Choosing a Live Encoder

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Agenda

- Overview
- Hardware encoders
  - Big iron
  - Portable
  - On-camera
  - Specialized
- Software
  - Encoding only
  - Studio
Where we want to get to

- At least two adaptive streaming groups
  - Content files
  - Metadata files

How to get there

- Big iron encoder

Elemental Live
Output all formats/metadata files directly
Price: ~$36,000
How to get there

- Software encoder
- Transmux server

![Diagram showing the process of how to get there from an on camera encoder to transmux server and adaptive streams for Desktop and mobile.](image)

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How to get there

- On camera encoder
- Transrate to multiple files
- Transmux server

![Diagram showing the process of how to get there from an on camera encoder to transrate and transmux server and adaptive streams for Desktop and mobile.](image)
What’s the Point

- Anyone from PETA here?
  - There’s more than one way to skin a cat
- Understand total workflow before you choose an encoder category

Live Encoder Taxonomy
Big Iron Encoders

- When
- Who
- Generic considerations
- Advanced considerations

Big Iron - When

- High volume usage
  - Periodic large events
  - Daily broadcasts
- Advanced features
  - Advertising insertion
  - Closed captions
  - Access to encryption and DRM
  - Audio normalization/CALM
- Most reliable operation
  - Proven in 24/7 broadcast apps
Big Iron - Who?

- Ateme
  - TITAN Live
- Cisco
  - Media Processor
- Digital Rapids
  - StreamZ Live
- Elemental
  - Elemental Live
- Envivio
  - 4Caster
- Haivision
  - Makito, Barracuda
- Viewcast
  - Niagara Pro 7550, 9100, Pro II

Generic Considerations

- Does it connect to your inputs
- Does it produce the required outputs
  - Codecs, formats, metadata
  - Stream count
- Does it come in the form factor I want
- Most products have:
  - Remote operation and monitoring via browser-based interface
  - Create and modify presets
  - Schedule broadcasts
- Most claim:
  - Best quality encoding
  - Superior scaling, de-interlacing, frame rate conversions, etc.
  - Claims are tough to verify
**Big Iron - Advanced Considerations**

- What’s the density?
  - How many units to produce required streams
- Advertising support
  - SCTE 35
  - SCTE 104
- Closed caption support
  - Pass through to OTT
  - HLS, Flash, Smooth
- Software updateable to ATDC/H.265
- Audio normalization and CALM act
- Encryption and DRM for all formats
- Output to multiple redundant servers
- Failover support
- What OS?
  - Windows or Linux
- Price – will vary significantly based upon inputs and HD/SD

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**Portable - When**

- When broadcasting from multiple locations
- When you don’t want to use a computer
  - E.g. non-technical users
Portable - Who?

- Digital Rapids
  - Touchstream
- Haivision
  - Viper
- Viewcast
  - Niagara Pro 2200, 4100
- Vitec
  - Optibase Nano

Generic Considerations

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- Most products have:
  - One button streaming
  - Remote operation and monitoring
  - Create and modify presets
  - Choose preset in the office for use in the field
Advanced Considerations

- Control paradigm
  - Touch screen most convenient, but also $$$
  - Most units are self-contained computers
    - Attach monitor and keyboard
    - Or, control with other computer on same network
  - Graphics input (PowerPoint/screen apps)

- Size, weight
- Price – will vary dramatically based upon connections and HD/SD
- Noise
- Operating system
  - Windows vs. Linux

On Camera - When

- When you can’t use a portable encoder
  - No power
  - No Ethernet or Wi-Fi
  - You have to move the camera around so need a truly portable encoder
On Camera - Who?

- Livegear
  - Aircam
- Livestream
  - Broadcaster
- Minicaster
  - Minicaster
- Teradek
  - Bond, Cube

Generic Considerations

- Does it connect to your inputs
- Does it produce the required outputs
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- Most products:
  - Can mount on camera
  - Have USB for 4G modem
Advanced Considerations

- Does it connect to your service
  - If connect to Livestream, use Livestream
- Wi-Fi or 4G?
  - If primarily 4G, consider integrated encoder/link aggregator
    - Better than single 4G
    - Can adapt to changing bandwidth
- Real world battery life varies greatly
- On-board SD storage
- Integrated (chargeable) vs insertable batteries
  - Integrated is nice unless requirements exceed charge duration
- Remote control apps
  - iPhone/iPad control preferred

