Industrial Enterprises are Racing to Digitalize

NVIDIA AI

NVIDIA Omniverse

Automotive & Transportation
Electronics & Semiconductor
Energy
Manufacturing
Retail & CPG
Telco
Digitalizing the World’s Largest Industries

Design, Build, Operate, Optimize - Virtually

DESIGN DIGITAL TWIN

PERFORMANCE DIGITAL TWIN

AV DIGITAL TWIN

FACTORY DIGITAL TWIN

ROBOTICS DIGITAL TWIN

WAREHOUSE DIGITAL TWIN

NVIDIA Omniverse
Omniverse Unifies the Entire Product Lifecycle with OpenUSD

From Concepting & Design, to Manufacturing, to Marketing & Advertising

Design

Manufacturing

Advertising

Supercharge with Gen AI
NVIDIA Omniverse Unlocks Unified Digitalization
One Foundational Platform to Connect Every Step of Industrial Processes
We built Omniverse to develop our own reference applications

ACE
AI driven avatars

DRIVE Sim
AV testing and validation

Isaac Sim
Robotics Simulation

Earth-2
Climate simulation
The Big Bang of Omniverse
Confluence of Enabling Technologies

OpenUSD
Powerful Asset Interchange

RTX Technology
Physically Accurate Simulation

Accelerated Computing
Scalable Accelerated Computing

AI Revolution
Demand for Simulation
Omniverse is Not a Tool
Omniverse is a Connecting Fabric of the World's Largest Tool Ecosystems

- DIGITAL TWINS
- DESIGN & ENGINEERING
- SENSOR MODELS
- SYSTEMS MANUFACTURERS
- SYNTHEIC DATA & SIMREADY 3D ASSETS
- ROBOTICS
- CONTENT CREATION & RENDERING

- SYSTEMS INTEGRATORS & SERVICE PROVIDERS

- 300K Downloads
- 220 USD Connections
- 100% Connections to World's Leading 3D Apps
The World’s Largest Industries are Adopting Omniverse

Industrial Digitalization at Every Scale

BMW Group
AI Smart Factories

Amazon Robotics
Warehouse Automation

Deutsche Bahn
Autonomous Railways

Ericsson
5G Network Simulation
Omniverse is Everywhere
Connecting Fabric Across the World’s Largest Industries

Software Partners
Over 150 Universal Scene Description (USD) Connections Across Industry Applications

Adopters
Across Transportation, Retail, Manufacturing, Energy, Telco, and More
NVIDIA Omniverse
Platform for Connecting and Developing Industrial Digitalization Applications on OpenUSD

AI Avatars | 3D Design | Autonomous Vehicles | Scientific Digital Twin | Industrial Digital Twin | Robotics | Synthetic Data Generation

Foundation Applications & APIs
- Code
- USD Composer
- DRIVE Sim
- Isaac Sim
- Replicator
- USD-GDN Publisher

Development Platform

NVIDIA RTX-Enabled Systems from Edge to Cloud
NVIDIA Omniverse

Cloud Native Platform for Connecting and Developing Industrial Digitalization Applications on OpenUSD

- Open, Interoperable
- Easily Extensible, Customizable
- Scalable from Workstation to Data Center
- Connected

3rd Party Applications & Services

Editor
Build, manage, assemble apps

Platform
Core technology
On-Premise Deployment
Use workstations, servers, OVX

Code
Shared Extensions

Foundation Applications & Production Ready Templates

Nvidia

Workstations
Servers
NVIDIA OVX

3rd Party Editor

Other editor

SyncTwin
BMW FactoryVerse
Bentley LumenRT
Siemens Factory Viewer
Rendered.AI
Amazon Robotics

USD Composer
USD Presenter
Replicator
Isaac Sim
DRIVE Sim

Nucleus
Connect
Kit
Simulation
RTX Renderer

NVIDIA, CERTIFIED

Microsoft

Workstations
Servers
NVIDIA OVX
Modular Development Platform for Building OpenUSD Applications

- Cloud-native
- Multi-GPU Enabled
- Built on Universal Scene Description (OpenUSD) for cross-team, tool and workflow collaboration
- Ability to use, customize, or copy foundation applications
- Deploy applications on all NVIDIA RTX™ solutions, from laptops to data centers
Modular Development Platform for Building OpenUSD Applications

