

SharpMedia™ Platform 2U Media Processing Acceleration Appliance

Data Sheet

The SharpMedia™ Platform enables high density voice and video processing in a 2U rack server appliance.

- 2U NEBS Server with single Intel® Xeon® E5-2609 2.50 GHz or dual Intel Xeon E5-2640 2.00 GHz configurations
- Up to 64GB dual channel DDR3-1333 memory
- 500 GB storage memory
- Dual 10 Gigabit and dual Gigabit ports
- 1100W AC or DC power supply options
- Configurable for up to four single slot full length full height PCI express cards with x4 interface
- High performance media processing core based on power-efficient DSPs
- Comprehensive voice and video processing firmware and programmers interface included
- Support for 720p and 1080p video conferencing
- Designed for NEBS Level 3 and ETSI telecom standards compliance

The Artesyn Embedded Technologies SharpMedia™ Platform is a carrier grade 2U server powered by up to four SharpMedia PCIE-8120 PCIE Express media processing acceleration engines to accelerate voice and video applications in a standard server architecture.

Voice and video streaming is becoming more pervasive as customer demand for media consumption continues to rise, and the diversity of media sources, network conditions and individual consumption devices proliferate. Using traditional Intel® Xeon® server architectures, power and efficiency soon become a limitation when scaling to high channel density media stream transcoding. By employing highly efficient digital signal processors (DSP) to provide direct offload of the host CPU, the SharpMedia Platform's PCIE-8120 acceleration engines offer higher density voice and video processing and take up less rack space. Network equipment providers can either add or substantially increase the voice channel or video processing density with the SharpMedia approach, thus reducing overall power and space demands for their equipment as it scales to higher throughput. The SharpMedia Platform and its SharpMedia PCIE-8120 acceleration boards are particularly suited to the following applications:

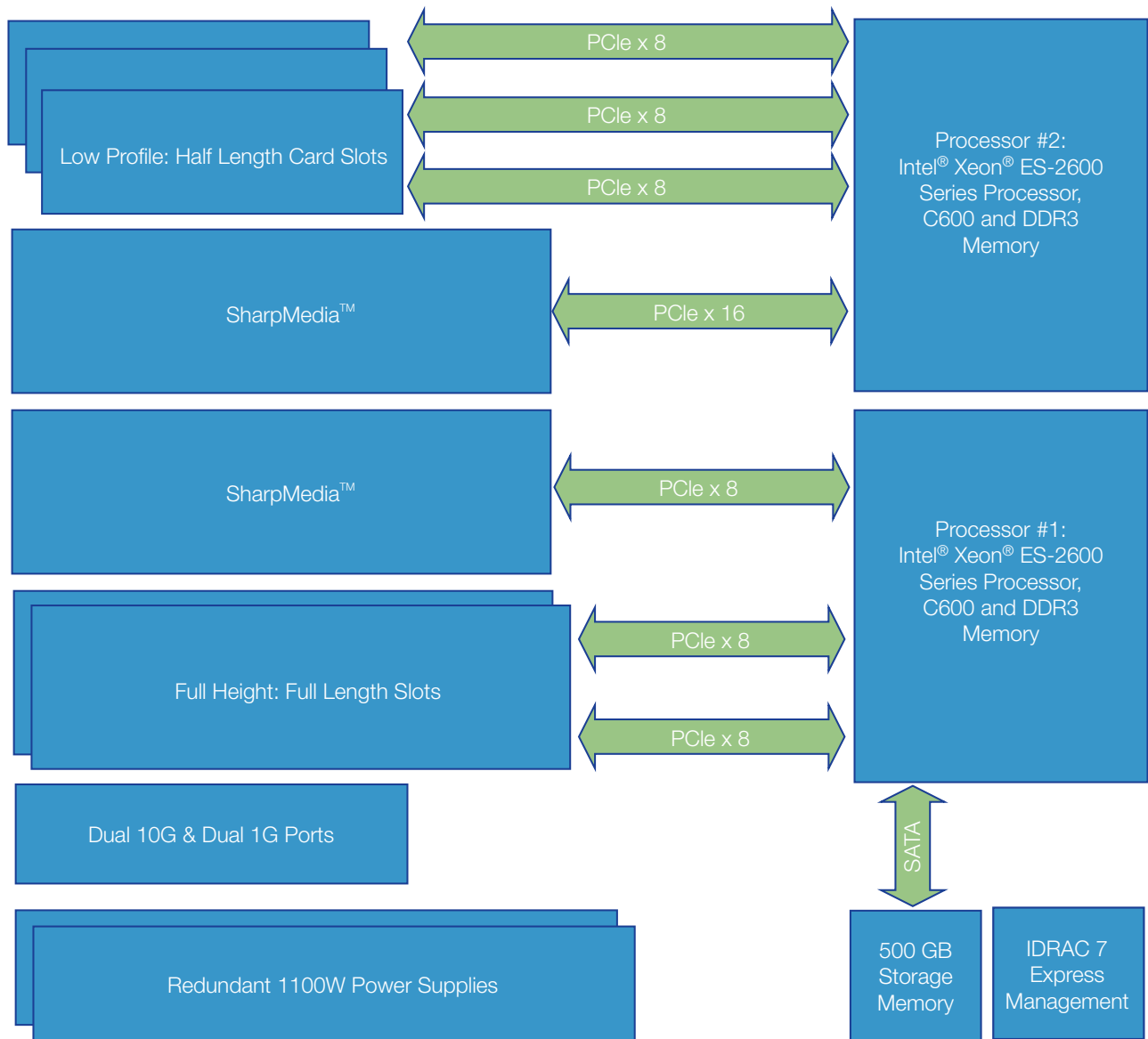
- Session border controllers (adding voice or video transcode)
- Media gateways
- Media servers/media resource function
- Video/content optimization (transcode and transrating)
- WebRTC voice applications
- Interactive voice and video response systems

