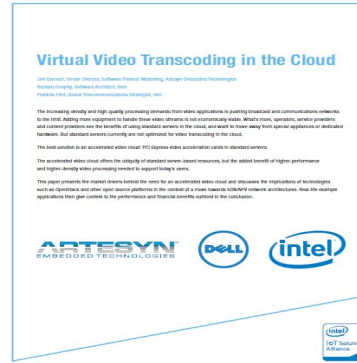


Virtual Video Transcoding in the Cloud



Dell World, 2014

Kim Crawford



Based on a white paper
co-written by Intel, Dell and Artesyn



Artesyn - Who We Are?

The Global Leader in Power Conversion and Embedded Computing Technologies

Founded in
1971

Headquartered in
Tempe, AZ

\$1.2B Revenue
in 2013

~20,000
Employees

The **Largest** Installed
Base of ATCA Blades
and Systems in the World

#1 World Leader In OEM Embedded Power

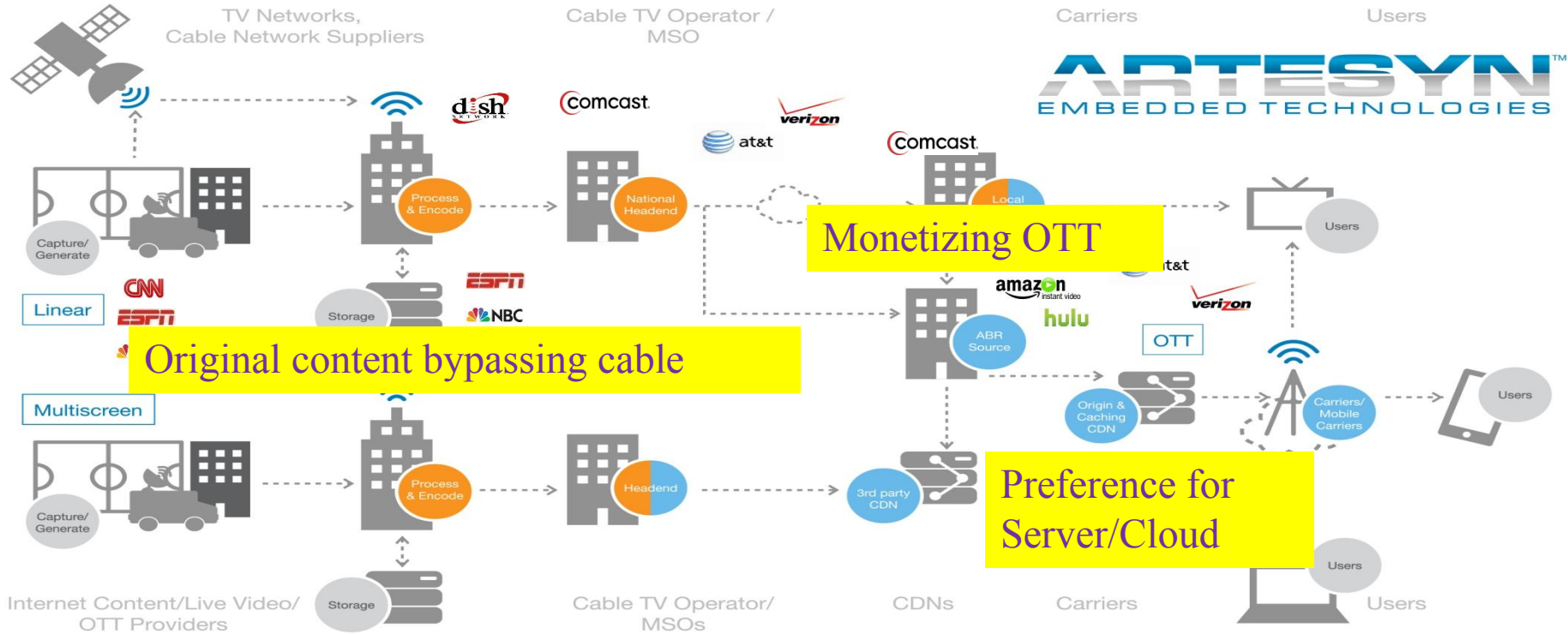


Advanced TCA®



What's Driving CAPEX Investment?

\$2.8B market in 2015



On-demand strains bandwidth

Higher resolutions

Multiscreen

Responding to Critical Market Need



- The Growing Need to Convert from One Video Compression to Another – “**Transcoding**” with multiple formats and end points
- **Channel density capability to accommodate multiplatform** (traditional and multiscreen), large scale distribution at **higher resolutions**
- With the shift to IP and cloud deployment, growing preference by operators for standard **server-based** broadcast solutions (**no dedicated hardware**)

Application Example



Challenges of Today's Network

- **Service providers prefer using standard servers** vs. dedicated hardware for video encoding/transcoding
- Standard Servers with **software-based video processing solutions don't scale** well to support higher densities, and become costly
- **Network demand for video encoding/transcoding is rising as user habits change**



Single server capacity:
6 streams (1080p30 AVC transcodes)



1 Add-on Card Can Deliver 8X the Density of 1 Server

Intel GPU-acceleration multiplies density

48 Video Transcodes

48 Video Transcodes



1 SharpStreamer PCI Express Card

2U Server (12 streams on dual CPU)

2U Server

2U Server

2U Server



SharpStreamer™

Processor: Intel i7+GPU
Form Factor: PCIE ¾ Length
Designed for use with Artesyn & Dell Servers

Application Fit: OTT Streaming, Mobile Network Optimization, CDN, Secondary Distribution



