

Nexus Risk Platform - Documentation

Nexus Risk Platform - Project Documentation

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1. Ingredients (Tech Stack & Resources)

Before building the recipe, here are the high-quality ingredients used to construct the Nexus Risk Platform.

Frontend (User Interface)

- Framework: Next.js 16.1.1 (App Router)

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Backend (API & Intelligence)

- Framework: FastAPI 0.115.0 (Python)

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Database & Cloud

- Database: Supabase (PostgreSQL)

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External APIs (Data Sources)

- Real-Time Tracking: AISStream.io (WebSocket API)

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DevOps & Tools

- Version Control: Git

2. Project Description

Nexus Risk Platform is a cutting-edge, real-time supply chain intelligence system designed to monitor, analyze, and predict risks along critical global shipping routes, with a specific focus on the Taiwan-US semiconductor corridor.

In an era where supply chain disruptions can cost billions, Nexus moves beyond simple 2D map tracking. It provides a cinematic, 3D immersive experience that combines real-time vessel telemetry with AI-driven risk analysis. The platform aggregates data from satellite tracking (AIS), global news events (GDELT), and proprietary risk models to give logistics managers a holistic view of their active shipments.

Key Use Cases

1. Real-Time Vessel Tracking:

2. Supply Chain Risk Intelligence:

3. Sustainability Monitoring (Carbon Tracker):

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4. Fleet Management:

3. Implementation Details: How We Built It

We built Nexus Risk Platform using a modern Microservices architecture where the frontend and backend are decoupled but highly integrated.

Phase 1: The Foundation (Backend)

We started by building a robust FastAPI backend to serve as the brain of the operation.

Phase 2: The Experience (Frontend)

The frontend was built with Next.js to ensure high performance and SEO optimization.

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Phase 3: Data & Polish

- Hybrid Data Strategy: We designed the system to be resilient. It prioritizes real-time data (AISStream), falls back to the database (Supabase) if the stream is quiet, and uses high-fidelity simulation for demonstration purposes when no live data is available.

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Conclusion

Nexus Risk Platform transforms raw data points into a visual, actionable intelligence command center. By combining the speed of FastAPI with the visual power of WebGL and React, we created a tool that is not just functional, but immersive and intuitive for the modern supply chain professional.