- Integrate NVIDIA core technologies directly into any custom applications and tools
- Build once for interoperability everywhere
- Leverage Omniverse’s network of networks to grow audience and user base
Material Definition Language (MDL)
Open standard to define physically-based materials

› Declarative material definition based on a powerful material model
› Procedurally programmable functions that compute values for the parameters of the material model
› Defines what to compute, not how to compute it, leaving this for the renderer of choice
› Designed for modern highly-parallel machine architectures
Omniverse Nucleus
Asset Database and Collaboration Engine

- Allows multiple software tools to talk to each other as well as live sync workflow
- Universal asset exchange – can house assets of any filetype
- Enables collaboration on large, ultra-complex scenes and passes only the change deltas
- Because only deltas are exchanged, extremely fast creation/replication is enabled
- No more hour-long or overnight uploading/downloading of entire scene files – everything is real-time and live
- Enables a single source of truth and eliminates messy, redundant file copies
Advanced Tools and Technologies
Foundational Platform Components

- NUCLEUS
- CONNECT
- KIT
- SIMULATION
- RTX RENDERER
CONNECTING TO OMNIVERSE

Multiple Ways to Interact – Some in Real-Time with Automated Material Conversion

- BI-DIRECTIONAL CONNECTOR*
  - Application plug-in
  - *Optional Live Sync & Delta Save

- UNI-DIRECTIONAL CONNECTOR*
  - Application plug-in
  - *Optional Live Sync & Delta Save

- Omniverse Drive
  - Drive mounts a Nucleus server to a virtual hard drive

- EXPORT and IMPORT
  - Native and Industry file format converters to/from USD

- EXTENSIONS
  - Python based tools for Kit-based apps
## Connect to Omniverse with USD

**Many Ways to Connect, Baseline is USD Ingest**

<table>
<thead>
<tr>
<th>BI-DIRECTIONAL NUCLEUS CONNECTION</th>
<th>ENTERPRISE SUPPORTED</th>
<th>BETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updates shared between 3rd party tools and Omniverse after a single export/import. Live sync available for some connectors.</td>
<td><strong>3</strong> AUTODESK 3ds Max</td>
<td><strong>BETA</strong> Houdini</td>
</tr>
<tr>
<td></td>
<td>Bentley</td>
<td>iClone</td>
</tr>
<tr>
<td></td>
<td>CESIUM</td>
<td><strong>ipolog</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>UNREAL ENGINE</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNI-DIRECTIONAL NUCLEUS CONNECTION</th>
<th>ENTERPRISE SUPPORTED</th>
<th>BETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updates reflected from 3rd party tool to Omniverse but aren’t shared back. Material conversion supported. Live sync available for some connectors.</td>
<td><strong>3</strong> AUTODESK Revit</td>
<td><strong>BETA</strong> Blender</td>
</tr>
<tr>
<td></td>
<td>Rhino 3d</td>
<td>SketchUp</td>
</tr>
<tr>
<td></td>
<td>Siemens</td>
<td><strong>VECTORWORKS</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USD INTERCHANGE</th>
<th>BETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similar to uni-directional. Allows for USD or texture export.</td>
<td><strong>BETA</strong> Autodesk Alias</td>
</tr>
<tr>
<td></td>
<td>ZBrush</td>
</tr>
<tr>
<td></td>
<td>DS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPORT AND IMPORT</th>
<th>IMPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion to USD via direct import or third-party app.</td>
<td>3D PDF, 3DS, 3DXML, ACIS, Alembic, CATIA V4, CATIA V5, Collada, DWF, DWG, E57, IFC, IGES, Inventor, JT, LXD, MD5, NX, Parasolid, PRC, PRO/E, ShapeNet, Solid Edge, SOLIDWORKS, STL, STP, U3D, URDF, VDA-FS, VRML, X3D</td>
</tr>
</tbody>
</table>
Incorporating Non-Geometric Data into Omniverse

Building 3D Data

Non-Geometric Data
- Lights
- Elevations
- Location
- Construction Timeline
- BIM
- IoT
- Metadata

Combined USD Model
Omniverse USD Composer (formerly Create), View

Connectors, Extensions, Plugins
Incorporating Non-Geometric Data into Omniverse
Connecting Various Sources including Metadata & IoT

