

um
2026

VOLTA MCP: Bringing AI into the Digital Thread

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Agenda

The challenge & the opportunity
What we hear from you

VOLTA MCP
VOLTA MCP server architecture

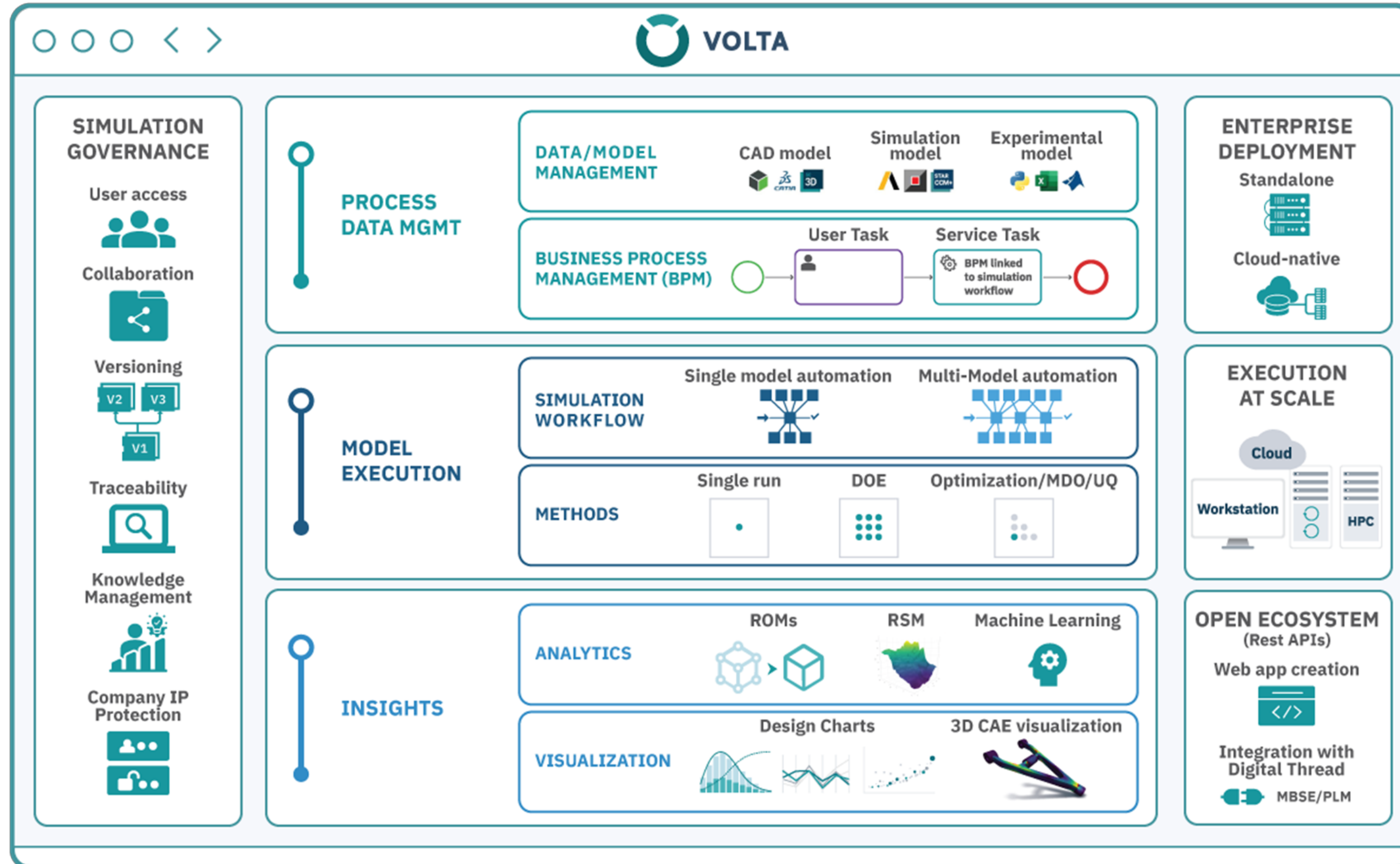
In Action
Use Cases

Design drivers
Benefits, security and governance

Next Steps
The road ahead



VOLTA – Digital Engineering Platform



The challenges we hear from you



Disconnected Data

- Simulation data disconnected from the digital thread
- Similar data without enough context



Non-standardized execution

- Different simulation tools with different execution setup and approach



User Friction

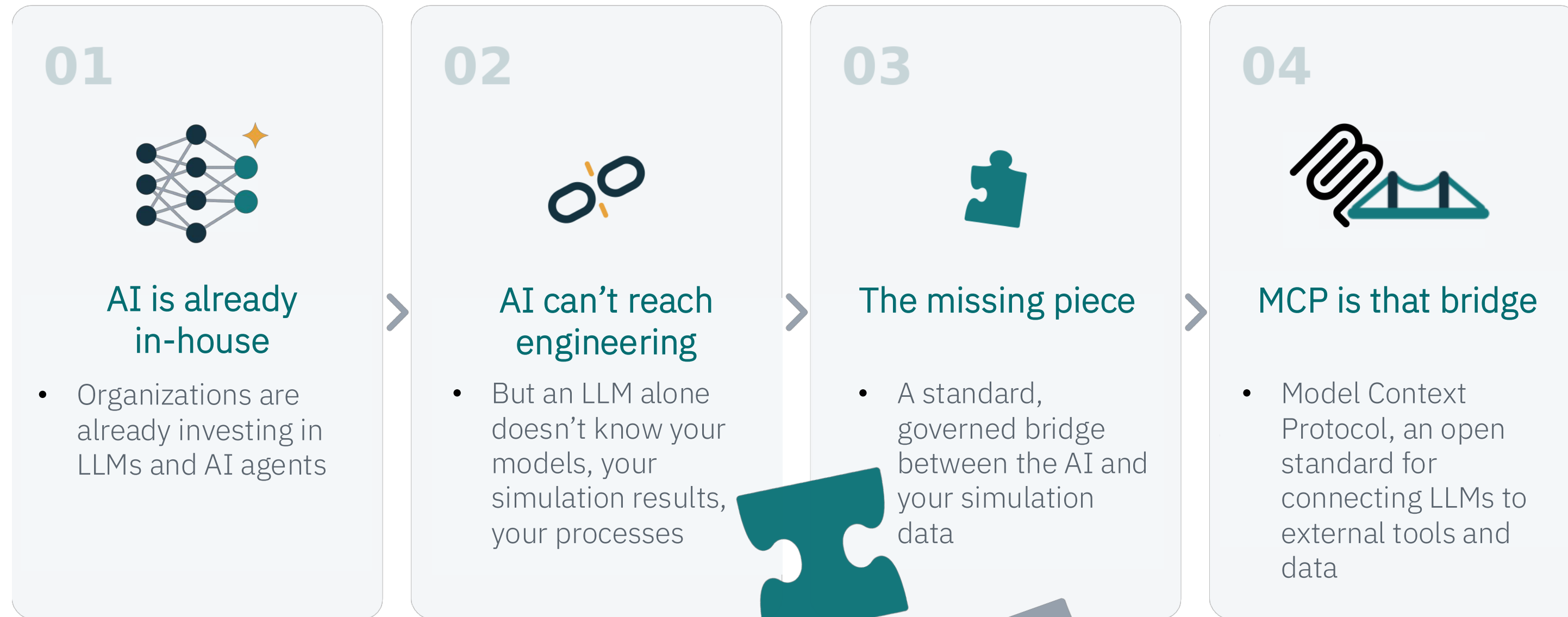
- Slow onboarding
- Complex simulations set up



