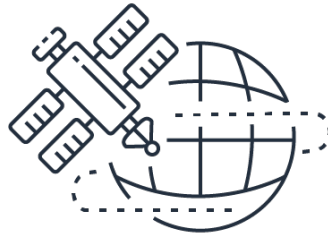
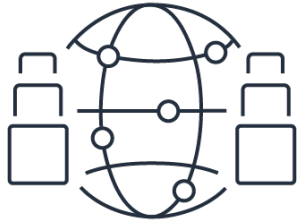


DyNO

Dynamic Node Orchestration



Customer Challenges



Space Network Resilience

Loss of connectivity due to lack of self-healing

Bottlenecks from suboptimal routing configurations

Insufficient scale to react to changes in the environment in real-time

Complex Mission Operations

Thousands of routers moving at 15000+ mph, each running different workloads

Lack of interoperability between different network providers (satellite, 5G, terrestrial)

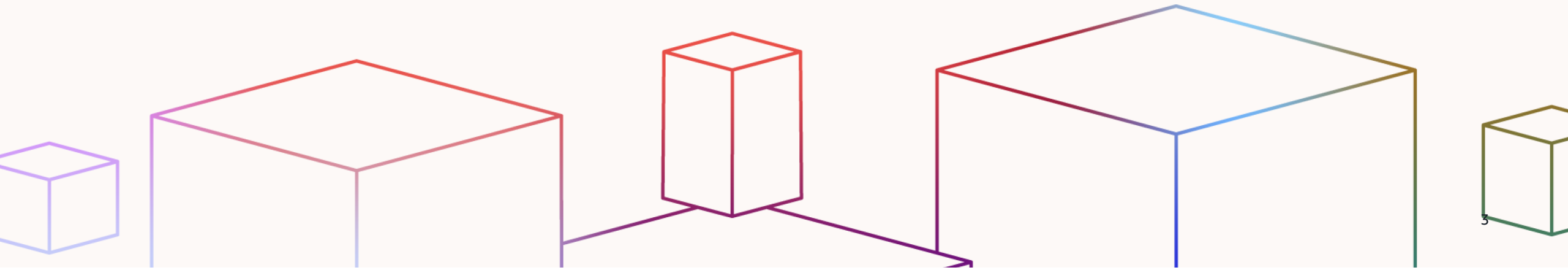
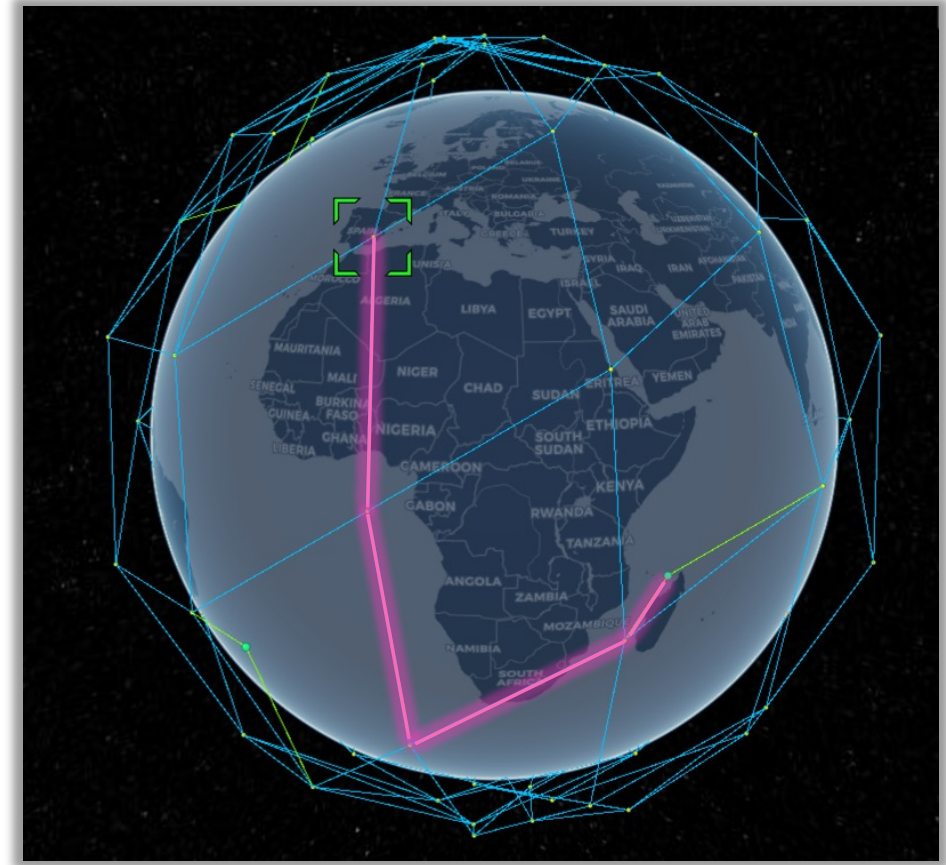
Modeling Flexibility

