The Brutus™ IV 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 12 Core Intel® Xeon® CPU for acceleration. We have also optimized the transcode engine to get the best possible efficiency from each core.

The Brutus IV 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 IV IP/IP: TELCO receives transport streams, demultiplexes the requested channels and streams these channels using UDP, RTSP, 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. It can also multiplex the streams if required.

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 IV 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 feeds
- 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
- Redundant Power Supplies
- 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
### IP Input and Output

**IP Input**

**IP Output**
- Ethernet: Four 10 Gig E 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

- 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
- H.264up

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

- 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, 48 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

#### Ad Insertion

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

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**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

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**Benchmarks**

<table>
<thead>
<tr>
<th>MPEG-2 In</th>
<th>H.264 Out</th>
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<td>SD in at 4 Mbps, 720p inputs at 12 Mbps, 1080i/p inputs at 15 Mbps</td>
<td>SD out at 2 Mbps, 720p outputs at 2 Mbps – Up to 12 streams, 1080i/p outputs at 3 Mbps – Up to 8 streams</td>
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**MPEG-2 In**

| SD in at 4 Mbps, 720p inputs at 12 Mbps, 1080i/p inputs at 15 Mbps | SD in at 1 Mbps, 480i – Up to 48 streams, 720p outputs at 2 Mbps – Up to 12 streams, 1080i/p outputs at 3 Mbps – Up to 8 streams |
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**Benchmarks – Optional H.265**

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**Ordering Information**

- Brutus IV 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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