CSV Data – Patch Manager
2D Floorplans/Drawings – Autodesk Revit
BIM Data – BIM Explorer Extension

Google Sheets - to OmniGraph
IoT – Cooling Systems
USD and Omniverse Break Data Siloes
Combine datasets into a unified view for faster iteration

Design, Edit, Create
3rd Party Tools

Aggregate Data
Omniverse Nucleus

Interact, View, Edit, Collaborate
Omniverse USD Composer & USD Presenter

Design, Edit, Create
3rd Party Tools

Autodesk 3ds Max
Revit
Rhino
SketchUp
Autodesk Maya

Aggregate Data
Omniverse Nucleus

Project USD
Street USD
Building 1 USD
Building 3 USD
Streetlights USD
Prop 1 USD
Prop 2 USD
Tree Maple USD
Tree Oak USD

Interact, View, Edit, Collaborate
Omniverse USD Composer & USD Presenter

Workstation
Virtual Reality
Augmented Reality
3D Browser
Advanced Tools and Technologies
Foundational Platform Components

NUCLEUS
CONNECT
KIT
SIMULATION
RTX RENDERER
Omniverse Kit & Kit Extensions
Easily Build Advanced 3D Tools, Services, Applications

- Extensible platform, modular, flexible, open

- **Omniverse Kit** – SDK to build extensions, apps, microservices

- **Omniverse Extensions** - the building blocks of Omniverse Apps

- Provide over 300 extensions as source

- Majority written in Python

- Provide app templates to build-your-own
Advanced Tools and Technologies
Foundational Platform Components

NUCLEUS
CONNECT
KIT
SIMULATION
RTX RENDERER
Bringing in Physics Data in Omniverse

NVIDIA PhysX
Rigid & Soft Body Dynamics, Destruction, Fluid & Fire

Import Physics Instance
Offline from External 3rd Party Application

NVIDIA Modulus
Accelerated with Physics-ML Platform
NVIDIA Modulus
A Framework for Developing Physics-ML Models for Digital Twins

• Available as Omniverse Extension
• Train Physics-ML Models Using Governing Physics, Simulation, and Observed Data
• Multi-GPU Multi-Node Training
• 1,000-100,000X Speed Models – Ideal for Digital Twins
Advanced Tools and Technologies
Foundational Platform Components

NUCLEUS
CONNECT
KIT
SIMULATION
RTX RENDERER
Omniverse RTX Renderer
Advanced, Multi-GPU, Multi-Node Renderer for World Simulations

Scalable, Multi-GPU, Multi-Node
Infinitely scalable ray tracing to handle more geometry, thousands of dynamic lights with no baking.

Real time, Photoreal, Physically Accurate
Leading the convergence of real time and offline renderers.

Based on Open Standards
USD-enabled, flexible MDL, MDL-based procedural dome lights
Omniverse Farm
Systems Layer to Harness Multiple Compute Resources

- **Infrastructure Agnostic**
  - Works on workstations, servers, bare metal, virtualized

- **Task Agnostic**
  - Rendering, synthetic data generation, file conversion, thumbnail creation
  - Rendering: GTC Spring – rendered 60,000 frames across 800 NVIDIA servers and workstations with minimal set up
  - Synthetic Data Generation: Farm was used in both Isaac Sim and DRIVE Sim demos during GTC – generating

- **Licensing**
  - Omniverse Farm now included in Omniverse Enterprise Creator Subscription – up to 64 agents/license
XR in Omniverse
Collaborative, Full Fidelity Ray Traced XR

- **AR in Omniverse**
  - Streaming Omniverse RTX-ray traced scenes via CloudXR for AR and Virtual Camera modes
  - Omniverse Streaming Client App is now available
    - iOS – available on the App Store
    - Android – generally available

- **VR in Omniverse**
  - World’s first full frame, real time ray traced VR
  - Native in all foundation applications
Full-Fidelity XR
Immersive, Real-Time, Collaborative Design Review

Product Design Review

Architectural Design Review

Design & CAD Data

Design & CAD Data
NVIDIA Omniverse is Built on Universal Scene Description

3D Tool Interoperability, Non-Destructive, Collaborative Workflows
Universal Scene Description (OpenUSD)
Framework and Universal Interchange for Describing, Simulating and Collaborating Across Tools
Universal Scene Description (OpenUSD)

More than just a file format

Connects Tools, Data

Enables Collaborative, Non-Destructive Workflows

Connects Devices, Humans, AI Agents
What does this mean for content creation?

