

## Designed and built an MSP automation platform: 90+ tool orchestrators behind one portal

Solo design, build, and operation · In production, internet-facing · Role: architect, developer, operator

**Outcome:** A single FastAPI application mounting ~240 API routers across 90+ admin tool orchestrators, fronted by a tabbed single-page portal, deployed in Docker behind a zero-trust tunnel - run by one person.

### The Situation

MSP-style administration means dozens of small tools - monitoring, ticketing, network audit, compliance checks, training - that normally live in dozens of browser tabs and shell histories. The goal: one platform, one login, every tool a tab, every tool an API.

### What Was Built

- **Backend:** Python/FastAPI application mounting ~240 routers, each tool packaged as an orchestrator class + REST router with consistent status/dashboard endpoints; failures isolated so one broken module never takes down the platform.
- **Auth:** JWT with three permission tiers, login lockout, and tier-enforcement middleware on every API route.
- **Frontend:** single-page portal (Alpine.js + Tailwind) with hundreds of components - dashboards, an integrated training system with 25 certification paths, interactive games and visualizations.
- **Storage:** SQLite tuned for concurrent access (WAL mode, busy timeouts) across ~80 modules.
- **Deploy:** Docker Compose (API + nginx) on a dedicated host behind a Cloudflare Tunnel - no inbound ports exposed; volume-mount deploys so code ships with a git pull and restart, no rebuilds.
- **Quality:** a 17-phase Playwright verification suite drives the live portal - login flows, every tab, API health, content integrity, responsiveness - before changes ship.

### Results

- In production and internet-facing today, operated solo.
- Platform survives module failures gracefully by design - broken tools degrade, never crash the host application.
- Automated browser verification catches regressions a human reviewer would miss.

### Stack & Methods

**Stack:** Python · FastAPI · Alpine.js · Tailwind · SQLite (WAL) · Docker Compose · nginx · Cloudflare Tunnel · JWT auth · Playwright