Difficult integration of physics and network models reduce ability to predict network behavior

Restrictive licenses are cost and scale-prohibitive

Dynamic Node Orchestration with AWS

A cloud-native digital twin solution that unifies multi-domain physics and network models enabling real-time optimization, historical analysis, and mission plan evaluation.



Dynamic Node Orchestration

Decision-Making

Use real-time operational data, optimize with historic performance, or run 'what-if' analyses

Integrate external data like weather or geospatial intelligence

Cost

Fully-managed and serverless services provide high availability and reduced operational burden with pay-as-you-go pricing

Performance

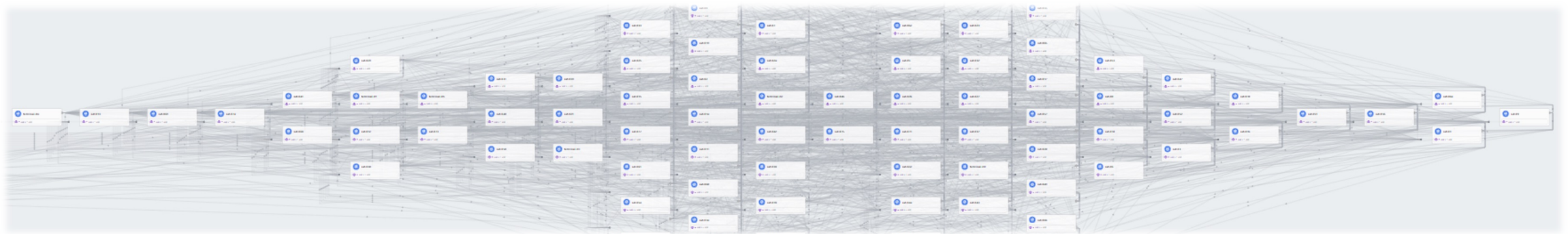
Simulate 5M hours of ephemerals per second with on-demand parallel compute