Non destructive, layer based workflows; protects every layer of data
Traditional 3D Multi-App Workflows
Each User Iterating in a Silo – Linear Process
Traditional Multi-App Workflows

Increased Complexity with Custom Apps/Plugins
Collaborative Workflows with Omniverse & USD

Use Preferred 3rd Party Applications, Collate to Open Format, All Data and Geometry is equal
Collaborative Workflows with Omniverse & USD

Build interoperable plugins for Omniverse & USD, to enhance global workflow.
NVIDIA Omniverse
Connect and Develop Connected 3D Pipelines and Applications based on OpenUSD

Connect Your Tools & Data with OpenUSD

Build New, Interoperable Tools on OpenUSD

Connect Your Teams
Omniverse Connects Artists’ Favorite Tools via OpenUSD

Lead Designer
AI Assistant
Path-Tracing
Generative AI
Materials
Physics

Omniverse Nucleus

Designer
Project Architect
Omniverse Connects Industrial 3D Tools & Data via OpenUSD
Connect Your Tools with OpenUSD and Omniverse
Real Time, Collaborative, Non-Destructive Workflows

Simple Full Fidelity Visualization Workflows
Rhino Grasshopper to Omniverse USD Composer (formerly Create)

Complex 3D Workflows with Legacy Software
Autodesk 3ds Max to Omniverse USD Composer (formerly Create)
Connect Your Existing Tools, and Easily Build Custom Tools

WPP, World’s Largest Ad Agency, Builds 3D Content Creation Pipeline with Omniverse Enterprise

Unified Car Digital Twin & AI Environment in NVIDIA Omniverse

Deploy Real Time Configurator

Generate Cinematics
Generative AI in 3D Workflows

Omniverse Enterprise Lets You Connect Your 3D and Generative AI tools

Real Time, Unified View in NVIDIA Omniverse
Customers Unifying their Workflows with OpenUSD and Omniverse
Build the Next Era of 3D Applications on Omniverse

3rd Party Applications
- Bentley Systems
- BMW Group
- HEAVY.AI
- Ipolog SyncTwin
- Rendered.AI
- Siemens
- SmartCow

Application Building Blocks
- Ext
- KIT

Foundation Applications
- Code
- USD Composer
- DRIVE Sim
- Isaac Sim
- Replicator
- USD-GDN Publisher

Development Platform
NVIDIA Omniverse
Developers Building Custom OpenUSD Applications with Omniverse

- **Wistron**
  Developed an IoT Extension

- **BMW Group**
  Factory Viewer

- **Fosters + Partners**
  Presentation App (Variant Viewing)

- **Nike**
  Integrated USD Workflow & Applications

- **Lowe’s**
  Extensions to Planogram Tools & Asset Store

- **Amazon Robotics**
  Package Stowing & Sensor Placement Emulators

- **Moment Factory**
  Extension bringing live video feeds into Omniverse

- **Mead & Hunt**
  Seamless MDL – text-to-material
Omniverse USD Composer (formerly Create)
Advanced USD Scene Composition, Lighting, Rendering

- Simplify world building with intuitive layout tools and physics
- Breathtaking photorealism with physically-accurate materials, and real time ray and path traced rendering
- Advanced simulation capabilities with NVIDIA PhysX 5, Flow, and Blast integration
Omniverse USD Presenter (formerly View)

Immersive, true-to-reality visualization for reviews & approvals

› Simple to use tools for project reviews including camera waypoints, annotations, measure, and markup
› Ability to make minor environment or material iterations and edits to present multiple options
› Quick toggling between real-time ray traced and ultra-high-fidelity path-traced mode allows teams to visualize interactively
Omniverse Code
Integrated Development Environment (IDE) to build Omniverse extensions, apps, microservices

- Simple to learn and use – easy user interface, interactive documentation, sample templates, and ‘Hello World’ exercises
- Helps developers and power users achieve maximum output with minimal code – free to use any of the 300+ NVIDIA-built Omniverse Extensions in their projects, so no need to start from scratch
- Easily package and publish to a private or public registry
- Includes Omniverse Kit runtime
Omniverse Replicator
Build Custom Synthetic Data Generation Pipelines

- SDK to build custom synthetic data generation pipelines
- Bootstrap AI model training
- Generate quality data faster than ever
- Integrates seamlessly with existing SDG tools
Saving Time and Money with Omniverse & OpenUSD

**Omniverse for OpenUSD Factory Data Workflows**

BMW Group reduced design freeze times from 3 days to 1 hour by building a custom Omniverse OpenUSD application.

