

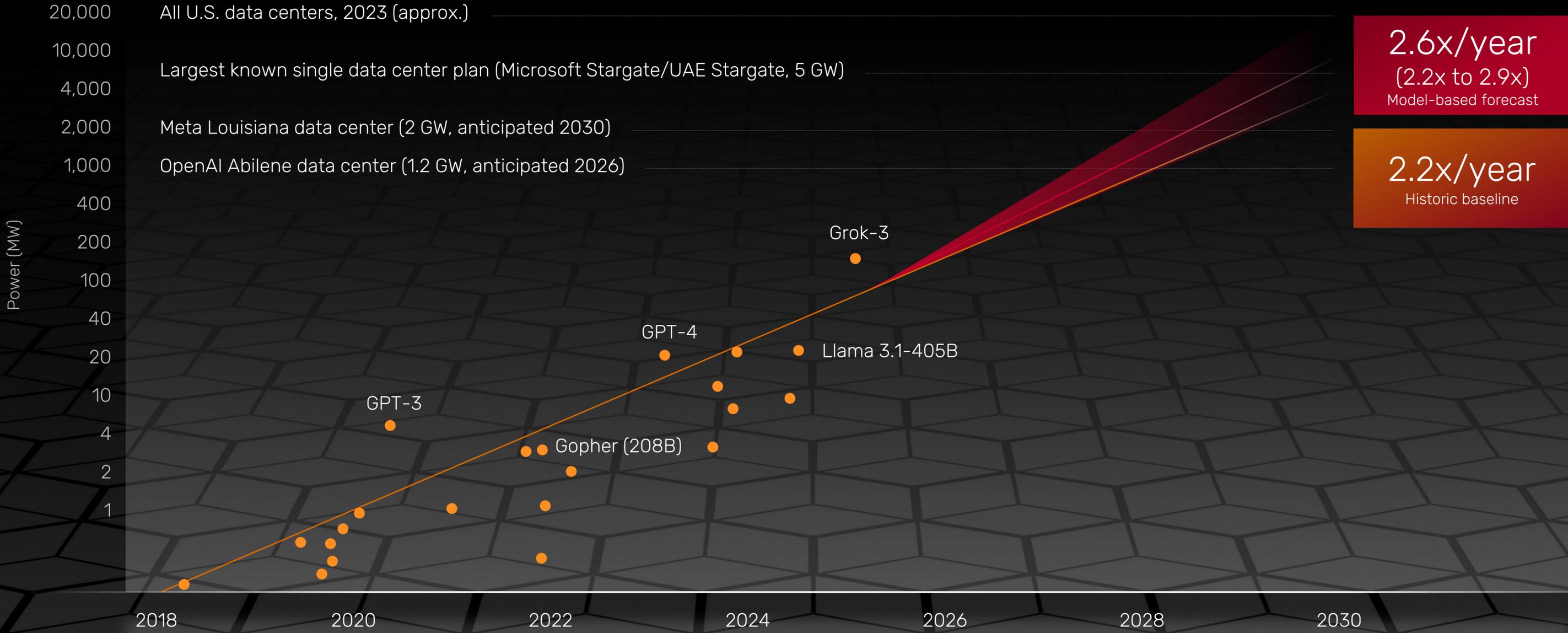
Design for AI and AI for Design

Charles Alpert
AI Fellow, Cadence

This presentation contains forward-looking statements based on current expectations or beliefs, as well as a number of preliminary assumptions about future events that are subject to factors and uncertainties that could cause our actual results to differ materially from those expectations or results described in the forward-looking statements. You are cautioned not to put undue reliance on these forward-looking statements, which are not a guarantee of future performance and are subject to a number of risks, uncertainties and other factors, many of which are outside Cadence's control.

AI Power Needs Growing Rapidly

Projected Power Growth for Frontier AI Training



Source: Joshua You, David Owen, David Porter, and Tom Wilson. 'Scaling Intelligence: The Exponential Growth of AI's Power Needs'. EPRI, 2025. <https://www.epri.com/research/products/000000003002033669>

