

MCP SERVER

NO CODE

CLOUD HOSTED

Dice Probability Calculator MCP for AI Agents

Calculate the statistical odds of tabletop game outcomes and challenge levels

The Dice Probability Calculator MCP models the math behind tabletop gaming dice rolls. It instantly calculates full statistical profiles, including mean, median, and standard deviation, for any notation like '2d6' or '1d20+5'. You can determine exactly what your chance is of hitting a specific Difficulty Class or quantify how much advantage truly boosts success rates.

A+ Quality Score 100/100

dice

probability

ttrpg

statistics

math-engine



The connectivity layer between AI and the world's software.



Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest
managed MCP catalog

Vinkius is the connectivity layer where AI connects 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.

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.

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.

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

Encryption at rest

Ed25519

PKI vault signatures

24h TTL

Ephemeral session keys

V8 Isolate

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.

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.

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.

06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot 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.

FinOps

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

Firewall & DLP

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

Agent Activity

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

Tool Health

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

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.

Dice Probability Calculator MCP

3 tools available

Cloud-hosted on Vinkius

Need to know if those new combat rules actually make sense? This connector handles the math behind dice rolls, moving you past messy spreadsheets and endless calculations. Instead of guessing whether an opponent's save DC is too high, your AI client tells you the exact percentage chance of success or failure for any given roll mechanic.

It lets you feed in complex notations—stuff like rolling multiple dice while accounting for advantage/disadvantage or dropping the lowest die—and immediately gets back a full statistical profile. You can run comparisons to see precisely how much better one system is than another, or calculate your odds of reaching a specific target number.

Accessing this engine through Vinkius means you connect once from any compatible client (like Claude or Cursor) and get instant access to professional-grade statistics for all your TTRPG planning.

Core Capabilities

01 — Compute full statistical profiles

Get the mean, median, standard deviation, and complete frequency distribution for any dice notation, handling modifiers and drop rules.

02 — Determine success odds against a target DC

Calculate the exact probability of rolling a result that meets or exceeds a specified Difficulty Class (DC).

03 — Compare different roll mechanics

Quantify how changing a core rule, such as gaining advantage versus just adding a bonus, changes your overall success rate.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/mcp/dice-probability-calculator — connect your AI agent in three steps.

- 01** Start by giving the MCP a specific dice notation and any modifiers. For example: '2d6' or '1d20+5'.
- 02** The calculator processes the input, factoring in advanced rules like advantage/disadvantage or dropping lowest dice.
- 03** You get back concrete statistical results: clear percentages for hitting targets, or a full distribution chart showing every possible outcome.

The bottom line is, you tell it the math problem, and it gives you the definitive odds, no guesswork required.

Built For

This MCP is for Game Masters (GMs), TTRPG writers, and game designers. If your job involves balancing rules or creating believable challenge levels, this tool saves hours spent in statistical software, giving you hard numbers instead of gut feelings.

Game Designer

Needs to balance new equipment or abilities by comparing their success odds against existing game mechanics.

Tabletop RPG Writer

Designs encounter difficulty, calculating the probability that a player group can overcome a specific challenge level.

Game Master (GM)

Prepares for sessions by quickly determining if a proposed DC is too high or too low given the established roll rules.

What Changes When You Connect

- 01** Stop guessing about difficulty. Use `calculate_threshold_probability` to instantly know the percentage chance your players have of meeting a specific Difficulty Class.

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- 02 Better balance means better games. Compare core rules using `compare_roll_mechanics` to prove whether an upgrade is actually worth the mechanical change.

 - 03 Get deep statistical data on any roll. Running `compute_dice_distribution` provides the full mean, median, and standard deviation for every dice setup.

 - 04 Saves time writing balance notes. Instead of spending hours in external math tools, your agent pulls up the complete distribution right when you need it.

 - 05 Quantify advantage properly. The MCP tells you exactly how much better rolling with advantage is compared to a straight roll against a target value.
-

Real-World Applications

Designing a new challenge level

A Game Designer needs the average difficulty of an enemy group. They ask their agent to use the Dice Probability Calculator, which runs `compute_dice_distribution` on the monster stats and provides the mean roll, ensuring the encounter feels appropriately challenging.

Setting a difficult obstacle DC

A Game Master sets an escape route with a Difficulty Class of 18. Instead of eyeballing it, they use `calculate_threshold_probability` to confirm that only about 35% of their players have a chance of passing.

Balancing a class ability

A TTRPG Writer wants to see if their new 'critical hit' feature is strong enough. They use `compare_roll_mechanics` to compare the old critical rules against the new ones, getting hard numbers on the improvement percentage.

Assessing skill improvement rates

A designer wants to know if leveling up improves character chances significantly. They run the calculator on '1d20' vs '1d20+5', using `compare_roll_mechanics` to show a measurable increase in success probability.

Patterns to Avoid

Treating it like a simple coin flip

X AVOID

Assuming that because 1d20 is often used, the average roll must be exactly 10. This ignores modifiers and distribution curves.

✓ INSTEAD

Don't just look at the average. Use ``compute_dice_distribution`` to see the full spread of outcomes, which gives you a much better picture than a simple mean.