Rigid process and automation

- Multi-step engineering automation breaks easily

Where AI meets engineering



The anatomy of agentic AI

Three key ingredients:

1) Human prompting

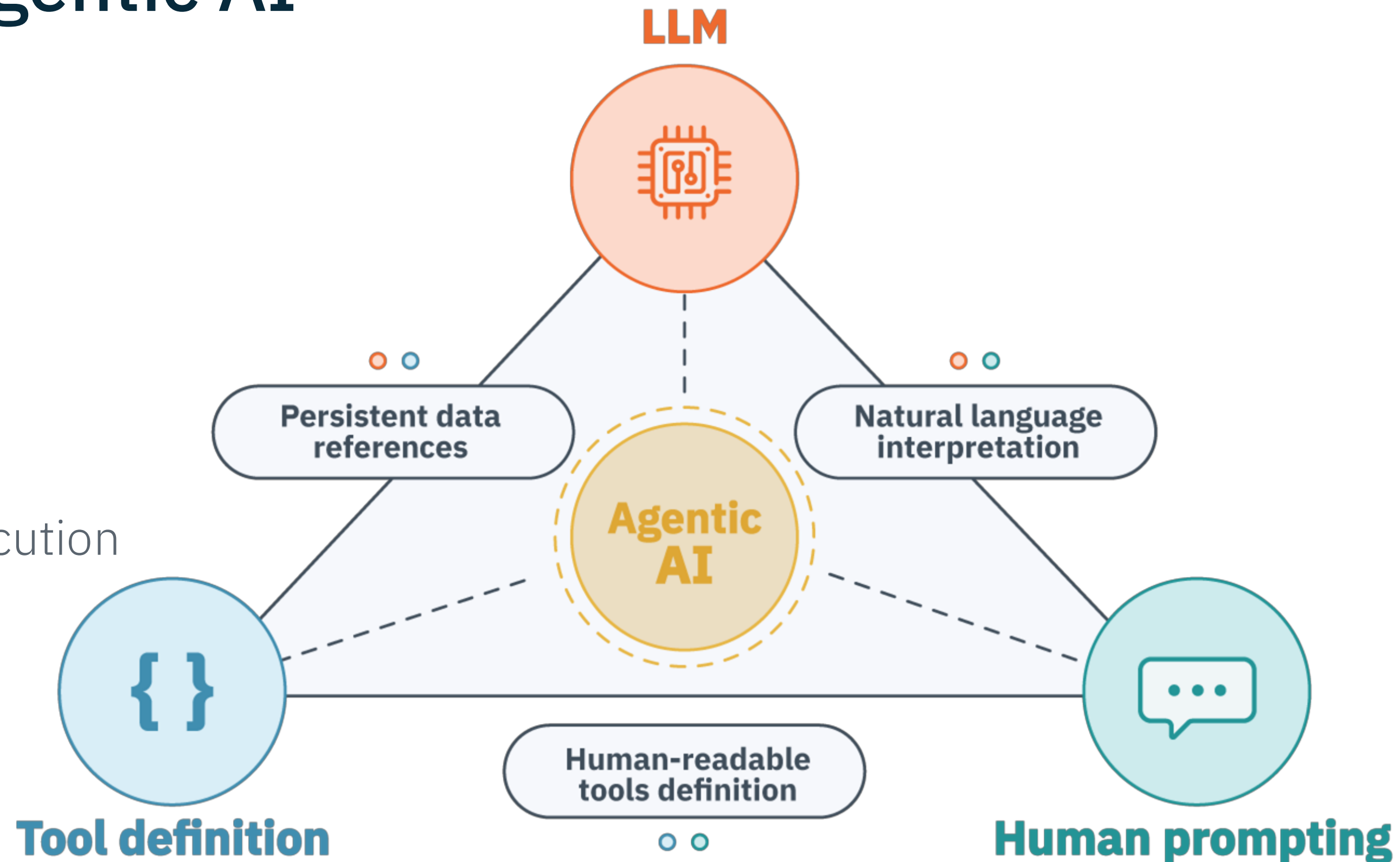
- Your intent

2) LLM

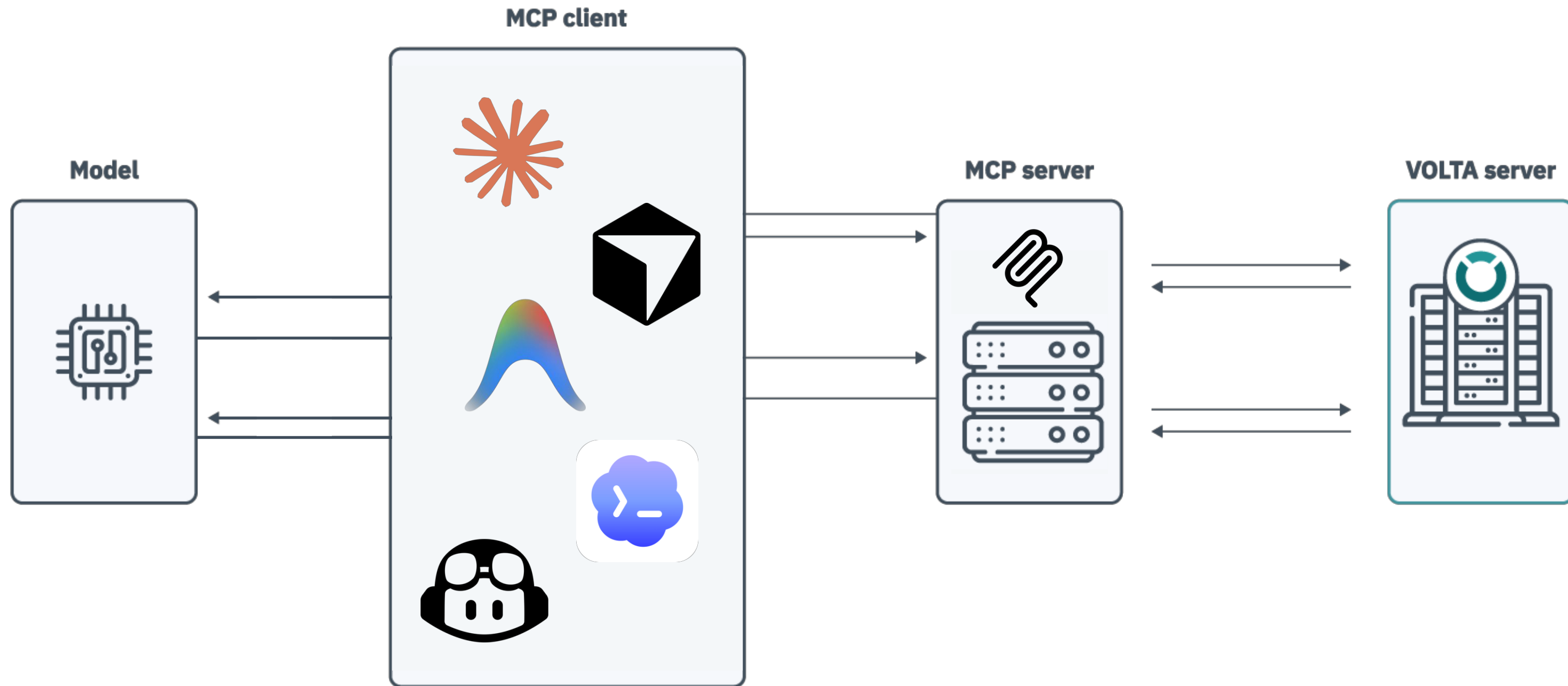
- The non-deterministic reasoning

3) Tool Definition