Representative Performance

of 1080P30 Transcode Channels

# of SharpStreamer (s)	1	2	4	6	16
H.264 (AVC)	48	96	192	288	768
HEVC	4	8	16	24	64



CAPEX & OPEX Impact

Stacked Servers vs. SharpStreamer™

Next-day TV OTT Content Transcoding

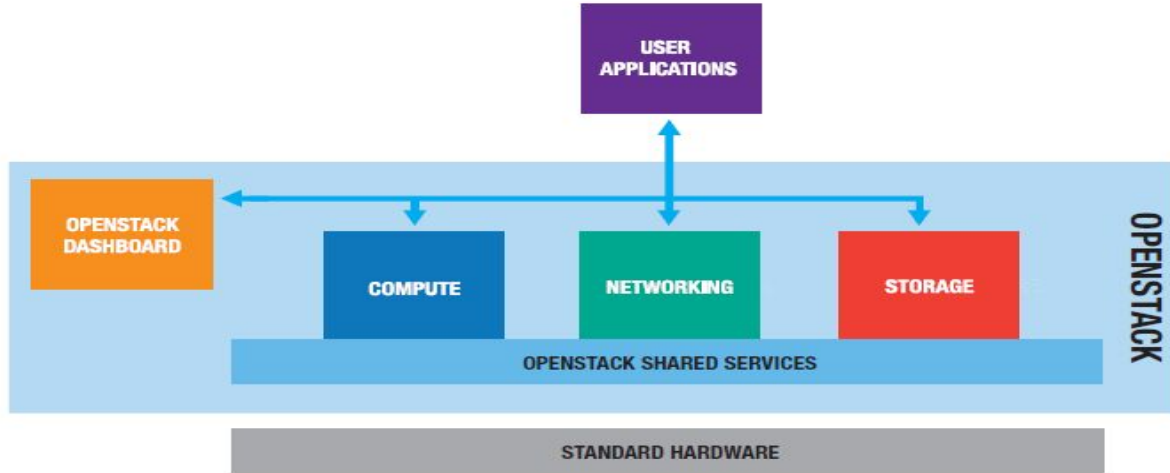
- Processing 200 hours of content in 10 different formats
- CAPEX Trade-off:
 - Requires 24 servers without acceleration
 - Requires only 1 with 4 SharpStreamers accelerated
- OPEX Trade-off:
 - Requires 11,405W – estimated \$9,991 power costs/year without acceleration
 - Requires only 1056W – estimated \$925 power costs/year with SharpStreamer acceleration

Real-time Broadcast ABR Transcoding

- Processing 96 1080p streams in multiple formats
- CAPEX Trade-off:
 - Requires 16 servers without acceleration
 - Requires only 1 with 4 SharpStreamers accelerated
- OPEX Trade-off:
 - Requires 7,604W – estimated \$6,661 power costs/year without acceleration
 - Requires only 1056W – estimated \$925 power costs/year with SharpStreamer acceleration

Source: "Video Transcoding in the Cloud," a white paper co-written by Artesyn, Intel and Dell released September 12, 2014

Cloud Provisioning & Management through OpenStack



OpenStack and What It Enables

OpenStack is an open source cloud computing platform, which has seen unprecedented growth and support for implementing Infrastructure as a Service (IaaS).

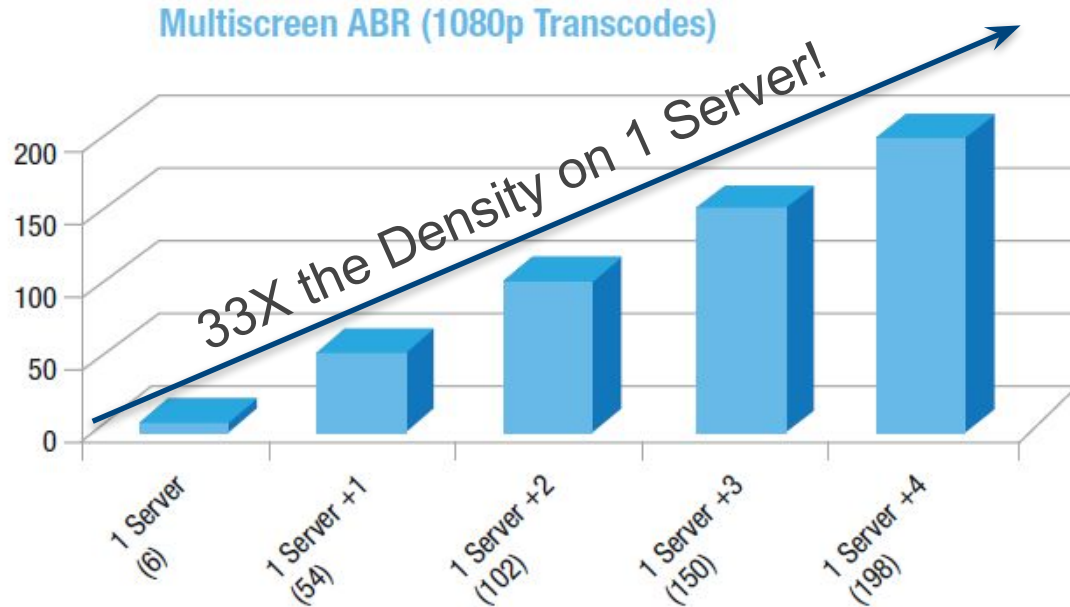


OpenStack-based
Vantrix Transcoding
Demo Featured at
IBC 2014



Benefits

- Reduced Capital Equipment Spending
- Power Savings and Reduced Overhead Cost
- Scalability:



- Ease of Use through Ubiquity of x86-based processing in the Cloud



Thank You!