For Industrial Strength Requirements

- Consider luggable unit – LiveGear AirStream
  - Integrated encoding multiple mode bonded 3G/4G
  - Video preview
  - Up to 6 hour operation with hot swappable batteries
Webcam/Encoder – Logitech Broadcaster

- Send encoded video directly to UStream over Wi-Fi
  - No computer necessary
- Operate as traditional webcam, connected via Wi-Fi

Software Encoders

- Enterprise
- Desktop
- Production/encoding
- Service provider specific
Enterprise Software - When

- Industrial strength encoding
  - High quality
  - Adaptive output
  - Advertising insertion
  - Closed caption support
- Prefer a software solution (or hybrid hardware/software)
  - Utilize existing hardware
  - Minimize hardware investment

Enterprise Software - Who?

- Haivision – Kulabyte Encoder
  - Available as software or bundled with portable or rack mounted hardware
  - In the cloud
Generic Considerations

- Does it produce the required outputs
  - Codecs, formats, metadata
  - Stream count

- Kulabyte claims:
  - Best quality encoding
  - Superior scaling, de-interlacing, frame rate conversions, etc.
  - Claims are tough to verify

Desktop Encoders - When

- Inexpensive, encode only solution
- Free to $199
Desktop Encoders - Who?

- Adobe Flash Media Live Encoder
  - Free
- Microsoft Expression Encoder - $199

Generic Considerations

- Compatible with your video input card
- Does it produce the required outputs
  - Codecs, formats, metadata
    - Flash – for Flash
    - EE for Smooth/Silverlight
  - Stream count
    - FMLE maxes out at 3
- Both claim:
  - Best quality encoding
  - Superior scaling, de-interlacing, frame rate conversions, etc.
  - Claims are tough to verify
Advanced Considerations

- Really, none
  - AFMLE – Flash
  - EE – Smooth/Silverlight

Production Encoders - When

- Perform production functions like
  - Multiple camera switching
  - Transitions
  - Titles
  - Play disk-based files
  - Green screen
  - Virtual set

- Picture-in-Picture
- Many other production oriented features
Production Encoders - Who?

- Telestream Wirecast
  - $499 +
- CombiTech
  - VidBlaster $195+

Generic Considerations

- Does it support your OS?
- Compatible with your video input card
- Does it produce the required outputs
  - Codecs, formats, metadata
  - Stream count

- Both claim:
  - Best quality encoding
  - Superior scaling, de-interlacing, frame rate conversions, etc.
  - Claims are tough to verify
Advanced Considerations

- General/Encoding features
  - Encode to multiple formats simultaneously
  - Stream to multiple servers simultaneously
  - Store stream to disk
  - Preset for your streaming service provider

- Production features
  - Instant replay
  - Playlists

Service Provider Specific - When

- Most Live Streaming Service Providers offer free encoders, plus (in some cases) for fee upgrades with more features
  - Livestream – Procaster, iPhone, Android encoders
    - Livestream Studio
  - Ustream – Producer, iPhone, Android encoders
    - Multiple producer versions with increasing capabilities

- These simplify operation may enable access to features un-accessible from other encoders
  - Bottom line: if using a LSSP, you should consider their software first, and only use a third party tool if absolutely necessary
Server/Cloud Transcoding - What

- These tools input a single stream and output multiple streams, in real time

Server/Cloud Transcoding - When

- Use when purchasing other encoders doesn’t make sense
  - Periodic broadcasts
- When bandwidth out of facility is limited
  - 4G
    - Limited bandwidth broadband
- When increased latency isn’t an issue
  - 2-3 seconds
Server/Cloud Transcoding - Who?

- Haivision KulaByte Transcoder
  - Server and cloud
- Wowza
  - Server and cloud
- Brightcove/Zencoder
  - Transcoding SaaS
  - Cloud only

Generic Considerations

- Does it input the streams you’re currently outputting
- Does it produce the required outputs
  - Codecs, formats, metadata
  - Stream count
- Most claim:
  - Best quality encoding
  - Lowest latency
  - Claims are tough to verify
Advanced Considerations

- Pricing
  - Audio only terms
  - Buy vs. rent
  - Least capex for anticipated usage
- Nuts and bolts of integration
  - Accept streams from your encoder
  - Deliver to your CDN
  - Integrated API for Haivision encoder/cloud encoders
- Closed captioning
  - Which formats
  - Advertising insertion?
  - DRM support
  - AES encryption
  - Proven performance
  - Available support levels
  - Availability of integration services