

LEADING-EDGE SOLUTIONS FOR AEC WORKFLOWS

New Technologies Improve Collaboration,
Accelerate Design, and Facilitate Design Reviews



PNY



NVIDIA

CREATING NEW OPPORTUNITIES WITH ADVANCED TECHNOLOGY

The architecture, engineering, and construction (AEC) industry is undergoing a transformation. Projects are becoming more complex and team members are increasingly working remotely, complicating workflows, communication, and collaboration. Enabling efficient and cost-effective work in teams across regions is vital to a firm's success. But when, for example, remote team members need to work together on a single BIM model and version control is lost or when downloading massive datasets from the cloud stalls, productivity and employee morale falter.

Although rapid progress of technology brings huge benefits, it can also come with challenges. Advanced visualization technologies such as real-time ray traced rendering and immersive virtual reality (VR) deliver extraordinary improvements to AEC workflows, but they also demand powerful graphics and compute performance. While 3D models offer extensive advantages over 2D drawings, working with them requires additional graphics power, especially when using dual or 4K displays.

A new, streamlined way of tackling these challenges is needed to boost productivity, team collaboration, design review efficiency, and customer engagement.

NVIDIA RTX POWERS BUILDING DESIGN

As a trusted technology partner for AEC professionals worldwide, NVIDIA is continually enhancing solutions to tackle these complexities and streamline workflows.

The latest NVIDIA RTX™ professional GPUs, based on the new NVIDIA Ampere GPU architecture, fuse AI, real-time ray tracing, and programmable shading to speed up and optimize the building design process. As part of an advanced ecosystem of hardware, software, and tools, RTX accelerates new design workflows—such as 3D graphics virtualization, VR, interactive physically based rendering, and AI-enabled applications—and improves how teams collaborate by creating effective work-from-anywhere capabilities. These virtual solutions also put NVIDIA at the operational forefront, helping to protect intellectual property and enabling geographically dispersed teams to collaborate on a single master data file. With the recent open beta release of NVIDIA Omniverse for AEC—a real-time graphics and simulation platform that transforms how teams collaborate—companies have a groundbreaking new tool to drive productivity and help meet project deadlines.

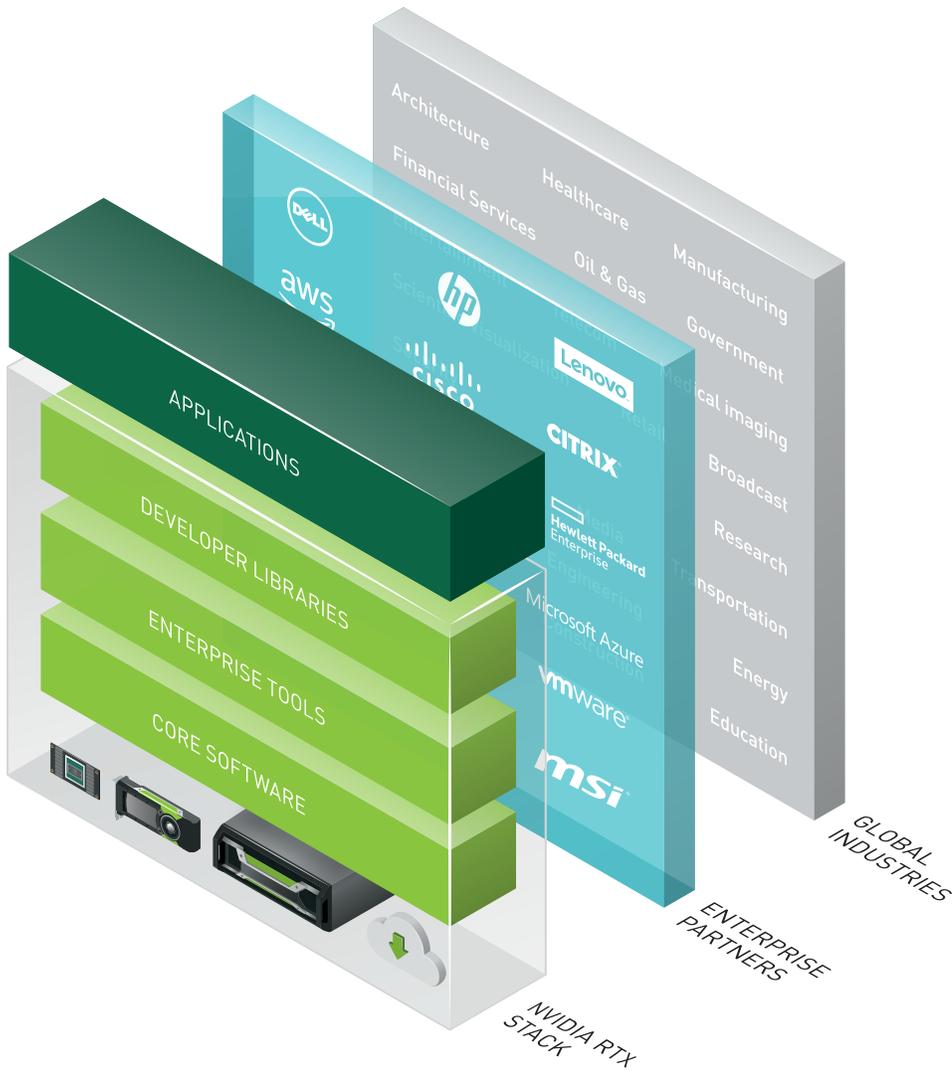
> [Learn more about NVIDIA RTX](#)



