MCP SERVER | NO CODE | CLOUD HOSTED

# 3D AI Studio MCP for AI Agents

## Create production-ready assets from text prompts and photos, mastering complex geometry.

3D AI Studio MCP gives your AI client full control over professional 3D asset creation and processing. Generate complex models from simple text prompts, convert sketches to finished assets, or apply realistic textures—all without needing specialized software knowledge.

F Quality Score 3.6/100

3d-generation | text-to-3d | image-to-3d | mesh-processing | rendering | ai-texturing

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vinkius.com/mcp/3d-ai-studio

SCAN TO VIEW

# The infrastructure that powers AI agents in the real world.

Vinkius connects AI to the world's software through secure, enterprise-grade infrastructure — enabling real-world execution at scale, built on the Model Context Protocol (MCP).

# Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the cloud infrastructure where AI agents connect to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

## Four Pillars of the Vinkius Runtime

**01 — Security by design**

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

**02 — Built on MCP Fusion**

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

**03 — Deterministic observability**

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

**04 — Autonomous operations**

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

| AES-256 | Ed25519 | 24h TTL | V8 Isolate |
|---|---|---|---|
| Encryption at rest | PKI vault signatures | Ephemeral session keys | Sandboxed execution |

## One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

## Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

**01 — Ed25519 PKI Vault**

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

**02 — V8 Isolate Sandboxing**

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

**03 — SSRF Guard**

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

**04 — DLP & PII Redaction**

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

**05 — Cryptographic Audit Trail**

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

**06 — Honeytoken Trap System**

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

# Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

**01 — Server deactivated**

The MCP server is immediately taken offline across the entire cluster.

**02 — All tokens revoked**

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

**03 — WebSocket connections killed**

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

## Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

**Control Plane**

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

**Agent Activity**

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

**FinOps**

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

**Tool Health**

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

**Firewall & DLP**

PII redaction activity, sensitive data protection counters, and security event timeline.

**Incident Log**

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

# 3D AI Studio MCP

12 tools available
Cloud-hosted on Vinkius

The 3D AI Studio MCP lets you treat your AI agent like a dedicated digital modeling studio. You stop manually jumping between Blender, Substance Painter, and multiple export utilities. Instead, you talk to your agent, and it handles the entire asset pipeline: generating initial geometry, applying detailed PBR textures, optimizing file size for web use, or fixing meshes that break in game engines.

For instance, if you have a product photo, instead of hiring an expensive artist, your agent can run `generate_image_to_3d` to give you a full 3D model. You can then refine it by using tools like `segment_3d_mesh` to isolate components or running `calculate_volume_3d` for accurate shipping weight estimates. When you connect the 3D AI Studio MCP via Vinkius, your agent gains access to this entire suite of professional-grade functions through natural conversation, making complex workflows feel as simple as asking a question.

## Core Capabilities

**01 — Generate Models from Text or Images**

Creates brand new 3D geometry using only descriptive text prompts or by converting existing concept photos into models.

**02 — Process and Optimize Meshes**

Cleans up raw 3D files, repairing holes and non-manifold geometry, and optimizing the polygon count for specific platforms like web viewers or mobile games.

**03 — Apply Realistic Textures**

Automatically adds high-detail materials—like 'rusty metal' or 'polished wood'—to existing models using advanced PBR texturing techniques.

**04 — Reconstruct from Multiple Views**

Builds accurate 3D geometry by analyzing and combining details provided in two or more reference images taken from different angles.

**05 — Prepare for Manufacturing and Printing**

Calculates physical properties like volume, surface area, and weight, while also converting files into print-ready formats like STL.

**06 — Render Professional Visualizations**

Produces high-resolution images or even short turntable videos from any 3D model for marketing and portfolio use.

## One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/3d-ai-studio** — connect your AI agent in three steps.

01 Connect your AI client to the Vinkius catalog and authorize access to the 3D AI Studio MCP.

02 Tell your agent what you need, whether it's generating a model from a description or fixing an existing file. The agent routes the request through the appropriate tool.

03 The MCP processes the data, running complex geometry calculations and material simulations, then returns the finished files—whether that's a textured GLB or optimized STL.

The bottom line is: you use natural language to control a full professional 3D asset pipeline without ever touching specialized modeling software.

## Built For

This MCP targets creative professionals and technical pipelines. It's for the e-commerce manager who needs product renders fast, the game developer needing optimized assets, or the industrial designer preparing a prototype file.

**Product Designer**

Needs to rapidly iterate on concepts, generating initial 3D models using text prompts and then refining them with `generate_ai_texturing` for material testing.

**Game Developer**

Must prepare assets for engines by running `remesh_3d_model` to get clean quad topology, followed by optimization using `optimize_3d_model`.

**E-commerce Specialist**

Requires high-quality product shots and visualizations. They use the MCP to generate models from photos via `generate_image_to_3d` and then render them for marketing copy.

**Industrial Engineer**

Needs accurate physical data for manufacturing planning, using tools like `calculate_volume_3d` and ensuring files are compatible by calling `convert_3d_format` to STL.

