Telco Quality, Highly Reliable, 1 RU, 19 Inch Wide, 16 Core Intel® Xeon® Based Real Time, Multi Definition, Multichannel IP Transcoder and or Streamer (up to 1080p/i), with Ability to Transcode 52 SD Streams from MPEG-2 to H.264 or H.264 to MPEG-2. With Optional H.265, Transcodes up to 20 SD Streams. It Boots Quickly from Flash Drive and Remembers all Settings. Easy to Use GUI Allows Full Config of Each Stream and via SNMP. Can Report its Status to Remote Network Operations. Typical Real Time Transcodes Benchmarks Include 52 SD Streams, or 20 Each 720p60 Streams, or 13 Each 1080p/i Streams. Supports Flash, HLS, RTMP, HTTP, and Live Streaming and Works Well with Atlas™, Wowza®, and Adobe® Flash® Servers. Ideal Device for Creating Low, Medium, and High Bit Rate Streams inside ISP's and CDN’s. SDK Available for CDN’s Who Wish to Offer Transcode Management via "Their" Application. Supports 50 Simultaneous HLS Users. With Optional Atlas™ Add-on, Supports 500 RTMP, DASH, and/or HLS Users Natively.

Features

- Input or output format can be MPEG-2, H.264, optional H.265, or a mixture, with most popular Wrappers and Containers
- Can sit in the cloud as a Cloud Encoder
- Supports HLS (adaptive) for output to mobile devices
- Input: IP (H.264, MPEG-2, VC-1, or optional H.265)
- Supports NewTek™ NDI® input
- Supports IP content protection with rotating Key Servers like Verimatrix® VCAS™, Widevine, etc. via OPT
- IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Supports logo insertion, text overlay, and SCTE 35 compliant cue tone insertion ("ad markers") on outputs
- Supports 50 simultaneous HLS users. Optional built-in server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users natively (without Media Servers).
- Transcoding bit rates: .1 to 15 Mbps with 4:2:0 or optional 4:2:2
- Resolutions: qHD, H.264up, SQVGA, QCIF, QVGA, CIF, or any custom size up to 1080i/p. Also supports all computer resolutions.
- 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 to 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
- Creates simultaneous High, Medium, and Low bitrate streams
- Able to upconvert incoming SD streams to HD, and scale down
- 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 compatible with major brands of IP devices including Amino™, Roku®, Telergy, Android™, and Apple iPad® and iPhone®
- 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
- Based on embedded Linux® (via flashdisk)
- Remote GUI includes some scheduling
- Supports Reliable Scrambling via Rotating Key Encryption or classical AES and DES standards
- Supports 3G mobile network and Internet network, including 3GPP v4, 5, 6 and 3GPP2
- Now! QUALYS certified to Level 2 for Critical Vulnerabilities like Open Ports, Tracking applications with COBIT, FISMA, HIPAA, NERC, PCI DSS, SANS, SCAP compliance

Overview

The Brutus™ II IP/IP: TELCO is a real time multichannel streamer that is able to transcode streams into bit rates and protocols that are best suited for the targeted viewing devices. It is designed to be scalable, easily adaptable, customizable, and field upgradeable to meet the needs of broadband network operators who are now more than comfortable with embedded Linux® based appliances. It relies on a 16 core Intel® CPU for acceleration. We have also optimized the transcode engine for reliability, efficiency, and flexibility.

The Brutus II IP/IP: TELCO is an MPEG-2 to H.264, or H.264 to MPEG-2 transcoder or transcoder. It receives transport streams several ways and transcodes them to MPEG-2 or H.264 or optional H.265, and outputs them to an IP network. Resulting streams can be viewed with standard transport stream compatible set-top boxes, streaming video, smart phones, or software clients such as VLC or JW Player. The Brutus II IP/IP: TELCO receives transport streams, demultiplexes the requested channels and streams these channels using UDP, RTP, RTMP, adaptive, or HTTP via IP networks as either IP multicast or IP unicast streams. The system transcodes individual streams into H.264 or MPEG-2 format up to a maximum individual bitrate of 15 Mbps.