Manage 250K dynamic network nodes simultaneously

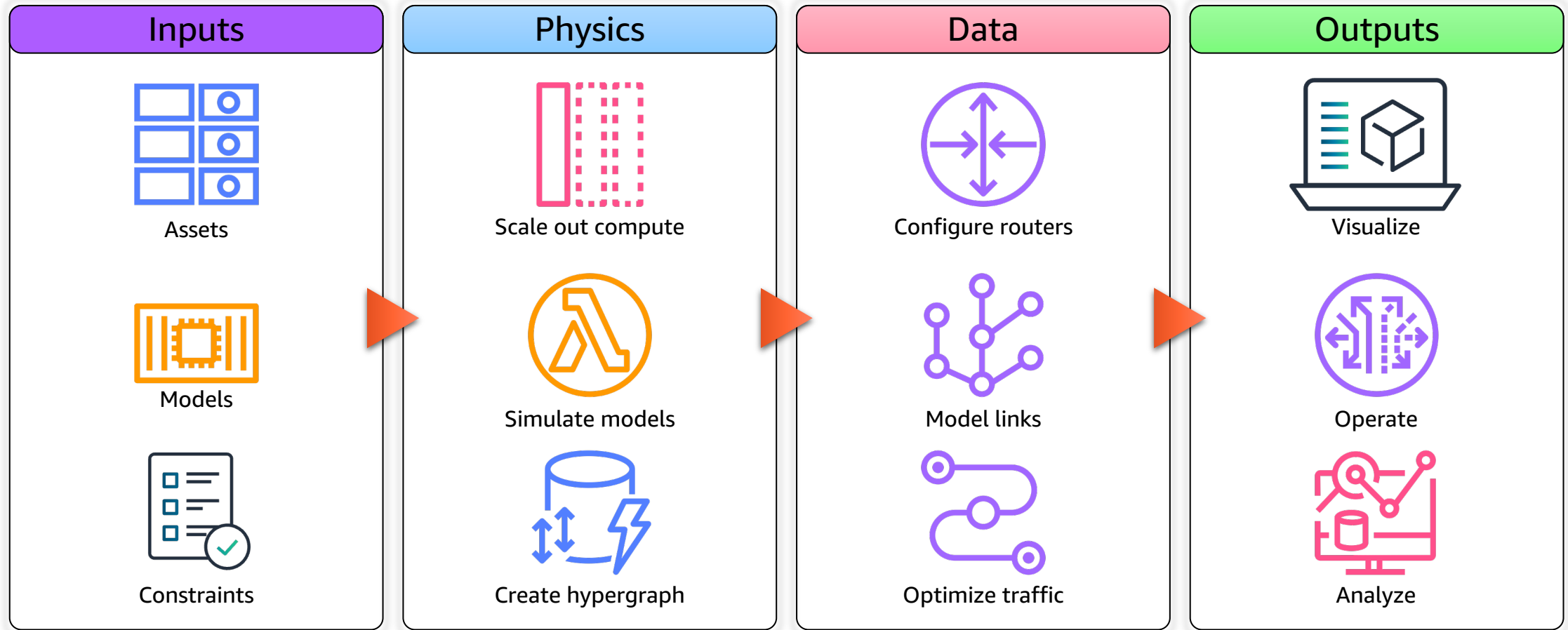
Extensibility

Virtualized OSI L1 and L2 gives full control of the digital twin