**Omniverse for OpenUSD M&E Workflows**

Sony Pictures Animation reduced asset update times in previz workflow from 5 days to 1 hour by building a custom Omniverse OpenUSD application.

72x reduction in review time

100x reduction in asset update time
Omniverse Is Everywhere
Customers Across Every Industry Building Custom 3D Pipelines & Virtual Worlds
Industries Racing to Digitalize with NVIDIA Omniverse

Amazon Robotics
Warehouse & Supply Chain Automation

BMW Group
Automotive Manufacturing

Deutsche Bahn
Autonomous Railways

Ericsson
5G Network Simulation

KPF
Architecture, Construction, Engineering

Pegatron
Electronics Manufacturing

Siemens
Industrial Automation

WPP
Digital Advertising, Consumer Experiences
Priority Industries & Workloads

**AECO**
Architectural Design Review

**Media & Entertainment**
Previsualization

**Manufacturing - Product Development**
Product Design Review
Common Architectural Design Review Workflows
Disconnected Tools, Data, Teams

Pre-Design  Schematic Design  Design Development  Construction Documentation  Bidding & Negotiation

Legacy Infrastructure
Incompatible Tools
Siloed Data
Disconnected Teams

3D Modeling
BIM
Geospatial
Environmental & Simulation
Misc.
Game Engines

Autodesk Revit  Bentley  AUTODESK  SketchUp  Vectorworks  CESIUM  CityEngine  ParaView  Siniscale  Adobe  Twinbru  Unreal  Unity
NVIDIA Omniverse Enterprise in Architectural Design Review

1. Connect your tools & data
2. See it in a single view
3. Develop new experiences

Connect your tools & data: Autodesk, Bentley, CityEngine, Adobe, ParaView, SketchUp, AutoDesk, SINSOCLE, Unity, Twinmotion, Vectorworks

See it in a single view: Viewing App, Variant Presenter, One-Click to XR App, Your Custom App

Develop new experiences: Clients, Project Leaders, Visualization Specialists, Simulation Specialists, Designers, Structure, Layout, Product, Process & Metadata, Lighting, Analyses, Point Cloud
Omniverse Enterprise in Architectural Design Review

Outdoor Living

KPF

300% Increase in annual output
OutdoorLiving3D

Reduced Cost & Waste
Increased Quality & Output
Accelerated Speed to Market
### CHALLENGES

- Importing and exporting data across apps leading to data loss
- Unable to visualize and simulate all project data in a single platform
- Remote collaboration across multiple users and stakeholders

### OMNIVERSE VALUE

- Interoperability between preferred 3D apps
- Visualized and simulated environmental, wind and agent crowds in master models
- Interactive and vivid environment for design reviews including AR/VR

Transforming Architectural Design Pipelines

KPF – Global Architectural Firm
Workflows – Before and After
Full Fidelity Visualization

LEGACY 3D PIPELINE

PIPELINE WITH NVIDIA OMNIVERSE

CLIENT PRESENTATION

URBAN STUDIES

VISIONALIZATION

LIGHTING

CONSULTANT COORDINATION

PROJECT MODEL

DIAGRAMMING

PROJECT SCOPE

PROTOTYPING

ENVIRONMENTAL & URBAN STUDIES

2D DELIVERABLES / PROTOTYPING

2D DELIVERABLES / PROTOTYPING

Omniware Hecules

PROJECT MODEL

PROTOTYPING

CLIENT PRESENTATION

CLIENT PRESENTATION

PROJECT MODEL

PROTOTYPING

VISUALIZATION

LIGHTING

URBAN STUDIES
OMNIVERSE FOR M&E
Common Previsualization Workflows
Disconnected Tools, Data, Teams

