Overview

The Gearbox™ Media Platform is a real-time multichannel receiver and transcoder designed to receive Digital Compressed Uncompressed, satellite and terrestrial RF signals and transform them into streams that are best suited for today’s digital environments. It is designed to be scalable, easily adaptable, and field upgradeable to meet the needs of cable and IP network operators who are very comfortable with embedded Linux® based appliances. It relies on an Intel® 16 Core CPU as an accelerator. We have also optimized the transcode engine for reliability, efficiency, and flexibility.

The Gearbox Media Platform is an MPEG-2 to H.264 transcoder or transcaser. It receives transport streams several ways and transcodes them to H.264 or optional H.265, and outputs them to an IP network. Resulting streams can be viewed with standard IP capable set-top boxes, streaming video, smart phones, or software clients such as VLC or JW Player. The system receives transport streams, demultiplexes the requested services and streams these services using UDP, RTP, RTMP, DASH, Adaptive streaming, or HLS via IP networks as either IP multicast or IP unicast streams. The system transcodes individual streams into H.264 format up to a maximum individual bitrate of 50 Mbps.

The Gearbox Media Platform selects all required PIDs and multiplexes the demultiplexed transport stream packets into IP packets.

The unit provides PID filtering of all unwanted traffic, increasing system performance and the number of channels which can be transmitted per unit.

Programs typically are forwarded (pushed) as transport stream packets via UDP or as RTP (real time protocol) payload (RFC 2250). Pushing can be either unicast or multicast. In addition to push, programs can be forwarded on request (pulled) using HLS, HTTP Live, RTMP, DASH, etc. Unit is security tested for military applications.

Features

- **Inputs:** Simultaneous choices from HD-SDI, SDI, DVB-S-S2, CVBS, Encrypted DVB-S-S2, 8VSF, QAM (digital), DVB-C, DVB-T+T2, DVB-ASI, ISDB-Tb, HDMI or GigE and IP (H.264, MPEG-2, VC-1, or optional H.265)
- Based on embedded Linux®
- Remote GUI includes some scheduling
- Redundant power supply
- **Outputs:** Simultaneous SDI, HD-SDI, IP, or ASI
- IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Supports HLS (adaptive) and DASH for output to mobile devices
- Supports logo insertion, text overlay, and SCTE 35 compliant cue tone insertion (“ad markers”) on outputs
- Supports rotating key servers like Verimatrix® VCAST™
- Performs AES-128 encryption
- Supports 50 HLS users natively. Optional built-in server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users.
- Supports NTSC or PAL
- Transcoding bit rates: .1 to 15 Mbps
- Creates simultaneous High, Medium, and Low bitrate streams
- Supports 1080i, 1080p, 720p, 576i, 480i, and 480p and any other broadcast or video format
- Simultaneous demodulation, transcoding, encapsulation, optional time delay, and optional multiplexing
- Transcodes up to 20 720p60 HD streams, or 13 1080i/p HD streams, or 52 SD streams from MPEG-2 to H.264, or vice-versa
- Optional H.265 transcodes are up 5 720p HD streams, or 3 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264 to H.265, or vice-versa
- SNMP, REST, SOAP support for remote management and monitoring
- Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency
- Tested to work with Atlas™, Wowza®, and Adobe® Flash® media servers
- Tested to work with Akamai, Tuxix, Verizon, etc. CDN's
- Tested compatible with major brands of IP devices including Amino™, Roku®, Telergy, Android™, and Apple iPad® and iPhone®
- Tested compatible with major brands of professional H.265, H.264, and MPEG-2 decoders and video servers
- Audio support: AAC, Embedded pass-through, MPEG-1 Layer II, optional MP3, and/or optional “SurCode for Dolby Digital” AC-3
- Settings are remembered when power cycled
Applications

Encoding/Transcoding
- Up to 16 SD or HD encodes
- Up to 52 SD or 13 HD transcodes
- Supports MPEG, AAC, or AC-3 encoding
- Supports MPEG-2, J2K, H.264, H.265

Receiving
- Up to 16 channels of DVB-T2, 8VSB, QAM, DVB-S2
- Descrambles DVB-S2
- Reduces services by PID filtering
- Remultiplexes streams
- Supports 16 ASI ports in

Stream Processing
- Logo Insertion
- PID filtering
- SCTE 35/104 insertion
- 10 Gig ports
- Fiber optic connectors
- MIL grade security

Input/Outputs Example

Transcodes up to up to 52 SD streams, or 20 720p60 streams, or 13 1080i or 1080p HD streams from MPEG-2 to H.264, or vice-versa.

Throughput

If you have five Mbps bandwidth Internet then you can only stream five one Mbps streams.

CDNs Tested With:

1. Akamai*
2. Limelight
3. Tata
4. Octoshape
5. CDNetworks
6. Internap
7. Highwinds
8. Verizon*
9. Ustream*
10. Mirror Image
11. Tulix*
12. More to come!

*Certified

Sample of GUIs

Network Setup

Scheduled IP Input Setup

IP Output Setup

Options

- Optional transcoding to H.265
- 4:2:2 10 bit encoding
- Optional DOZER™ Automated UDP Packet Recovery protocol, enabling error-free video delivery over UDP. DOZER ensures smooth MPEG-2, H.264, and optional H.265 delivery through DVEO patented algorithms for automated packet recovery and re-ordering of out-of-sequence packets.
- Optional built-in “Mini Atlas” server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users
IP Input and Output

**IP Input**

- Input protocols: UDP, RTP, RTSP, HTTP, HTTP Live, RTMP (pushed from Flash server).
- Supports NewTek™ NDI® input.

