ImaGen Visual Servers

COTS-based Image Generation Solutions

- Civil & Military Simulation
- Mission Planning
- Homeland Security
- Scientific and Medical Visualization
- Architectural Design
- Energy Exploration

ImaGen Visual Servers... at the Speed of Imagination!

Concurrent Real-Time's ImaGen™ visual server family offers fully integrated, affordable high-performance image generation (IG) solutions for real-time simulation and modeling applications. An ImaGen solution running Concurrent's RedHawk™ Linux® is the ideal platform for truly interactive, virtual reality, landscape, architectural and aerial, ground and marine simulation.

Complete Image Generation Solutions for a Wide Spectrum of Industries

The ImaGen family provides the most flexible, multichannel Linux-based graphics platforms available today. ImaGen can be custom configured to address a broad range of price/performance requirements from low-end, single-channel systems to large, genlocked, multi-channel video server solutions. ImaGen delivers the technology needed to rapidly develop and deploy accurate, real-time 3D visual solutions for industry applications.

ImaGen platforms are complete IG solutions. All required IG components are fully integrated and supported by Concurrent, including COTS imaging channels, monitors, color-matching projectors with edge-blending and curved screen distortion correction, display screens, rackmount chassis, mounting hardware and application software.

Support for Industry Standard Rendering Software

ImaGen supports a wide range of 3D visualization software, such as Diamond Visionics™ GenesisIG, Presagis® Vega Prime™, OpenSceneGraph, OpenGL® and OpenGL Performer™. ImaGen solutions running GenesisIG are specially designed and fully optimized for multi-channel applications.

ImaGen with GenesisIG renders a scene during fast-jet training.

Wet runway reflections on ImaGen with GenesisIG

Commercial-Off-The-Shelf Systems and Graphics

ImaGen visual servers are powered by COTS technology for affordable simulation and modeling solutions. Offering the highest levels of computer-generated image quality, fidelity and determinism, ImaGen are configured with the latest powerful, multi-monitor capable NVIDIA® Quadro graphics cards.

The ImaGen Advantage

Concurrent's ImaGen family of multi-channel visual servers achieves what was once only possible on large, costly, dedicated visual systems. Concurrent's ImaGen servers employ COTS technology for highly deterministic modeling display without compromising visual quality or real-time responsiveness. ImaGen offers powerful, expandable and easily upgradeable IG solutions to meet the most difficult technical challenges.

An ImaGen is the imaging platform of choice for simulation applications that require enhanced realism and the ability to process very large amounts of input data. ImaGen servers can be used with Concurrent iHawk™ host multiprocessors to provide a complete training system platform with the highest levels of computer-generated image quality and fidelity.

Flexible Multi-Channel Rendering

Any number of ImaGen visual servers can be linked together to produce a single, unified output image to any desired level of photorealism. For example, the power of individual ImaGen servers can be assigned to render specific subsets of an image in parallel. The servers support a variety of image combining modes such as sample division for anti-aliasing, time division, image division, eye division and volume division for large rendering applications.

A full range of video synchronization capabilities are also offered. Commercial and military flight, maritime and driving simulators require multiple displays to provide photorealistic views of an environment as seen from a cockpit, window or control panel. ImaGen framelock features provide a seamless viewing experience in these multiple display applications. ImaGen genlock functionality enables synchronization with standard video signal formats or house-sync signals providing a powerful solution for display, video briefing and compositing.

Custom Image Generation Services

Concurrent offers a range of customized IG services including:

- Visual database creation
- Simulation model interfaces to the IG
- Avionics and instrumentation
- Physical control devices
- Custom hardware

ImaGen Powered by GenesisIG

ImaGen servers feature GenesisIG visualization software from Diamond Visionics. GenesisIG is a family of on-the-fly 3D data assembly products that leverage modern GPU architectures and multi-core processors to provide high-fidelity real-time CIGI-compliant visualization. GenesisIG

GenesisIG renders highly detailed, high density geo-specific and geo-typical datasets. Building models courtesy of PLW Modelworks.