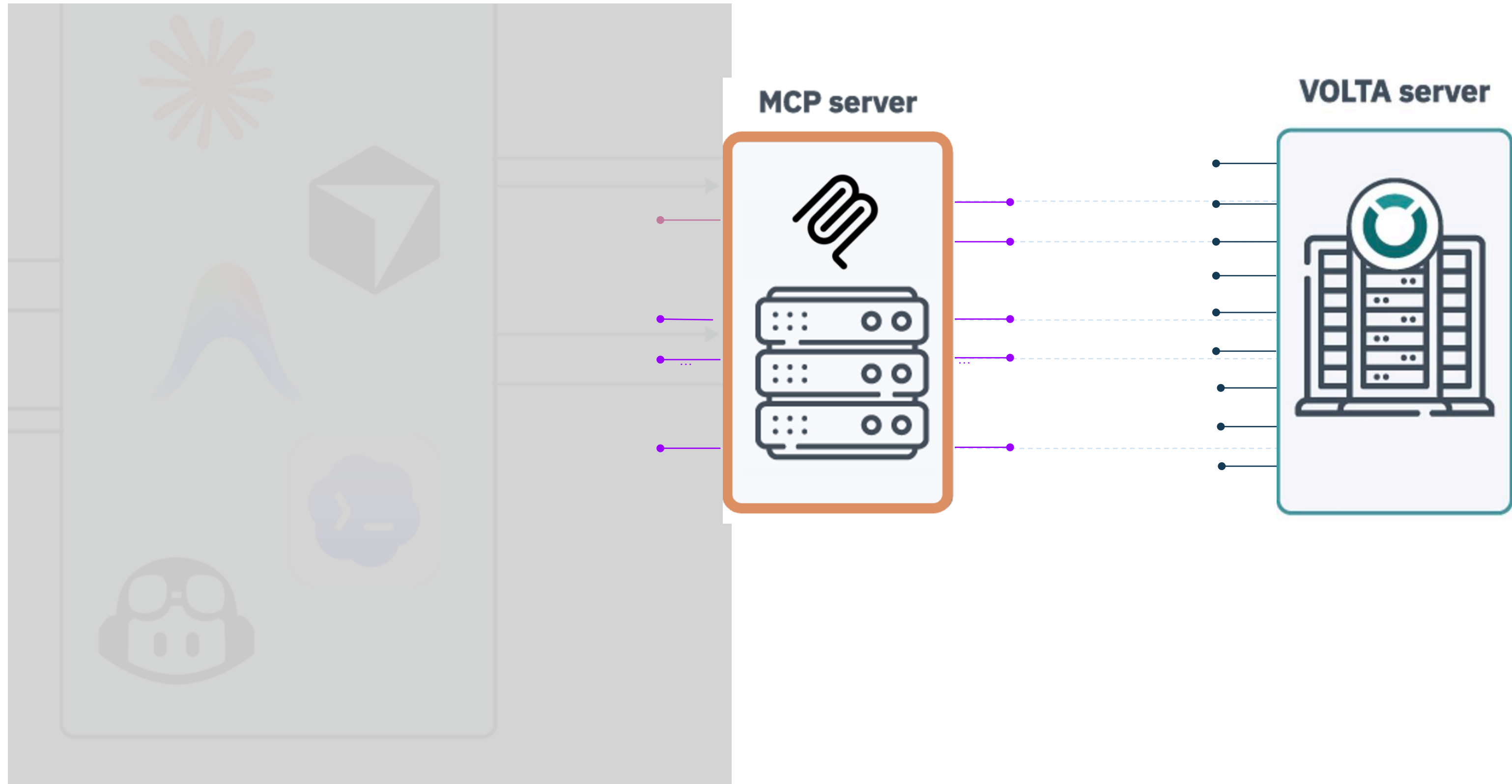
- The deterministic execution



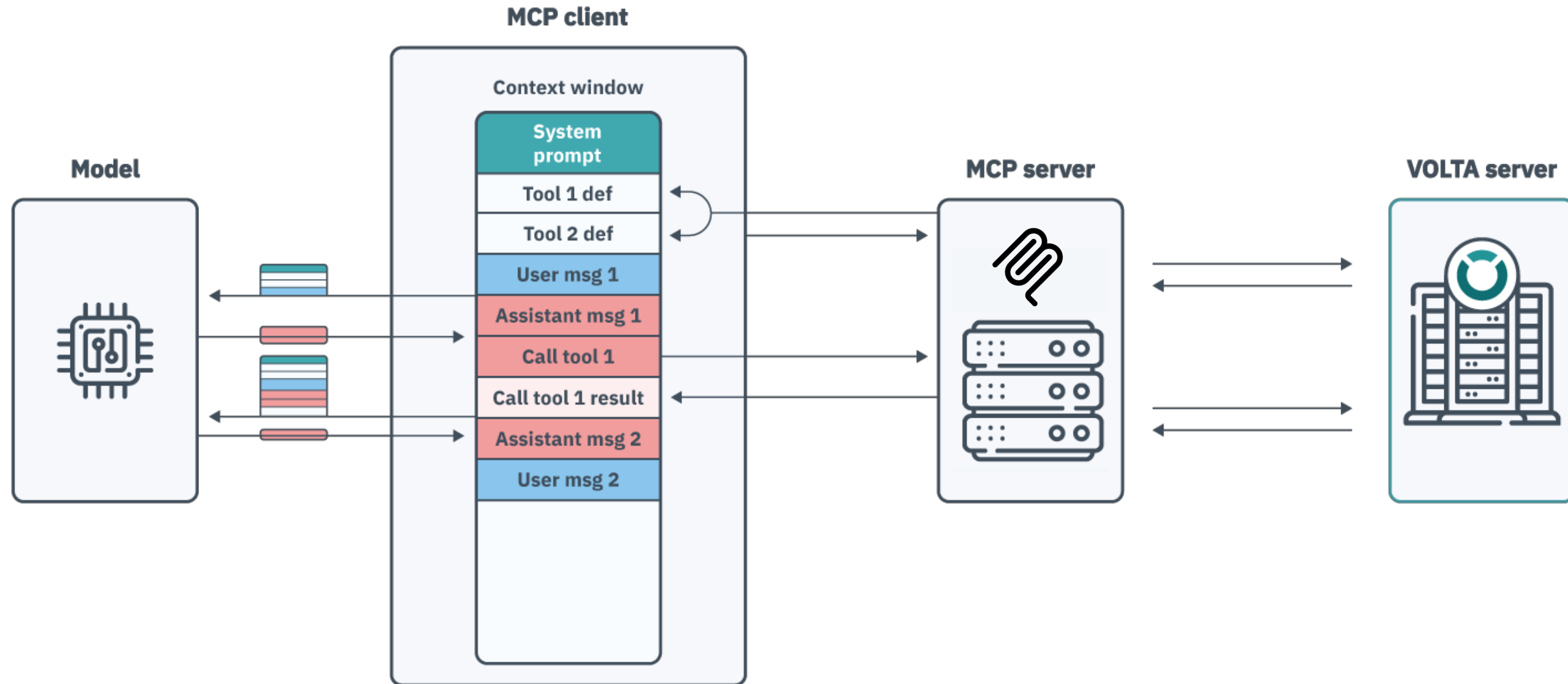
VOLTA MCP Server: the architecture



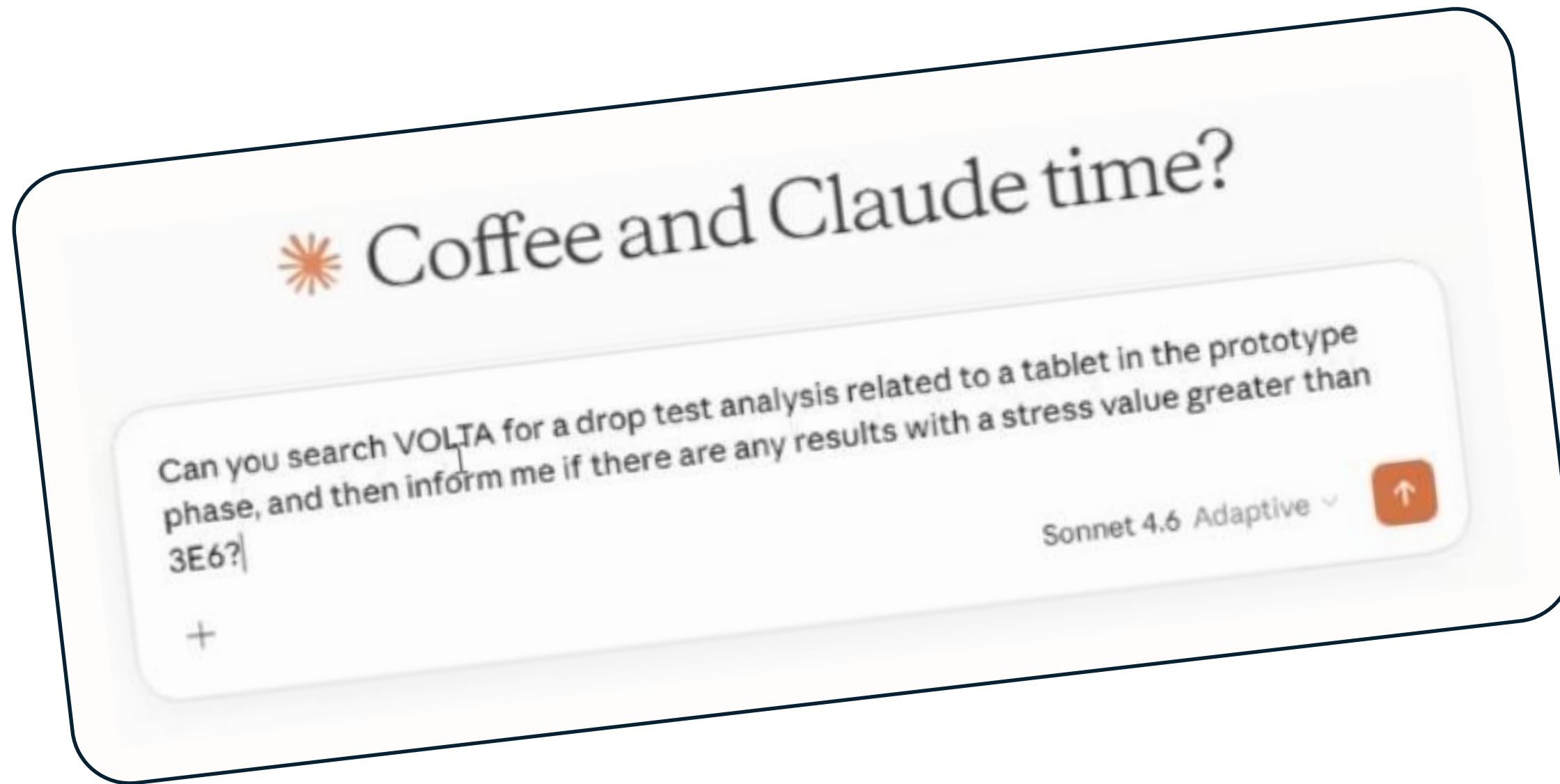