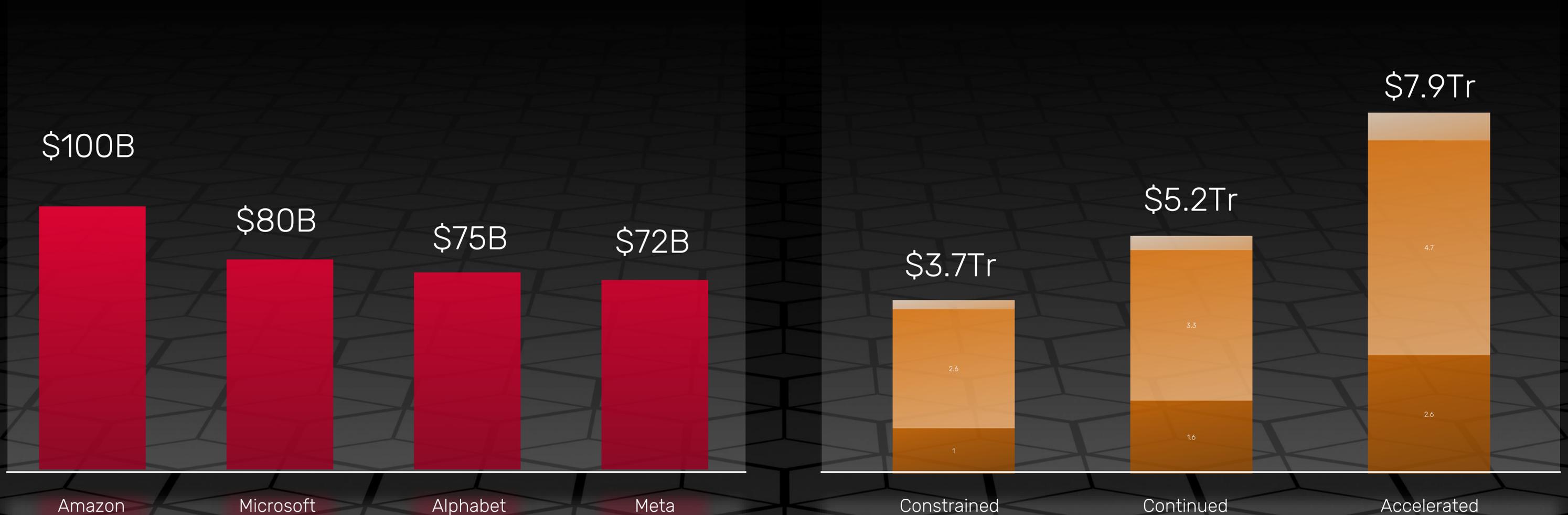
AI Infrastructure Investments are Real

Key players are ramping up their AI Investments

AI infrastructure spending based on recent announcements for 2025

A multi trillion dollar industry, regardless of scenario

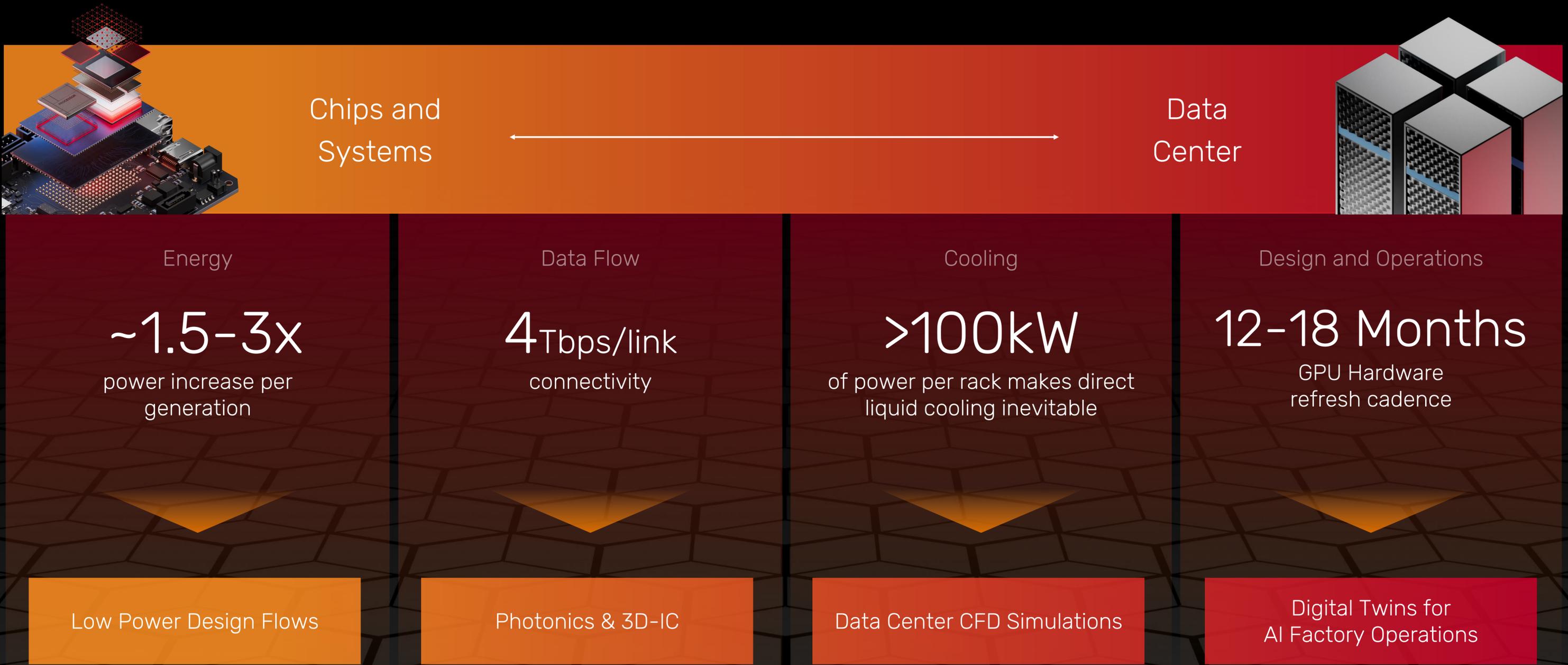
2030 Global data center total capital expenditure scenarios driven by AI



Source: Reuters, Techcrunch

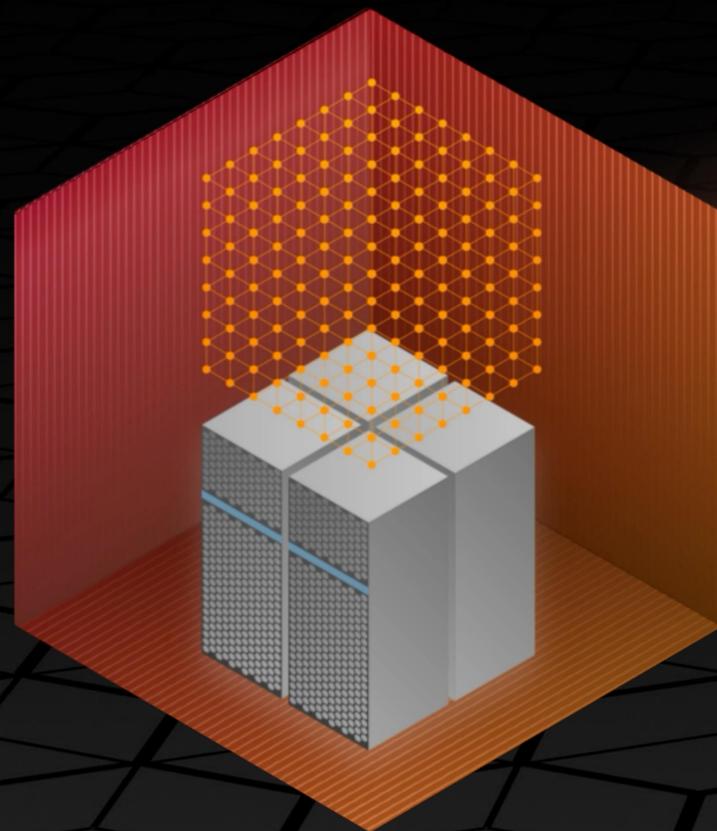
Source: McKinsey & Company, The cost of compute: A \$7 trillion race to scale data centers, 2025

