



## Digital Rapids & BlueArc

### Meeting the Performance and Storage Demands of High-Volume Media Repurposing

In today's highly connected, information- and entertainment-driven world, media and entertainment companies must be able to quickly and efficiently transform and distribute high-quality content to reach consumers on a constantly growing range of diverse delivery platforms from Blu-ray Discs to iPads, iPhones and Internet-enabled TVs. This ecosystem of consumer electronic devices capable of video playback represents incredible opportunity to extend the reach of existing media assets and bolster ROI, but to take maximum advantage of the opportunity, enterprise-level media businesses need to develop highly effective content creation and delivery pipelines capable of standing up to the rigors of high-volume production, transformation, delivery and archiving.

Automated media transcoding systems provide the means to convert file-based production assets and finished content into a wide range of formats tailored to a plethora of device-specific specifications, standards and formats. But the overall performance, quality and format support of transcoding solutions can vary significantly, and other components of the overall content transformation and delivery pipeline can dramatically affect the overall performance of the transcoding workflow.

Storage systems are critical in this regard, with inefficient storage architectures a significant bottleneck to maximum transcoding performance, particularly in distributed transcoding environments where the storage must support transferring large media files to and from multiple—from two to hundreds—of transcoding nodes concurrently. Input sources may be extremely large sequential video files—possibly hundreds of gigabytes each in the case of uncompressed HD sources—with each transcoded to many smaller, compressed output files simultaneously. If the storage system can't keep up, the processing power of the transcoding systems will be underutilized—slowing operations and delaying the availability of content to the consumer.

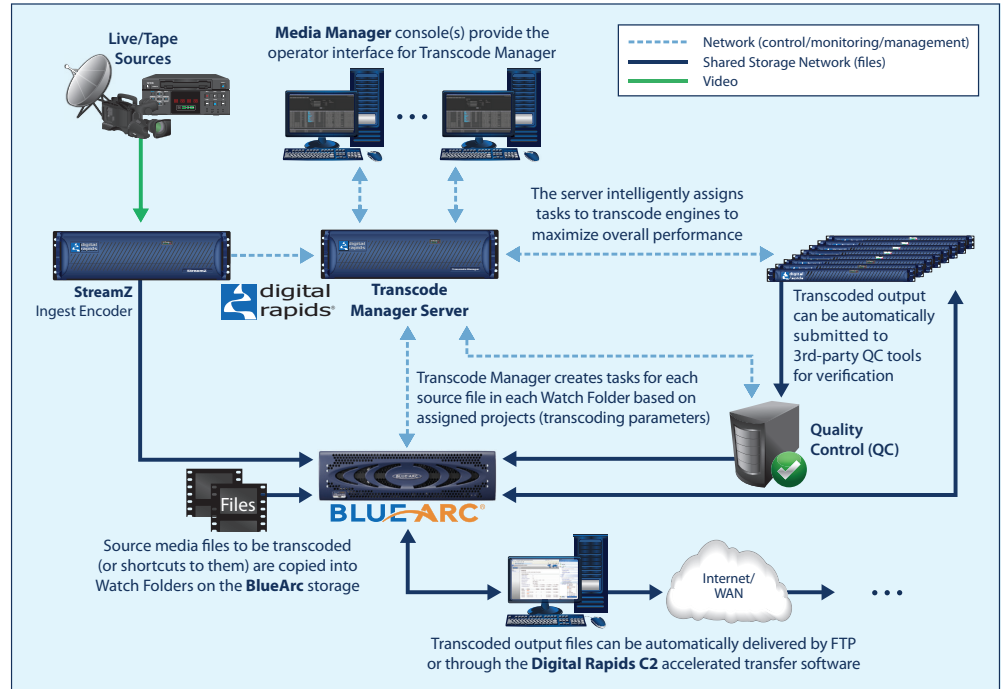
Effective high-volume media transformation pipelines require an automated transcoding solution that can quickly, efficiently and concurrently transcode source content into all required output formats for supporting the vast array of viewing devices and other applications such as deep archive—and all at the maximum possible visual quality that major media organizations demand to protect their brand image. The solution must also scale seamlessly as content volumes continue to grow, allowing additional transcoding nodes to be added without interruption to existing operations. The transcoding solution must be supported by a high-performance storage platform that is up to the task of handling many concurrent input and output operations from multiple transcoding nodes with varying data profiles—extremely large sizes for individual source files, but each resulting in multiple—even dozens—of concurrent but much smaller outputs.

