Market Size Estimation of a Decentralized Compute Platform/Marketplace

Bottom-Up Market Sizing Using First Principles:

1. Define User Segments and AI Applications:

User Segments:

- Large-scale Enterprises: Major corporations with extensive data operations.
- Mid-sized Enterprises: Smaller companies increasingly adopting AI technologies.
- Researchers: Academics and private sector researchers focusing on AI.

Types of AI Applications:

- Data-intensive applications: Require significant computational power for tasks like deep learning and big data analytics.
- Real-time applications: Need continuous, real-time computing power for applications like IoT and autonomous vehicles.
- Others: Includes more traditional or less resource-intensive applications such as basic machine learning models and research-focused computations.

2. Estimate Demand for Each Application Type:

Assumptions for Annual GPU Hour Demand Estimation:

- Data-intensive applications: Account for 50% of the GPU hours due to their high computational requirements.
- Real-time applications: Consume 30% of GPU hours, reflecting the growing importance of IoT and real-time data processing.
- Others: Take up the remaining 20%, covering a wide range of less demanding applications.

Assumptions:

1. Increased Adoption Rates: Assuming more widespread adoption of AI technologies than initially estimated, particularly in:
   - Small to mid-sized enterprises not previously fully accounted for.
   - Expansion in use cases within existing segments due to technological advancements and decreasing costs of AI technologies.
2. Higher Utilization Rates: Assuming more intensive use of AI applications requiring GPU computations, such as:
   - Increased daily GPU hours due to more complex models being used more frequently across industries.

- 24/7 operations for critical applications, especially in sectors like healthcare, autonomous vehicles, and real-time analytics.

3. New Markets and Geographies: Expanding the market presence to developing regions and new industries adopting AI technology at a faster rate than initially predicted.

GPU Hours Calculation:

A. Large-scale Enterprises:

- Data-intensive: 20,000 x 12hours/day x 365days = 87,600,000GPU hours/year
- Real-time: 20,000 x 10hours/day x 365days = 73,000,000GPU hours/year
- Others (assuming 2 hours/day remains): 20,000 x 2hours/day x 365days = 14,600,000GPU hours/year

B. Mid-sized Enterprises:

- Data-intensive: 200,000 x 12hours/day x 365days = 876,000,000GPU hours/year
- Real-time: 200,000 x 10hours/day x 365days = 730,000,000GPU hours/year
- Others (assuming 1 hour/day remains): 200,000 x 1hour/day x 365days = 73,000,000GPU hours/year

C. Researchers:

- Data-intensive: 50,000 x 4hours/day x 365days = 73,000,000GPU hours/year
- Real-time: 50,000 x 1hour/day x 365days = 18,250,000GPU hours/year
- Others: 50,000 x 2hours/day x 365days = 36,500,000GPU hours/year

Total Annual Global GPU Hours:

- Total for Data-intensive Applications: 87,600,000 + 876,000,000 + 73,000,000 = 1,036,600,000GPU hours/year
- Total for Real-time Applications: 73,000,000 + 730,000,000 + 18,250,000 = 821,250,000GPU hours/year
- Total for Others: 14,600,000 + 73,000,000 + 36,500,000 = 124,100,000GPU hours/year
- Grand Total Annual GPU Hours: 1,036,600,000 + 821,250,000 + 124,100,000 = 1,981,950,000GPU hours/year

Based on the increased adoption and utilization rates among 20,000 large-scale and 200,000 mid-sized enterprises, along with 50,000 researchers, the revised calculations project an annual demand for approximately 1.982 billion GPU hours. With an average cost of $2.5 per GPU hour, this usage represents a potential Total Addressable Market (TAM) of nearly $5 billion for io.net