**BRUTUS V IP/IP: TELCO**

Telco Quality, Highly Reliable, 1 RU, 19 Inch Wide, 4 x 14 Core Intel® Xeon® CPU Based Real Time, Multi Definition, Multichannel IP Transcoder and or Re Streamer (up to 1080p/i), with Ability to Transcode 160 SD Streams from MPEG-2 to H.264 or H.264 to MPEG-2. With Optional H.265, transcodes up to 40 SD Streams.

Based on Embedded Linux®. 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 160 SD Streams, or 60 Each 720p Streams, or 40 Each 1080p/i Streams. Ships with 4 10 Gig E Ports. 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. DASH is Now Supported. Supports 50 Simultaneous HLS Users. With Optional Atlas™ Add-on, Supports 1,000 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
- Supports Transport Stream Demultiplexing
- Can sit in the cloud as a Cloud reEncoder to generate High, Medium, and Low bit rate 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®/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
- 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 60 720p HD streams, or 40 1080i/p HD streams, or 160 SD streams from MPEG-2 to H.264, or vice-versa
- Optional H.265 transcodes are up to 12 720p HD streams, or 6 1080i/p HD streams, or 40 SD streams from MPEG-2 or H.264 to H.265, or vice versa
- Able to upconvert incoming SD streams to HD, and scale down
- SNMP, REST, SOAP support for remote management and monitoring
- OPTION: Fiber Optic Interface with SFP interfaces
- Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency
- 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)
- Telco Grade CBR out. Interoperates with well known brands of equipment found at major Telcos.
- Supports Reliable Scrambling via Rotating Key Encryption or classical AES and DES standards
- NEW: Ships with 4 10 Gig E ports
- 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, HIPAAA, NERC, PCI DSS, SANS, SCAP compliance

### Overview

The **Brutus™ V 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 upgradable 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 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 V 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 V 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 V 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
- 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:

2. Limelight  5. CDNetworks  8. Verizon*  11. Tulix*

*Certified

Sample of GUIs

- Status Screen
- Manual IP Input Setup
- Scheduled IP Input Setup
- IP Output Setup

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Benchmarks

<table>
<thead>
<tr>
<th>MPEG-2 In</th>
<th>H.264 Out</th>
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<tbody>
<tr>
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<td>SD out at 2 Mbps, 480i – Up to 160 streams</td>
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<td>720p inputs at 12 Mbps</td>
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Benchmarks – Optional H.265

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Options

- Optional transcoding to H.265
- DVEO GOLD CARE™ – Extended Warranty with Priority Tech Support
- 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.
- 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

Ordering Information

Brutus V 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

Specifications

Some Supported Resolutions – Input and Output

<table>
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<th>Input</th>
<th>Output</th>
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<tr>
<td>1920 x 1080</td>
<td>1080p at 15 Mbps – Up to 40 streams</td>
</tr>
<tr>
<td>1280 x 720</td>
<td>720p at 12 Mbps – Up to 60 streams</td>
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<tr>
<td>720 x 576</td>
<td>576p at 4 Mbps – Up to 40 streams</td>
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<th>Input/Output Bit Rates</th>
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<td>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.</td>
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<td>Quality: 8 bit encoding with 4:2:0 color sampling; optional 4:2:2</td>
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Ad Insertion

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

Security

Ports security scanned to MIL requirements prior to shipment

IPC and Operating System

CPU: Quad Intel® CPU server, 56 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

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