Hewlett Packard Enterprise | NVIDIA

Solution brief

GreenLake Flex Solutions Digital Twin

As established leaders in computing technology, HPE and NVIDIA® provide all the right tools to improve collaboration and performance in virtual environments:

- Accelerating time to design, deployment, and value for 3D workflows
- Providing a simple, unified experience with no need to learn underlying technology
- Extending the cloud experience on-premises for greater flexibility and scale with security and control
- Offering a holistic ecosystem of cloud-based solutions and services to drive innovation and reduce costs

The future of the virtual universe

Today's organizations are facing unique challenges with the rise of remote workforces and increasingly complex 3D workloads. Physically accurate simulations are critical in every industry and demand robust compute performance that is accessible from anywhere—as well as multiple autonomous systems interacting in the same space-time. Trying to collaborate on these 3D assets with various machines scattered across geographic locations negatively impacts productivity.

The convergence of the physical and virtual worlds is empowering organizations to develop real-world solutions to some of humanity's biggest challenges. This is known as the metaverse, the next evolution of the internet, the 3D overlay of the web, the collection of interoperable virtual worlds. Just like the web, there are metaverse applications for entertainment and consumer experience and others for enterprise industrial use cases. The metaverse offers a visual experience using photo-realistic, real time virtual representations (of products or production) that envelope users in a world that looks and behaves like reality. Digital twins are the engine for the virtual universe and the key to de-risking business operations and gaining faster time to value. The use of digital twins allows organizations to aggregate, connect, and protect assets, people, and processes virtually. Ultimately, the technology enables faster, more informed decisions and collaboration between users—across the room or across the globe—will revolutionize how organizations implement complex systems and processes.

The GreenLake Flex Solution built for digital twin will revolutionize how organizations design, simulate, and optimize virtual assets and processes in the metaverse:

- Transforming existing technology infrastructure cost-efficiently
- Improving business performance across multiple dimensions
- Expanding data access, visibility, and utilization
- Enabling better-informed decisions throughout the entire digital twin lifecycle
- Gaining faster, broader insights to optimize business operations

To make full use of digital twins, organizations need an integrated end-to-end system to increase productivity and collaboration, without impacting their existing processes. Savvy decision-makers are investing in cloud computing and infrastructure accelerated by artificial intelligence (AI) to power the latest advances in digital twin technology. The right solutions can help them visualize streams of complex data to gain greater visibility into their operations, make better-informed decisions, and keep pace with new requirements.

Industry outcomes in the metaverse

Digital twins are helping organizations everywhere increase data visibility and insights to drive impact. Many industries depend on these 3D content creation pipelines to build and deliver the latest products and services, enhance user experiences, and boost their bottom lines.

In healthcare and life sciences, organizations use digital twins to enhance scientific research and improve clinical outcomes. With 3D models, healthcare providers and researchers can simulate the impact of specific medicines, therapies, or procedures on the human body. Digital twins are paving the way for use cases—including drug discovery and personalized medicine—that will transform patient care.

The architecture, engineering, and construction sector speeds up time to market by collaborating on digital twins. Digital twins allow users to share data securely across design applications to produce highly accurate 3D designs, access the most up-to-date models, and make changes instantly. Immersive virtual experiences are available on a variety of devices. These capabilities accelerate design reviews as well as new iterations, from build up to operations.

Manufacturers are leveraging digital twins to shorten product development cycles. Unifying design and engineering data using a single digital model eliminates the time and costs of physical prototyping. Through thorough and efficient design testing, manufacturers can predict and optimize high-quality models and get to market faster with less risk.

Media and entertainment teams use “twin” movie footage and digitally enhanced images with ray tracing to produce compelling new content and deliver it quickly. Digital twins allow artists and directors to collaborate on complex assets in real time, maximize iterations with no opportunity cost, and bring creative ideas to life.