**Digital Rapids Transcode Manager distributed transcoding systems offer enterprise-level, top-quality automation and workflow management for high-volume transcoding:**

- Highly efficient, scalable, multi-threaded software architecture maximizes performance by optimally leveraging the full computing power of systems with advanced, multi-core processors.
- Compression components (codecs) are deeply configurable and finely tuned for superior quality while maintaining exceptional performance.
- Seamless scalability with interruption-free deployment of new Transcode Engines to grow with increasing production volumes.
- Advanced fault tolerance and workflow features increase reliability and automation while integrating seamlessly into existing enterprise operations.

**The Solution: Digital Rapids Transcode Manager and BlueArc Storage**

The combination of Digital Rapids’ enterprise-class, automated, high-volume transcoding software and BlueArc Network Attached Storage (NAS) solutions provides a cost-effective platform enabling media repurposing workflows with performance, throughput and scalability.



BlueArc Network Attached Storage solutions like Mercury integrate seamlessly into Digital Rapids transcoding workflows, enabling high-volume, high-throughput media ingest, encoding and transcoding that can scale to meet the needs of entertainment and media companies that need to deliver content on demand, to any device and with maximum quality.

**Digital Rapids Transcode Manager: Scalable, High-Volume, Top-Quality Transcoding**

The Digital Rapids Transcode Manager software provides enterprise-level workflow management for transcoding media files to multiple output formats. Designed specifically for the demanding needs of high-quality, high-volume transcoding pipelines, Transcode Manager works with multiple Transcode Engines, combining intelligent load balancing and efficient use of resources to boost throughput and streamline operations—resulting in more profitable media publishing. Scalable from small transcoding farms to global operations with hundreds of transcoding nodes, Transcode Manager is ideal for both dedicated transcoding applications and as part of complete ingest-through-delivery media workflows.

Transcode Manager supports today’s multi-screen distribution opportunities with unparalleled quality and broad format support for viewing platforms from mobile phones and tablets to game consoles and connected TVs. Transcode Manager also supports all popular production, archive and broadcast server formats.

Transcode Manager features a highly efficient, scalable thread and stream management architecture optimized to take advantage of advanced systems with multiple processor cores. Transcode Manager also incorporates deeply configurable codecs optimized and finely tuned for superior quality while still maintaining exceptional performance.

Digital Rapids Transcode Manager’s automated capabilities—with features such as automated ‘commercial black’ removal—eliminate costly, time-consuming manual effort and reduce errors. Meanwhile, easy integration with enterprise business systems helps users better manage and measure operations.

## BlueArc Storage Platforms

Designed for high-performance, BlueArc Mercury Storage Platforms deliver high data throughput for high-volume transcoding workflows. Field programmable gate arrays (FPGAs) and traditional multi-core processors optimize and separate data movement and management processes that normally compete for system resources—and impact transcoding performance. BlueArc’s Hybrid-Core Architecture supports advanced file system functions while preventing conflicts or bottlenecks and ensuring consistently high performance required by transcoding applications that rely on high throughput and great numbers of concurrent read/ write operations.

With their ability to virtualize up to 2 petabytes in a single namespace of usable, tiered storage, BlueArc Mercury servers can scale with the growing data requirements associated with digital content creation, repurposing and distribution.

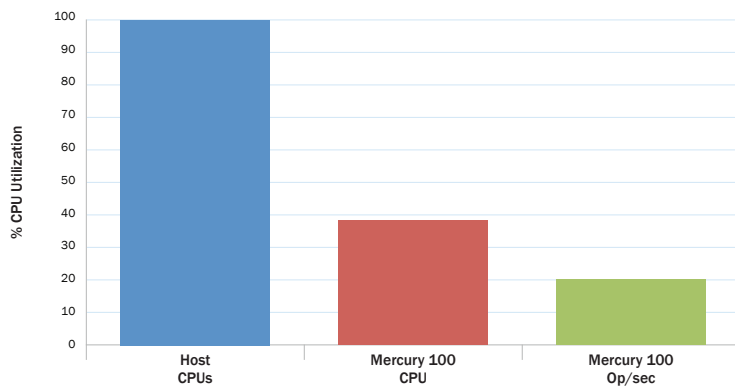
Mercury’s Intelligent Tiered Storage allows organizations to reduce infrastructure costs by automatically placing data on the most cost-effective or highest utility tier of storage without compromising accessibility. For example, high-performance drives can be used to hold high-priority content for on-demand transcoding, moderate-performance drives can be used to hold secondary content and archival footage can be stored on lower-performance systems. The Mercury Storage Ecosystem supports best-in-class storage arrays from multiple vendors that include SSD, FC, SAS and SATA drives, as well as leading tape libraries.