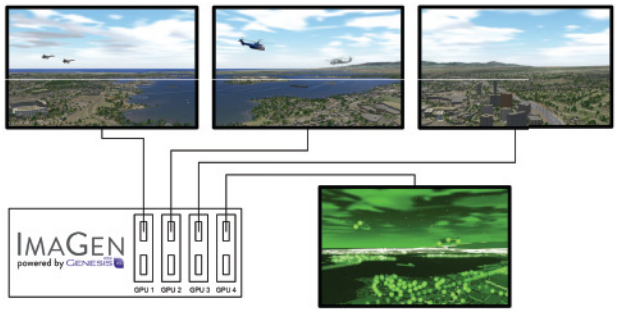
and shape files to build a complete 3D scene on-screen in real time. Visualization is immediate and can be modified on-the-fly.

GenesisIG provides 60Hz whole earth day/night/sensor multi-channel visualization for flight, maritime, and ground simulation. GenesisIG includes APIs and source code examples to allow integration of its rendering engine into a custom application along with customized extensions and assemblers. Users can create image generation, synthetic visualization, Semi-Automated Forces (SAF), and mission planning applications with complex, dynamic 3D scenes. Advanced physics-based FLIR, NVG and E/O sensor simulation is optionally available.

ImaGen Platform Features

- RedHawk Linux optimized for real-time image generation
- PCI-Express graphics boards: The latest PCIe x16 graphic cards from NVIDIA
- Up to eight graphics cards per visual server
- Genlock and framelock
- Convenient upgrade to new technology
- Configurable 1U/3U/4U rugged rackmount chassis
- Single and dual-socket multi-core Intel Xeon™ CPUs
- Removable SATA or SAS disk drives for easy visual database management
- 14U to 43U cabinets supporting from 4 to 13 ImaGen servers
- Integrated Gigabit and I0 Gbit Ethernet switches
- 1U rackmount monitor drawer with 8 or 16-port KVM switches
- Multi 110 volt power source or single 220 volt with 30

GenesisIG renders a scene during runtime for helicopter training.



Four separate channels of GenesisIG are rendered on a single ImaGen system. Each channel can be a part of a continuous scene or be a separate eye-point or a sensor channel.

Genesis IG Features

Formats Supported

- Elevation: DTED, GeoTiff, GridFloat, Jpeg2K
- Imagery: ECW, JPEG2K, NITF
- Vectors: ESRI Shape
- Models: OpenFlight
- Misc GDAL supported formats

60Hz Dynamic Construction

- Elevation: Gridding and real-time modification
- Imagery: Filter, select, clip, feather, contrast
- Vectors: Filter, construct, attribution translation
- Models: Scaling, construction and sprite generation
- Lights: Size, attributes, light pools
- 3D particles: Smoke, explosions, fires, wakes, rotor wash, contrails, chaff, flares
- Features: Pitched and slanted roofs on extruded buildings

With GenesisIG 3D visualization, users can perform the following on screen in real time:

- Filter, convert, and expand vector data
- Modify the data to make linear, areal, and point changes
- Include clipping, feathering, contrast; and even add floodlights
- Synthesize multispectral imagery into geogeneric high-res imagery and model representation
- Construct parametric models such as roads, airports, bridges, and animated lights
- Select the best data for every elevation using overlapping source files

GenesisIG renders highly detailed geo-specific and geo-typical datasets. Building models courtesy of PLW Modelworks.

About Concurrent Real-Time

Concurrent Real-Time is the industry's foremost provider of high-performance real-time computer systems, solutions and software for commercial and government markets. Its real-time Linux solutions deliver hard real-time performance in support of the world's most sophisticated hardware in-the-loop and man-in-the-loop simulation, high-speed data acquisition, process control and low-latency transaction processing applications. With over 50 years of experience in the real-time market, Concurrent Real-Time provides sales and support from offices throughout North America, Europe and Asia.

For more information, please visit Concurrent Real-Time at www.concurrent-rt.com