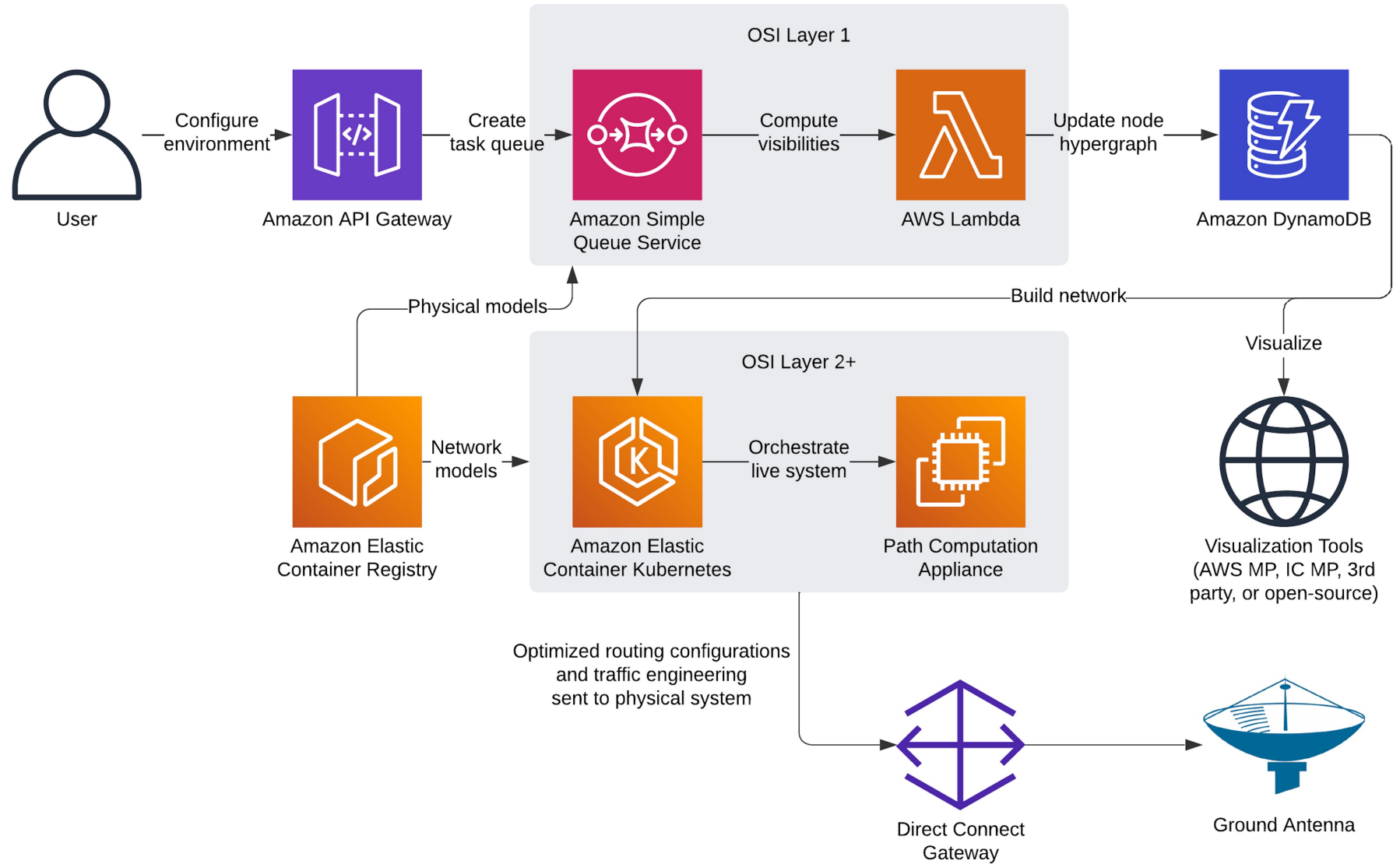
Each node and link is modeled with configurable open source or customer-provided models



