



ANIMURE

MARVELATM

Real-time Ultra-High Resolution
Rendering Server



LIVE Multi-View for Targeted TV

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Marvela's™ patented real-time graphics engine utilizes deep machine analysis algorithms and provides the world's fastest and most proactive video composition server.

The future of live production of multiple personalized TV-views from a single live broadcast is here!

Convert a single live source into multiple personalized live streams.

Marvela™ is a state-of-the-art video composition server that allows high-quality video production in LIVE real-time. You can broadcast personalized or region-specific content to each consumer, creating all views simultaneously from the same source, without altering the source material.

Product Specs

Height	1.7" (43mm)	Motherboard	Super X11DGQ
Width	17.2" (437mm)	CPU	2 X Intel® Xeon®
Depth	39.3" (997mm) with rails	GPU	4 X NVIDIA Tesla Pascal™
Weight	Net: 45 lbs (20.4 kg)	Memory	Up to 768GB ECC
Power Supply	2000W Redundant	Drive Bays	2 x 2.5" Hot-swap

Advantages

- > Create Viewer Specific Content
- > Pure server-side solution, does not rely on clients
- > Hyper-composition utilizing GPU and CPU in full sync
- > Patented Graphics Engine
- > Hardware Accelerated GPU Transcoding
- > Resolution up to 8K in real-time
- > No Latency on graphic alterations
- > Change content Instantly during Live Broadcast

Hyper Composition

LIVE Multi-View Hybrid Rendering

Marvela™ is a dedicated GPU server, designed for LIVE real-time multi-view Ultra-HD video composition. No matter what modifications are made to each personalized version of the source video, all of them are done in hyper-speed. The resulting streams are synchronized on the frame, even when rendering a 3D model. Intended to be used by advertisement providers, the creative industry, broadcasters, large content owners and media producers, the Marvela™ server offers an easy way to monetize your future targeted-advertisement models.

Targeted Rendering

The most advanced server-side solution

Animure's Marvela™ is a pure server-side solution, leveraging synchronous processing of the latest Intel CPUs and the state-of-the-art NVIDIA Tesla P100 GPUs. The server uses universal streaming and video codec interfaces to support all available media players. It combines hardware accelerated live-stream transcoding, and a multi-layer graphics compositing engine integrated into a real-time video compositor. The compositor, with its real-time communication API, lets you leverage your current infrastructure, providing cinematic quality and interactive experience to each viewer using existing equipment and without any need for client changes.

The change in the TV industry is moving towards 'Personalized Content.' That content should include something personally relevant to the viewer. The Marvela™ server renders the final video as it is broadcasted, offering the ability to embed custom content live. The viewed content is tailored to the consumer, maintaining quality and resolution while keeping the original video source intact.



Best Quality. Extreme realism. Amazing performance.

Live Production

Benefits of Real-time Rendering

Marvela™ allows your viewers to own their content consuming time. You will be able to provide them for example, the ability for multiple screens as Picture-in-Picture overlays on the main screen showing...

- > Their favorite Local and International news channels or headline excerpts, so that they will not miss the latest headlines. In this modern era of emergencies, TV news gives viewers the right information on breaking news.
- > Their stock news program of choice or streamline stock updates in a graphically pleasing way, keeping them up to date with economic news. You have just become the darling of Day Traders and Investors alike.
- > Live streaming from a webcam set up inside your favorite pub or at your favorite beach; so they know whether to wear shorts or long pants and a jacket; maybe let them connect their private webcam.
- > Their favorite sports channel, so they don't miss the start of the big game, with constant scores updates across the league.
- > Their favorite music channel in the background, so when you see David Bowie's Let's Dance video, you can turn up the volume.

Patented Tech

Intelligent Hyper-Composition

Marvela's™ patented graphics engine creates cinematic quality personalized views by leveraging color palettes from the video data sets. It automatically extracts color mapping information from high-resolution video frames and performs real-time frame modification based on these color maps. This allows different cascaded graphical layers to be composited smartly into a unified high-resolution output while maintaining the original media sources intact.