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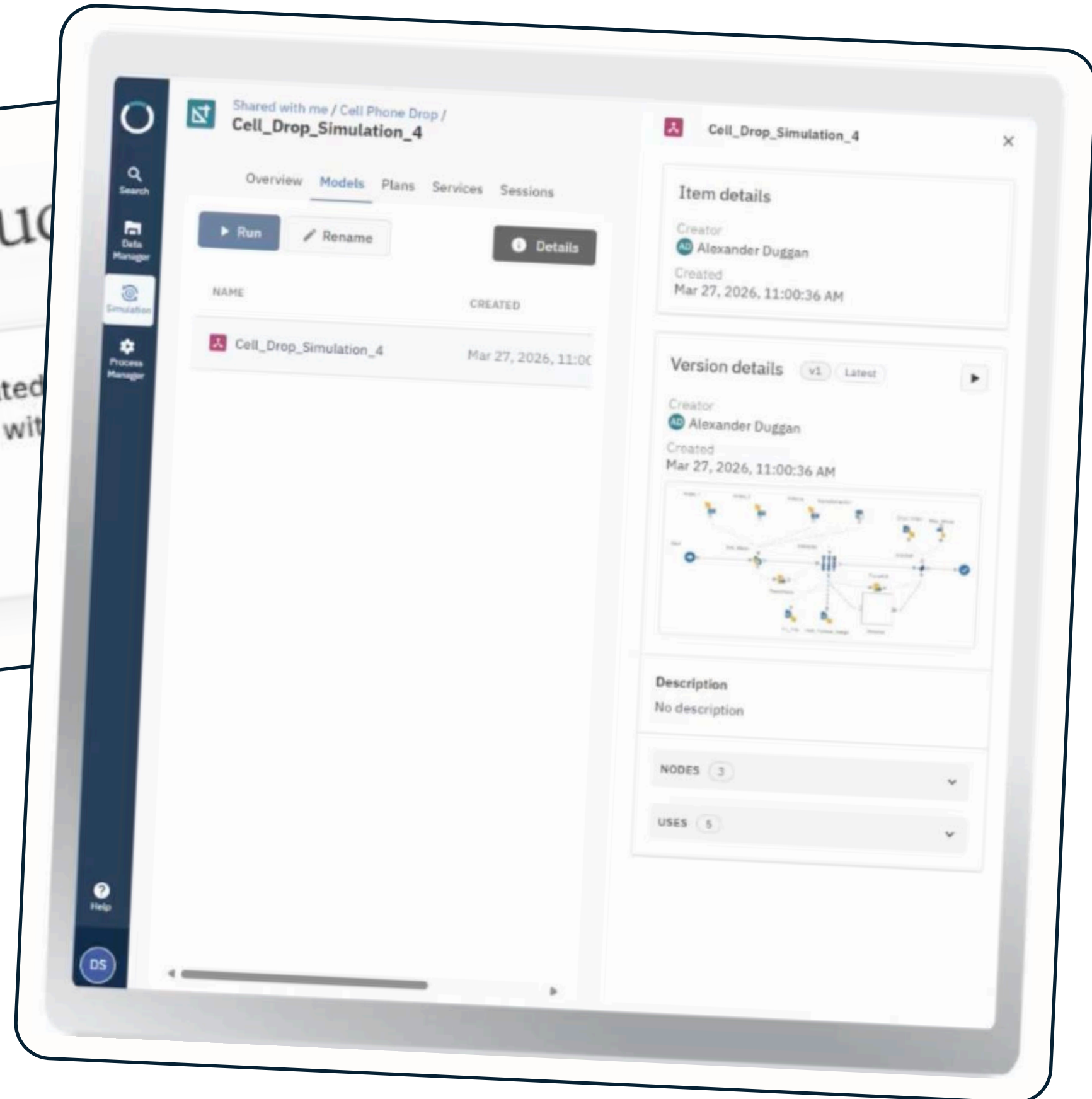
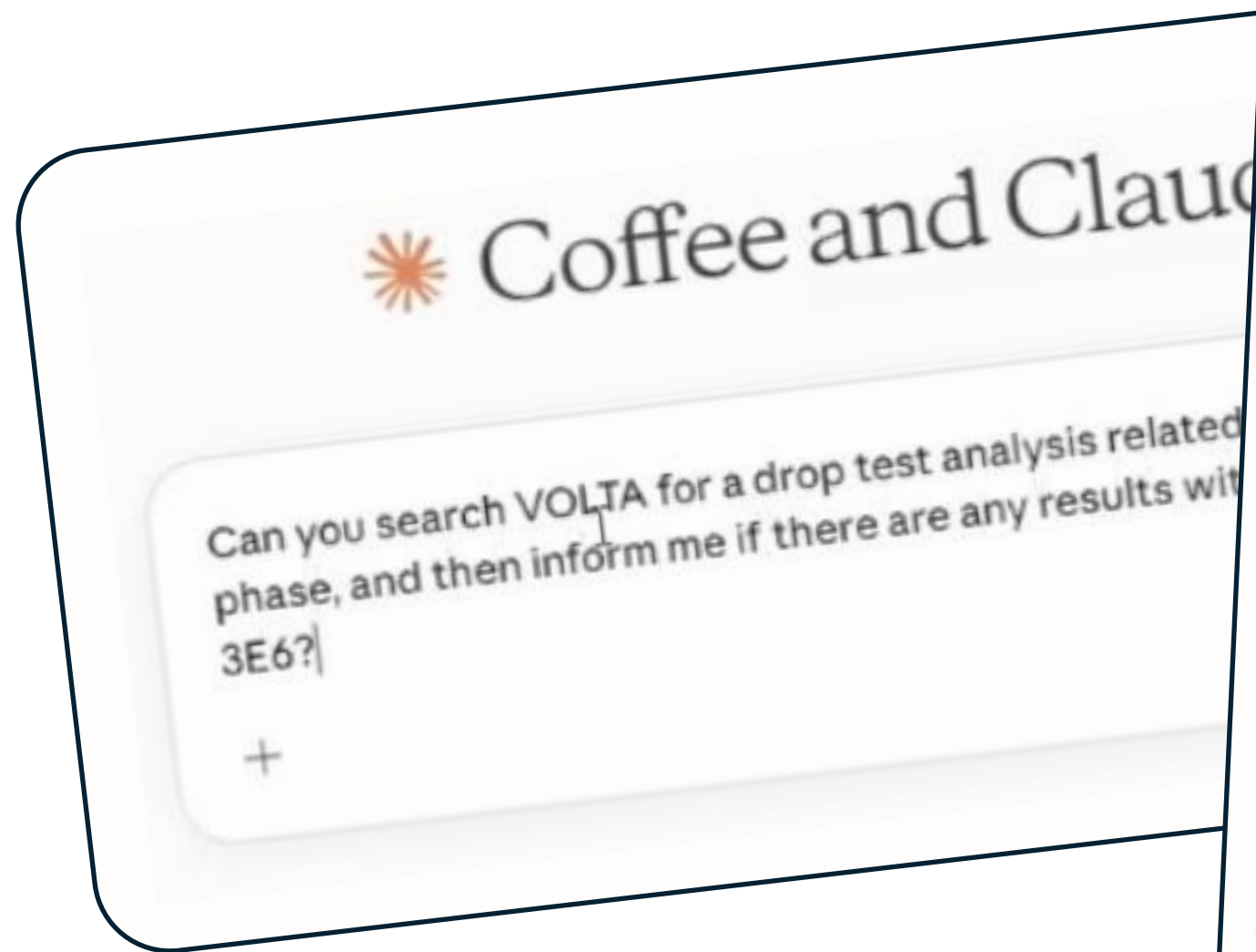
VOLTA MCP Server: how it works



