



NVIDIA DSX Air

Accelerate deployment of AI factories using high-fidelity digital simulations.

Simulating AI Infrastructure in the Cloud

As data center infrastructure grows in complexity, organizations are finding it more and more difficult to validate changes and streamline operations. NVIDIA DSX Air addresses this by giving organizations the ability to build simulations of their AI factory. NVIDIA DSX Air delivers high-fidelity digital simulations of NVIDIA hardware infrastructure, including GPUs, NVIDIA® SuperNICs™, DPUs, and switches, and integrates with leading partner solutions for storage, longhaul routing, security, orchestration, and more via open, API-based interfaces.

DSX Air features a cloud-hosted virtual environment for design, testing, and validation of network provisioning, automation, security policies, and more, and enables day-zero operations before hardware deployment. Teams can simulate, validate, and automate changes before production, accelerating time to first token with cloud-scale efficiency.

Beyond accelerating deployment and bring-up, DSX Air supports DevOps' continuous integration and continuous delivery (CI/CD) pipelines for rapid, reliable software updates and change management. DSX Air simulations can be launched via the SDK for integration with Git and other artifact repositories. This enables seamless operations and management with safer updates that maximize network availability and AI factory resource utilization.

Integrated into the NVIDIA DSX Platform, DSX Air works with DSX Sim to model and validate AI factories as high-fidelity digital twins, with DSX SimReady adding detailed 3D geometry, logistics, and system behavior.

Run Virtual Labs to Simulate, Test, and Train Networks

As AI adoption accelerates, organizations need faster, more flexible ways to design, validate, and optimize infrastructure—without the expense or delay of physical labs. As a virtual lab platform, DSX Air provides on-demand virtual labs that replicate real-world environments with full software functionality. Engineers, architects, and DevOps teams can model data center deployments, simulate operations, and test automation or security policies, all in a digital twin environment that streamlines operations from day zero.



Key Features

Infrastructure Simulation

- > Open, cloud-native architecture that simulates server, networking, storage, security, and management elements through a GUI or SDK

Networking Software in the Cloud

- > Full support for NVIDIA® Cumulus® Linux, SONiC, and NetQ™

GPU and End-Host Support

- > GPU and x86 server simulation with operating systems and applications

Prebuilt Network Templates

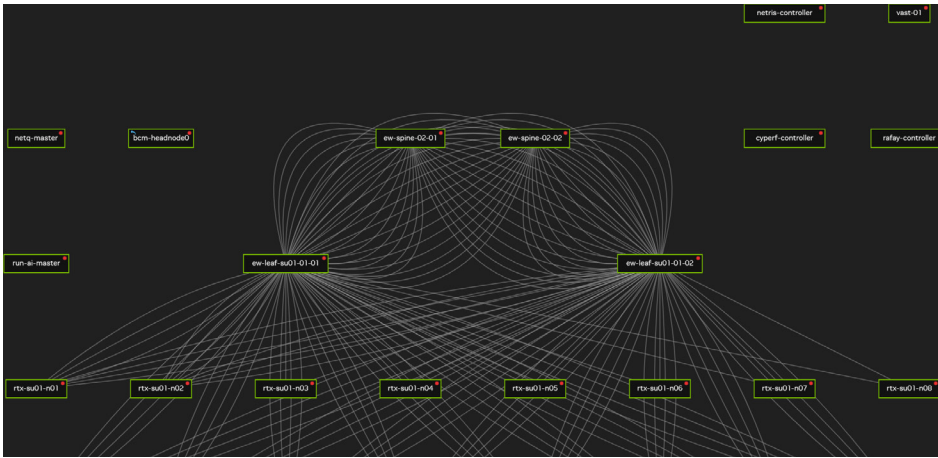
- > Ready-to-use leaf-spine networks with either or both Cumulus and SONiC

Custom Topologies

- > Drag-and-drop interface with bring-your-own configuration or NVIDIA-led virtual proofs of concept

Demo Marketplace

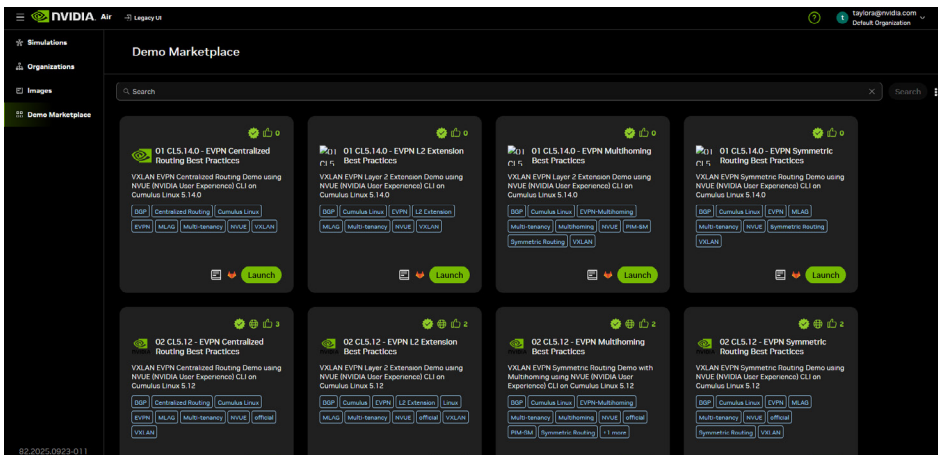
- > Embedded tutorials and documentation for NVIDIA networking



The NVIDIA DSX Air canvas features a digital twin of NVIDIA networking and GPU infrastructure, as well as partner orchestration, security, and storage offerings.