Maximizing the value of digital twins

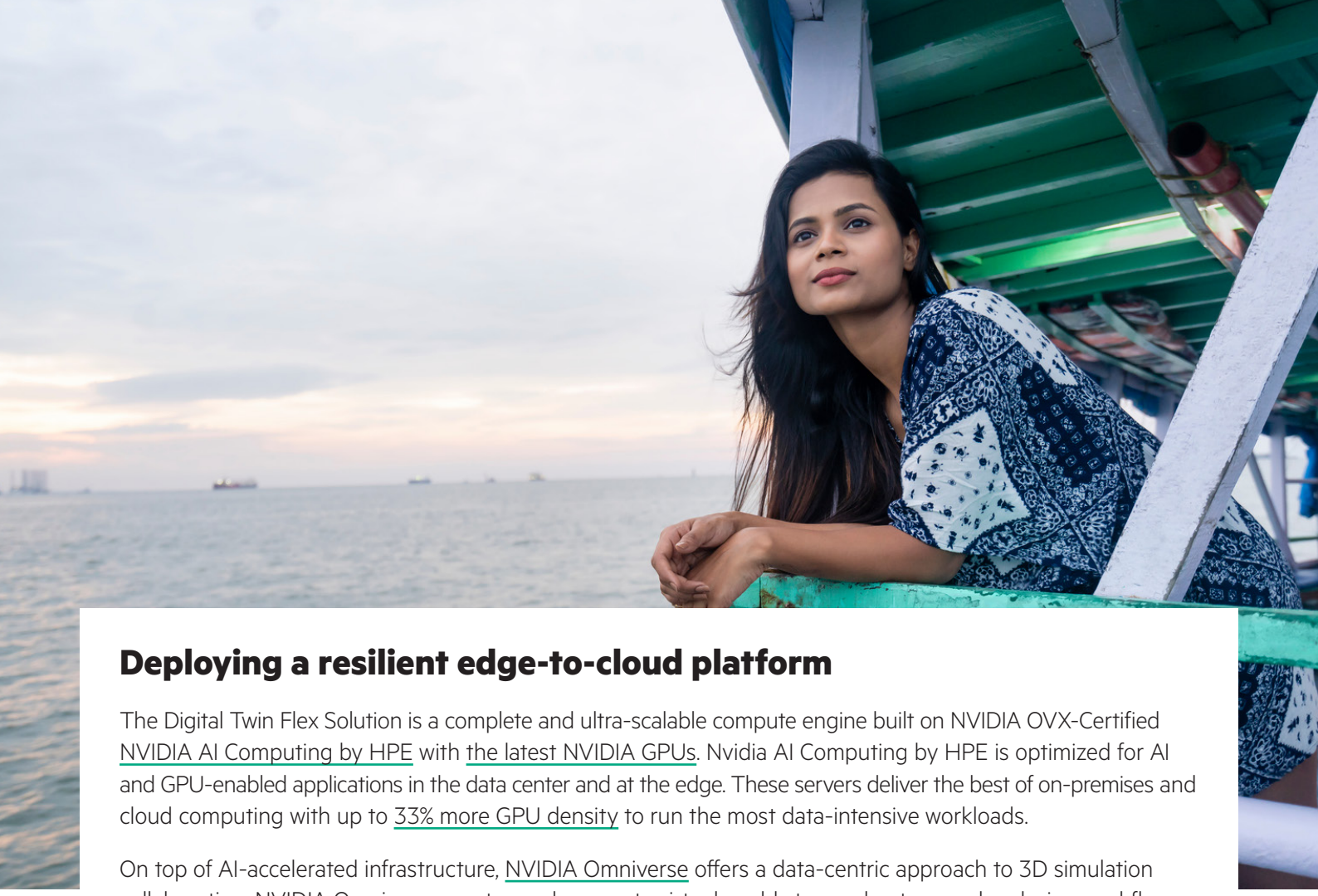
Hewlett Packard Enterprise and NVIDIA are helping organizations gain exceptional value in the metaverse. We bring decades of expertise with industry-leading technologies to prepare businesses for the future and improve performance across multiple dimensions. We know efficiency is critical to the success of digital twin workflows. That's why we are making it simpler to deploy and manage a virtual environment. Our hybrid approach delivers a cloud experience on-premises combining NVIDIA-Certified high-performance infrastructure, massive GPU acceleration, and AI to secure private data and provide on-demand access to countless data sources.

The GreenLake Flex Solution built for digital twin is an end-to-end managed solution that empowers organizations to design, simulate, and optimize virtual assets and processes in the metaverse. This scalable, multi-GPU, real time reference development framework features Nvidia AI Computing by HPE and the NVIDIA Omniverse™ platform, combining the scalability and availability of public cloud with the flexibility and security of private cloud to deliver faster time to value. NVIDIA Omniverse Enterprise is a native OpenUSD software platform for connecting complex 3D pipelines and developing applications for industrial digitalization. Organizations can easily unify 3D tools and data to break down information siloes, minimize tedious data preparation, and supercharge collaboration across enterprise teams. The platform offers easy-to-use developer tools to build advanced, real time 3D applications that enable teams to visualize and simulate products, assets, and facilities in full design fidelity. NVIDIA Omniverse can be deployed in your preferred environment, on a variety of NVIDIA-Certified servers or NVIDIA OVX™.