Use case: democratizing simulation



Use case: democratizing simulation



Use case: democratizing simulation

field name.

Navigated data retrieval challenges and hypothesized stress field variable names >

There are 101 designs in this project. Let me retrieve one session's results to identify the exact stress output variable name.

Investigated stress field variables and strategized filtering approach >

I can see the stress output fields now — the project uses **Max_Stress** and **MISES** variables for multiple components. Let me now filter for any results where the stress exceeds 3E6.

Filtered stress data to identify values exceeding threshold >

The **MISES** fields have data. Let me now apply the stress threshold filter across them.

Identified ten designs exceeding stress threshold, prepared visualization >

I have the results. Let me present this clearly for you.

Yes — there are results with stress values exceeding 3×10^6 Pa. The search identified the project **Cell_Drop_Simulation_4** (tagged: Tablet, Proto, Abaqus, Drop) and found **10 designs** where at least one component's von Mises stress surpassed the 3E6 threshold. Here's a breakdown:

■ Peak von Mises stress (Pa) ■ 3E6 threshold

Here's a summary of the 10 flagged designs from Cell_Drop_Simulation_4:

Design ID	Velocity	Angle 2	Angle 1	Peak Stress (Pa)
4	-5.0	-61.97°	15.88°	6,589,272
33	-5.0	-78.70°	-7.22°	5,734,618
37	-5.0	-60.58°	-34.36°	5,424,358
45	-5.0	-79.83°	-6.10°	6,025,059
53	-5.0	-63.74°	-8.14°	6,801,435
57	-5.0	-65.71°	5.30°	9,466,824
60	-5.0	-77.24°	-38.98°	6,047,479
88	-5.0	-67.39°	13.57°	6,129,409
89	-5.0	-80.15°	-24.95°	15,040,802 ⚠
93	-5.0	-64.48°	32.00°	5,445,791

Reply...