The SharpMedia portfolio brings high density DSPs with embedded voice and video firmware from Octasic together with Artesyn's strong embedded system heritage and thermal design skill, resulting in an industry-leading media processing density for the next generation of voice and video processing systems.

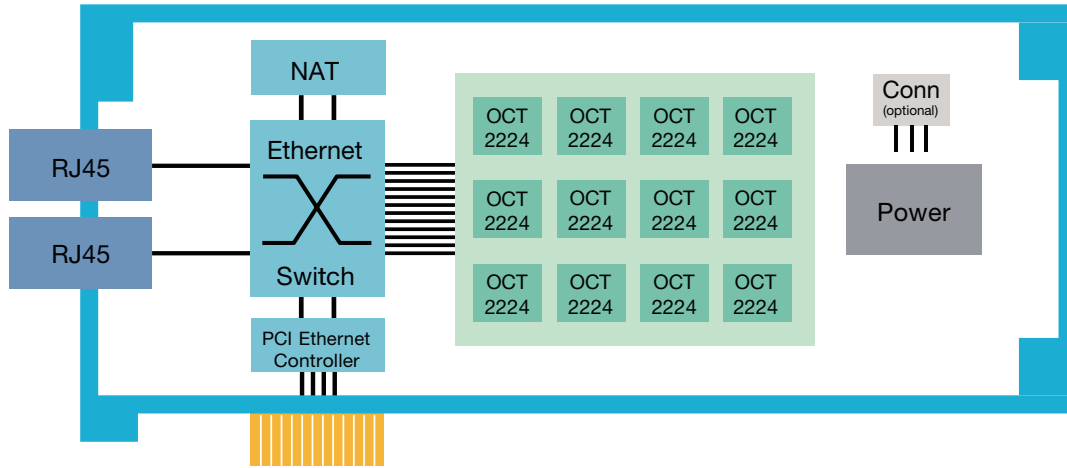


SharpMedia Server Block Diagram

The SharpMedia™ Platform delivers high-density media processing through a scalable platform of up to 2 host processors with media expansion for up to four single slot full length full height PCI Express SharpMedia PCIE-8120 acceleration blades. The SharpMedia Platform is designed for carrier-grade applications that require NEBS, power and cooling for high-performance media processing, and ease of integration.



SharpMedia PCIE-8120 Block Diagram



The SharpMedia™ PCIE-8120 is based around the Octasic OCT2224M multi-core DSP running Vocallo MGW firmware. The DSP array performs media processing acceleration for a host server, supporting both voice and video conferencing and transcode applications.