In short, the BlueArc architecture is designed to overcome the data network bottlenecks that plague lesser storage systems in transcoding operations and delivers superior performance without sacrificing scalability, storage bandwidth or overall capacity. Better still, BlueArc’s scalable, modular storage platforms allow enterprise and media companies to upgrade server modules and capacity without replacing the entire system.

## Proven Performance

To measure the performance of BlueArc storage in a Digital Rapids Transcode Manager media repurposing workflow, a workload consisting of 36 uncompressed 1080p23.976 AVI source files was processed on a transcoding farm consisting of transcoding nodes on six multi-core hostsystems. The source files totaled 2.04TB and 6 hours, 16 minutes and 12 seconds in duration.

Each source file was converted to six different combinations of resolutions and bitrates (including 1080p, 720p and 480p at varying bit rates) using H.264 video and AAC audio compression in an MP4 container. The encoding parameters used were the actual profiles used by a major studio to create premium deliverables for audience distribution. After transcoding, the 216 output files totaled 68.1GB.



- Total time to completion of all transcoded outputs: 97 minutes, 8 seconds
- Average CPU utilization of Transcode Engines hosts: 100%
- Mercury 100 CPU utilization: 39%
- Average number of IOPS: 14,179
- Mercury 10GbE throughput: 3,896Mbps

## BlueArc intelligent high-performance storage helps deal with the major pain points in a transcoding facility.

- Intelligent high-performance NAS allows transcoding system storage to avoid the bottlenecks and latency issues that are common with less intelligent storage systems.
- I/O performance scales to meet the needs of concurrent users running multiple transcoding engines.
- High performance combined with data migration software allows BlueArc network storage solutions to support processing and copying large video files required in enterprise-scale transcoding workflows.
- State-of-the-art system stability and reliability increase the efficiency and effectiveness of transcoding workflows.

The overall system throughput was more than up to the encoding workload, and the Transcode Engines were able to take full advantage of their available CPU horsepower without waiting for storage requests. Furthermore, the NAS system had plenty of IOPS and CPU horsepower to spare—proof that the highly scalable storage system can easily accommodate a larger number of host CPUs, Transcode Engines and heavier workloads.

For more information, please see the BlueArc white paper *“Elements of Transcoding Performance.”*

### Summary

High-volume, enterprise-level media transcoding requires high-performance, scalable transcoding software and storage solutions. BlueArc Network Storage Systems in conjunction with the Digital Rapids Transcode Manager software help eliminate bottlenecks, leveraging the available processing power in modern multi-core, multi-threaded CPU architectures and delivering high throughput with solid stability to increase the efficiency and effectiveness of transcoding workflows.

### About Digital Rapids

Digital Rapids is the leading provider of professional hardware and software tools, technology and expertise for bringing video to wider audiences and the latest viewing platforms. Continuing to set new standards in quality, productivity and versatility, our solutions span the critical points in media workflows, including video ingest, encoding, transcoding, streaming and delivery. From standalone appliances to integrated enterprise and global workflows, we can help you increase your revenues, expand your audience, and reduce your costs.

### About BlueArc

BlueArc is a leading provider of high performance unified network storage systems to enterprise markets, as well as data intensive markets, such as electronic discovery, entertainment, federal government, higher education, Internet services, oil and gas and life sciences. Our products support both network attached storage, or NAS, and storage area network, or SAN, services on a converged network storage platform.

We enable companies to expand the ways they explore, discover, research, create, process and innovate in data-intensive environments. Our products replace complex and performance-limited products with high performance, scalable and easy to use systems capable of handling the most data intensive applications and environments. Further, we believe that our energy efficient design and our products' ability to consolidate legacy storage infrastructures, dramatically increases storage utilization rates and reduces our customers' total cost of ownership.



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