AI Infrastructure Challenges



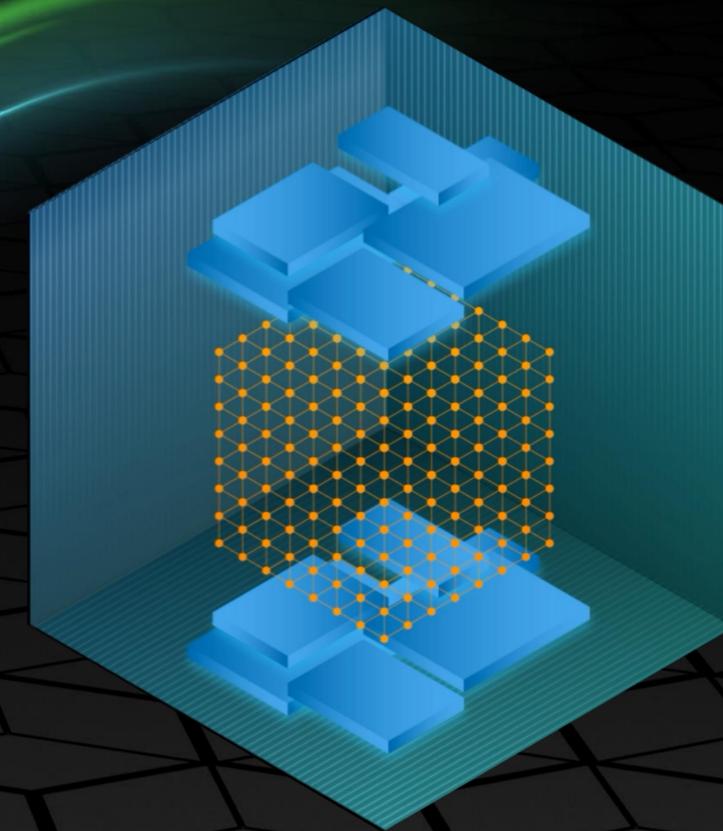
Design for AI

Helping build the AI infrastructure



AI for Design

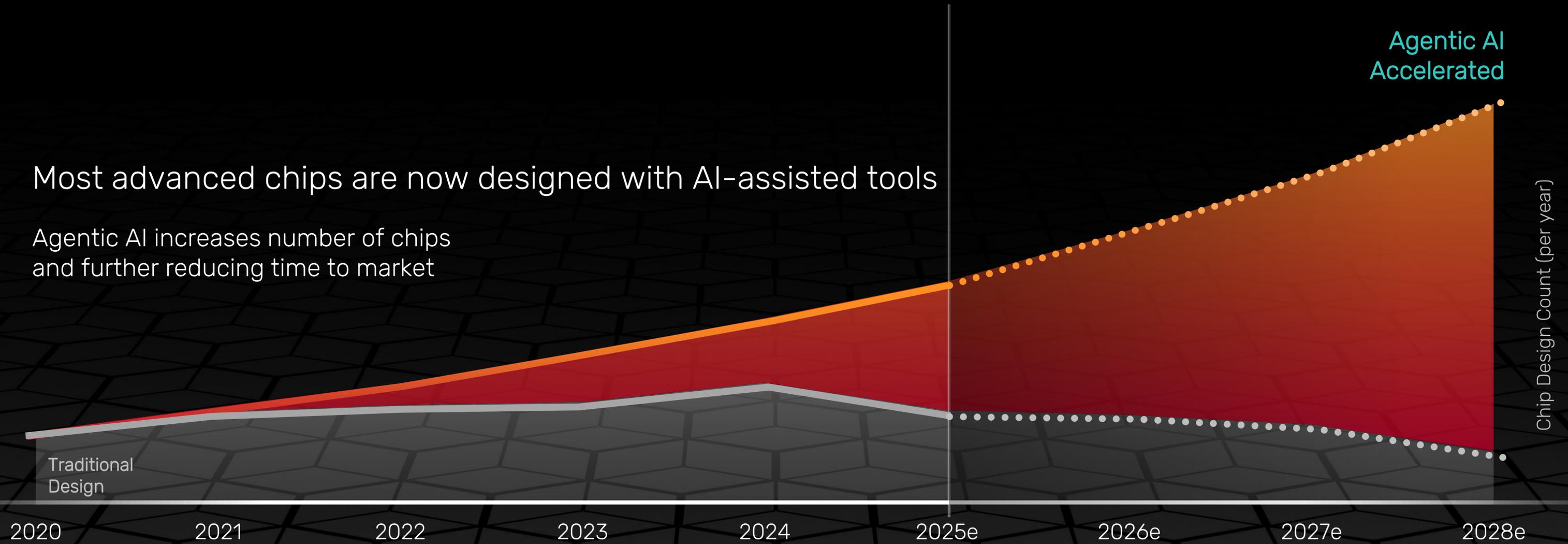
Using AI in our design solutions



AI-Driven Chip Design Inflection Point

Most advanced chips are now designed with AI-assisted tools

Agentic AI increases number of chips and further reducing time to market



Sources: Industry projections for tape-outs and AI adoption, and Cadence analysis.