Media acceleration performance depends on both the codecs required and the number of DSPs available. A variety of board configurations allow for differences in application needs and server capabilities, and include a choice of 4, 8 and 12 DSPs, with maximum power consumption between 25W and 65W. For systems with limitations on PCIe slot power, an external power connection option is available by special arrangement.

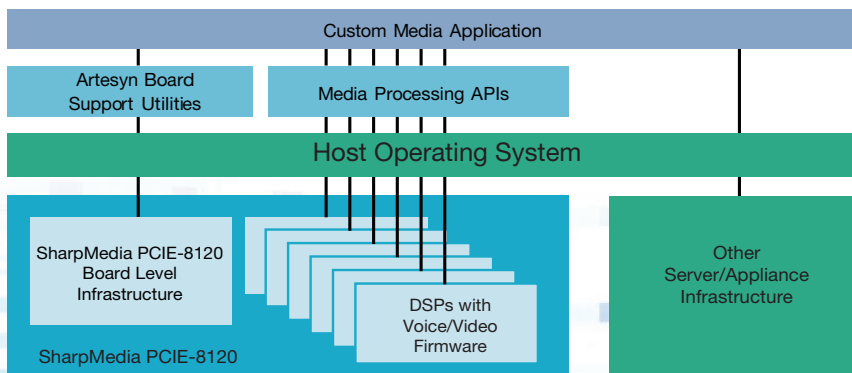
A comprehensive host-based media processing Application Programmers Interface (API) is provided. This is used to configure and execute voice and video stream processing functions. The API commands communicate directly with the DSP array based on an endpoint and stream resource model.

A non-blocking command/ response protocol aids multi-channel programming efficiency. Additional board support utilities can set the board’s internal switching infrastructure into various modes, and provide diagnostic information.

The internal data flows of the board are all based on Gigabit Ethernet connections with all DSPs accessible via a local Ethernet switching subsystem. Host access to all the DSPs is via a 2 x 1Gb/s PCI Ethernet controller. The Ethernet switching subsystem also supports two 1Gb/s links to each DSP to support special 1080p video conferencing modes.

Media streams can be routed to the DSPs either via the host CPU or optionally via two external Gigabit Ethernet ports provided for direct traffic termination. In this configuration, packets for transcode can bypass the host computer entirely while a special Network Address Translation (NAT) device makes the hardware and software architecture.

Software Architecture



Media Processing Functions

TRANSPORT AND ENDPOINT SUPPORT

- Voice and video over IP endpoints
 - RTP/UDP/IP endpoint
 - Pv4 with DHCP & IPv6
 - Supports secure RTP
 - Adaptive jitter buffer
 - Supports RTCP (RTCP-XR in future)
- Line echo cancellation and voice quality enhancements
 - G.168 (2004) compliant line echo cancellation, up to 128ms tail, with HLC and music protection
 - Manual and automatic level control (G.169)
 - Acoustic Echo Control (AEC)
 - Adaptive Noise Reduction (ANR)
 - Natural Level Enhancement (NLE)
- Endpoint statistics
 - RTP/UDP/IP per channel and per port packets and errors
 - Per channel/port states, terminations used, media stream events

AUDIO STREAM PROCESSING

- 3GPP/3GPP2 wireless voice codecs
 - GSM Full Rate (FR) and Enhanced Full Rate (EFR)
 - GSM Adaptive Multi-Rate (AMR)
 - GSM wideband AMR-WB (G.722.2)
 - EVRC and EVRC-B (subject to additional upgrade license fee)
- ITU-T, IETF, and other voice codecs
 - Clear channel operation
 - G.711 μ -law/A-law with appendices I and II silence suppression with spectral comfort noise generation
 - Narrowband: G.729AB, G.723.1, G.726
 - Wideband: G.722, G.722.1
 - T.38 fax relay
 - V.152 voice band data
 - iLBC
 - SILK (Skype codec) – subject to additional upgrade license fee
 - OPUS

- In-band announcements and signaling support
 - Announcements and message playback
 - Tone detection, generation and removal
 - SS5, MFR1, MFR2, DTMF
 - Tone relay (RFC 2833/4733)
 - Caller ID generation and detection (ETSI, BellCore and NTT)
- N-way audio conferencing
 - All channels on a DSP can participate in one or many conferences
 - Noise reduction for conferencing
 - Prime speaker detection
 - Conference supervisor function

