MEP100

100G ST 2110 SmartNIC

Turn your server into a professional video processor with MEP100

MEP100: 100GbE SMPTE ST 2110 SmartNIC

The MEP100 is a 100GbE SMPTE ST 2110 SmartNIC that brings real-time, high-density IP media transport to standard computing platforms. Purpose-built for broadcast, live production, and advanced media workflows, it delivers ultra-low-latency, hardware-accelerated ST 2110 I/O while minimizing CPU and GPU load.

Hardware Offload and Deterministic Performance

Unlike software-based solutions prone to latency, CPU overhead, and scalability issues, the MEP100 leverages a built-in FPGA for packet processing, PTP synchronization, and hitless redundancy (ST 2022-7). This approach ensures deterministic, high-performance media transport and eliminates common software bottlenecks.
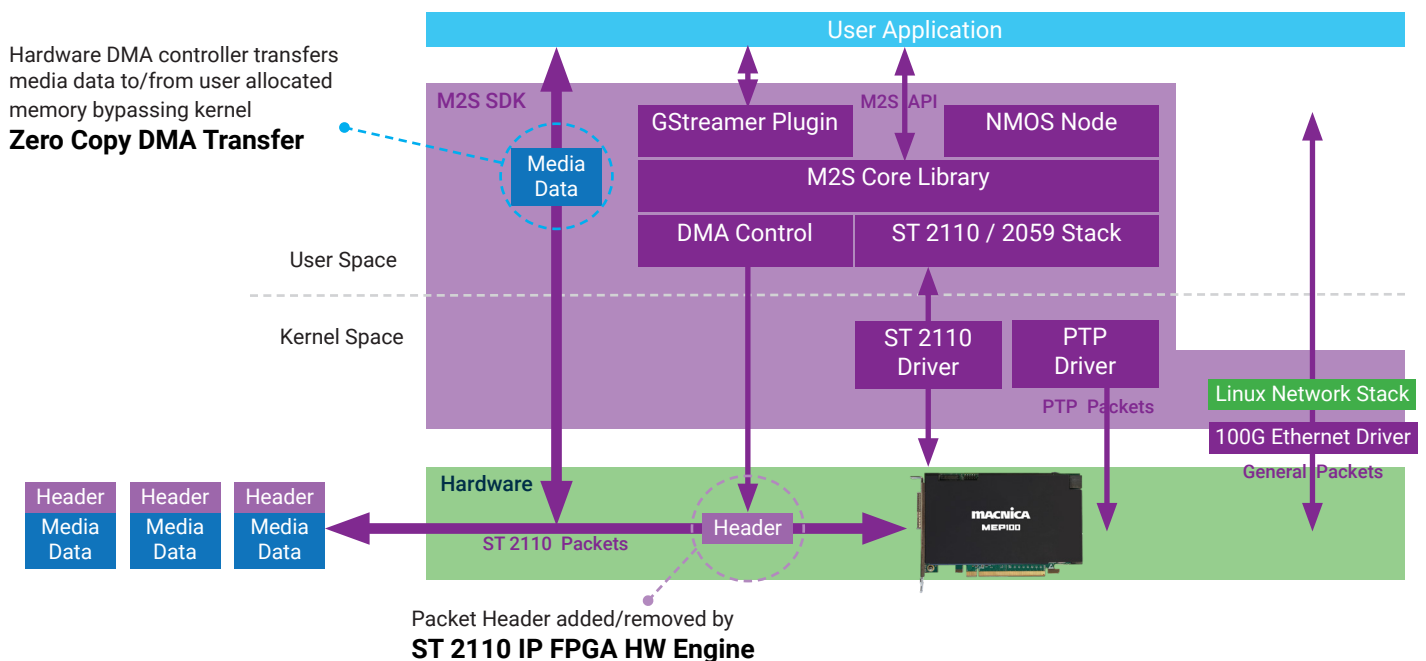
Dual 100GbE, Zero-Copy DMA, and Broad OS Support

Featuring dual 100GbE interfaces, zero-copy DMA, and support for macOS, Linux, and Windows, the MEP100 removes platform restrictions and enables scalable, software-driven IP workflows. Its M2S API simplifies ST 2110 integration by providing direct frame and sub-frame access to media buffers—no complex packet handling required.