Agentic AI: Continuing Evolution of EDA

EDA's 40-Year History

Improving Productivity Through Design Abstraction

Manual Layout

Automated Transistor-Level Layout

Automated Cell-Based Place and Route

RTL Synthesis

High-Level Synthesis

Excellence in Simulation and Optimization

NUMERICAL SOLVERS

SMT SOLVERS

GRAPH THEORY AND TOPOLOGY

BINARY DECISION DIAGRAMS

BOUNDED MODEL CHECKER

DISTRIBUTED PROCESSING

SAT SOLVERS

ADAPTIVE MESHING

NON-LINEAR SOLVERS

SYMBOLIC MODEL CHECKERS

MATRIX SOLVERS

COMPUTATIONAL GEOMETRY

cādence.ai

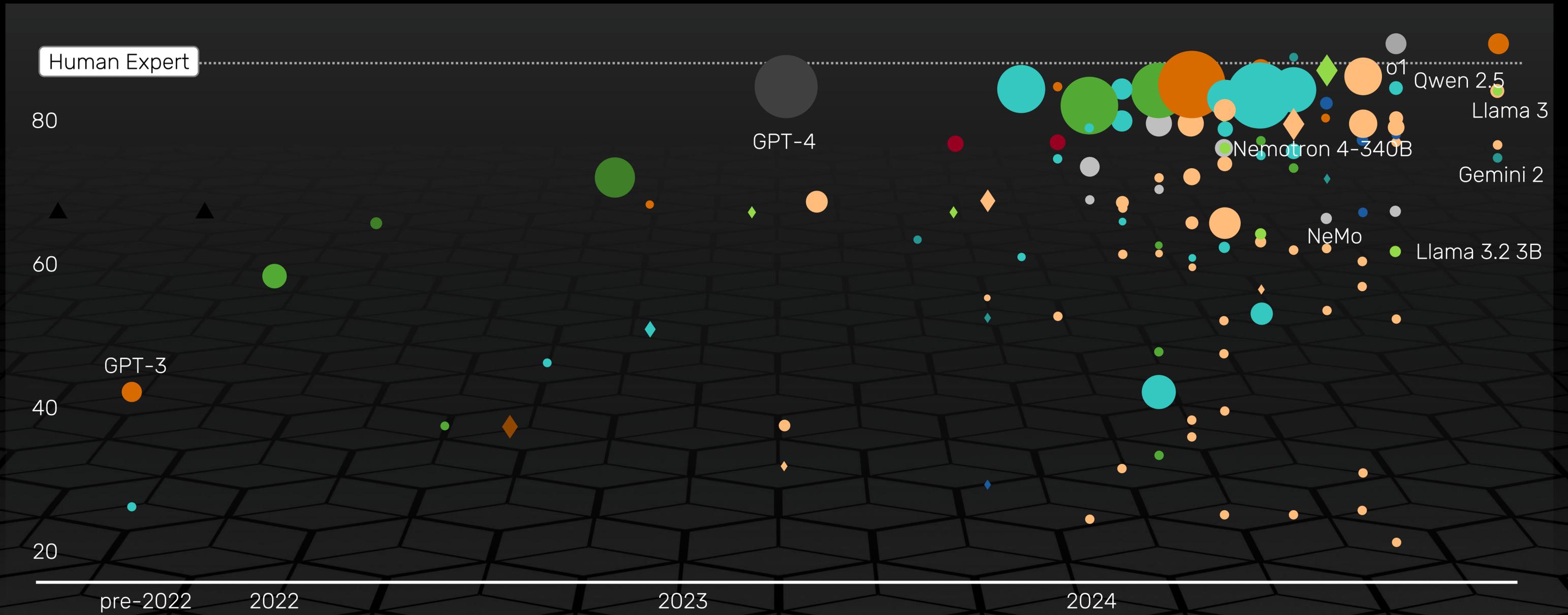
Natural Language



Cadence Agentic AI

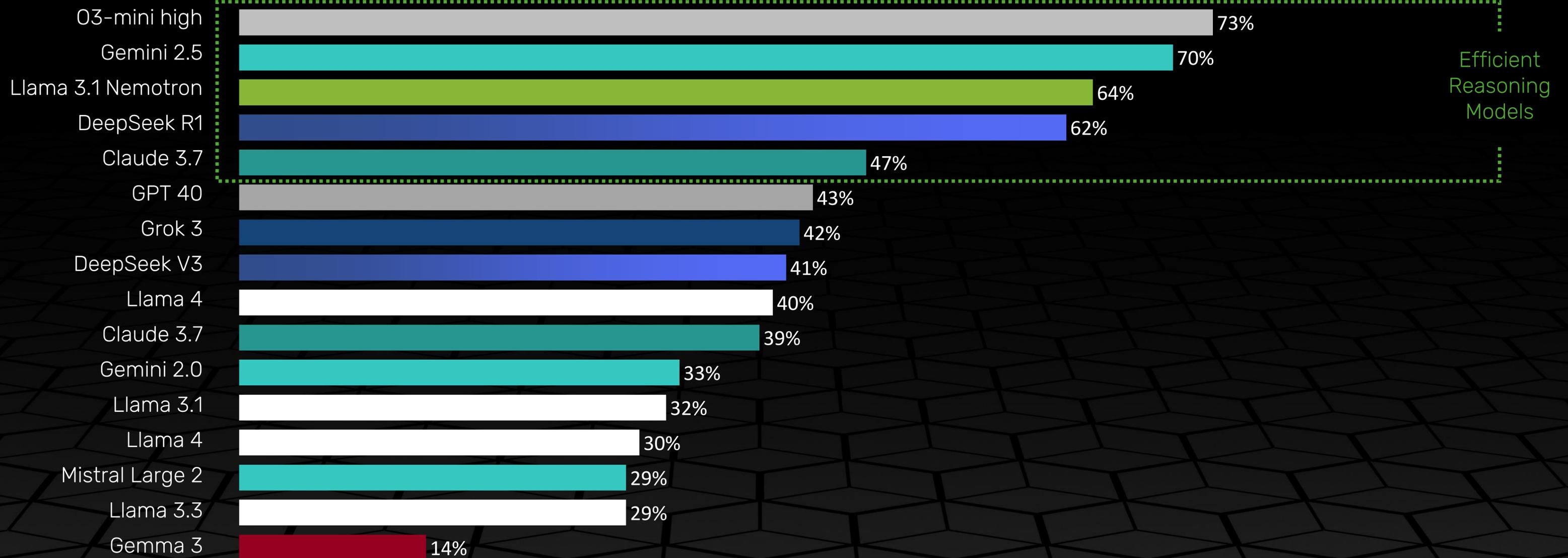
Optimization AI

A New Age of Fuel Efficient Models

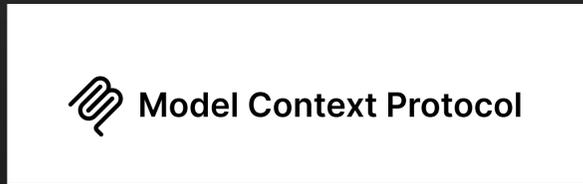


The Emergence of Reasoning Models

LiveCodeBench (Coding) Results



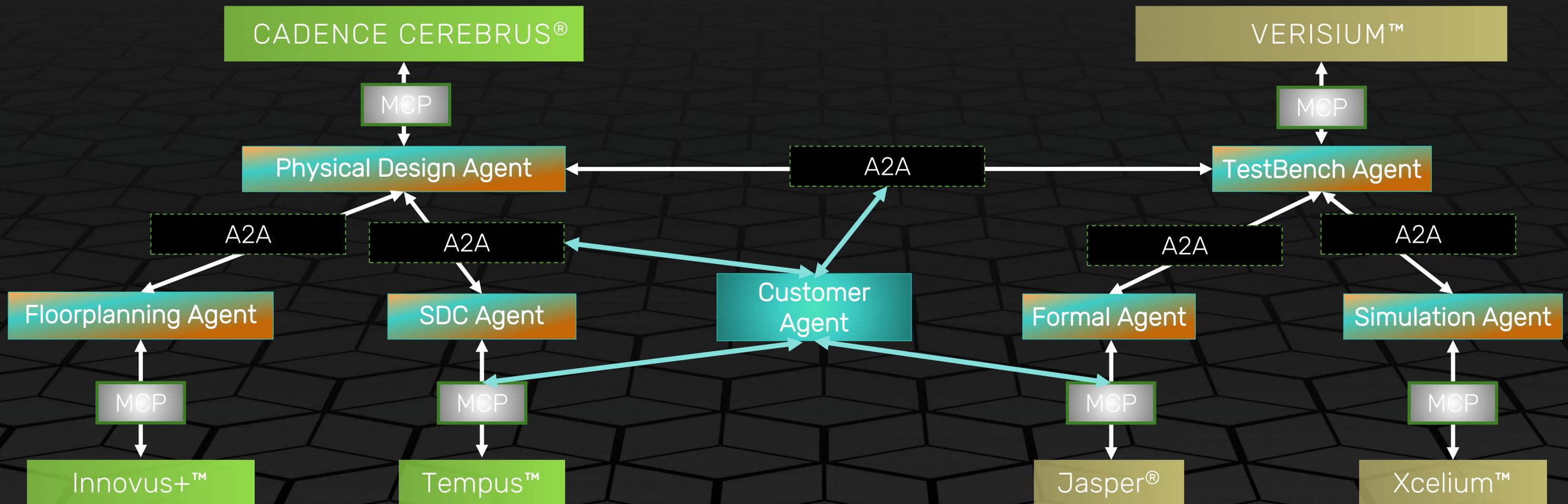
New Protocols Are Enabling Plug-and-Play Agentic Systems



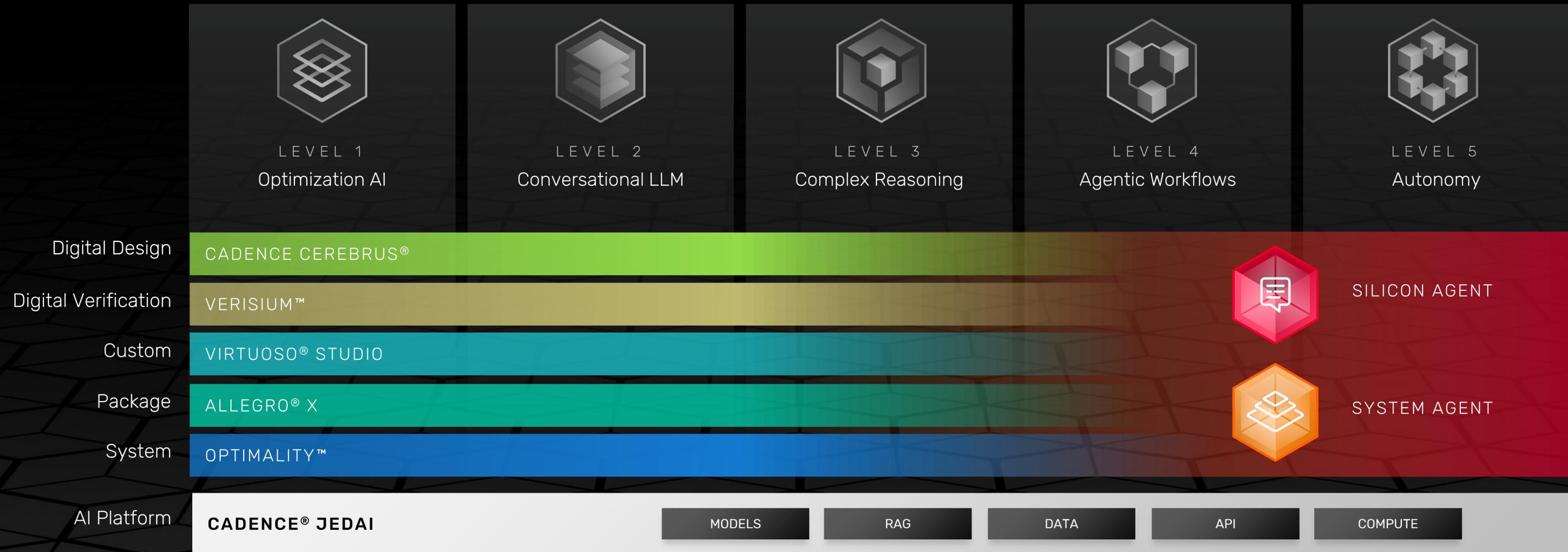
Model Context Protocol (MCP).