VIDEO STREAM PROCESSING

- Video encoder/decoder support
 - H.263 profile 0 (baseline) and 3 level 10, 20, 30, 40, 45 and 50 (CIF/QCIF) RFC4629
 - MPEG-4 simple profile, single object level 0, 1, 2 and 3 (CIF/QCIF) RFC3016
 - H.264 Baseline Profile and High Profile level 1, 1b, 1.1, 1.2, 1.3 (CIF/QCIF) level 2.2 (VGA), 3.2 (720p) and 4.2 (1080p) RFC3984
- Scaling and adaptation
 - Advanced-CBR, CBR and VBR rate controllers
 - Frame rate adaptation up to 30 FPS/channel
 - Scaling between resolutions, from SQCIF to 1080p
 - Packet loss concealment
 - A/V synchronization (lip sync) via delay compensation
- Video conferencing/mixing support
 - Video MCU function
 - Voice activity based source selection
 - Graphics overlay with key color
 - Video mix: up to 16 layers per stream for video or graphics

Technical Specifications

HARDWARE

- Server Form Factor: 2U rack
 - Processors: 95W Intel® Xeon® E5-2600 series
 - Internal Interconnect: 2 x Intel® QuickPath Interconnect (QPI)
 - Chipset: Intel® C600
 - Memory: Up to 384GB DDR3 1600MT/s memory
 - I/O Slots: 7 PCI express slots-One x16 full-length, full height*; Three x8 full-length, full height*; Three half-length, low profile
- * Slot may already be populated with SharpMedia™ cards
- Communication NIC: Intel Ethernet X540 DP 10Gb BT + I350 1Gb BT DP
 - Power Supply: Redundant hot swap 1100W DC or 1100W AC power supplies
 - Remote Management: iDRAC7 Express
 - Optional Card Form factor: PCIe long card
 - Full height (106 mm) x full length (311 mm), single-slot width
 - PCIe X4 Gen 2 electrical connection
 - DSP core
 - Multicore Octasic OCT2224M DSPs running Vocallo
 - MGW firmware
 - Standard variants: 4, 8 or 12 DSPs
 - External Ethernet port option
 - 2 x Gigabit Ethernet (GbE) 1000BASE-T RJ45
 - Network address translation function makes DSP array look like single IP address (up to 1Gbit/s)
 - Internal Ethernet infrastructure capacity
 - 2 x 1Gbit/s to host via PCI Ethernet controller
 - 2 x 1Gbit/s to each DSP to support 1080p video conference function
 - 2 x 1Gbit/s to external ports
 - Board control and management functions
 - On-board temperature monitoring and reporting
 - Individual DSP and other function resets

DEPLOYMENT ENVIRONMENT

Server: NEBS Level 3

Optional Card:

- Board power consumption (estimated worst case)
 - 4 DSP variant: 25W
 - 8 DSP variant: 46W
 - 12 DSP variant: 65W
- Board operating temperature
 - Normal operation: 0 °C to 40 °C
 - NEBS exceptional operation: 0 °C to 55 °C [in suitable enclosure]
- Cooling requirement
 - Passive heatsinks (requires forced air flow)
 - Approx 4CFM for 12 DSP card at 40 °C ambient
 - Approx 5CFM for 12 DSP card at 55 °C ambient

HOST SOFTWARE ENVIRONMENT

- Host operating system
 - Centos 6.5
- Programmers environment
 - Octasic Vocallo MGW SDK and documentation
 - Octasic debug tools
 - Artesyn SharpMedia™ PCIE-8120 board support and configuration

Standard System Configurations

Server Variants	Low-end A/C	High-end A/C	High-end D/C
SharpMedia	Single PCIE-8120-V12	Dual PCIE-8120-V12	Dual PCIE-8120-V12
Processor	Single Intel Xeon E5-2609 2.50GHz	Dual-processor: Intel Xeon E5-2640 2.00GHz	Dual-processor: Intel Xeon E5-2640 2.00GHz
System Memory	32GB DDR3-1333 Memory	64 GB DDR3-1333 Memory	64 GB DDR3-1333 Memory
Storage Memory	500 GB	500 GB	500 GB
Power Supplies	Dual Redundant 1100W AC	Dual Redundant 1100W AC	Dual Redundant 1100W DC
Network Connectivity	Dual 10G & Dual 1G ports	Dual 10G & Dual 1G ports	Dual 10G & Dual 1G ports