Scalable, Software-Defined Media Workflows

Whether processing 32 FHD streams or 8 UHD streams, the MEP100 delivers unparalleled efficiency, reliability, and flexibility. Ideal for live production, media infrastructure, AI-driven content processing, remote production, and hybrid broadcast environments, it brings broadcast-grade performance to workstations, servers, and cloud-based applications—without compromise.

High Performance & Balanced Architecture

Hardware DMA controller transfers media data to/from user allocated memory bypassing kernel
Zero Copy DMA Transfer

User Application

M2S SDK
M2S API
GStreamer Plugin
NMOS Node
Media Data
M2S Core Library
DMA Control | ST 2110 / 2059 Stack

User Space

Kernel Space

ST 2110 Driver
PTP Driver
Linux Network Stack
PTP Packets
100G Ethernet Driver
General Packets

Hardware

Header / Media Data | Header / Media Data | Header / Media Data

ST 2110 Packets
Header

Packet Header added/removed by
ST 2110 IP FPGA HW Engine

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The seeds of tomorrow.
MACNICA

MEP100
100G ST 2110 SmartNIC

High Performance & Balanced Architecture

▶ Macnica MEP100 - 100G ST 2110 SmartNIC provides a special and unique ST 2110 stream processing solution

▶ Accelerations by Macnica ST 2110 hardware engine
» ST 2110 packets are processed by hardware with no CPU usage for packet header handling

▶ Fastest media route by Kernel Bypass Technology
» Direct transfer to/from allocated user memory

▶ Flexibility of Linux Network Stack
» General Ethernet packets are handled by reliable host OS network stack

M2S SDK MEP100 edition (included)

▶ Simple and intuitive API for media data
» Read & write of Video/Ancillary data by frame or subframe unit
» Read & write of Audio data by millisecond unit
» No need to handle ST 2110 packet data. Media is in samples and frames, ready to be used by your application

▶ GStreamer plugin support
» Video sink
» Audio source
» Audio sink

▶ NMOS node support
» IS-04
» IS-05

Features and Specifications

	Features	Specifications	Notes
Software	Target OS	Linux, Windows, macOS	
	User Interface	Macnica M2S SDK (included with MEP100)	
Ethernet	100Gbos x 2		
PCIe Streaming	System Bus	PCIe Gen4 x 16	
	DMAC	Macnica ST 2110 Specific DMAC	Version: Quartus 21.3 Pro
	Video Buffer Pixel Format	YUVP: Packed YUV 422 only	U0-V0-Y1 U2-Y2-V2-Y3
ST 2059	Macnica ST 2059 IP Core: FPGA Component + Software on Host CPU		Offloading to onboard ARM CPU is not supported
ST 2110-20	Resolution	3840 x 2160 p, 1920 x 1080p, 1920 x 1080i	
	Number of Streams	Up to 32 Tx and 32 Rx streams (target)	4K up to 8 Tx and 8 Rx streams
	Mapping Structure	4:2:2 10 bit	
	Frame Rate (Hz)	59.94, 50, 60	
ST 2110-21	Supported Rate	Tx side : Type-NL, Rx side : Type-W	
ST 2110-22 * (JPEG-XS codec base)	Resolution	3840 x 2160 p, 1920 x 1080p, 1920 x 1080i	
	Number of Streams	Up to 4 x Tx and 8 x Rx	ST 2110-20 to -22 Conversion on Roadmap
	Mapping Structure	4:2:2 10 bit	
	Frame Rate (Hz)	59.94, 50, 60	
ST 2110-30	Number of Streams	Up to 32 Tx and 32 Rx streams	
	Conformance Level	Level-B + 32 ch	
	Sampling Rate	48 kHz	
	Number of Channels per Stream	1 to 32	Packet time 1ms: up to 8 ch, packet time 125us: up to 32 ch
ST 2110-40	Number of Streams	Up to 32 Tx and 32 Rx streams	
ST 2022-7	Support Class	Class-A, -B, -C and Class-D	Depending on system memory resource
NMOS	Support Protocol	IS-04 and IS-05	

* Phase 1 Production Release does not support these features

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