## What Changes When You Connect

01 Generate initial assets instantly: Need a fantasy sword or castle? Use `generate_text_to_3d` to get a complete, textured model in seconds, skipping the brainstorming phase.

02 Save on physical prototyping costs: Before printing, run `calculate_volume_3d`. You get precise weight and volume measurements so you never order too much material again. The results are detailed and ready for BOM sheets.

03 Future-proof your assets: Game engines need clean geometry. Instead of manually fixing meshes, use `repair_3d_mesh` to automatically fix holes and inverted normals before exporting the file.

04 Master complex pipelines: You can go from a concept photo straight into a visualization. Use `generate_image_to_3d`, then refine it with `segment_3d_mesh` to prepare components for animation, all through one conversation.

05 Maximize performance: Don't upload massive files. Run `optimize_3d_model` and `remesh_3d_model` to reduce the polygon count drastically while keeping the visual quality high enough for web viewing.

## Real-World Applications

**Concepting a New Product Line**

A product designer wants to test three new gadget ideas. Instead of drawing them, they ask their agent to 'generate 3D model of a sleek handheld vacuum' using `generate_text_to_3d`. They then run `render_3d_model` on all three concepts to create marketing visuals instantly.

**E-commerce Photography Upgrade**

An e-commerce team has thousands of product photos. They use the MCP's capability to 'generate 3D model from multiple reference images' via `generate_multiview_to_3d` for each item, allowing them to create accurate, multi-angle visualizations without a photo shoot.

**Preparing Assets for Print**

An industrial engineer has a CAD file that keeps failing in the slicer. They send it to the agent and ask it to 'repair non-manifold geometry' using `repair_3d_mesh`. The resulting watertight, printable STL is ready for immediate slicing.

**Creating Game Assets**

A game developer has high-resolution concept sculpts. They send the model to run through `bake_textures_3d` and then `optimize_3d_model`. This process generates a low-poly, texture-mapped asset ready for direct inclusion in the game engine.

# Patterns to Avoid

### Treating 3D files like simple images

✗ AVOID

Trying to use image generation tools on a complex product photo and assuming it will yield a usable, textured model. The result is usually flat, uneditable raster data.

✓ INSTEAD

Always start with specialized geometry workflows. If you have an image reference, use the `generate_image_to_3d` tool to create initial 3D volume. Then, refine it by running `generate_ai_texturing` before rendering.

### Ignoring file compatibility issues

✗ AVOID

Exporting a model directly from one program and having the receiving engine (like Unity) fail because of bad topology or missing normals. The whole pipeline breaks.

✓ INSTEAD

Always run `remesh_3d_model` to ensure clean quads, then use `convert_3d_format` to guarantee the target platform gets a standard file type like FBX.

### Overcomplicating text prompts

✗ AVOID

Writing a massive paragraph describing every nuance of a fictional object. The agent struggles to parse the core geometry, and the model is inaccurate.

✓ INSTEAD

Keep it direct. Start with `generate_text_to_3d` using simple descriptors like 'chrome-plated futuristic air rifle' or 'moss-covered medieval chest'. Focus on the main subject.

# The Right Fit

Use this MCP if your workflow involves turning descriptive ideas, photos, or existing models into standardized, manufacturable 3D assets. Specifically, if you need to transition from concept art (using `generate_image_to_3d`) to a game-ready asset (requiring

`remesh_3d_model` and `optimize_3d_model`), this is your tool. Don't use it if you only need simple 2D textures or basic image manipulation; those are better handled by dedicated graphics editors. If your primary goal is just model conversion without any geometry fixing, a simpler format converter might suffice, but for full-cycle production quality, stick with the robust tools here.

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## 3D AI Studio MCP: Solving Product Visualization Pipeline Issues

Right now, making a detailed product visualization is a huge headache. You take a photo of your new widget, send it to an artist, wait days for the 3D file, and then you spend hours in Blender manually cleaning up geometry or applying materials that look flat. It's copy-pasting files between five different programs just to make one render.

With this MCP, your agent handles the entire chain. You give it a photo, and it uses `generate_image_to_3d` to build the volume. Then, you ask it to 'add polished brass texture' using `generate_ai_texturing`. In minutes, you get a fully textured, high-res model ready for rendering—no manual cleanup needed.

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## How 3D AI Studio MCP Improves Asset Preparation and File Standardization

The biggest time sink is always asset standardization. You might have a beautiful, high-poly model that's perfect for rendering but unusable in an actual game engine because the polygons are messy or the file format is wrong. You waste hours optimizing topology.

Now, you simply tell your agent to prepare it for a specific use case. It runs `optimize_3d_model` and `remesh_3d_model`, guaranteeing clean quads and low poly counts suitable for Unity or Unreal Engine right out of the box.