- Modelling
- Layout
- Animation
- Lighting & Surfacing

Legacy Infrastructure
Incompatible Tools
Siloed Data
Disconnected Teams

Adobe
3ds Max
Maya
blender
Houdini
REALLUSION
Unity
UNREAL
Connect your tools & data
See it in a single view
Develop new experiences

NVIDIA Omniverse Enterprise in M&E Previz

1. Connect your tools & data
2. See it in a single view
3. Develop new experiences

Models
Environment
Rigging
Animation
Materials and Textures
Lighting
Cameras

- Artists
- Team Leads
- Technical Directors
- Clients
- Directors

- Viewing App (Flixiverse)
- Variant Presenter
- Lighting Simulator
- Your Custom App

Teams:
- Directors
- Team Leads
- Artists
- Technical Directors
- Clients
Omniverse Enterprise in Media & Entertainment Previs

Sony Pictures Animation

DNEG

More time for creative iterations

Sony Pictures Animation

4x

Reduced Redundant Processes

Increased Quality & Output

Accelerated Speed to Market
Transforming Global Film Production Workflows
DNEG – Leading Visual Effects and Animation Studio

CHALLENGES

- Making creative decisions with limited visual information, such as reduced scene information including no lighting or fur
- No context of character interactions with self and environment
- Notes on renders take a long time to turnaround and implement any changes requested

OMNIVERSE VALUE

- Artists can see their work in context at full fidelity before they deliver and get closer to final frames faster
- No long wait times for renders, accelerating review cycles from days to hours
- A flexible non-linear workflow means departments can contribute at the same time. Reviews are interactive and iterations can be made on the fly
## DNEG Case Study

**Pre-Visualization Before Omniverse and After**

<table>
<thead>
<tr>
<th>Autodesk Maya Playblast - Offline</th>
<th>Omniverse USD Composer (formerly Create) - Real Time</th>
</tr>
</thead>
</table>

[Image of pre-visualization and real-time visualization]
Connect Your Tools with OpenUSD and Omniverse
Build Unified Asset Pipelines

LEGACY 3D PIPELINE

USD PIPELINE

Animation
Shot Sculpt
Layout
CFX
Lighting
Character Design
Case Study: Rimac
Unlocking the content supply chain for automotive marketing

CHALLENGES
- Delivering Luxury, High end Sales Experience
- Existing method required lengthy asset prep time
- Localizing interactive content for new markets

OMNIVERSE VALUE
- Unlock Design Data for Marketing Purposes
- Reduce Duplicative 3D Work & Data Prep
- Deliver Personalized Content at Scale
- Library of Reusable 3D Assets
- Automate the Content Supply Chain
Workflow Example: Automotive Marketing

Automation of the content supply chain

Design ➔ Collaboration ➔ Distribute & Publish

3D Designers

Unified Asset

Geometry
Variants
Environments
Materials

Sales Teams
Ecommerce Teams
Marketing Teams

External Vendors

Workstation
Virtual Reality
Augmented Reality
Web Browser

Adobe Substance 3D Painter
Adobe 3ds Max
Autodesk Maya
Rhino 3D
CATIA
Unreal
OMNIVERSE FOR MANUFACTURING
Common Product Design Workflows
Disconnected Tools, Data, Teams

Concept Design
Surface Modeling
Render & Visualize

Prep
Review
Prep
Review

Legacy Infrastructure
Incompatible Tools
Siloed Data
Disconnected Teams
NVIDIA Omniverse Enterprise in Product Design Review
Minimize Data Prep, Accelerate Design Reviews, Enable Full-Fidelity Collaborative Workflows

1. Connect your tools & data
2. See it in a single view
3. Develop new experiences

Connect your tools & data ➔ See it in a single view ➔ Develop new experiences

- Executives
- Product Owners
- Team Leads
- Industrial Designers
- Visualization Artists
- R&D Engineers / Developers
- CMF Designers
- Geometry
- Variants
- Materials & Textures
- Environments
- Animations

Viewing App
Variant Presenter
One-Click to XR App
Your Custom App
Omniverse Enterprise in Product Design Review
Minimize Data Prep, Accelerate Design Reviews, Enable Full-Fidelity Collaborative Workflows

