



SOLUTION BRIEF

nabJet mediaEngine SDK

Accelerated by Artesyn

Design Advantages

- Highly optimised, integrated media transcode solution offering
- Industry leading CapEx and OpEx per transcode
- Multi-format and resolution support
- Based on industry standard PCIe hardware
- Hardware agnostic object-oriented C++ interface
- Plug-in interface to integrate third party modules (DirectShow, Media Foundation, QuickTime, GStreamer, AviSynth etc.)
- 8-bit 4:2:0 GPU accelerated transcoding
- 10-bit 4:20/4:2:2 HEVC GPU accelerated encoding
- 10-bit 4:2:2 high quality software based transcoding (nabJet CODECs)
- Smart rendering for MPEG-2 based video (like XDCAM or XDCAM HD family of formats)
- Smart rendering for AVC-I and X-AVC video

Just like telecommunications and audio before it, video is undergoing an IP revolution. Where previously video signals were transmitted using satellite or terrestrial broadcasting techniques, the adoption and continued advancement of high speed broadband technologies has allowed video to be packetized and sent over an I/P network with limited or no impact to perceived video quality. This in turn has led to a change in consumer consumption habits, from scheduled broadcast to video on demand (VOD) viewing.

This change in viewer habits has placed increasing demands on service providers responsible for providing Internet services. As video can be replayed at any time and any place, the demand for video is exponentially growing and service providers face a two-pronged problem. The first part of this problem is how to minimize the traffic over the network such that quality and network performance are not compromised. The second is how to monetize the take up of video to pay for the increased infrastructure costs.

Transcoding plays an essential part in the first problem. Efficient transcoding ensures that each video stream takes the minimum system resource or bandwidth, without compromising perceived quality. For example, transcoding ensures that the resolution and frame rate transmitted matches the target device; there is no point in sending very high definition video (and audio) to a smaller mobile phone. A smaller resolution could be sent with no perceived loss of quality or diminishment of viewer experience.

There are other trade offs to be made with transcoding as well. For example, for seldom watched video files it might make sense to transcode to a target resolution only when needed, as opposed to a commonly watched video file in which it might make sense to store multiple copies and avoid constant reprocessing. The transcode-as-needed approach decreases storage requirement, but increases processing requirement.



Performance Highlights

nabtel mediaEngine software achieves the following impressive transcode densities on the Artesyn PCIE-7207-4-i5 SharpStreamer card.

MPEG2 → H264 Transcode						
	Number of Simultaneously Transcoded Channels Per Card					
Input/Output	3840x2160	1920x1080	1280x720	854x480	352x288	176x44
1920x1080 (30fps)		20	24	32	40	44
1280x720 (30fps)			36	40	60	68
854x480 (30fps)				56	104	132
352x288 (30fps)					104	132
176x144 (30fps)						156
H264 → MPEG2 Transcode						
	Number of Simultaneously Transcoded Channels Per Card					
Input/Output	3840x2160	1920x1080	1280x720	854x480	352x288	176x44
3840x2160 (30fps)	4	16	20	20	20	24
1920x1080 (30fps)		32	40	52	60	64
1280x720 (30fps)			60	64	84	96
854x480 (30fps)				84	104	120
352x288 (30fps)					132	140
176x144 (30fps)						156

Artesyn and nabtel Expertise

Artesyn has a long pedigree and expertise in IP connected computer systems, originally developing telecommunications systems with IP backbones. This work led to developing audio CODEC acceleration engines and from there to video CODEC acceleration with IP connectivity underpinning all of these products. Artesyn now has a complete portfolio of transcoding solutions.

nabtel has a long history in video transcoding and CODECs – the founders of nabtel were the founders of Main Concept. nabtel is a preferred supplier to a number of influential industry players and have many years of expertise in developing and optimization CODEC implementations.

Artesyn and nabtel have collaborated to integrate the nabtel mediaEngine software development kit (SDK) with the Artesyn SharpStreamer™ line of acceleration add-in cards. You can use this combined solution to put your video handling on the fast track, whether you are involved in editing (news, cloud services), workflow automation, transcoding, scene detection, object tracking, logo detection or many more video applications. Based on Intel® architecture GPUs, the SharpStreamer/mediaEngine combination provides flexibility, quality and total cost of ownership (TCO) optimization for visual cloud solutions, including hosting desktops and workstations remotely or delivering video in the cloud.

nabtel mediaEngine Software Development Kit

The nabtel mediaEngine software is a transcoder for live- and file-based workflows that facilitates the encoding of video and audio media to a variety of acquisition, editing, broadcast and web formats. the mediaEngine SDK runs either stand-alone or within a multi-node rendering farm controlled by third-party applications. It takes advantage of graphics processing units (GPUs) incorporated in the Artesyn SharpStreamer PCI Express card family and supports either Windows or Linux operating systems. nabtel mediaEngine software has an integrated ultra-fast threading model that makes maximum use of the given resources. Transcoding speed is maximized as the internal nabtel video CODECs are also optimized to the internal workflow.

Specially optimized encoders and decoders for specific formats, such as XDCAM, give further advantage against standard multi-purpose CODECs. mediaEngine software is designed to allow the highest possible scalability to set up cluster- and cloud-based media processing and high density transcoding solutions.