Image courtesy of KPF.

NVIDIA RTX VISUAL COMPUTING PLATFORM

The world's most widely used hardware and software companies partner with NVIDIA to bring the power of RTX to the AEC industry.

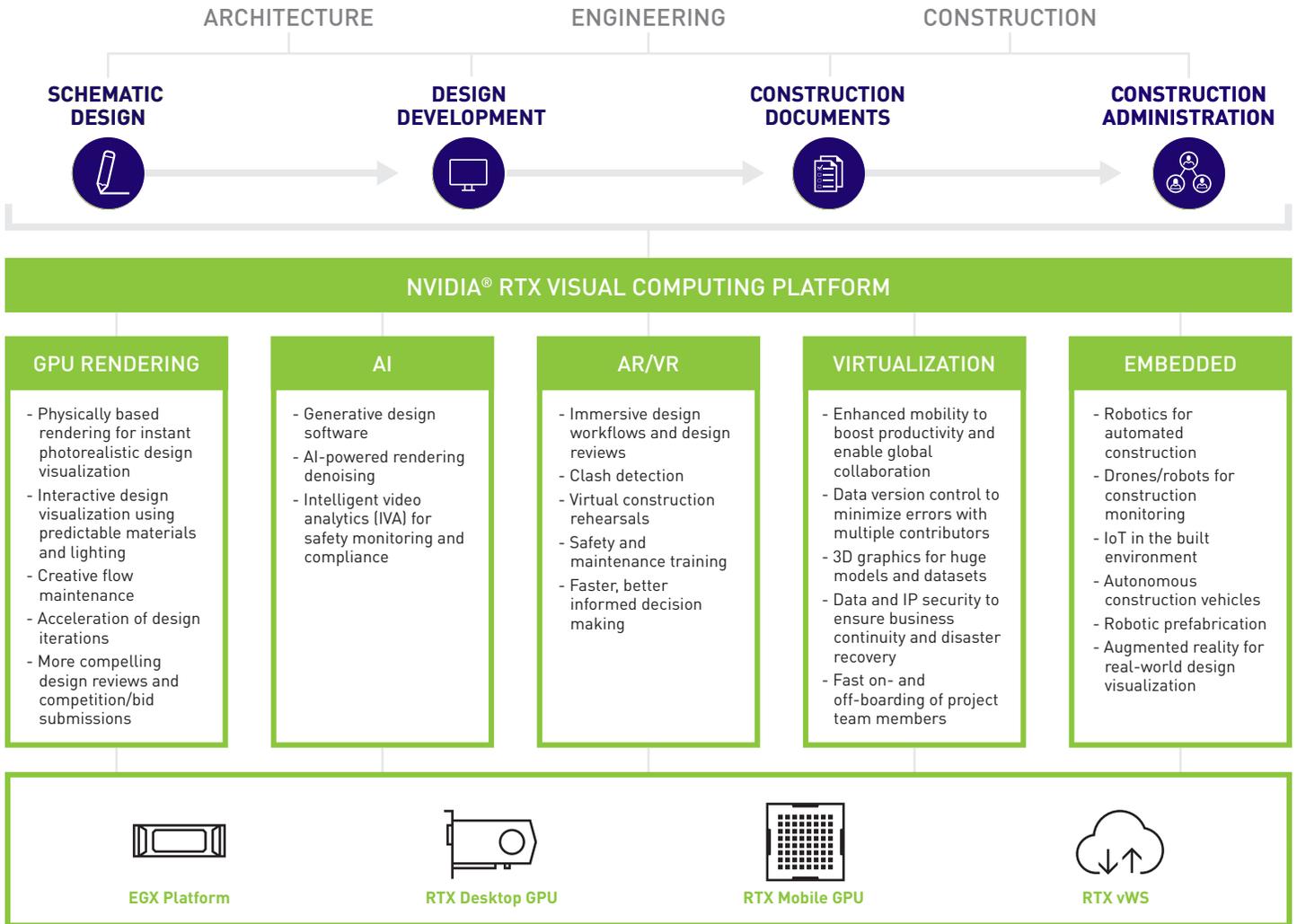


NVIDIA RTX ADVANTAGES FOR AEC FIRMS

- > Improved collaboration among remote teams of designers, architects, and engineers
- > Rapid design iteration resulting in more innovative designs
- > Faster, better customer decision making while streamlining design reviews
- > Immersive VR experiences to enhance design, design reviews, construction rehearsals, safety and maintenance training, and property marketing
- > AI-enabled functionality through generative design software and interactive physically based rendering
- > Smooth design workflows with massive BIM models for detailed, accurate designs while meeting project milestones
- > Optimized data management, version control, mobility, and security while rapidly on-boarding new project stakeholders
- > Faster creation of photorealistic marketing and sales collateral

POWERFUL NEW WORKFLOWS DELIVER RESULTS

AEC professionals know they must take advantage of the latest technology to achieve greater efficiency and meet project budgets and deadlines.



NVIDIA RTX solutions can assist in six key categories:

GPU-ACCELERATED, INTERACTIVE PHYSICALLY BASED RENDERING



Real-time ray traced rendering for viewing predictable models.