75%

Reduction in product development time

Predator Cycling

Reduced Cost & Waste
Increased Quality & Output
Accelerated Speed to Market

General Motors
More Seamless Multi-App Workflows
Rhino, Fusion360, Omniverse USD Composer (formerly Create)

Transforming Product Design Workflows
Predator Cycling – Design and Manufacturing Company

CHALLENGES

- Complex design workflows leading to delays in product launch
- Incompatible data formats from multiple engineering applications hamper creativity
- Lag in synchronizing data between design, engineering, manufacturing and marketing

OMNIVERSE VALUE

- Better communication, feedback, and decision-making, dramatically reducing production time from 12-18 weeks to 4 weeks
- Efficient and modern manufacturing workflow that aggregates full-fidelity 3D data across multiple apps without any data loss
- Interactive and vivid environment for design reviews; photorealistic models for marketing and customer engagements
Use Case: Design and Styling
Building Unified Data Pipeline to Unlock Real-Time, Collaborative Workflows

CHALLENGES

- Fragmented design and engineering data, tools, and workflows
- Lengthy design and engineering review preparation
- Lengthy marketing asset preparation

OMNIVERSE VALUE

- Breaks data and design team siloes
- Enables multi-stakeholder, real time collaboration
- Accelerates decision-making, review cycles
- Reduces data prep, export/import time
- Eliminates rework, lost and stale data
Use Case: Design and Styling

Key Omniverse Features Used

Developer Tools
Building Custom Kit-Based Applications

USD Workflow - Modeling
Autodesk Alias & Siemens TeamCenter to Omniverse

USD Workflow – Set Dressing
Autodesk 3ds Max, Maya, Unreal Engine to Omniverse

XR in Omniverse
Varjo HMDs

Multi-User, Live Collaborative Review
Geographically dispersed, virtualized from the data center
Workflows – Before and After

LEGACY 3D PIPELINE

PIPELINE WITH NVIDIA OMNIVERSE

“Dead” Data Non-Collaborative

“Live” Data Collaborative
Use Case: Design and Styling

Building Unified Data Pipeline and Real-Time, Collaborative Workflows

CHALLENGES

× Access and tracking of latest geometry and files
× Departments lack context when designing individual components
× High res renders not accessible during design phase

OMNIVERSE VALUE

☑ Breaks data siloes
☑ Enables multi-stakeholder, real time collaboration
☑ Accelerates decision-making, review cycles
☑ Reduces data prep, export/import time
☑ Eliminates rework, lost and stale data
Use Case: Design and Styling

Key Omniverse Features Used

Visualize Design in Context
Break Down Design Data and Workflow Siloes

USD Workflow - Configure & Review Variants
Connect to Configurator and Business Logic

Multi-User, Live Collaborative Design Review
Accelerate Review Process, Increased Iterations
Omniverse Runs on NVIDIA RTX
NVIDIA-Certified Systems Optimized for Omniverse Workloads

RTX WORKSTATIONS
Desktop: RTX 6000 Ada 1-4x GPU
Mobile: Up to RTX 5000 Ada Laptop GPU

NVIDIA-Certified Servers
1-8X GPU
L40S / L40 / L4 / A40 / A10

NVIDIA OVX
High Performance, Scalable Reference Architecture
L40S / L40 + CX7 + BF3
### Omniverse For Everyone

<table>
<thead>
<tr>
<th>COLLABORATION</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between multiple apps and one other user</td>
<td>Between multiple apps and licensed users</td>
<td></td>
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<tr>
<td></td>
<td>Maximum 8 concurrent editors per scene session</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LICENSING</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free for individuals</td>
<td>Subscription License, Annual and Multi-Year</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SUPPORT</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Forums, Training Videos &amp; Community</td>
<td>Full Enterprise Support</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NUCLEUS</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nucleus Workstation only</td>
<td>Enterprise Nucleus Server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nucleus Workstation</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>CONNECTORS</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of all Connectors, including beta</td>
<td>Use of all production Connectors, beta at own risk</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPS</th>
<th>OMNIVERSE FOR INDIVIDUALS</th>
<th>OMNIVERSE ENTERPRISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Omniverse apps, including beta</td>
<td>Omniverse USD Composer (formerly Create)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Omniverse USD Presenter (formerly View)</td>
<td></td>
</tr>
</tbody>
</table>

