

Deployment Analysis Report

Positeasy Clone - Canteen Automation Ecosystem

1. Infrastructure Analysis & Resource Requirements

The system follows a Hub-and-Spoke architecture with a central Java backend and three React frontends.

Backend (Java 17 / Spring Boot):

- CPU: 4 vCPUs recommended for high-concurrency request processing.
- RAM: 8GB RAM is the critical baseline to avoid Out-Of-Memory (OOM) crashes during peak hours.

Database (PostgreSQL):

- High-performance NVMe SSD is essential to prevent I/O bottlenecks, especially during daily archival tasks.
- Recommended: 2 vCPUs / 4GB RAM.

Frontends (React/Vite):

- Purely static assets; should be served via a Global CDN for low latency.

2. Deployment Options

Option A: The Managed Powerhouse (GCP/AWS)

Best for Enterprise reliability and automatic scaling. Use Cloud Run/Fargate for Backend, Managed SQL for DB, and S3/CloudFront for Frontends. Pros: Highest reliability. Cons: Highest cost.

Option B: The Developer's Balance (DigitalOcean/Railway)

Recommended. Best balance of cost, ease of use, and stability. Use Premium Droplets (4vCPU/8GB) and Managed PostgreSQL. Frontends on Vercel/Netlify. Pros: Predictable pricing, fast setup.

Option C: The Budget Optimizer (Hetzner/OVH)

Best for minimum cost. Single powerful VPS hosting both API and DB via Docker Compose. Frontends on Cloudflare Pages. Pros: Lowest cost. Cons: High maintenance burden.

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3. Comparison Matrix

Dimension	Option A	Option B	Option C
Monthly Cost	High (~\$150+)	Medium (~\$60-90)	Low (~\$20-40)
Setup Effort	Medium	Low	High
Scalability	Automatic	Manual/Vertical	Manual/Vertical
Reliability	99.99%	99.9%	Moderate
Maintenance	Near Zero	Low	High

4. Operational Strategy

CI/CD Flow: GitHub Actions -> Maven/Vite Build -> Docker Image -> Rolling Update.

Security:

- Secret Management: Use environment variable managers; never commit .env files.
- CORS Strategy: Set APP_CORS_ORIGINS to allow only the three specific production frontend domains.
- Backups: Automated daily snapshots via managed database providers.

Monitoring: Implement Spring Boot Actuator to monitor JVM heap and thread counts in real-time.