**Overview**

The Brutus™ III 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 2 x 14 Core Intel® Xeon® CPU for acceleration. We have also optimized the transcode engine to get the best possible efficiency from each core.

The Brutus III IP/IP: TELCO is an MPEG-2 to H.264, or H.264 to MPEG-2 transcoder or 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 III 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 III 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.

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**Features**

- Input or output format can be MPEG-2, H.264, optional H.265, or a mixture, with most popular Wrappers and Containers
- Supports Transport Stream Demultiplexing
- Can sit in the cloud as a Cloud reEncoder to generate High, Medium, and Low bitrate streams from inexpensive original 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® VCSS™, Widevine, etc. via OPT
- IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Supports 50 simultaneous HLS users. Optional build-in server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users natively (without Media Servers).
- Two built in 10 GigE ports
- Transcoding bit rates: .1 to 15 Mbps with 4:2:0 or optional 4:2:2
- Creates simultaneous High, Medium, and Low bitrate streams
- Resolutions: qHD, H.264up, SQVGA, QCIF, QVGA, CIF, or any custom size up to 1080i/p. Also supports all computer resolutions
- Transcodes up to 30 720p60 HD streams, or 20 1080i/p HD streams, or 80 SD streams from MPEG-2 to H.264, or vice-versa
- Optional H.265 transcodes are up to 8 720p HD streams, or 4 1080i/p HD streams, or 32 SD streams from MPEG-2 to H.264, or vice-versa
- 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
- OPT: Fiber Optic Interface with SFP interfaces
- Tested to work with Atlas™, Wowza®, and Adobe® Flash® servers
- Down converter ability to convert all HD services to SD
- 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)
- Supports Reliable Scrambling via rotating Key Encryption or classical AES and DES standards
- VOD optional
- Works well with Load Balancers
- Designed for secure 24x7x365 operation
- Supports AES encryption
- NEBS version available with DELL TELCO platform
- Tested to work with most middleware including Beenius™ and Minerva
- 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
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

- PS 1  PS 2  WAN  LAN
  (Two 10 GigE Ports – 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. CDN Networks
6. Internap
7. Highwinds
8. Verizon*
9. Ustream*
10. Mirror Image
11. Tulix*
12. More to come!

*Certified
### IP Input and Output

**IP Input**


**IP Output**

- **Ethernet:** Two 10 GigE ports
- **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**

<table>
<thead>
<tr>
<th>Resolution</th>
<th>1920 x 1080</th>
<th>1280 x 720</th>
<th>720 x 576</th>
<th>640 x 480</th>
<th>480 x 480</th>
<th>320 x 240</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG-2 Out</td>
<td>720 x 480</td>
<td>704 x 480</td>
<td>640 x 480</td>
<td>480 x 320</td>
<td>320 x 240</td>
<td></td>
</tr>
<tr>
<td>H.264 Out</td>
<td>480 x 480</td>
<td>480 x 320</td>
<td>320 x 240</td>
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</tbody>
</table>

Also supports any custom resolution not listed here, including computer formats like 1280 x 1024, etc. Note: Lower resolution results in higher transcodes.

**H.265 output resolutions supported are 1080, 720, 576, 480.**

**H.265 576/480 resolutions only have 4:3 aspect ratio.**

### Output Bit Rates

<table>
<thead>
<tr>
<th>Bit Rates</th>
<th>SD in at 4 Mbps, 480i</th>
<th>720p inputs at 12 Mbps</th>
<th>1080i/p inputs at 18 Mbps</th>
<th>SD in at 6 Mbps, 480i</th>
<th>720p in at 12 Mbps</th>
<th>1080i/p in at 15 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD in at 4 Mbps, 480i</td>
<td>6 Mbps</td>
<td>12 Mbps</td>
<td>18 Mbps</td>
<td>6 Mbps</td>
<td>12 Mbps</td>
<td>18 Mbps</td>
</tr>
<tr>
<td>1080i/p in at 3 Mbps</td>
<td>SD in at 1 Mbps, 480i</td>
<td>SD in at 1 Mbps, 480i</td>
<td>SD in at 1 Mbps, 480i</td>
<td>SD in at 1 Mbps, 480i</td>
<td>SD in at 1 Mbps, 480i</td>
<td></td>
</tr>
<tr>
<td>Latency: 1.2 seconds (fixed)</td>
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</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

### Ordering Information

**Brutus III 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

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