Ignoring advantage/disadvantage

X AVOID

A GM thinks that rolling with advantage just means adding two dice. They ignore the statistical benefit of re-rolling and taking the best result.

✓ INSTEAD

Use ``compare_roll_mechanics`` to correctly quantify the true increase in success chance when you use advanced mechanics like advantage.

Using it for non-dice math

X AVOID

Trying to calculate compound interest or tax rates. The calculator is built specifically around dice rolls and TTRPG rulesets.

✓ INSTEAD

This MCP only works with dice notations (like '2d6'). For other financial calculations, you'll need a different specialized tool.

The Right Fit

Use this if you are designing or playtesting a game and the core problem is calculating complex probabilities from dice rolls. If your job involves balancing systems based on chance—like determining encounter difficulty or quantifying class abilities—this MCP is essential. You'll use `calculate_threshold_probability` when you need a specific percentage against a DC, and `compare_roll_mechanics` whenever you want to prove that Rule A is statistically better than Rule B. Don't use it if you just need simple arithmetic (like multiplying two numbers); for that, you need a basic math engine. This tool focuses entirely on the mathematical outcomes of dice rolls.

Dice Probability Calculator: Balancing TTRPG Rules with Dice Rolls

Right now, balancing a new ability means opening up spreadsheets and manually running probability calculations. You copy-paste modifiers, input different die combinations, and spend time trying to figure out if that DC is fair or too forgiving. It's slow, and it's easy to make a math error.

With this MCP, you just feed the dice notation into your agent. Need to see how an opponent's save works? The tool instantly provides the full statistical profile. You get clear data showing exactly what players can expect when they try to hit that target.

Using Dice Probability Calculator for TTRPG Encounter Difficulty

Manually setting encounter difficulty means guessing if the challenge feels right. You might eyeball a DC and hope it lands in the sweet spot, but you never know if the odds are stacked too heavily on one side.

Now, you can ask your agent to calculate the exact probability of success against any target number. This moves game design from 'feels balanced' to 'statistically proven.' It gives you confidence that your world makes sense.

Dice Probability Calculator: 3 Tools for TTRPG Statistical Analysis

These tools let your agent compute full statistical profiles, compare rolling rules, and determine success chances against any target DC.

#	TOOL	DESCRIPTION
01	<code>compare_roll_mechanics</code>	Compares two different rolling systems to show exactly how much one mechanic improves your chances of success over another.
02	<code>compute_dice_distribution</code>	Calculates the full statistical profile for any dice notation, supporting modifiers and advanced mechanics like advantage/disadvantage.
03	<code>calculate_threshold_probability</code>	Determines your precise probability of rolling a result that meets or exceeds a specific difficulty target value.

See It in Action

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

U What is my chance of rolling 15 or higher on a 1d20+5?



Probability Calculation: DC Check

- **Target Value:** 15 or greater.
- **Dice Roll:** 1d20 + 5

METRIC	VALUE
Success Probability	35%
Minimum Roll Required	10
Maximum Roll Possible	30

The probability of achieving a result of 15 or higher with 1d20+5 is exactly 35%.

U How much does advantage improve hitting DC 15 on a d20 roll?



Advantage vs. Standard Roll Comparison

- **Target Difficulty Class:** 15.
- **Standard Roll (1d20):** Success chance is 30%.
- **Advantage (2d20, best result):** Success chance jumps to **51.25%**.

The improvement from standard rolling to advantage is an increase of 21.25%. This confirms the mechanical value of having that bonus.

U What's the average result and standard deviation for rolling two d6 dice?



Dice Distribution Profile (2d6)

- **Mean (Average):** 7.0
- **Median:** 7
- **Standard Deviation:** ~1.71
- **Distribution Notes:** This tells you that while the average roll is 7, results cluster most heavily around 6 and 7.

Frequently Asked Questions

01 How does the Dice Probability Calculator handle complex rules like advantage or disadvantage?

It accurately models advanced mechanics for you. Instead of just adding a bonus, it calculates the true statistical shift when you roll twice and take the best result (advantage), providing real numbers that confirm mechanical balance.

02 Can I use this MCP to check if my Difficulty Class is too high or too low?

Yes. You specify a target number, and the tool calculates your precise chance of hitting it. This lets you adjust your DC until the probability matches the difficulty level you want for the encounter.

03 What kind of dice notations can I input into the Dice Probability Calculator?

You can use standard notation like '2d6' or more complex formulas such as '1d20+5'. The MCP supports modifiers, drop counts (like dropping the lowest die), and full distribution analysis.

04 Does this tool help me compare different game systems?

Absolutely. You can use the comparison function to quantify how much better one rule set is than another. It gives you hard evidence on which mechanic provides a greater statistical advantage for your players.

05 I need to calculate the average roll, but what does 'standard deviation' mean?







Standard deviation measures how spread out your results are from the average. A low standard deviation means most rolls cluster tightly around the mean; a high one means outcomes are highly unpredictable.

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 <code>"dice-probability-calculator": { "url": "..." }</code>
 Windsurf	MCP Settings → <code>mcp_settings.json</code> → 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

Dice Probability Calculator 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](https://cloud.vinkius.com) →

vinkius.com · support@vinkius.com

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