Intelligent Hyper-Composition is the ability to put objects inside live video in a way that they are seen as an intrinsic part of the original transmission. This is done using the integrated compositor combining the GPU hardware and Marvela's™ state-of-the-art embedded software.

MagicEngine™

Video Modifications Made Easy

The heart of the Marvela™ server is the MagicEngine™.

It is a real-time graphics engine that fuses the sparkle of captivating graphics into the live stream and renders the final-frame output. Each instance of the MagicEngine™ allows the simultaneous application of multiple modification sets, making it easy to produce various video streams from the same sources by running several instances of the MagicEngine™.

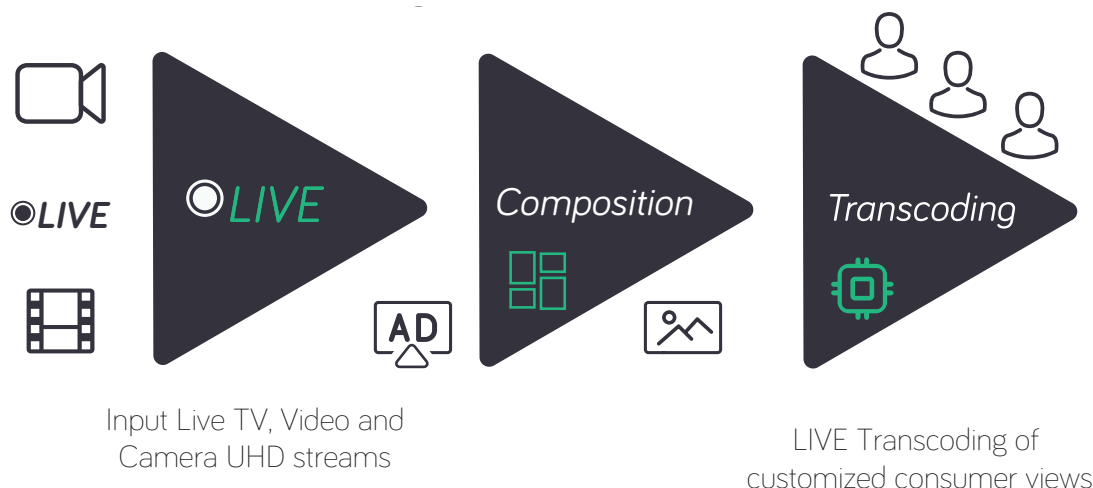
All the color modifications, composition, rendering of the 2D and 3D models, and arrangement of the graphical work are being made in live real-time, with virtually no latency. All of the resulting video streams are synchronized at frame-accuracy.

The MagicEngine™ transcodes video using GPU hardware acceleration transcoding to ensure crystal-clear picture and real-time performance for ultra-high resolutions.

This innovative approach of a real-time graphics engine integrated into the graphical hardware transcoding process, all done on the GPU, is what makes Marvela™ special.

Product Flow Diagram

LIVE compositing of Branding, Logos, CGI, Adverts



Many live streams, each slightly different - customized for its viewer, ready to broadcast to all platforms.

Key Features

- > Programmable VFX pipeline
- > AI-powered video re-timing
- > Multiple Picture-In-Picture video streams
- > Support for 3D models and materials
- > Dynamic lighting models
- > Graphical live RSS feeds
- > Graphical live RSS feeds
- > Live Chroma keying
- > AI-enhanced color branding
- > Full support for stereoscopic (VR) streaming

Cluster & Sync

Creating an unlimited amount of perfectly synchronized streams with Marvela™

The Marvela™ server supports a synchronized cluster installation, enables easy scalability and sharing of resources between the systems under load, with frame-accurate synchronization across the entire cluster. Marvela™ grid configuration gives you the ability to spread the Marvela™ components on different nodes so you can add computing power only where it's needed.

Concurrently running instances of the Marvela™ server on a cluster installation, which are modifying the same video source, have their input supplied using a proprietary synchronization method. Since all of the MagicEngines™ are processing the same frame at the same time, the resulting multiple uniquely modified streams are synchronized at frame accuracy.