The Digital Twin Flex Solution offers all the right tools to empower industrial digitalization with an easy-to-use unified experience. This robust ecosystem allows end users to connect their 3D workflows and developers to create new tools and services in a shared virtual space—critical capabilities that make it faster to build, deploy, and operate a collaborative 3D simulation and design environment.

Organizations can maximize the value of digital twins in keyways:

- Aggregating data from numerous sources
- Seamlessly connecting XR use cases (augmented reality, virtual reality, "day in the life" experiences, and workshops)
- Protecting vast datasets with protocols that ensure backup and recovery, disaster recovery, and high availability



Deploying a resilient edge-to-cloud platform

The Digital Twin Flex Solution is a complete and ultra-scalable compute engine built on NVIDIA OVX-Certified NVIDIA AI Computing by HPE with the latest NVIDIA GPUs. Nvidia AI Computing by HPE is optimized for AI and GPU-enabled applications in the data center and at the edge. These servers deliver the best of on-premises and cloud computing with up to 33% more GPU density to run the most data-intensive workloads.

On top of AI-accelerated infrastructure, NVIDIA Omniverse offers a data-centric approach to 3D simulation collaboration. NVIDIA Omniverse creates and connects virtual worlds to accelerate complex design workflows of any scale. With real time interoperability across applications, this is the ideal foundation for building and operating metaverse applications.

GreenLake offers an easier and more cost-effective way to utilize infrastructure from HPE and NVIDIA. GreenLake merges the scalability and availability of the cloud with the security and control of on-premises IT. Flexible and secure hybrid cloud services deliver resources across disparate locations with public cloud integration when needed. Because digital twin data comes from multiple sources, edge-to-cloud infrastructure runs closest to where data is generated. Organizations can choose to run in the cloud, state-of-the-art colocation facilities, or data centers—each while avoiding the cost and risk of moving mission-critical data to the cloud and dramatically accelerating time to value. Offered as a consumption-based model that allows organizations to pay as they go, it has never been easier to scale, self-serve, or manage a solution your way. Organizations can start small to avoid large investments and add additional resources or make updates as needed for intensive 3D and AI workloads, with a built-in buffer to meet unexpected spikes in resource demand and scale ahead of growth. With predictable performance and cost, users have realized operational savings of 65%.

Thousands of experts are available worldwide to oversee solutions on your behalf. From infrastructure and operating systems to the application layer, we can remotely monitor your Digital Twin Flex Solution and provide recommendations on how to optimize results.

HPE Services provides a single point of contact and end-to-end accountability for new solutions. Advisory and professional services are available to make the most of your solution and the applications you need to run, from HPE infrastructure to NVIDIA Omniverse. We help you evaluate top XR use cases and select the right technologies and tools for your edge-to-cloud solutions. From workshops and POC or enterprise deployments, you have hands-on guidance to scope digital twin projects and plan for future requirements. HPE Services experts are available to help you at every stage of the journey, from conceptualization and assessing IT to platform enablement and user onboarding.

Conclusion

The metaverse is already transforming how we design, manufacture, and interact with physical entities across industries. The potential for better operational results, automation, and monetization is fueling the demand for new metaverse applications. The possibilities are endless to transform both the virtual and physical worlds.

HPE and NVIDIA are enabling superior performance outcomes across the entire digital twin lifecycle. We give you boundless capacity to innovate and scale as workload requirements change, to meet today's infrastructure challenges and prepare for whatever comes next. Our simple road map for success guides you through critical steps, from identifying use cases and evaluating your data to building a team and measuring impact.

The Digital Twin Flex Solution enables you to build a powerful, scalable, and secure virtual environment for collaboration and innovation. Organizations are already harnessing the power of large-scale simulation to transform their industries and revolutionize scientific discovery.

Whether you are developing cutting-edge products and services, advancing precision medicine, or pursuing the next great scientific discovery, this is your opportunity to unlock the value of metaverse applications. Let HPE and NVIDIA help you achieve game-changing results in the virtual universe.

Resources

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nvidia.com/en-us/data-center/h100/

nvidia.com/en-us/omniverse/

hpe.com/us/en/greenlake.html

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