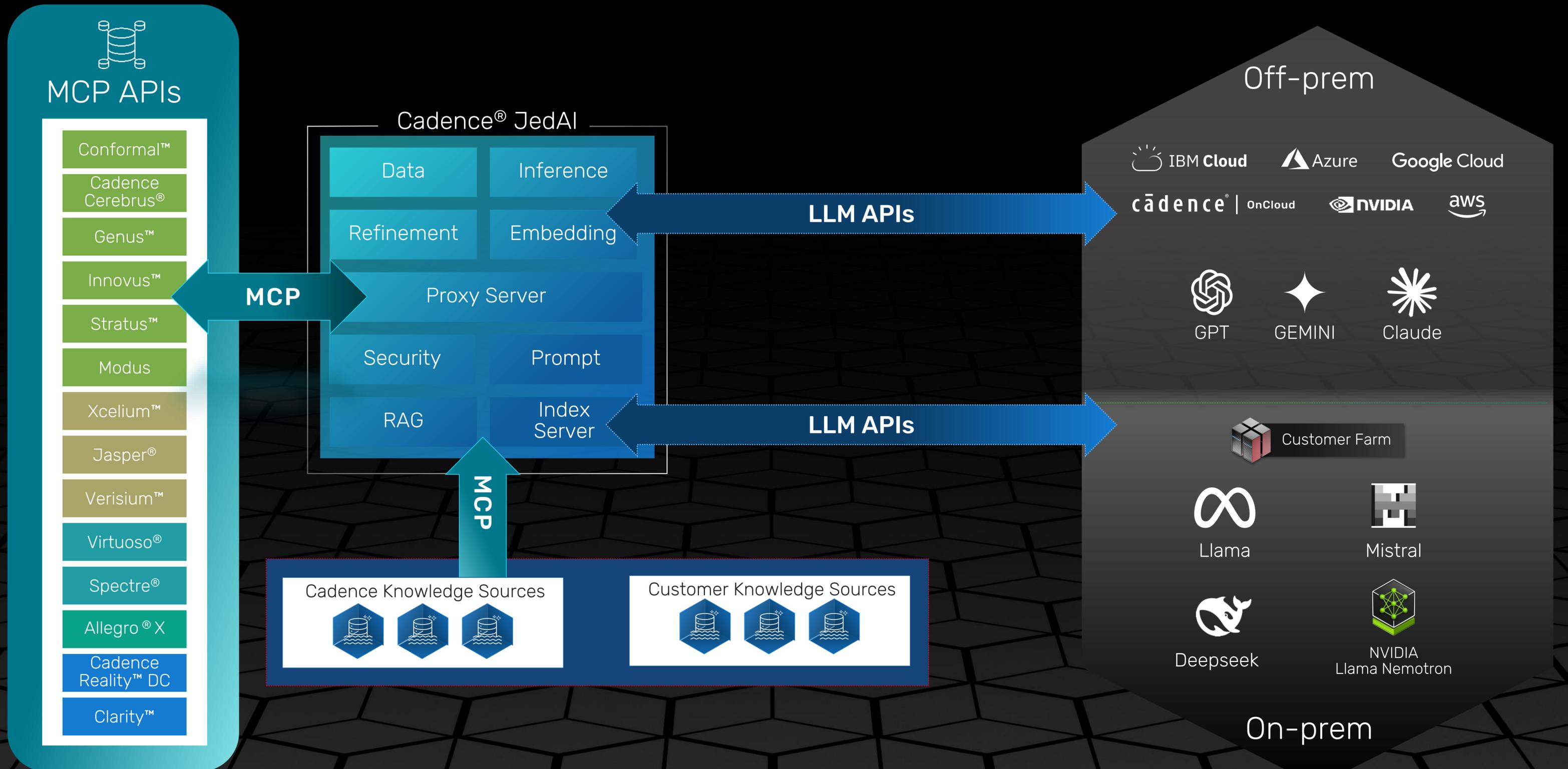
Agent2Agent (A2A)