Depending on the configuration, it forwards selected programs via IP datacasting; PAT, PMT, video PID, audio PID(s) and PCR information are transmitted. The Brutus II IP/IP: TELCO 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 HTTP, HTTP Live, RTMP, DASH, etc.

The Brutus is a very powerful multi-channel transcoder designed for large scale enterprise level deployments.
Applications

- IPTV Unicasting, Multicasting, Streaming
- OTT and Mobile
- Replicating single streams into Low, Medium, and High bit rates
- Telco TV
- Hotels, Cruise Lines, Universities, Resorts
- Rendering and Encoding Farms
- Digital Media Distribution

Inputs/Outputs

- PS 1       PS 2             IP                  WAN 2     LAN 2
- Management (Either can be used for IP Input or Output)

Reliability Points

- No hard drives
- Lots of spare fans
- Remote MIBs
- Server Class MB
- Quick swap redundant power supply
- Boots up in 40 seconds
- Supermicro IPMI management

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
Benchmarks

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 4 Mbps, 480i  720p inputs at 12 Mbps  1080p/i/p inputs at 15 Mbps</td>
<td>SD out at 2 Mbps, 480i – Up to 52 streams  720p outputs at 4 Mbps – Up to 20 streams  1080p/i/p outputs at 6 Mbps – Up to 13 streams</td>
</tr>
<tr>
<td>SD in at 4 Mbps, 480i  720p inputs at 12 Mbps  1080p/i/p inputs at 15 Mbps</td>
<td>SD out at 1 Mbps, 480i – Up to 20 streams  720p outputs at 2 Mbps – Up to 5 streams  1080p/i/p outputs at 3.5 Mbps – Up to 3 streams</td>
</tr>
</tbody>
</table>

IP Input and Output

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

**IP Output**
- Ethernet: Up to 2 x 1 GigE
- Output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Type: IP-multicast, IP-unicast
- Video: NTSC or PAL
- Latency: 1.2 seconds (fixed)

Specifications

**Some Supported Resolutions – Input and Output**
- 1920 x 1080
- 1280 x 720
- 720 x 576
- 720 x 480
- 704 x 480
- 640 x 480
- 480 x 480
- 480 x 320
- 320 x 240
- qHD

**Output 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

**Administration**
- Access: Web interface, ssh interface
- SNMP: Monitoring and alerts, MIBS available
- Scheduling: On, Off support for timeslots

**CPU and Operating System**
- CPU: Single 16 Core Xeon®
- OS: DVEO embedded Linux® in SSD

**Physical & Power**
- Size: 1.7” h x 17.2” w x 25.6”d (433 x 437 x 650 mm)
- Power Supply: 500W redundant power supplies with PMBus
- Voltage: 100-240Vac, 50-60 Hz, 6.1-2.6A, 500 watts
- Operating Temperature: 10° to 35°C (50° to 95°F)
- Non-Operating Temperature: -40° to 60°C (-40° to 140°F)
- Operating Humidity: 8% to 90% (non-condensing)
- Non-Operating Humidity: 5% to 95% (non-condensing)
- Fans: 5 Counter-rotation 40x56 mm PWM fans
- Weight: 24 lbs (10.89 kg)
- Conformities: UL, CSA, CE, RoHS

**Security**
- Ports security scanned to MIL requirements prior to shipment

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

Options

- Optional transcoding to H.265
- DVEO SILVER or GOLD CARE™ – Extended Warranty with Priority Tech Support
- Optional DOZER™ Automated UDP Packet Recovery protocol, enabling error-free video delivery over UDP.
- 4:2:2 10 bit encoding
- Fiber Optic Interface with SFP interfaces
- Optional built-in “Mini Atlas” server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users
- "Cloud" version available

