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IPA Academy LMS Case Study

Production Learning-Management Platform: From Architecture to Operations

Live Production: www.ipaegy.com

Tech Stack: Next.js 15 · NestJS · PostgreSQL · Prisma · Redis · Docker · Nginx · Cloudflare

1. Overview

A complete, bilingual (Arabic / English) learning-management system built and deployed as a solo full-stack engineer. The platform serves a professional training institute and replaces a legacy site with a modern, secure, self-hosted system featuring a marketing front-end, a secure e-learning module, and a full administrative dashboard.

2. The Architectural Challenge & Solution

The requirement was a highly reliable, easily manageable system without needing a dedicated internal DevOps team. The solution involved owning the build entirely from the PostgreSQL schema design (~50 tables) to hardening the production Linux server for resilient, automated operations.

3. Key Engineering Highlights

- **Production-Grade DevOps:** The entire application stack is containerized using Docker and deployed on a provisioned, hardened Linux server. The deployment features an Nginx reverse proxy, automated Let's Encrypt TLS, and a strict CDN setup.
- **Automated Disaster Recovery:** Automated, nightly off-site PostgreSQL database backups are configured with a strict retention policy, ensuring business continuity without manual intervention.
- **Safe Schema Evolution:** A disciplined database migration pipeline runs against live production data, utilizing transactional, additive-only changes to ensure zero-downtime and zero-data-loss schema evolution.
- **Security & Data Protection:** A pre-launch security audit closed high-impact data-exposure vectors, alongside implementing strict role-based access control (RBAC) across the API before going live.