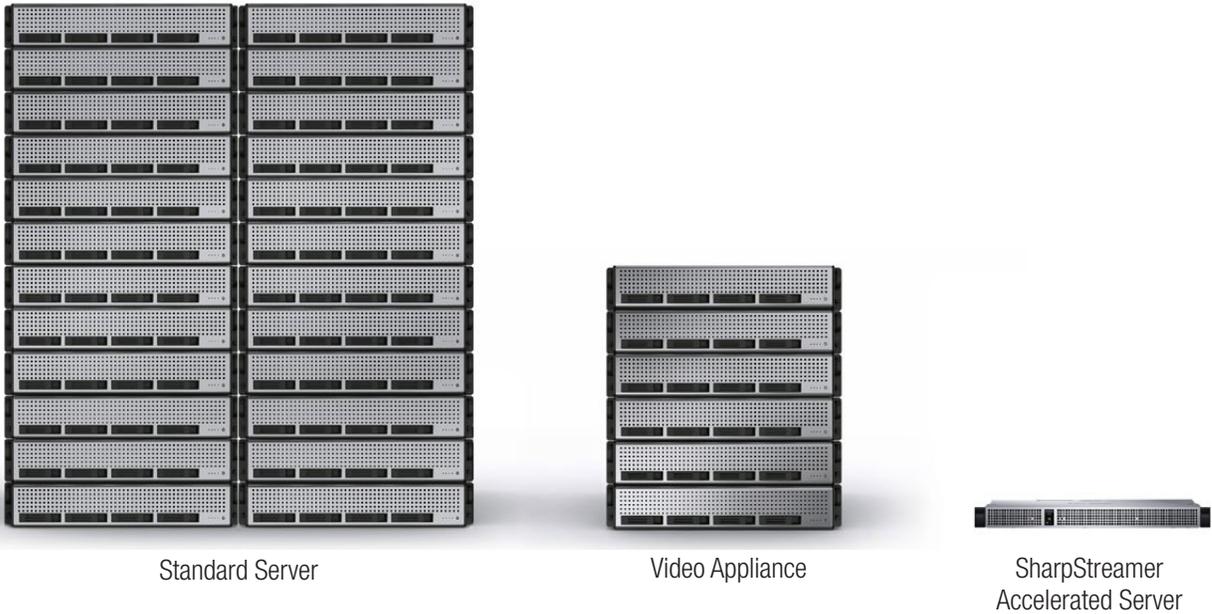
Time-critical ingest jobs that media companies face today are optimized by using mediaEngine's MXF while-function. It greatly reduces latency by processing MXF files while reading or writing. nabtel mediaEngine software allows file based stitching and transcoding using simple configuration files, even with live ingest into MXF. In addition, mediaEngine software takes full advantage of a GPU-accelerated processing pipeline that includes Intel® Quick Sync Video-based encoding and decoding, as well as other functions such as scaling, inverse telecine, etc.

Save CapEx and OpEx with nablet mediaEngine Software and Artesyn SharpStreamer Card

Traditional white box servers are commonly deployed for video transcode, but these servers are designed for general purpose computing and are not optimised for media processing. Compared with a standard white box server (based on 2 x E5-2650V2 processors), a single Artesyn SharpStreamer card running the nablet mediaEngine software provides the following advantages (assuming MPEG2 to H.264/1080p/30fps transcode):

- **CapEx Cost (\$) per transcode:** **9.4% of the standard server**
- **Power (W) per transcode:** **2.5% of the standard server**
- **Space (Rack Unit) per transcode:** **2.4% of the standard server**

Furthermore, the host server is freed from media transcode tasks and can be fully utilized for general purpose computing.



Legacy Support

In addition to providing cutting edge new transcode capability, nablet also has support for legacy APIs. These legacy APIs reference nablet's heritage and allow customers to seamlessly port existing solutions to current generation and most importantly fully supported hardware and software with a committed roadmap.

Artesyn Transcode Solutions

As voice and video streaming becomes more pervasive and customer demand for media consumption continues to rise, Artesyn's PCI Express server accelerators enable existing servers to scale up to higher densities, and support higher-density traffic at a fraction of the cost and server footprint, ultimately reducing CapEx and OpEx costs.

Hardware Acceleration Optional

The architecture of the nablet mediaEngine SDK provides for optional hardware acceleration. For low volume or occasional transcode requirements, nablet provides transcode acceleration through the native Intel® CPU resource available within the server. However, in the event that the transcode requirements increase (maybe more users come on line, or the required resolution is significantly increased) Artesyn hardware can be added to significantly increase capacity and capability without the solution provider being required to make changes to software. Such seamless expansion lends itself to aftermarket field upgrades and future-proofs implementations against an increase in demand.

Artesyn SharpStreamer™ Products

SharpStreamer™ PCIE-7207	SharpStreamer™ Pro PCIE-7210	SharpStreamer™ Mini PCIE-7205	MaxCore™ Platform
High density video transcoding accelerator card for H.264 applications	High performance HEVC video transcoding accelerator card	Video accelerator card for medium density transcoding and encoding applications	Enables highest density, economical and application-focused systems



About Nablet

nablet GmbH was founded in the autumn of 2011, and is a privately held corporation whose focus is on developing technologies for automated content recognition. nablet is located in Aachen, Germany. Its team has track record in the broadcast and film industry for the development of video codecs and related technologies just like container formats, streaming, transcoding and image processing products.

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About Artesyn Embedded Technologies

Artesyn Embedded Technologies is a global leader in the design and manufacture of highly reliable embedded computing solutions for a wide range of industries including communications, military, aerospace and industrial automation. Building on the acquired heritage of industry leaders such as Motorola Computer Group and Force Computers, Artesyn is a recognized leading provider of advanced network computing solutions ranging from application-ready platforms, single board computers, enclosures, blades and modules to enabling software and professional services. For more than 40 years, customers have trusted Artesyn to help them accelerate time-to-market, reduce risk and shift development efforts to the deployment of new, value-add features and services that build market share. Artesyn has over 20,000 employees worldwide across ten engineering centers of excellence, four world-class manufacturing facilities, and global sales and support offices.

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