Representative Performance*

Media processing application	Optional Card			Low End AC	High End AC/High End DC (Default)	High End AC/High End DC (Fully Populated)
	4 DSPs	8 DSPs	12 DSPs	SharpMedia™ x 1	SharpMedia™ x 2	SharpMedia™ x 4
Standard voice gateway/transcode: G.711 (20ms) <=> G.729AB (20ms)	2560 channels	5120 channels	7680 channels	7680 channels	15360 channels	30720 channels
Wireless voice gateway/transcode: G.711(20ms) <=> AMR NB (20ms)	1716 channels	3432 channels	5148 channels	5148 channels	10296 channels	20592 channels
Mobile video transcode MPEG4/CIF => H.264/CIF 15fps	128 channels	256 channels	384 channels	384 channels	768 channels	1536 channels
HD video conference H.264/720p 30fps x 4 participant conferences	2 bridges	4 bridges	6 bridges	6 bridges	12 bridges	24 bridges

*Note: Exact performance depends on many factors including exact codec mix and use patterns. These figures are provided as guidance to potential performance.

Ordering Information	
Server Options	
<i>Marketing Number</i>	<i>Description</i>
SMSRV01-71AC-1V12	SharpMedia Server, 1X PCIE-8120-V12, Single Processor, 32GB, AC
SMSRV02-72AC-2V12	SharpMedia Server, 2X PCIE-8120-V12, Dual Processor, 64GB, AC
SMSRV03-72DC-2V12	SharpMedia Server, 2X PCIE-8120-V12, Dual Processor, 64GB, DC
Software Upgrades	
<i>Marketing Number</i>	<i>Description</i>
8XXX-UPGR-SILK-X04/-X08/-X12	Audio codec upgrade for SILK - 4 DSPs/8 DSPs/12 DSPs
8XXX-UPGR-OPUS-X04/-X08/-X12	Audio codec upgrade for Opus - 4 DSPs/8 DSPs/12 DSPs
8XXX-UPGR-EVRC-X04/-X08/-X12	Audio codec upgrade for EVRC - 4 DSPs/8 DSPs/12 DSPs
Development Support Packages	
<i>Marketing Number</i>	<i>Description</i>
OEM-DEV-JMP	Jump Start Package - 3 month period - Includes 1 day training session, regular expert meetings
OEM-DEV-ADP	Advanced Developer Package - 3 month period - includes 1 day on-site consultation, regular expert meetings + 10 service requests

PATENT LICENSE LEGAL DISCLAIMER

The standard End User License Agreement under which the SharpMedia PCIE-8120 software is provided does not represent or warrant that the codec software is free of infringement of any third party patents, copyrights, or trade secrets. Many codecs and other recognized standards may require licensing arrangements involving the payment of fees to an intellectual property rights (IPR) holder or an IPR agent acting on behalf of the IPR holder. It is the user's responsibility to determine, for any codecs or other standards they intend to use, whether any additional IPR licenses are required, including the payment of royalties or license fees. The availability of implementations including codecs packaged in products acquired from Artesyn does not imply the right to practice these standards nor does Artesyn grant a license or the right to use or practice some or all of these standards. Depending on the country involved, the end user may be legally obliged to contact an IPR holder or agent and conform to their patents licensing requirements.

SOLUTION SERVICES

Artesyn Embedded Technologies provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh.

WORLDWIDE OFFICES

United States	+1 888 412 7832	China	+86 400 8888 183
Germany	+49 89 9608 2552	Japan	+81 3 5403 2730
Hong Kong	+852 2176 3540	Korea	+82 2 6004 3268

Artesyn Embedded Technologies, Artesyn and the Artesyn Embedded Technologies logo are trademarks and service marks of Artesyn Embedded Technologies, Inc. All other names and logos referred to are trade names, trademarks, or registered trademarks of their respective owners. © 2016 Artesyn Embedded Technologies, Inc. All rights reserved. For full legal terms and conditions, please visit www.artesyn.com/legal.



www.artesyn.com