Combining NVIDIA RTX GPUs with GPU-accelerated rendering software delivers an interactive visualization experience. Architects can view design changes in real time and stakeholders can visualize realistic models to make faster decisions with greater confidence.

And with NVIDIA RTX GPUs powered by the latest NVIDIA Ampere GPU architecture, AEC professionals can instantly create cinematic quality renders, even when working with the most complex BIM models.

> [Learn more about GPU rendering](#)

AI AND DEEP LEARNING-ENABLED APPLICATIONS



AI/Deep Learning is already impacting design workflows.

Deep learning-enabled generative design software—which draws on NVIDIA GPUs for training and inference—offers architects a powerful new aid to reduce time spent on mundane repetitive tasks, while driving productivity and innovation. AI-powered rendering denoising running on RTX GPUs or RTX Virtual Workstation (RTX vWS) software speeds up noiseless visualization of photoreal renders. And NVIDIA RTX is built to accelerate AI inferencing to power the next generation of visual computing.

> [Learn more about AI for content creation](#)

VIRTUAL REALITY

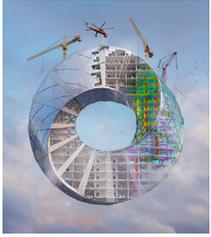


Enhancing building design workflows with VR.

NVIDIA RTX VR Ready GPUs drive immersive VR experiences with a true sense of scale that cannot be matched with drawings and 3D models on a computer display. VR-enabled walkthroughs allow instant feedback on designs, colors, textures, and features, reducing costly rework once construction has begun. They can also be used to run virtual construction rehearsals and more effective maintenance and safety training sessions.