Sonnet 4.6 Adaptive

Here's a summary of the 10 flagged designs from Cell_Drop_Simulation_4:

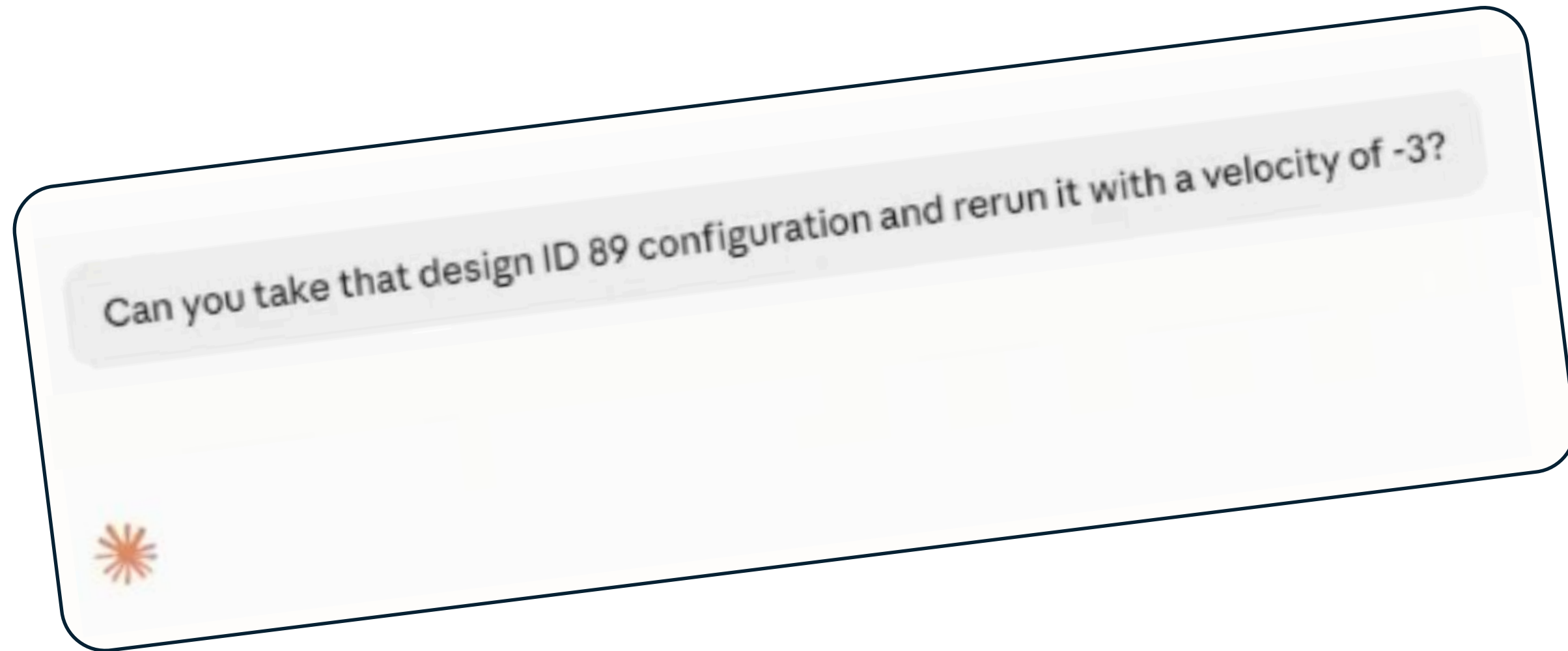
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Notable finding — Design 89 stands out significantly. Its peak stress of ~15 MPa is more than double any other flagged design and over 5× the threshold. The drop angle combination

Reply...

Sonnet 4.6 Adaptive

Use case: from insight to action



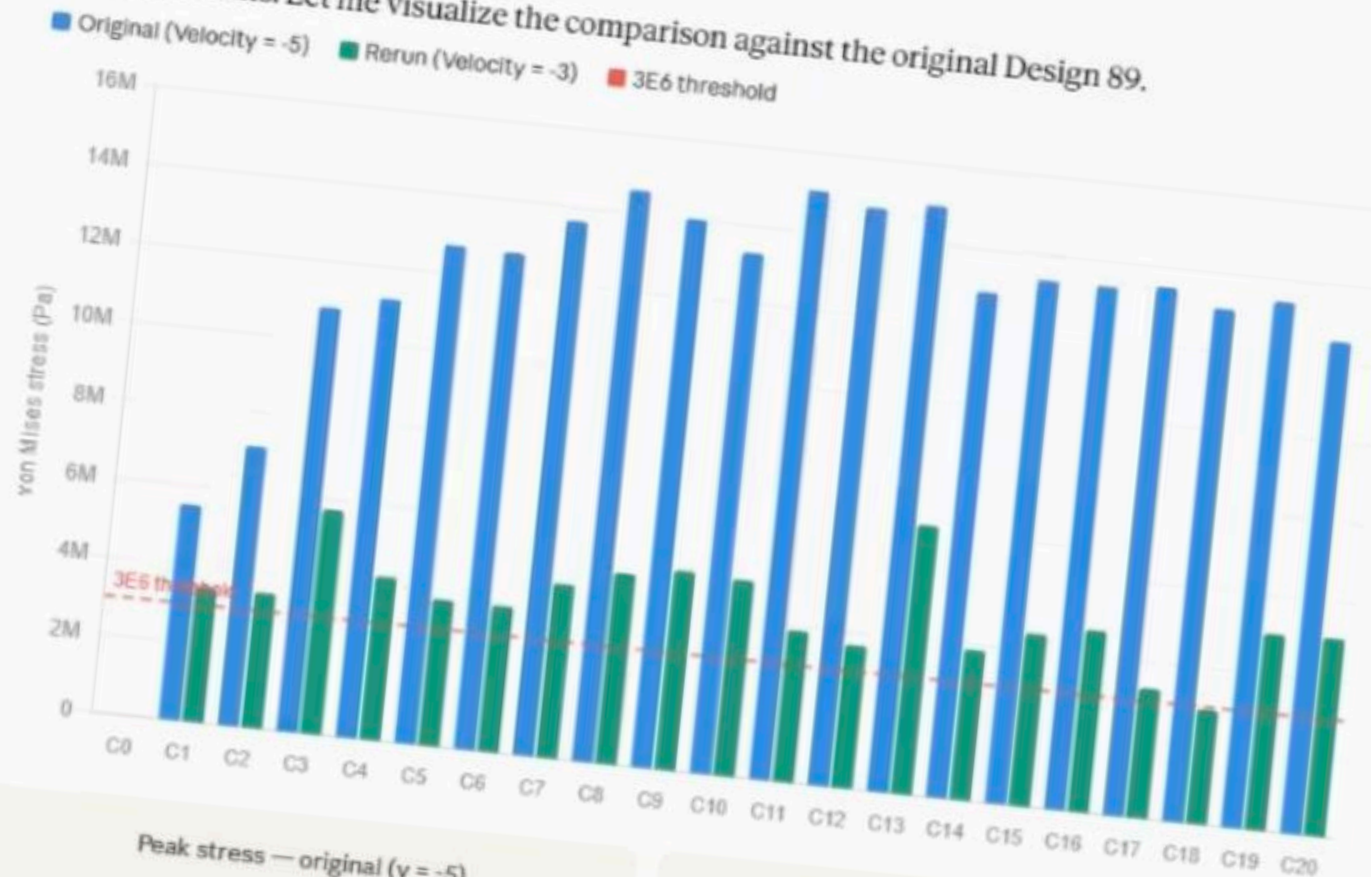
Use case: from insight to action

Can you take that design ID 89 config



Analyzed stress comparison and prepared visualization >

Got the results! Let me visualize the comparison against the original Design 89.



