The Brutus™ VI 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 4 x 18 Core Intel® Xeon® CPU for acceleration. We have also optimized the transcode engine to get the best possible efficiency from each core.

The Brutus VI IP/IP: TELCO is an MPEG-2 to H.264, or H.264 to MPEG-2 transcoder or trans scaler. 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 VI 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 VI 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**

- Small To Mid Size Headends for Multiple System Operators
- IPTV Grooming for differentiated services at different rates
- Grooming for OTT and Mobile
- Digital Turnaround for SD and HD combined services
- Perfect for Resizing and Reformatting IP camera inputs arriving via RTSP push
- Telco Grooming for 3G and 4G with 3GPP
- Adapting MPEG-2 streams to H.264 for Hotels, Cruise Lines, Universities, Resorts
- Ideal for Cloud based Encoding Farms
- Digital Media Distribution of content in right formats
- Adaptive Multirate Cloud Transcoding
- Will work with audio IP streams for digital music services

**Inputs/Outputs**

2 10 GigE Ports

**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>MPEG-2 In</th>
<th>H.264 Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 4 Mbps, 480i 720p inputs at 12 Mbps 1080i/p inputs at 18 Mbps</td>
<td>SD out at 1 Mbps, 480i – Up to 80 streams 720p outputs at 2 Mbps – Up to 18 streams 1080i/p outputs at 3 Mbps – Up to 10 streams</td>
</tr>
<tr>
<td>H.264 In</td>
<td>MPEG-2 Out</td>
</tr>
<tr>
<td>SD in at 6 Mbps, 480i 720p in at 12 Mbps 1080i/p in at 15 Mbps</td>
<td>SD out at 6 Mbps, 480i – Up to 200 streams 720p at 12 Mbps – Up to 75 streams 1080i/p at 15 Mbps – Up to 50 streams</td>
</tr>
</tbody>
</table>

### Benchmark – Optional H.265

<table>
<thead>
<tr>
<th>MPEG-2 In</th>
<th>H.265 Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 4 Mbps, 480i 720p inputs at 12 Mbps 1080i/p inputs at 18 Mbps</td>
<td>SD out at 1 Mbps, 480i – Up to 80 streams 720p outputs at 2 Mbps – Up to 18 streams 1080i/p outputs at 3 Mbps – Up to 10 streams</td>
</tr>
<tr>
<td>H.264 In</td>
<td>H.265 Out</td>
</tr>
<tr>
<td>SD in at 6 Mbps, 480i 720p in at 12 Mbps 1080i/p in at 15 Mbps</td>
<td>SD out at 1 Mbps, 480i – Up to 80 streams 720p outputs at 2 Mbps – Up to 18 streams 1080i/p outputs at 3 Mbps – Up to 10 streams</td>
</tr>
<tr>
<td>H.265 In</td>
<td>H.265 Out</td>
</tr>
<tr>
<td>SD in at 1 Mbps, 480i 720p in at 2 Mbps 1080i/p in at 3 Mbps</td>
<td>SD out at 6 Mbps, 480i – Up to 200 streams 720p at 12 Mbps – Up to 75 streams 1080i/p at 15 Mbps – Up to 50 streams</td>
</tr>
<tr>
<td>H.265 In</td>
<td>H.264 Out</td>
</tr>
<tr>
<td>SD in at 1 Mbps, 480i 720p in at 2 Mbps 1080i/p in at 3 Mbps</td>
<td>SD out at 6 Mbps, 480i – Up to 200 streams 720p at 12 Mbps – Up to 75 streams 1080i/p at 15 Mbps – Up to 50 streams</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>1920 x 1080</th>
<th>720 x 480</th>
<th>480 x 480</th>
<th>qHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1280 x 720</td>
<td>480 x 320</td>
<td>320 x 240</td>
<td>H.264up</td>
</tr>
</tbody>
</table>

H.265 output resolutions supported are 1080, 720, 576, 480.
H.265 576/480 resolutions only have 4:3 aspect ratio.

**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 (Secure command line interface)
- SNMP: Monitoring and alerts, MIBS available
- Scheduling: On, Off support for timeslots

**CPU and Operating System**

- CPU: Quad Intel® CPU server, 72 Core
- OS: DVEO embedded Linux® in SSD

**Physical & Power**

- Size: 1.7" h x 17.2” w x 28.25” d (43 x 437 x 718 mm)
- Voltage: 1000W Redundant Power Supplies with PMBus
- Total Output Power: 800W/1000W
- Operating Temperature: 10° to 35° C (50° to 95°F)
- Non-Operating Temperature: -40° to 60° C (-40° to 140° F)
- Humidity: Operating: 8% to 90% (non-condensing)
- Non-operating: 5% to 95% (non-condensing)
- Weight: 40 lbs (18.1 kg)

**Conformities:**

- UL, CSA, CE, RoHS

**Security**

- Ports security scanned to MIL requirements prior to shipment

**Optional Ad Insertion**

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

---

### Ordering Information

Brutus VI 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

© 2018 Computer Modules, Inc. DVEO, Atlas, Brutus, DOZER, and OnRamp are trademarks of Computer Modules, Inc. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. 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.