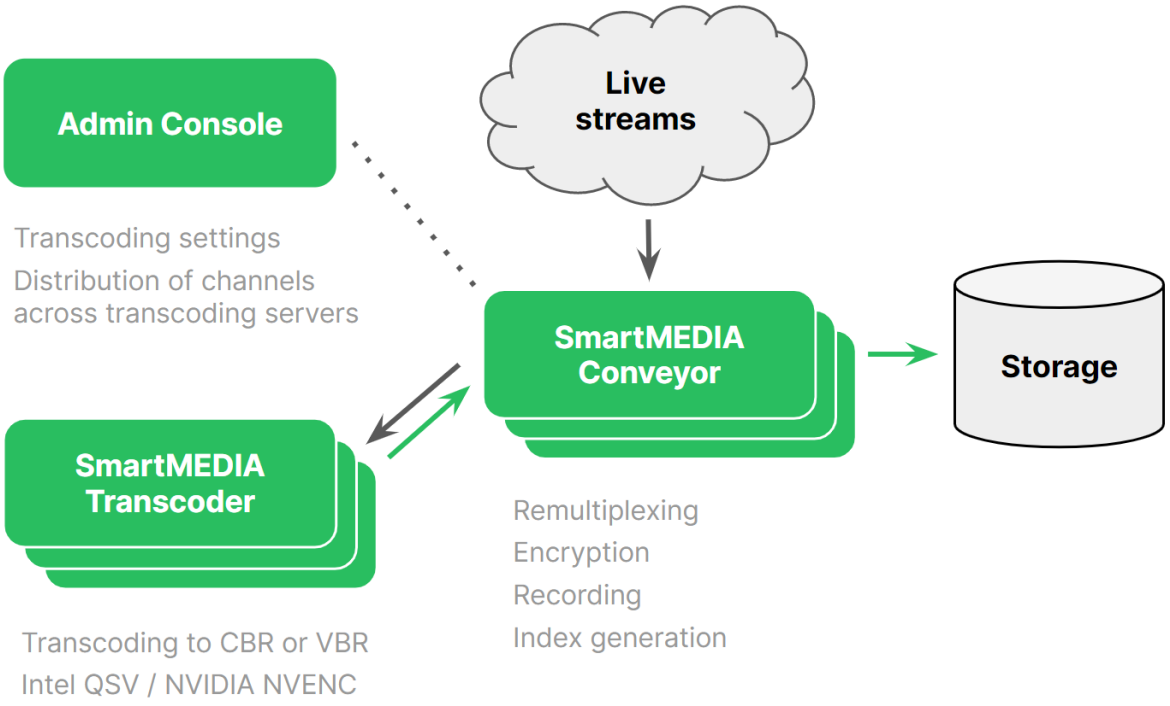
SmartLabs SmartMEDIA Transcoder

The SmartLabs SmartMEDIA Transcoder product allows you to perform transcoding of live input streams to multi profile adaptive bitrate, DASH or HLS, streams for OTT delivery. This software product runs on standard off-the-shelf hardware with Intel CPUs with QSV support or NVIDIA GPUs with NVENC support.

The solution architecture deploys two components of the SmartMEDIA Content Delivery Platform — *SmartMEDIA Conveyor* and *SmartMEDIA Transcoder*, which can be run on separate nodes and provide high stability and scalability. Transcoding profiles can be managed via a convenient web interface.



Key Advantages

- The solution allows you to use the most common generic hardware technologies for transcoding — Intel QSV and NVIDIA NVENC. You can reuse the existing hardware or opt for the new one. Wide range of Intel CPUs & NVIDIA GPUs is supported.
- Native integration with Intel and NVIDIA decoding/encoding API, unlike the ffmpeg-based solutions, ensures higher stability and lower resource utilization.
- Advanced algorithms avoid desynchronization of target streams and tracks, which often happens with ffmpeg-based solutions.
- *Transcoder* service can be shared between multiple *Conveyor* services, and vice versa. So you can build an optimal system configuration and, as a result, save on CAPEX & OPEX.
- High fault tolerance and easy scalability are the basis of the solution.

- Web-based GUI makes it easy to manage settings and channel distribution between transcoding servers.
- Native integration with SmartTUBE Service Delivery Platform.

QSV or NVENC

Taking into account factors such as hardware cost, power consumption, rack space, redundancy, and transcoding quality, we can conclude that the NVENC-based solution is much more cost effective in most cases. Tests of the SmartLabs SmartMEDIA Transcoder have shown that the price per transcoded channel in a NVENC-based solution can be up to 36% cheaper than in an QSV-based one. We present you a comparison of two indicative 6U installations:

- **QSV-based (non-redundant)**
  1× 6U server based on Supermicro MBE-628E-820D MicroBlade Enclosure and CPU Intel Xeon E-2224G

  vs.

- **NVENC-based (non-redundant)**
  3× 2U servers built on Supermicro SYS-2029GP-TR Barebone and GPU NVIDIA RTX A2000

	Intel QSV	NVIDIA NVENC	Difference
Indicative HW price	$ 61 414	$ 25 371	> 2 times cheaper
Number of channels	280	180	36%
Channels per unit	47	30	36%
Price per unit	$ 10 236	$ 4 229	> 2 times cheaper
Price per channel	$ 219	$ 141	⅓ cheaper

In addition, as of June 2022, the average delivery time of the QSV-based solution is 2–4 months, while the NVENC-based one — 1 month.

> *All examples of prices and delivery times above are indicative, and the company is not responsible for their accuracy at the time of reading.*

Component Overview

SmartMEDIA Conveyor

The *SmartMEDIA Conveyor* service is responsible for remultiplexing, segmenting, indexing and recording LiveTV streams to the storage.

Content can be delivered to the *SmartMEDIA Conveyor* server within the MPEG2-TS container using one of the following protocols:

- UDP over IP Multicast (without encapsulation in RTP),
- HTTP Stream,

- HLS (according to draft-pantos-http-live-streaming-07), without encryption.

SmartMEDIA Conveyor performs:

- remultiplexing,
- media data encryption (if necessary),
- recording to the storage,
- index generation and writing indexes to the database (MongoDB).

Adaptive Streaming Support

To record several streams of the single channel that have different bit rates (a.k.a. Adaptive Streaming), *SmartMEDIA Conveyor* synchronizes them at the recording stage and creates one index record for all of the chunks of different bitrates of the same time interval.

SmartMEDIA Transcoder

SmartMEDIA Transcoder service receives a stream of media samples from the *Conveyor* over the TCP connection, transcodes the stream and sends the resulting stream (or multiple streams in case of ABR) back to the *Conveyor*. It can be started on the same host where Conveyor runs as well as on the other, ”remote” host and work over the TCP/IP network.

SmartMEDIA Transcoder service uses proprietary protocol to exchange the data with *Conveyor* and cannot receive streams directly.