Peak stress — original (v = -5)

15.04 MPa
Component 11

Peak stress — rerun (v = -3)

6.88 MPa
Component 13

Here's the takeaway from the comparison:

- **Peak stress dropped by -54%** — from **15.04 MPa** (Component 11) at v = -5 down to **6.88 MPa** (Component 13) at v = -3, which makes sense given the lower kinetic energy at impact.
- However, **all 20 active components still exceed the 3E6 threshold** in the rerun, so while the stress is significantly reduced, the drop orientation (Angle_1 ≈ -25°, Angle_2 ≈ -80°) remains a critical failure concern even at the lower velocity.

What we learned

- **Standard interfaces with few input/outputs**
 - Less hallucination
 - Less token consumption
- **Make projects and models context discoverable**
 - Leverage tagging and metadata structures
- **Standardize simulation process**
 - Increase MCP tools reusability



Built with Enterprise adoption in mind

- **No credentials in the LLM context**
 - authentication handled outside the conversation
- **Authenticated by design**
 - every call runs with the user's own credentials and the agent sees only the data the user can already see
- **Logging & responsibility**
 - MCP actions distinguishable from UI/API for audit
 - AI disclaimer up front

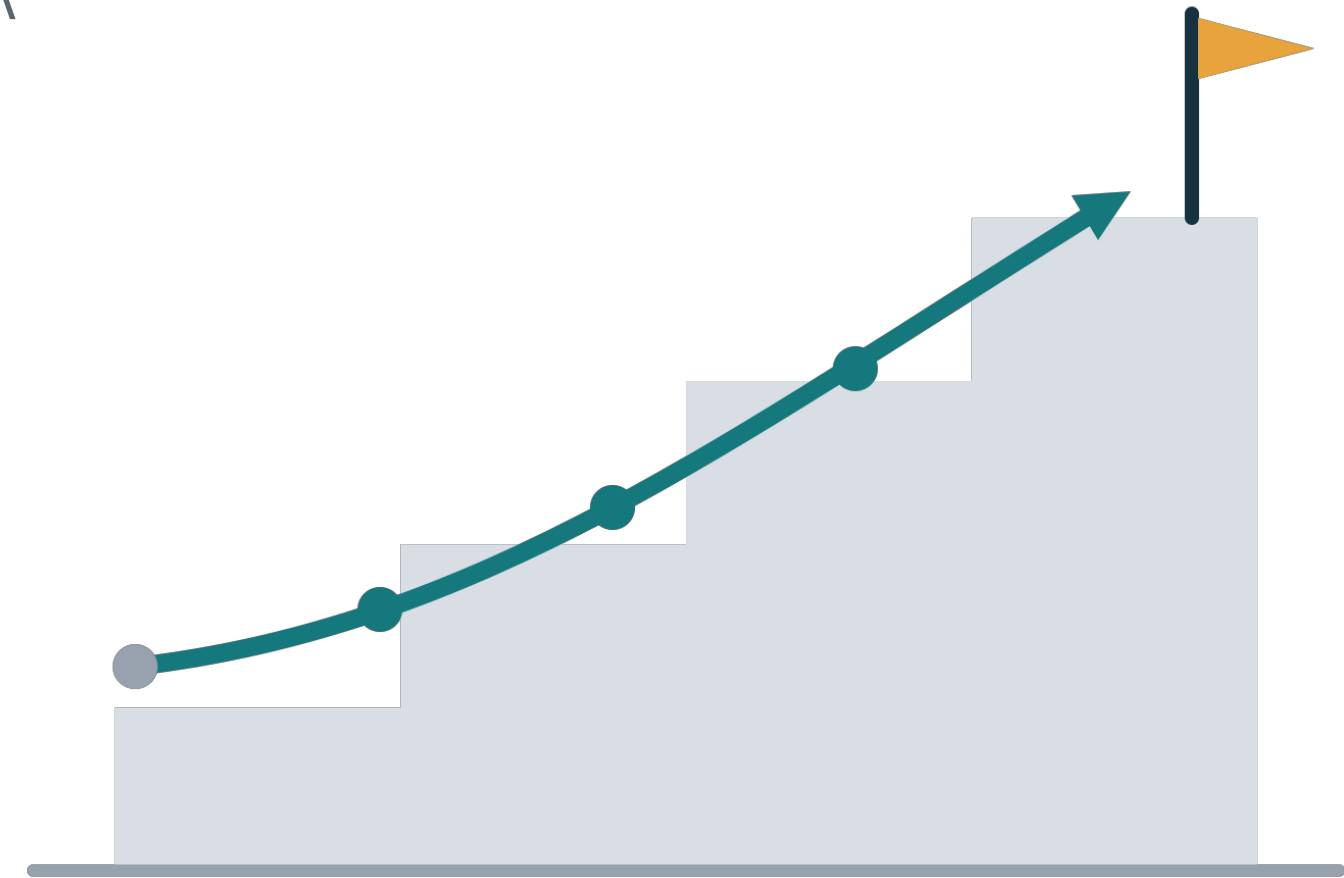


Next Steps

- Single Sign On support
 - OpenID Connect – OIDC(OAuth 2.0) as VOLTA
- Shared multi-user deployment
- Distribution
 - From manual install to product bundled

Open questions we're studying

- answer quality
- API load under agentic use
- right tools granularity



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Thank you

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