This centralized approach enables clustering of multiple Marvela™ servers connected to the same synchronizing service (with full redundancy, of course), to create an unlimited amount of perfectly synchronized personalized video streams which are based on the same video sources, making the most of the GPU graphical processing abilities, while avoiding the traditional bottlenecks of data transfer by using a single video source to feed any number of desired outputs in real-time.

Automation

Fully automated scene rendering

Multi-layered scene composition creates a unified scene in LIVE real-time from any media streamed into the Marvela™ server, using a predefined timed storyboard. It supports three levels of storyboard management:

1. Time-coded scenario: create a fully predefined, precisely timed storyboard.
2. Dynamic scenario: define events, which trigger content specific animations.
3. Live scenario: cue commands in real-time, while broadcasting.

Administration

Easy-to-Use dashboard with web-services integration

Channel management allows easy creation of live streaming channels. It will give you the ability to personalize each channel, to create any number of channels you want, and to define rules for automatic viewing customization for each viewer.

The system automatically combines the primary television program that can be spread across many channels and overlays it with advertisements that are personal to channel viewers.

Product Specification

System	<ul style="list-style-type: none"> > Supermicro SuperServer 1029GQ-TRT > Supermicro SuperServer 1019GP-TT
Graphics Processors	<ul style="list-style-type: none"> > Nvidia Tesla P100
Software Packages	<ul style="list-style-type: none"> > CentOS 7.5 > OpenGL 4.6 > Nvidia Cuda 10.0 > Nvidia VideoSDK 8.2 > FFmpeg 4.1 > Apache HTTP/HTTPS interface > Web based Storyboard Builder > Web based Management Dashboard
Supported Video Cards	<ul style="list-style-type: none"> > Bluefish444 Digital Epoch Neutron Family > BlackMagic DeckLink Mini recorder 4K
3d party plugins	<ul style="list-style-type: none"> > Function plugins > Computer Vision plugins > Business Intelligence plugins > FFmpeg plugins > Cloud / CDN plugins

Supported Codecs

Hardware Accelerated	<ul style="list-style-type: none"> > H.264/MPEG-4 AVC > HEVC/H.265 > MVC 3D > H.262/MPEG-2 Part 2 > VC-1 > VP8 > Uncompressed (Raw Video)
In / Out formats	<ul style="list-style-type: none"> > All streaming formats supported by FFmpeg > 720p, 1080p, UHD TV, 4K @ 23.98, 24, 25, 29.97, 30, 48, 50, 59.94, 60, 120 fp > Stereoscopic (VR) up to 120fps > Custom resolutions up to 8K

MagicEngine™ Features

LIVE Picture-in-Picture	<ul style="list-style-type: none"> > Effects and color corrections per video > Dynamic frame position 	AI-Enhanced Color Corrections	<ul style="list-style-type: none"> > Color Intensity > Light > Hue Rotation > Temperature > Saturation > Contrast > Sharpness > Gamma > Tint > Shade
3D-models	<ul style="list-style-type: none"> > Real-time rendering of 3D models and scenes > Supports bones, skinning, and skeletal animations > Physically Based Rendering for realistic materials > Supports most common 3D-model formats 		
Dynamic Lighting	<ul style="list-style-type: none"> > Lights defined for one or all objects, for easy matching of objects from different sources. 	Artistic Effects	<ul style="list-style-type: none"> > Color-channels bit-width > Custom Color Palettes with Smart Bias > Cartoonish - posterize > Details enhancement
CGI	<ul style="list-style-type: none"> > Effects and color corrections per CGI > Event-based and Automated animations > Real-time adverts and overlays insertion 	Distortions	<ul style="list-style-type: none"> > Built-in distortions, including Pixelate > Full screen distortions > Selective area distortions
In-Stream RSS Feed	<ul style="list-style-type: none"> > Easy graphical integration of live RSS feeds 	Proprietary Scripting Language	<ul style="list-style-type: none"> > Human readable and well documented > Real-time command injection
Stereoscopic Render (VR)	<ul style="list-style-type: none"> > Separate render of left-eye and right-eye views to mimic real-life vision 		
Chroma Keying	<ul style="list-style-type: none"> > Skin-tone > Custom Color 		