Dynamic Node Orchestration

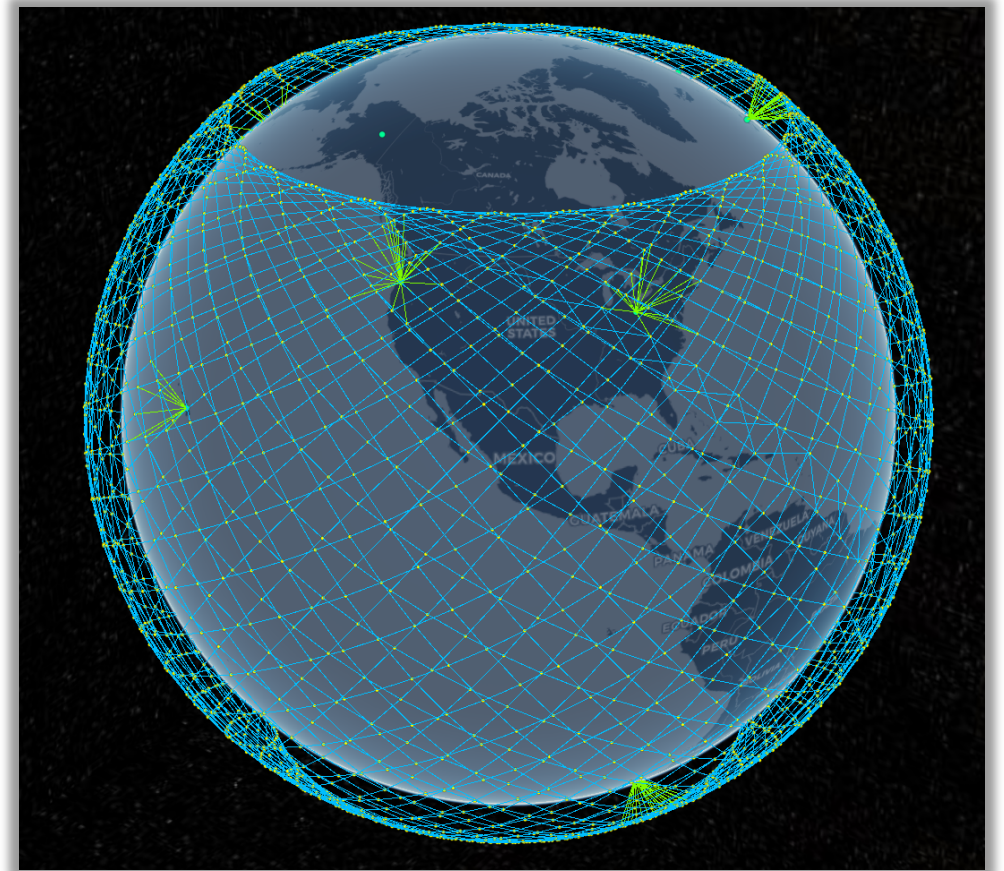


Architecture



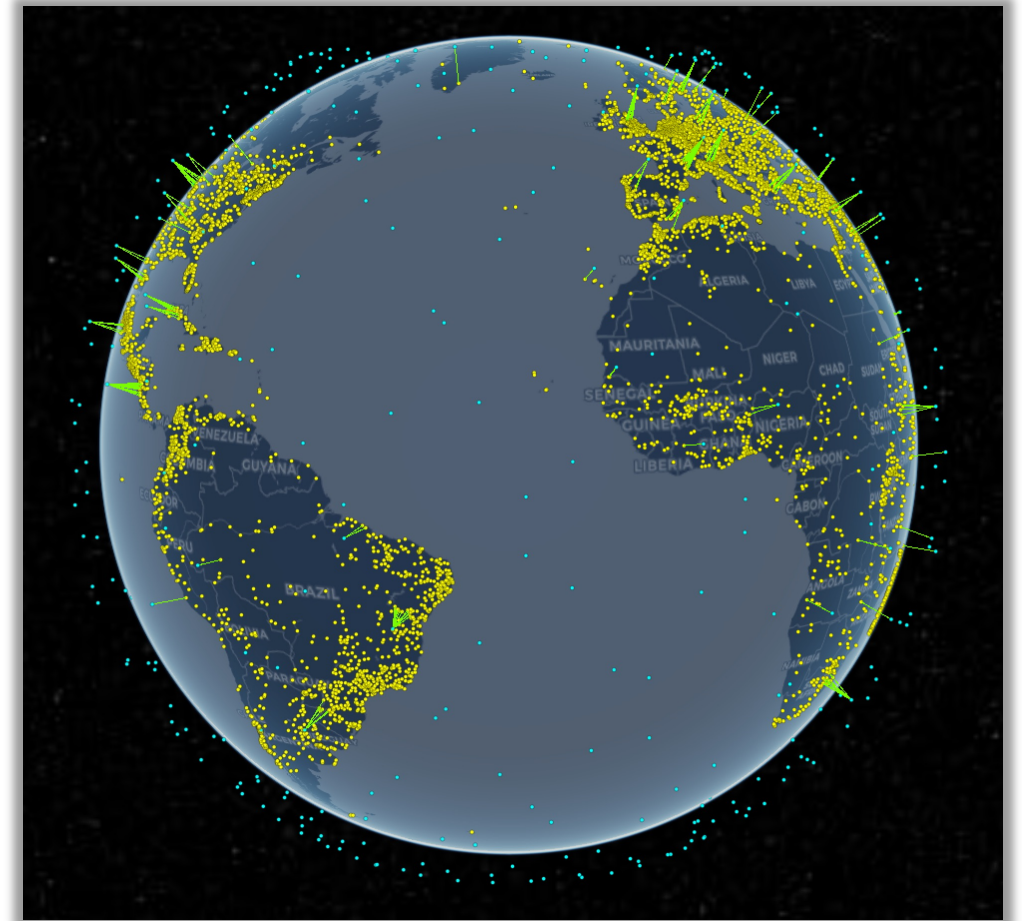
Use Case: Satellite Network Operations Center

- Model constellations with thousands of satellites and ground terminals in the cloud
- Run the same network stack in AWS and physical system
- Update the digital twin with operational telemetry
- Optimize routes based on outages or environmental constraints