# 3D AI Studio: 12 Tools for Advanced Mesh Processing and Geometry Creation

These tools cover the entire lifecycle of a 3D asset, letting your agent generate geometry, repair meshes, apply textures, optimize performance, or calculate physical dimensions.

| # | TOOL | DESCRIPTION |
|---|---|---|
| 01 | generate_ai_texturing | Applies new, realistic materials and surface details to existing 3D models using text or image prompts. |
| 02 | convert_3d_format | Changes the file format of a 3D model while maintaining its geometry, textures, and material data. |
| 03 | generate_image_to_3d | Builds an initial 3D model from a standard photograph or concept art sketch. |
| 04 | repair_3d_mesh | Fixes damaged or incomplete 3D model geometry, making meshes watertight and ready for printing or simulation. |
| 05 | segment_3d_mesh | Automatically separates a single 3D mesh into distinct, labeled parts (like body, head, wheels) for rigging preparation. |
| 06 | generate_multiview_to_3d | Creates an accurate 3D model by synthesizing information from two or more reference images taken at different angles. |
| 07 | optimize_3d_model | Reduces the overall polygon count and file size of a 3D model for better performance on web browsers and mobile devices. |
| 08 | remesh_3d_model | Restructures the underlying geometry of a model, controlling the face type (tri or quad) and resulting polygon count. |
| 09 | render_3d_model | Generates high-quality marketing images or full turntable videos from a completed 3D asset. |
| 10 | generate_text_to_3d | Creates a complete, initial 3D model directly from a written text description. |
| 11 | bake_textures_3d | Transfers high-detail visual information (like normal maps) from a detailed source mesh onto a simplified game-ready low-poly mesh. |
| 12 | calculate_volume_3d | Determines the physical volume, surface area, and weight estimate of a 3D model for material planning or shipping costs. |

# See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

**U** I need a 3D model of an antique diving helmet. Can you generate it from scratch?

**Generation Status:** Success! Model created using text input. **Details:** The asset is in GLB format, featuring aged bronze and brass textures with PBR maps applied. It has been optimized for web viewing (120K polygons). You can download the file here: [link]. Would you like me to segment the helmet into its core components, or perhaps calculate the total volume?

**U** I have a photo of my shoe. Can you turn it into a model I can print and tell me how much material I need?

**Image Processing:** Model generated successfully! **Material Check:** The mesh was fixed for printing, resulting in 0 holes and no inverted normals. **Calculations:** *Volume: 458 cm³.* Surface Area: 128 cm². * Estimated Weight (PLA): 56.8 grams. **Format:** Converted to STL for slicer compatibility. Download link provided.

**U** I need to create a 3D model of a dragon for my game, but I only have front and side views.

**Multi-View Reconstruction:** Processing two reference images... **Result:** A highly accurate 3D mesh has been generated. The geometry is ready for rigging. **Optimization Suggestion:** Since this is for a game engine, I recommend running `remesh_3d_model` to ensure clean quad topology before final export. Model size: 850K polygons (optimized). Download link available.

# Frequently Asked Questions

01 **How can I use the 3D AI Studio MCP to make a model from just a picture?**

You can use the `generate_image_to_3d` tool. Your agent takes your product photo and converts it into an initial, usable 3D mesh. This is perfect for visualizing e-commerce goods or prototypes when you don't have sketches or CAD files.

02 **Does the 3D AI Studio MCP help with game-ready assets?**

Absolutely. For game engines, you need clean geometry. The MCP offers tools like `remesh_3d_model` and `optimize_3d_model` that automatically fix topology issues and reduce polygon counts so your asset runs smoothly in the game.

03 **What if my 3D model has holes or is bad for printing?**

The MCP includes a dedicated tool, `repair_3d_mesh`. This fixes non-manifold edges and fills gaps automatically. After running this repair, you can then use `calculate_volume_3d` to get precise material estimates.

04 **Can I improve the texture of an existing 3D model?**

Yes, using `generate_ai_texturing`, your agent applies brand new materials—like weathered stone or polished chrome—to any model. You just describe the look you want, and it handles the PBR map generation.

05 **How do I create a 3D object if I only have multiple reference photos?**

Use `generate_multiview_to_3d`. This tool processes two or more images taken from different angles to construct an accurate, holistic 3D representation. It's much better than just generating from one angle.

06 **Is the 3D AI Studio MCP useful for industrial design prototyping?**

It's incredibly useful. You can generate models and then use `calculate_volume_3d` to get exact material quantities needed, making your initial prototypes much more accurate for manufacturing quotes.

# Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

| CLIENT | WHERE TO CONFIGURE |
|---|---|
| Claude AI | Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint |
| Cursor | Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint |
| VS Code | Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"3d-ai-studio": { "url": "…" }` |
| Windsurf | MCP Settings → `mcp_settings.json` → Add endpoint URL |
| ChatGPT | Settings → Tools & plugins → Add MCP server → Paste endpoint |
| Gemini | Extensions → Add MCP Server → Paste endpoint URL |

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

# 3D AI Studio is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

**Start at cloud.vinkius.com →**

vinkius.com · support@vinkius.com

## INDEPENDENT PLATFORM DISCLAIMER

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