*Use of custom Omniverse Kit-based apps require an Omniverse Enterprise license*
Easy Recipes for Omniverse Enterprise
Building Block Designs

Small Workgroup
1 - 5 Users

- RTX Mobile Workstation
- RTX Desktop Workstation
- RTX Workstation w/ Omniverse Nucleus
- RTX Mobile Workstation
- RTX Desktop Workstation

Enterprise Workgroup
1 - 1000 Users

- RTX Mobile Workstation
- RTX Desktop Workstation
- RTX Mobile Workstation
- RTX vWS (OVX L40s) 1-8 Users
- Optimized Server for Omniverse Nucleus
# Recommended Configurations
NVIDIA-Certified Systems Optimized for Omniverse Workloads

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>Mobile Workstation</th>
<th>Desktop Workstation</th>
<th>Server for Nucleus</th>
<th>NVIDIA OVX 4-GPU</th>
<th>NVIDIA OVX 8-GPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel Core i7-13700H or HX</td>
<td>Intel Xeon W5-3435X</td>
<td>Intel w/ 3.6GHz+ &amp; 16+Cores</td>
<td>2x Intel SPR 32 Cores 2x AMD Genoa 32 Cores</td>
<td>2x Intel SPR 56 Cores 2x AMD Genoa 56 Cores</td>
</tr>
<tr>
<td>System Memory</td>
<td>32GB DDR5</td>
<td>256GB DDR5 ECC</td>
<td>96GB+ DDR5 ECC</td>
<td>512GB DDR5 ECC minimum 384GB DDR5 ECC minimum</td>
<td>1024GB DDR5 ECC minimum 768GB DDR5 ECC minimum</td>
</tr>
<tr>
<td>Boot Drive</td>
<td>512 M.2 NVMe SSD x1</td>
<td>1TB M.2 NVMe x1</td>
<td>512GB M.2 NVMe SSD x1</td>
<td>1TB M.2 NVMe x1</td>
<td>1TB M.2 NVMe x1</td>
</tr>
<tr>
<td>Data Drive</td>
<td>2x1TB M.2 NVMe SSD x2</td>
<td>1TB M.2 NVMe SSD x2</td>
<td>4TB M.2 NVMe x2</td>
<td>8TB M.2 NVMe x2</td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>10G + CX6 DX Active</td>
<td>2x CX7 (2x200GB)</td>
<td>2x CX7 (2x200GB)</td>
<td>BF3</td>
<td>4x CX7 (2x200GB) + BF3</td>
</tr>
<tr>
<td>GPU</td>
<td>1x NVIDIA RTX 5000 Ada Mobile</td>
<td>Min 1x NVIDIA RTX 6000 Ada</td>
<td>–</td>
<td>4x NVIDIA L40S</td>
<td>8x NVIDIA L40S</td>
</tr>
</tbody>
</table>
NVIDIA Omniverse Cloud

Fastest path to end-to-end industrial digitalization, digital twin and metaverse applications

- Access Omniverse services via Omniverse Launcher in a web browser, or a custom integration
- Omniverse services deployed on NVIDIA OVX instances
- Power users work in 3rd party tools on RTX Workstations, publishing to Nucleus
- Customer sets up and manages Nucleus
- Available on Microsoft Azure
Bringing NVIDIA Omniverse to the Cloud
Purpose-built platform-as-a-service for industrial metaverse workflows

Instant, Secure Access
Single Source Solution
Interoperable & Extensible by Design
Expand with Ease
NVIDIA Omniverse Cloud
Enterprise Private Offer – Now Available

✓ NVIDIA Omniverse Foundation Apps & APIs
✓ NVIDIA Omniverse Platform-as-a-Service
✓ NVIDIA Omniverse Nucleus – customer chooses where to deploy, owns management
✓ NVIDIA OVX Instance (on Azure)
✓ 180 TB of Data Egress per OVX node purchased
✓ Production Onboarding with a technical Omniverse deployment expert
✓ Dedicated Support 24x7 Business Critical Support, Technical Account Mgr.
Omniverse Cloud on Azure Marketplace

Customer Journey

1. Appears on Azure Marketplace
2. Request Private Offer
3. Negotiate with NVIDIA
4. NVIDIA Creates & Sends Private Offer
5. Accepts Private Offer
6. Deploy from Marketplace