How ArcVideo Enterprise Video Processing Server Benefits from GPU Acceleration

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Agenda

• ArcSoft and ArcVideo introduction
• How ArcVideo benefit from NVIDIA Tesla and GRID GPU
• Real Cases Analysis
• New Business Opportunities
ArcSoft

- Headquartered in Fremont, founded in 1994
- ArcSoft is a pioneer in advanced photo and video imaging technologies
- 850 employees in key international locations:
  - 750 experienced software engineers and imaging scientists
  - Silicon Valley, Tokyo, Taipei, Shanghai, Hangzhou, NanJing, Seoul, Dublin
- Markets - Total video, image and audio software solutions and professional services for makers of:
  - Phones, tablets, multimedia PC, Camera, Camcorder, TV/STB, IP Cam, imaging, audio, video, broadcasting
- Top OEM customers worldwide: More than 220 OEM Customers
- ArcSoft Technology has been shipped on 1,500,000,000 devices

1994 1998 ... 2002 ... 2004 ... 2009 2010 ... 2014
Where are the Markets?

TV Station
Online Education
Broadcasting Networks
Government Agency
Military Organization
Internet Video
Content Provider
Telecom Industry
Corporate
Communication Company
Traditional Media Company
Video Surveillance
What is ArcVideo

• ArcVideo is our Enterprise Video Solution, including ArcSoft Codec engines, various container and streaming protocols support, Cloud services, and end device player, which are based on and validated by 10+ years OEM shipping

• Core products are Online Streaming/Offline File/Cloud Transcoder, and come with many pick and choose utilities

• It’s a combination of high quality/performance Video Transcoding, Video Processing, Intelligent video analyzing, Video Streaming and Cloud Services

• ArcVideo Solutions can be applied to many industries, like Pay TV Operators, Broadcasters, Content Providers, Telecom, Enterprise and others.
ArcVideo Products

Key Server Products
- ArcVideo Core: File based transcoder
- ArcVideo Live: Live streaming transcoder
- ArcVideo Cloud Transcoder: For Public and Private Cloud

Operation/Service Utilities
- ArcVideo Commander
- ArcVideo Editor
- ArcVideo Video Analyzer
- ArcVideo Media Playback Engine
- ArcVideo DRM Player
- ArcVideo 3D UI System
- ArcVideo P2P Client
- ArcVideo Cloud Transcoder
Advantages

- 20 years multimedia experience and OEM shipping records for major modules
- Hardware accelerated software Solutions with high quality and performance
- Total Solution with flexible customized video technologies
- All-in-one solution to cover content producing, processing, delivering, and consumption

- Less servers, ~80% reduced
- Less space of data center, 80% saved
- Fast delivery time, ~85% faster
- Less Power supply, ~60% saved

Technology wise

Economy wise
How NVidia GPU could help

**Tesla and GRID GPU capabilities:**
- Hardware accelerated decoding
  - With good error resilience
- Hardware accelerated encoding
  - NVENC for multiple sessions of encoding, with various quality level and latency mode choices
- CUDA accelerated video post processing
  - Adaptive Deinterlacing
- Powerful CUDA core for customization

**ArcSoft customized parts:**
- Transcoding pipeline optimization
  - Seamless buffer sharing between HW Decoding, Video Processing/Analyzing and HW Encoding
  - Handling various streaming content dynamic change
  - Reduce unnecessary overhead moving uncompress
- Modified NVENC with customization of QP
  - Better rate control over NVENC
- CUDA accelerated video processing and video analytic
  - Scaling/Video composition/CC/Subtitle
- CUDA accelerated video Codec
  - MPEG2 4:2:2,
NVCUVID

Benefit
• Major Codec Support like MPEG2/VC1/H.264, HEVC right away
• High Performance
• Industry level of bit-stream error tolerant

User scenarios
• Real time Multi-Screen Video Transcoding and Delivering
  – 1 HD input, multiple resolution output
  – With various video post processing
  – 20+ simultaneous sessions per 1U server
• Video Wall support 100 SD or 32 HD channels per GPU board easily
• Low latency APP/Game streaming to STB
NVENC

Benefit
• Impressive Performance, with various Quality Levels for different user scenarios
  – High Quality/High Performance/Low Latency

User scenarios
• Real time Multi-Screen Video Transcoding and Delivering
  – 10x real time HD sessions of multiple resolution transcoding
• Offline Fast Transcoding
  – 40x HD/8x 4K faster than real time (2x K340 or K1 per Server)
• Low latency and High Density APP/Game
CUDA Accelerated Video Processing

**Benefit**
- Easy to customize
- High Performance
- Highly efficient pipeline to access and interop with HW Decoding and HW Encoding

**User scenarios**
- Fast Video processing and analyzing
  - Scaling/Composition/SimHD (quality enhancement)/Anti-Shake
  - Video quality and fault detection
  - Special Video Codec support, like MPEG2, etc.
  - Video analyzing
What ArcVideo could benefit

- Impressive video performance comparing to traditional CPU or DSP/FPGA multimedia solutions:
  - Good Hardware accelerated Decoding/Encoding performance, and tons of CUDA cores
- Highly customizable via CUDA programming
  - Easy to customize CUDA accelerated video post processing and video analytic algorithms
  - Flexible CUDA programming to easily fit customer request in very short time
- Balanced GPU and CUDA core configuration
  - Both Tesla and GRID provide various combination of GPU and CUDA core to fit different user scenarios
  - Mature server vendors ecosystem to find reliable GPU servers, depends on task burden, pick multiple GPU board and achieve highest density
HunanTV Happy Sunshine – Fast HD file transcoding and editing system

- Get the hot movies and TV Series online 10x faster
WASU –
CUDA accelerated video quality enhancement

- CUDA accelerated SimHD help to boost SD channels to HD quality in real time
- End devices could playback smoothly with HD bitstreams, and no need to switch between SD and HD channels of source content

Wasu : China Digital TV Media Group
SMC –
Real time transcoding with good error tolerance
- Hundreds of TV Channels running 24/7/365, HW Decoding needs to be tolerant of any package dropping, bitstream change, etc.

Southern Media Corporation
New Business Opportunities
- APP Streaming

- APP/Game Streaming service
  - Need platform to handle 3D rendering/Game/Low latency HD encoding
  - IPTV service provider could flexibly update service without modifying STB and infrastructures

One ArcVideo Server = One ArcVideo Server
New Business Opportunities
-GPU virtualization

• Single purpose and dedicated servers moving to general purpose and multi-tenant servers, server Virtualization especially GPU Virtualization will play more important role for multimedia service
  – Video Editing and Transcoding share same physical or virtual server, work at day for editing, and night time for transcoding
New Business Opportunities
- Cloud Video Service

- Video Service moving to Private and Public cloud, data center with Video Editing, Transcoding and Delivering service
  - Online professional Video Editing and Transcoding Service
  - Online Education
  - Whole package solutions with both server side service and end devices APP
Feedback

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