**IP Output**

- Audio: AAC, Embedded pass-through, MPEG-1 Layer II, optional MP3, and/or optional “SurCode for Dolby Digital” AC-3
- Ethernet: Two GigE, optional 10 GigE
- Output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Type: IP-multicast, IP-unicast with “wrappers”
- Bit Rates: Multiple H.264 video streams at different bit rates (.1 to 15 mbps), resolutions, and protocols, wrappers, and containers.
- Optional H.265: H.265 average bit rate supported. No constant or variable.
- Quality: 8 bit encoding with 4:2:0 color sampling; optional 4:2:2
- Video: NTSC or PAL
- Latency: About 1.2 seconds (fixed)
- Optional Multiplexing: Multiplexing transport streams

## Supported Resolutions

**Supported Resolutions – Input and Output**

<table>
<thead>
<tr>
<th>Resolution</th>
<th>SDI In at 6 Mbps</th>
<th>HD Inputs at 12 Mbps</th>
<th>H.264</th>
<th>H.264up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920 x 1080</td>
<td>720 x 480</td>
<td>480 x 480</td>
<td>H.264up</td>
<td></td>
</tr>
<tr>
<td>1280 x 720</td>
<td>704 x 480</td>
<td>480 x 320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>720 x 576</td>
<td>640 x 480</td>
<td>320 x 240</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H.264 In**

- SD input: 3 Mbps, 6 Mbps
- HD input: Up to 52 streams
- 1080p: Up to 13 streams
- 1080p: Up to 13 streams

**H.264 Out**

- SD output: 3 Mbps
- HD output: Up to 52 streams
- 1080p: Up to 13 streams
- 1080p: Up to 13 streams

**MPEG-2 In**

- 480i: Up to 52 streams
- 720p: Up to 52 streams
- 720p: Up to 20 streams
- 1080i: Up to 13 streams
- 1080p: Up to 13 streams

**MPEG-2 Out**

- SD MPEG-2: Up to 52 streams
- HD outputs: Up to 52 streams
- 720p60: Up to 20 streams
- 1080i: Up to 13 streams
- 1080p: Up to 13 streams

**Specifications**

<table>
<thead>
<tr>
<th>Input/Output</th>
<th>Modulation</th>
<th>Inputs</th>
<th>Frequency range</th>
<th>Maximum raw throughput</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVB-C, QAM Input</td>
<td>DVB-C, Digital Clear QAM (Annex A, B, or C)</td>
<td>RF from cable</td>
<td>55 to 867 MHz</td>
<td>200 Mbps</td>
</tr>
<tr>
<td>8VSB (SMpte. 310M) Input</td>
<td>8VSB (SMpte. 310M) – terrestrial digital</td>
<td>RF from antenna</td>
<td>54 to 860 MHz</td>
<td>200 Mbps</td>
</tr>
<tr>
<td>DVB-S/S2 Input</td>
<td>DVB-S, DVB-S2</td>
<td>L-Band, K-Band, Ku Band, etc.</td>
<td>950 to 2150 MHz</td>
<td>200 Mbps</td>
</tr>
<tr>
<td>DVB-T or DVB-T2 Input</td>
<td>DVB-T or DVB-T2 – terrestrial digital</td>
<td>RF from antenna</td>
<td>54 to 860 MHz</td>
<td>200 Mbps</td>
</tr>
<tr>
<td>ISDB-Tb Input</td>
<td>ISDB-Tb</td>
<td>RF from antenna</td>
<td>54 to 860 MHz</td>
<td>200 Mbps</td>
</tr>
<tr>
<td>SDI, HD-SDI Input/Output</td>
<td>SDI (SMpte. 295M), HD-SDI (SMpte. 292M)</td>
<td>Does not support 608 closed captioning for SDI input. Only 708 is supported.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDMI Input/Output</td>
<td>HDMI</td>
<td>Does not support closed captioning for HDMI input.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVB-ASI Input/Output</td>
<td>DVB-ASI, 200 Mbps per port</td>
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</tbody>
</table>

### Bit Rates

- Multiple H.264 and/or MPEG-2 video streams at different bit rates (.1 to 15 mbps)
- Rate: Multiple H.264 and/or MPEG-2 video streams at different bit rates (.1 to 15 mbps)

**CPU & Operating System**

- **CPU**: Intel® Xeon® 16 Core
- **OS**: DVEO embedded Linux® on SSD

**Physical & Power**

- **Power Supply**: 3U 760W
- **Physical**: Size: 19 x 5.25 x 24.36 (48.26 x 133.4 x 64 cm)
- **Temperature Range**: Operating: 0°C ~ +50°C on Full Load; Storage: -20°C ~ +70°C
- **Weight**: 39 lbs. (17.69 kg)
- **Conformities**: UL, IBSIM, CSA, FCC, CE, RoHS

**Security**

- Ports security scanned to MIL requirements prior to shipment

**Ad Insertion**

- SCTE Ad Marker insertion via RS232, USB, IP, Contact closures

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**Ordering Information**

**Gearbox Media Platform**

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