Build and Deploy AI Factories Faster

NVIDIA DSX Air supports full east/west and north/south network simulation, accelerating NVIDIA Spectrum-X™ AI fabric deployment. It delivers true-to-life simulation of Spectrum hardware, network operating system (NOS) behavior (Cumulus, SONiC), and protocol stacks through a browser graphical user interface (GUI) or command-line interface (CLI). By eliminating hardware dependencies and hypervisor bottlenecks, DSX Air lowers costs while speeding validation. DSX Air's Demo Marketplace provides ready-to-run labs for training and technical demos, and its API/SDK integration enables seamless CI/CD workflows and infrastructure as code.



The NVIDIA DSX Air Demo Marketplace contains prebuilt labs demonstrating Cumulus Linux and SONiC features and functionality.

Automate Network Design

NVIDIA DSX Air delivers automation at every stage of network simulation, from topology design to configuration and validation. With Git for version control and Ansible for agentless deployment, teams can scale from small labs to full data center topologies quickly and reliably. Automation eliminates repetitive CLI work, reduces errors, and applies DevOps discipline to networking—accelerating testing and boosting efficiency.

Skill Building

- Always-on sandbox for training and hands-on practice

Data Protection

- User-owned configs and topologies; no data stored on the platform

Key Benefits

Digital Twins

- Fast spin up for pre-hardware testing, mobile/browser access, and platform-agnostic flexibility.

Infrastructure as Code

- Use Ansible and Git for version-controlled, repeatable, and scalable configuration management.

CI/CD Integration

- Automate validation, deployment, and reuse at scale within DevOps workflows.

Topology Portability

- Upload, share, and rapidly deploy topologies integrated with pipelines.

DSX Air Services

- Enable (HTTP/SSH) access for real-world integration, dashboards, and automation.

Real-World Integration via DSX Air Services

DSX Air enables real-world connectivity with HTTP, HTTPS, and SSH services per node, allowing dashboards, APIs, and external systems to interact with simulated environments as if on physical infrastructure. This realism streamlines collaboration and enhances testing fidelity.

CI/CD-Driven Network Automation

CI/CD pipelines—standard tooling in software engineering—bring agility, repeatability, and scale to network automation. With DSX Air, engineers apply these best practices to virtual labs and production deployments alike, ensuring error-free rollouts and highly scalable network operations.

Ecosystem Integration

Through its NVIDIA AI factory simulation, NVIDIA DSX Air offers significant benefits to customers and partners, but its true value is unlocked by enabling integration and interoperability with NVIDIA's partner ecosystem. This includes server, storage, and router original equipment manufacturers (OEMs), as well as ISVs specializing in network orchestration, security, and management/operations. Organizations can deploy verified solutions that combine NVIDIA infrastructure with partner offerings, ensuring day-one interoperability.

Server and System Vendors

Server and system vendors are essential for enterprise customer bases, in particular for enterprise inference. In the enterprise environment, requirements are flexible and service driven, and the use of predefined, strict reference architectures (RAs) is not realistic. Prior to DSX Air, OEM solution integration and testing would require expensive, inflexible infrastructure buildouts of compute, networking, and storage environments. With DSX Air, server OEMs can build their own optimized configurations based on their RAs with their software stack and even build a simulation tailored to specific, bespoke customer requirements.

Network and Compute Orchestration

Orchestration vendors fill a key gap in the industry, providing turnkey solutions for enterprise and Tier-2 clouds to provision and deliver AI cloud services. Orchestration vendors are building their solutions based on the NVIDIA reference architectures, but they cannot validate their solution at scale or for specific use cases diverging from best practices, since this requires a large investment in hardware. DSX Air enables validation for orchestration solutions.

Storage Vendors

Storage is a key component of the AI factory. The complexity of enabling an optimal storage solution—with the proper hot/cold tiering and correct sizing for capacity, bandwidth, and KV cache—is not suitable to a “one-size-fits-all” solution and is challenging to address via reference architecture. With NVIDIA DSX Air, storage vendors can validate their solutions with NVIDIA infrastructure and software, as well as with other ecosystem partners—such as security vendors—in a scalable and cost-effective manner.

“ NVIDIA DSX Air allows organizations to construct a full digital twin of their AI factory—compute, networking, storage, orchestration and security—before a single server is unboxed. By shifting integration and troubleshooting into simulation, customers are reducing the time to first token from weeks or months to mere days or hours, saving enormous amounts of time and costs.”

Security

Security is a base-level and vitally important requirement for any AI factory. Security solutions must apply policies for agents and/or users in a multi-tenant environment and align with other orchestrated components, including networking and compute—either through the security appliance or integration with NVIDIA BlueField DPUs. This is extremely complex and requires a real, operating cluster so this entire orchestration can be validated. With NVIDIA DSX Air, security vendors can validate their solutions with NVIDIA infrastructure and software, as well as with other ecosystem partners—such as storage, network, and Kubernetes vendors—in a scalable and cost-effective manner.

NVIDIA DSX Air also enables security vendors to run security checks in a customer's digital twin and detect security events and vulnerabilities long before the customer activates their production environment, ensuring greater safety from the first token.

Ready to Get Started?

To learn more about NVIDIA DSX Air, visit nvidia.com/air