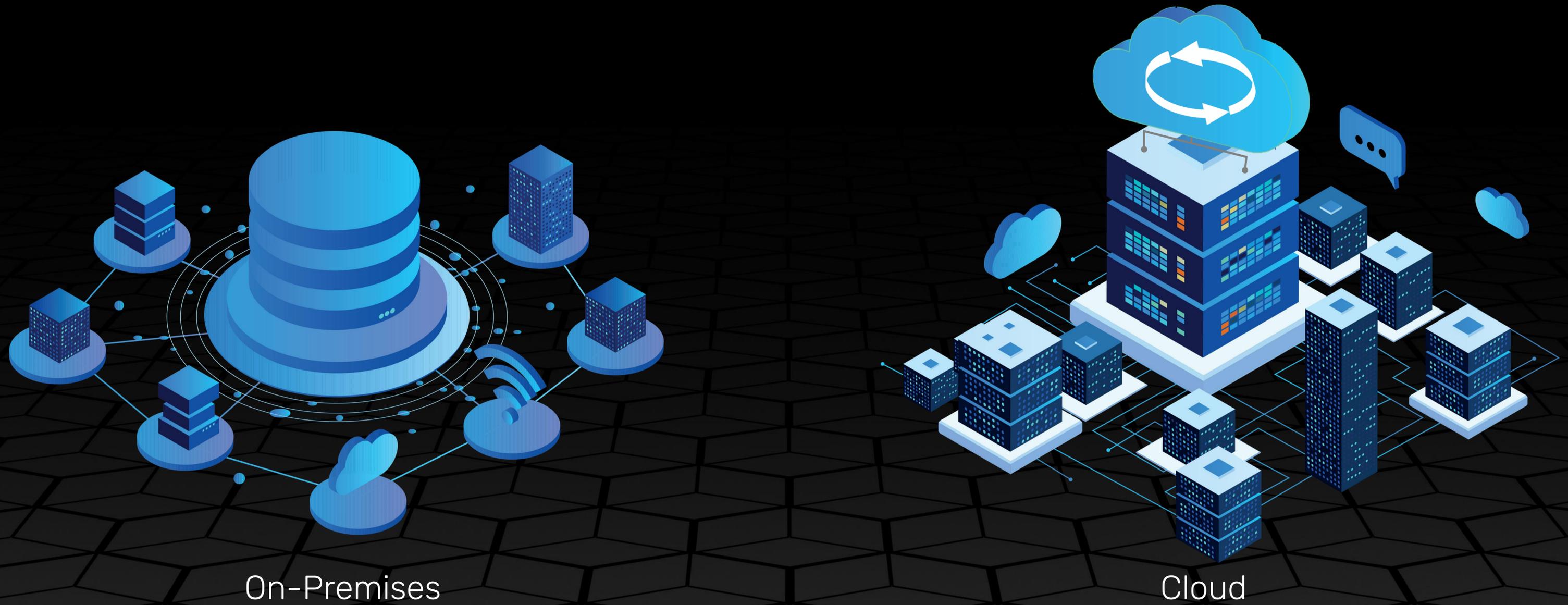
The Journey to Autonomous Design



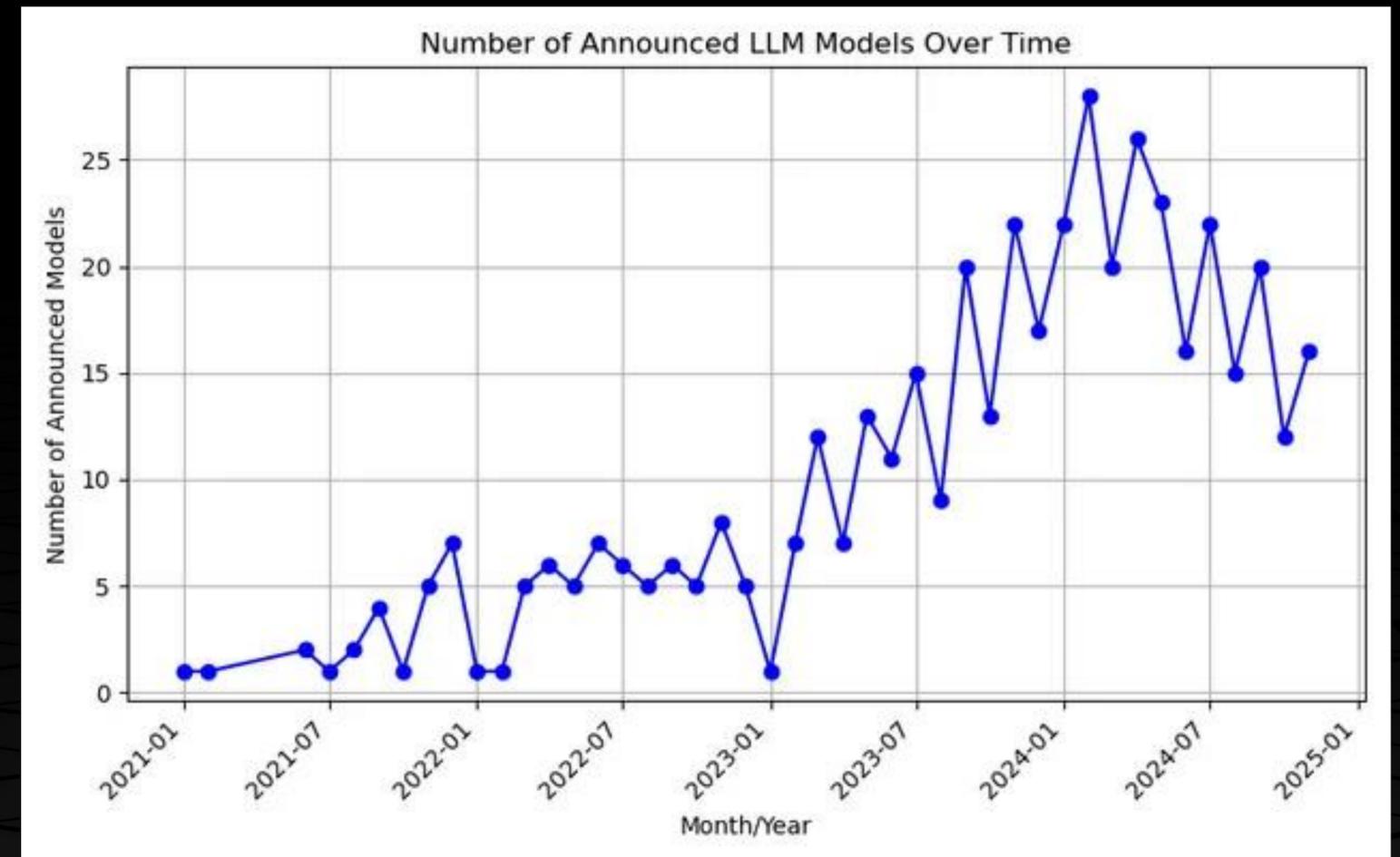
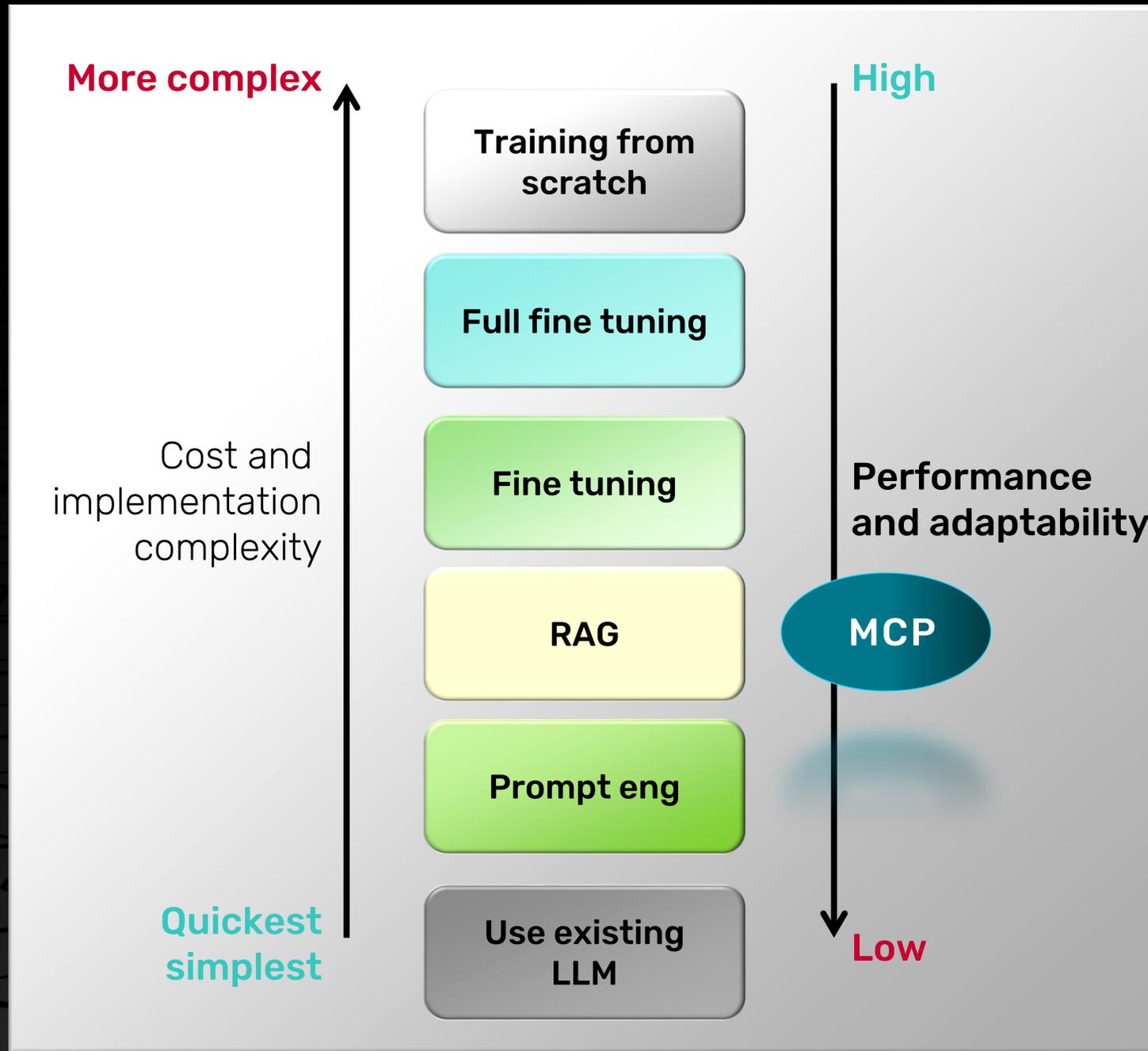
Cadence JedAI Platform



