Blog Post 4: Command & Control: PANTHEON's GIS Interface and UAV Swarm Management

PANTHEON is not just a backend analytical tool; it directly supports field operations and provides intuitive interfaces for command centers.

UAV Swarming Schemes

The platform includes a specialized module for managing drone fleets. Instead of controlling single drones, operators define high-level mission objectives. The **Resource Controller** and **Swarming Schemes** services then calculate safe trajectories, allocate tasks among the swarm, and adapt to dynamic environmental conditions (like no-fly zones or sudden obstacles) using ROS2 and MQTT protocols.

The Operator Interface

The User Interface (UI) is a GIS-based 2D map providing a unified operational picture. Key features designed for high-stress environments include:

- **Role-Based Views:** A firefighter sees different priority data than a medical responder.
- **Temporal Navigation:** An icon allowing operators to navigate back and forth in simulation time to assess the potential long-term impacts of current decisions.
- **Interactive Deployment:** Operators can "drag and drop" virtual assets (e.g., a fire truck or drone swarm) onto the map to test how their deployment might alter the crisis trajectory in the simulation.