-type: none"> Provides common interface to OS system calls independent of the Operating System. e.g: Synchronization API, Thread Management API etc.
Streaming Modules	<ul style="list-style-type: none"> Source wrapper - Handles audio input from multiple sources, Processing module - Implements the audio signal chain and Sink wrapper - Routes output audio data to speakers, headphones or back to the MOST.

Advantages

- Easily adaptable to different platforms
- Easily Scalable to support enhancements (e.g: multiple channels)
- Independent of NSL
- Efficient Memory utilization and low MIPS
- MISRA C Compliant

Comparison

	Third Party Module	NeST Module
MIPS (Per channel)	20%	5%
Memory (Per channel for 32 samples)	256	192
Threads (Per channel)	3	1

Note:

- The comparison is against the third party module we have used.
- The testing is done over BF539 platform.
- The values are taken for the framework with PCM data and minimal signal chain

Current Implementation Status

Control Module	Processing Audio Player Commands to application	✓
	Callback and events to the application	✗
	Connection Establishment	✓
	Controlling the Streaming modules	✓
	NetServices Management	✗
Streaming Manager	Connection establishment	✓
	Allocation and deallocation of channels	✓
	Resource Management	✓
NetServices Abstraction Layer	To realize the common interface to NetServices independent of the implementation.	✗
	All the requests to the NetServices are routed through this module.	✗
RTOS Abstraction Layer	Provides common interface to OS system calls independent of the Operating System. e.g.: Synchronization API, Thread Management API etc.	✗
Streaming Modules	Source wrapper - handles audio input from multiple sources	Partial
	Processing module - Implements the audio signal chain	✓
	Sink wrapper - Routes output audio data to speakers, headphones or back to the MOST.	Partial

For further Questions please
mail to
software.info@nestgroup.net

NeST

NeST Automotive services Overview

Overview

- Focused on Engineering Software & Tier 2 Supplier
- 1200+ Engineers
- CMMI L5, ISO 9001, ASPICE L5 certified center
- IP safeguards (ISO 27001 certified)
- Technology Partnerships (nVidia, Microsoft, Intel ...)
- ODCs for several major technology giants
- IP repository for fast turnaround

Software Services

- BSP , Device Drivers, Middleware
- VLSI/ FPGA Designs
- Application Development
- Algorithm Optimization
- Porting/ performance optimization
- Reverse and Re-engineering
- New Product Development

Automotive Domain Focus



HMI & In-Vehicle Networks

HMI
CAN, LIN, MOST, Flexray
WIFI, WiMax
USB, Bluetooth, IEEE
1394

Body Electronics

Doors, Windows, Mirrors
Seats, Climate Control
Lighting Control, Courtesy
lamps
Wiper, Washers, Defogger

Diagnostics & Active Safety systems

OBd Systems
Diagnostic Gateways
Run Time Diagnostics
KWP 2000, ISO 15765
Software update

Processes & Standards

ASPICE
MISRA C
OSEK/VDX
MBSE

Thank you

NeST look forward to work with you in future projects

Sivankutty K M

Managing Director

Tel: +49 89 20 80 39 – 186

sivankutty.km@nestgroup.net

Sabeen A

Software Lead

Tel: +91 471 2527441

sabeen.a@nestgroup.net

NeSTech GmbH ♦ Leopoldstraße 244 ♦ 80807 München

Tel: +49 89 20 80 39 – 186 ♦ Fax: +49 89 20 80 39 - 196