Benchmarks – Optional H.265

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 1 Mbps, 480i  720p in at 2 Mbps  1080p/i/p in at 3.5 Mbps</td>
<td>SD out at 1 Mbps, 480i – Up to 20 streams  720p outputs at 2 Mbps – Up to 5 streams  1080p/i/p outputs at 3.5 Mbps – Up to 3 streams</td>
</tr>
<tr>
<td>SD in at 1 Mbps, 480i  720p in at 2 Mbps  1080p/i/p in at 3.5 Mbps</td>
<td>SD out at 6 Mbps, 480i – Up to 52 streams  720p at 12 Mbps – Up to 20 streams  1 1080p/i/p at 15 Mbps – Up to 13 streams</td>
</tr>
</tbody>
</table>

Benchmarks

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 4 Mbps, 480i  720p inputs at 12 Mbps  1080p/i/p inputs at 15 Mbps</td>
<td>SD out at 2 Mbps, 480i – Up to 52 streams  720p outputs at 4 Mbps – Up to 20 streams  1080p/i/p outputs at 6 Mbps – Up to 13 streams</td>
</tr>
<tr>
<td>SD in at 4 Mbps, 480i  720p inputs at 12 Mbps  1080p/i/p inputs at 15 Mbps</td>
<td>SD out at 6 Mbps, 480i – Up to 52 streams  720p at 12 Mbps – Up to 20 streams  1 1080p/i/p at 15 Mbps – Up to 13 streams</td>
</tr>
</tbody>
</table>

Ordering Information

Brutus II IP/IP: TELCO
- Tech Support – One year support and updates, included
- Option 1: H.265 Transcoding
- Option 2: DVEO GOLD CARE™
- Option 3: DOZER™ Automated UDP Packet Recovery
- Option 4: 4:2:2 10 bit encoding
- Option 5: SPF Fiber Interfaces
- Option 6: Built-in “Mini Atlas” server

Options

- Optional transcoding to H.265
- DVEO SILVER or GOLD CARE™ – Extended Warranty with Priority Tech Support
- Optional DOZER™ Automated UDP Packet Recovery protocol, enabling error-free video delivery over UDP.
- 4:2:2 10 bit encoding
- Fiber Optic Interface with SFP interfaces
- Optional built-in “Mini Atlas” server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users
- "Cloud" version available

Specifications

**Some Supported Resolutions – Input and Output**
- 1920 x 1080
- 1280 x 720
- 720 x 576
- 720 x 480
- 704 x 480
- 640 x 480
- 480 x 480
- qHD
- H.264up

**Output Bit Rates**
- 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

**CPU and Operating System**
- CPU: Single 16 Core Xeon®
- OS: DVEO embedded Linux® in SSD

**Physical & Power**
- Size: 1.7” h x 17.2” w x 25.6”d (433 x 437 x 650 mm)
- Power Supply: 500W redundant power supplies with PMBus
- Voltage: 100-240Vac, 50-60 Hz, 6.1-2.6A, 500 watts
- Operating Temperature: 10° to 35°C (50° to 95°F)
- Non-Operating Temperature: -40° to 60°C (-40° to 140°F)
- Operating Humidity: 8% to 90% (non-condensing)
- Non-Operating Humidity: 5% to 95% (non-condensing)
- Fans: 5 Counter-rotation 40x56 mm PWM fans
- Weight: 24 lbs (10.89 kg)
- Conformities: UL, CSA, CE, RoHS

**Security**
- Ports security scanned to MIL requirements prior to shipment

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

© 2018 Computer Modules, Inc.  DVEO, Atlas, Brutus, and DOZER are trademarks of Computer Modules, Inc.  Intel and the Intel logo are trademarks of Intel Corporation in the United States and/or other countries.  All other trademarks and registered trademarks are the properties of their respective owners.  All rights reserved.  Specifications are subject to change without notice.  AAC licensed via Via Licensing.

Computer Modules, Inc.
11409 West Bernardo Court
San Diego, CA 92127
Tel: 858-613-1818  Fax: 858-613-1815
www.dveo.com