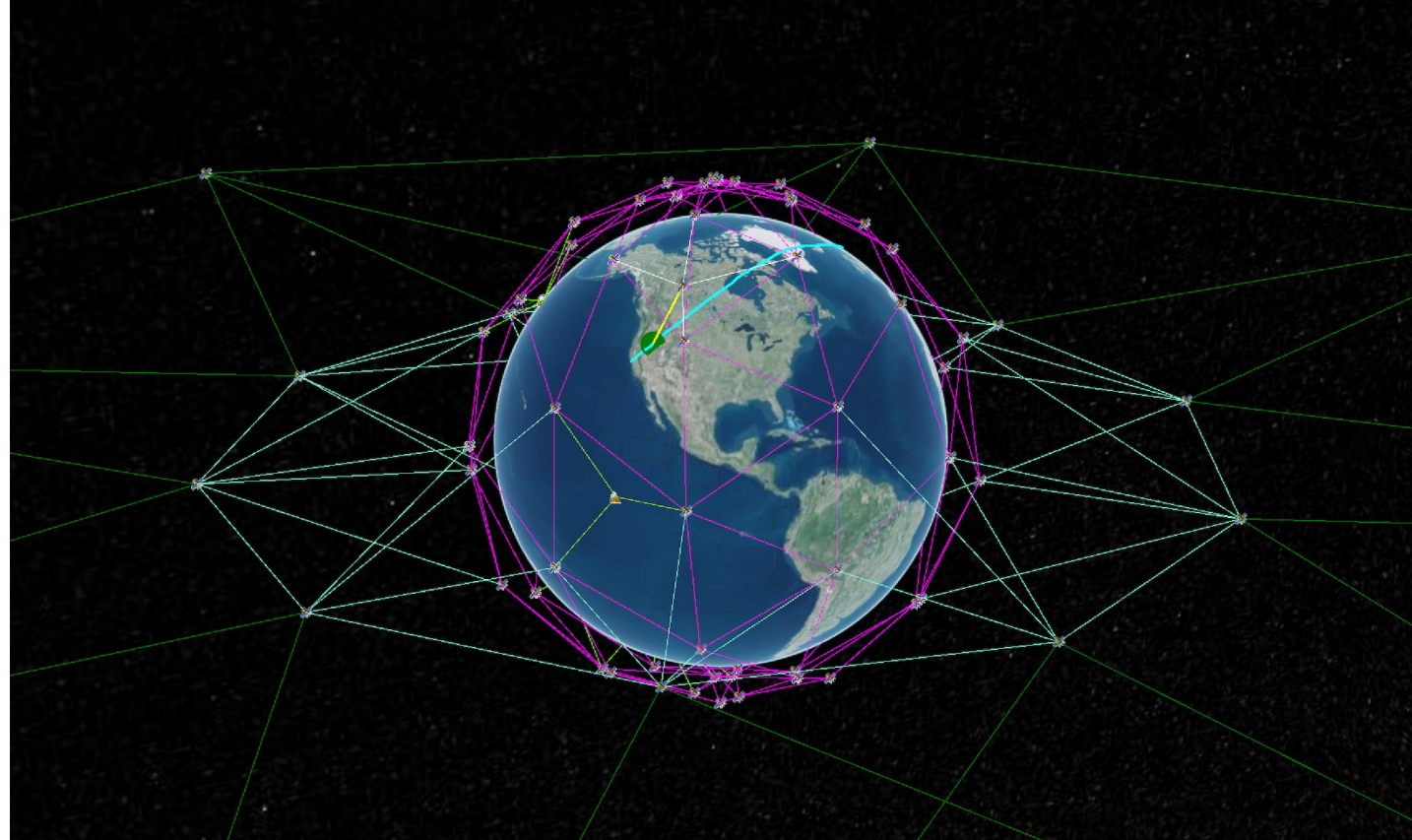
Use Case: Collection Optimization

- Turn communication links into collection opportunities
- Elastic compute scales up to generate opportunities with a pay-as-you-go model
- Execute thousands of individual satellite and payload models in parallel with full constraint checking
- Integrate into mission planning flow to run automatically when new tasks appear



Use Case: Multi-domain Mission Design

- Unify all network elements regardless of protocol
- Create network access requests across different operators
- Compute latency, bandwidth, and data delivery performance between ground, air, sea, and space systems



Key Takeaways

8

Seconds to plan
3 days of network
operations

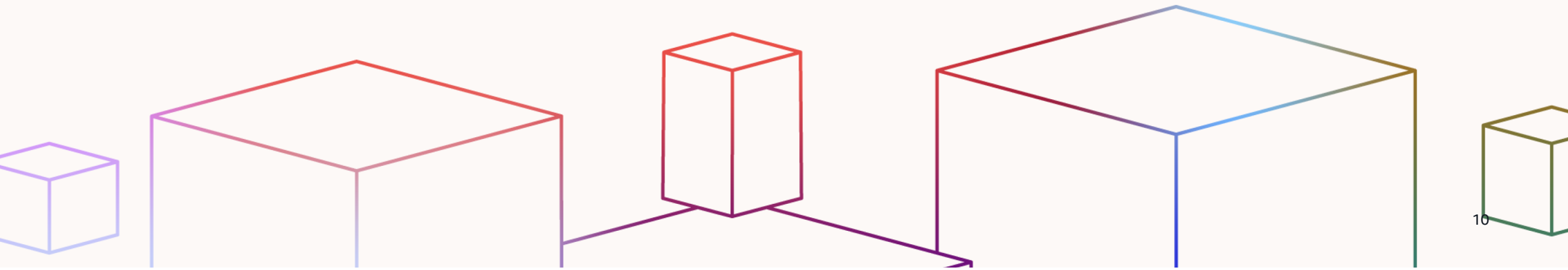
24

Hours using COTS
simulation tools on
16-core CPU

500

\$ spent on AWS for
1 month of operations

For a system with 300 satellites & 80 ground terminals



Get started

- Bring in a specialist architect to deep dive into requirements and build a **proof of concept**
- Ask about how **AWS Partners** or **AWS Professional Services** can accelerate implementation



Thank you!