The Deployment Dilemma



The Agentic AI Investment Dilemma



SOURCE Reddit Dec 2024:...

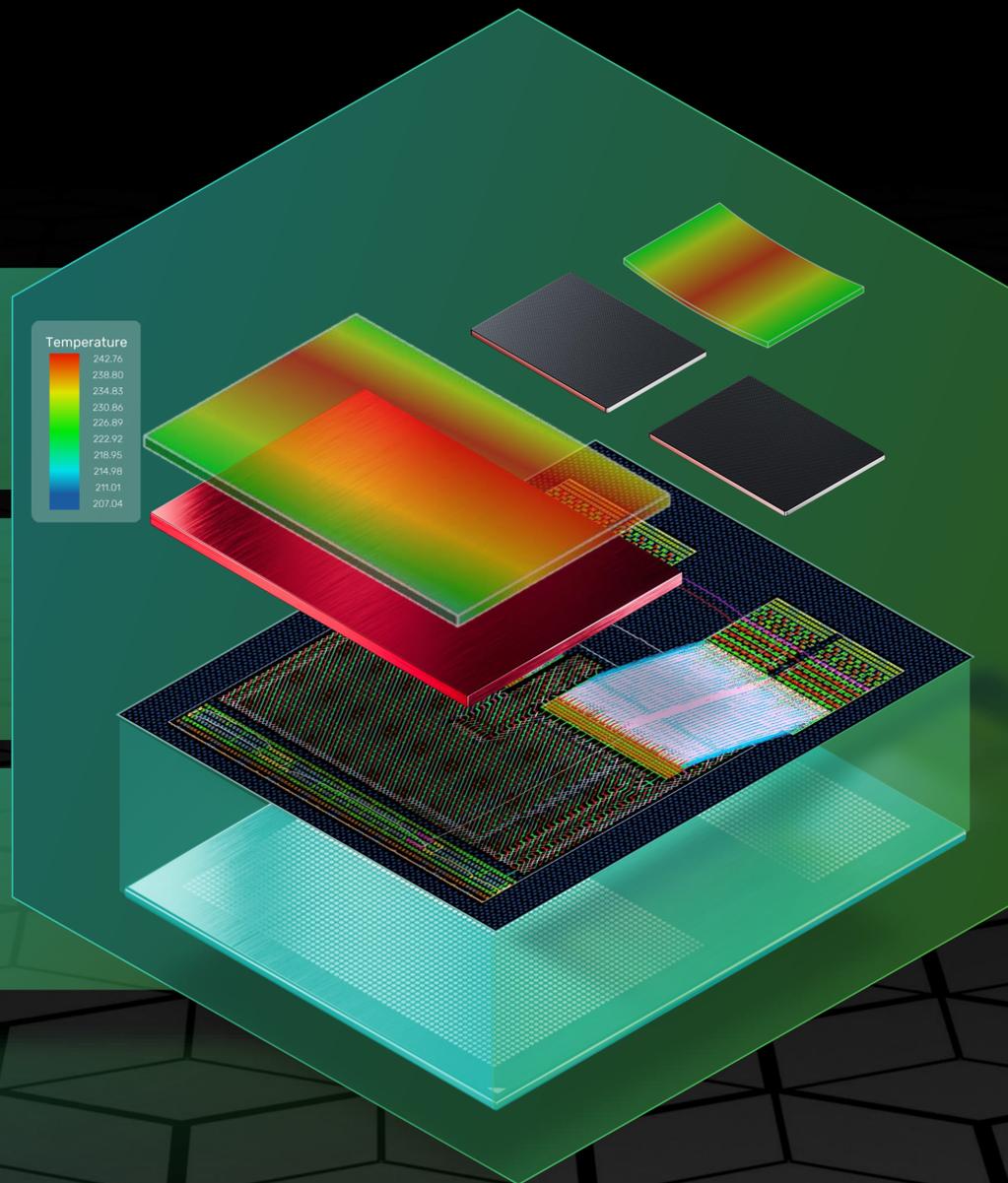
GPU Acceleration Benefits 3D-IC Design

Doubling the GPUs provides near linear acceleration for thermal and mechanical analysis