> [Learn more about VR](#)

COLLABORATION WITH OMNIVERSE

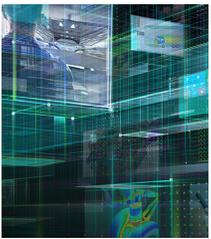


Transforming remote team collaboration with Omniverse

NVIDIA RTX professional GPUs deliver the performance needed to take full advantage of NVIDIA Omniverse for AEC and transform how project teams collaborate. Desktop and mobile RTX GPUs enable individual users to harness the RTX Renderer in Omniverse, while NVIDIA RTX vWS software and the NVIDIA EGX Platform offers the ultimate in visual computing power for AEC teams.

> [Learn more about NVIDIA Omniverse for AEC](#)

GPU-ACCELERATED VIRTUAL WORKSTATIONS

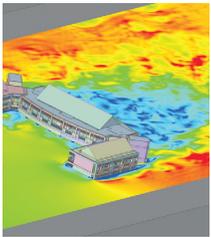


Virtualized 3D graphics for all users.

Global firms often have widely dispersed teams that touch all parts of a project cycle, from design to construction. Virtualized solutions powered by NVIDIA RTX vWS or NVIDIA vApp/vPC software and the NVIDIA EGX Platform enable more productive workflows to help teams meet demanding deadlines. In addition to simplifying IT management and helping protect intellectual property by maintaining data in the data center, NVIDIA vGPU solutions can facilitate designers' creativity by allowing anytime, anywhere access to visual computing power whenever inspiration strikes.

> [Learn more about RTX vWS](#)

REAL-TIME SIMULATION FOR AEC



Real-time simulation.

GPU-accelerated Ansys Discovery empowers architects, designers, and engineers to easily perform engineering simulation while iterating on designs. Teams can visualize modifications in real time, so they can evaluate thermal, gas, and fluid studies before submitting designs for validation. Introducing real-time simulation early not only helps save time and money but can result in a more optimally designed built environment.

> [Learn more about GPU-accelerated simulation](#)

KEY ISV PARTNERS



3ds Max, AutoCAD, Revit

MicroStation, ContextCapture,
LumenRTX, OpenBuildings
Designer, SYNCHRO

V-Ray, Vantage



ArcGIS Pro

Rhino, Grasshopper

Allplan, ArchiCAD, Cinema 4D,
Vectorworks

SketchUp

RTX-ACCELERATED WORKFLOWS FOR AEC

WORKFLOW PHASE	ARCHITECTURE	ENGINEERING	CONSTRUCTION
	Schematic design Design development	Design development Construction documents	Construction administration
WORKFLOW USE CASES	Photorealistic visualization VR for design and design reviews Omniverse for more effective remote team collaboration Deep learning for generative design Massive BIM datasets Mobility Data security	Photorealistic visualization AR/VR for design, collaboration, and construction rehearsals Massive BIM datasets Mobility Data security	AR/VR for safety, maintenance training and construction rehearsals Reality capture/point clouds Mobility Data security

WHAT OUR CUSTOMERS ARE SAYING ABOUT RTX



“For the first time in nearly 30-years of hospitality design, our clients were able to stand in an existing environment, fully understand our proposed design in context, and collaborate with us to modify and enhance the solution.”

Ron Swidler
Principal, The Gettys Group



“We work with massive, complex models with multiple tall buildings in cityscapes, which have at times been difficult to visualize at the level of detail that we’d truly like. Visualizing these huge models at the highest resolutions with the RTX A6000 is super impressive.”

Paul Renner
Visualization Manager, KPF



“The management and monitoring features we can access with NVIDIA [RTX vWS] software are a great value. Without them, we might have to run a subpar user experience without knowing. A good user experience leads to better productivity, happy users, translating to fewer help-desk tickets. Having data to make user experience quantifiable is invaluable.”

Jeremy Stroebel
IT Director, BDMD

RTX SOLUTIONS IN ACTION

- > **Discover how NVIDIA technologies are transforming AEC from concept to construction**
- > **Explore AEC customer success stories, webinars and more**

[Learn more](#)

For more information, visit www.pny.com/professional/learn-more/markets/aec

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