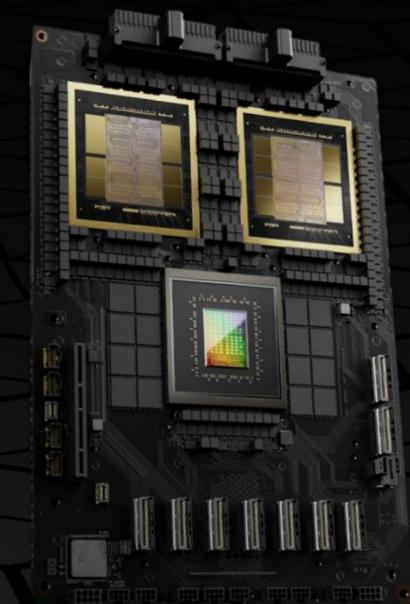
19x 3D-IC Static Thermal Simulation

8x 3D-IC Multi-Stage Stress and Warpage Simulation

12x 3D-IC Transient Thermal Simulation



Accelerated by



cadence®

REALITY™

DIGITAL TWIN

Data center design and
operation platform

ACCELERATED BY

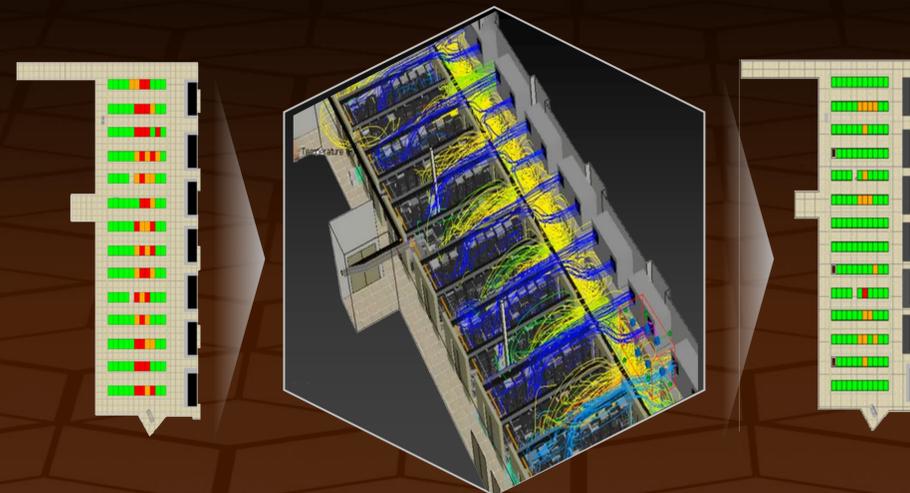


Powered by NVIDIA OMNIVERSE APIs

Deployed by
All Major Hyperscalers

Standard for
NVIDIA AI Factories

Improve uptime, utilization and
efficiency all at once



95%
of thermal downtime risk
eliminated

+31%
capacity
utilization

+10%
increase in energy efficiency

Rapid results
at enterprise scale



1 month
start to finish for optimizing infra
layout and cooling

100%
acceptable thermal conditions, up
from 82%

Phases of AI Adoption

Horizon 1
1 – 3+ years



Infrastructure AI

Horizon 2
2 – 7+ years



Physical AI

Horizon 3
5 – 10+ years

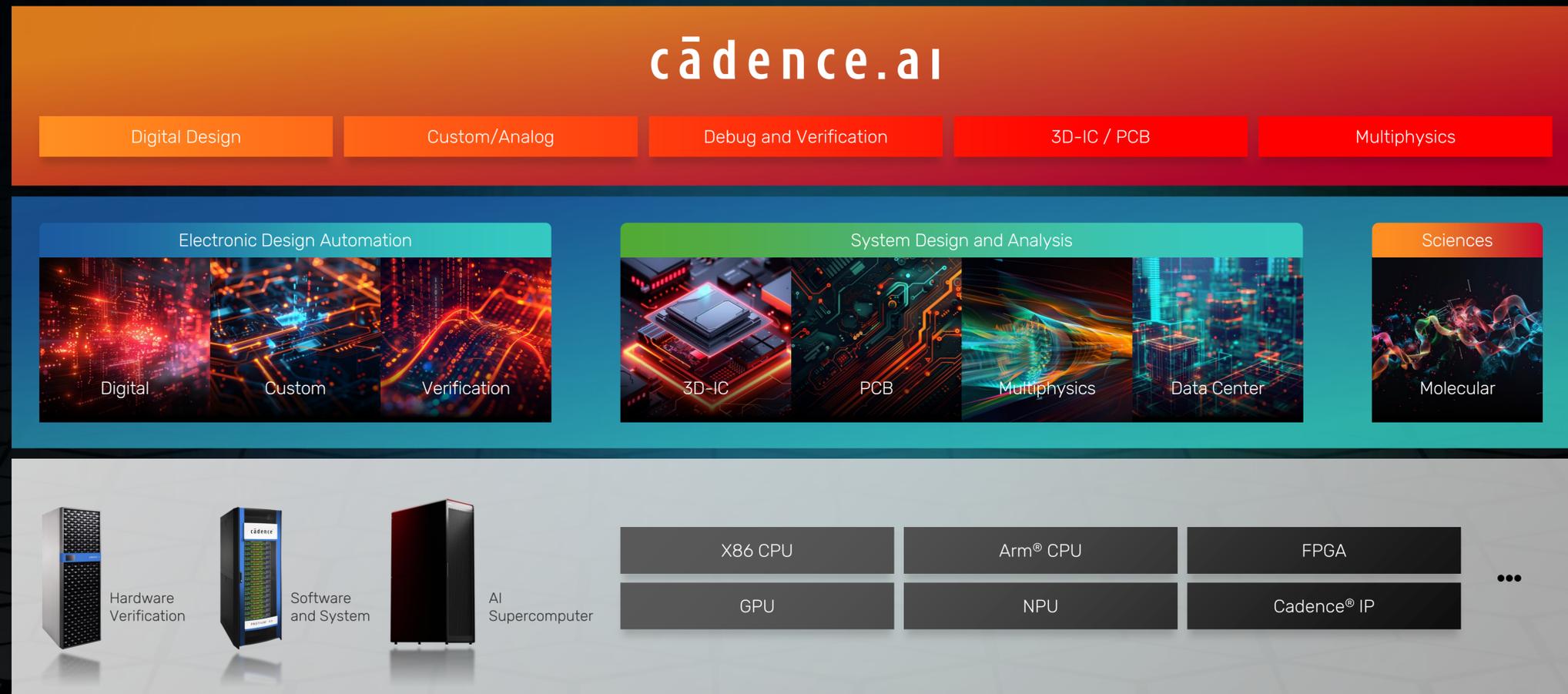
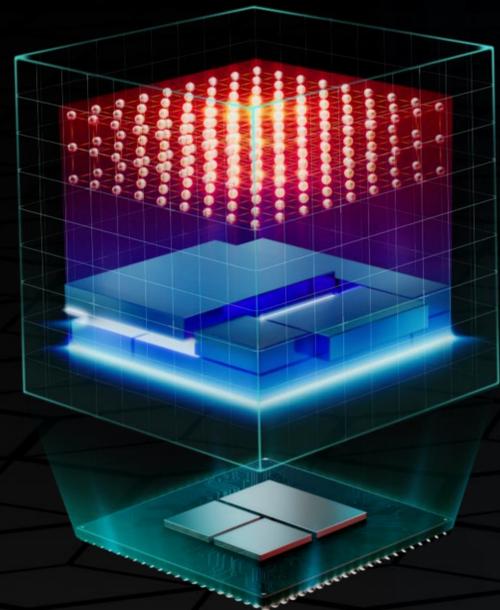


Sciences AI



Silicon and System
Volume and Complexity

Design for AI and AI for Design



AI Agents

Principled Simulation + Optimization

Accelerated Compute

AI Opportunities Are Endless



LEVEL 5
Autonomy



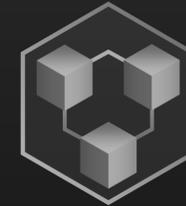
LEVEL 1
Optimization AI



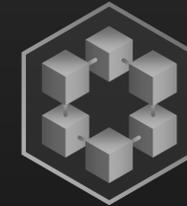
LEVEL 2
Conversational LLM



LEVEL 3
Complex Reasoning



LEVEL 4
Agentic Workflows



LEVEL 5
Autonomy

The Journey to Autonomous Design



Most advanced chips are now designed with AI-assisted tools

Design for AI

cādence[®]

AI for Design