# Railway Deployment Best Practices - Muscles AI Fitness

## Optimized Configuration for Railway

This document outlines the best practices implemented to ensure successful deployment on Railway.

### Key Improvements

1. **Memory Optimization**
   * Set NODE\_OPTIONS=--max-old-space-size=512 to respect Railway’s memory constraints
   * Optimized Vite build process with chunk splitting and minification
   * Removed source maps in production builds
   * Added production pruning of dev dependencies
2. **Build Process Improvements**
   * Enforced Node.js v20 usage via .nvmrc and package.json engine field
   * Set consistent pnpm configuration via .npmrc
   * Optimized build command to use production mode explicitly
   * Added chunk splitting for better loading performance
3. **Deployment Configuration**
   * Reduced healthcheck timeout from 300s to 120s for faster failure detection
   * Added healthcheck interval configuration
   * Changed restart policy from “always” to “on-failure” with max retries
   * Added engine constraints to ensure compatible Node.js version
4. **Package Management**
   * Enforced pnpm as the package manager
   * Added hoisted node linking for better compatibility
   * Locked dependency resolution to highest mode
   * Set up auto peer dependency installation
5. **Vite Optimizations**
   * Environment-based configuration for development vs production
   * Improved chunk splitting strategy
   * Disabled sourcemaps in production
   * Set sensible asset inlining limits
   * Configured proper port binding for Railway

### Railway.json Configuration

{  
 "$schema": "https://railway.app/railway.schema.json",  
 "build": {  
 "builder": "nixpacks",  
 "buildCommand": "pnpm install --frozen-lockfile && pnpm build:prod"  
 },  
 "deploy": {  
 "startCommand": "pnpm start",  
 "healthcheckPath": "/",  
 "healthcheckTimeout": 120,  
 "healthcheckInterval": 10,  
 "restartPolicyType": "on-failure",  
 "restartPolicyMaxRetries": 5  
 },  
 "environments": {  
 "production": {  
 "variables": {  
 "NODE\_ENV": "production",  
 "PORT": "3000"  
 }  
 }  
 }  
}

### Nixpacks.toml Configuration

[phases.setup]  
nixPkgs = ['nodejs\_20', 'pnpm']  
aptPkgs = ['build-essential']  
  
[phases.install]  
cmds = [  
 'pnpm config set node-linker hoisted',  
 'pnpm install --frozen-lockfile'  
]  
cacheDirectories = ['.pnpm-store']  
  
[phases.build]  
cmds = ['pnpm build:prod']  
cacheDirectories = ['node\_modules/.cache']  
  
[start]  
cmd = 'pnpm start'  
dependsOn = ['build']  
  
[variables]  
NODE\_ENV = 'production'  
PORT = '3000'  
NODE\_OPTIONS = '--max-old-space-size=512'

### Package.json Scripts

"scripts": {  
 "dev": "vite",  
 "build": "tsc -b && vite build",  
 "build:prod": "NODE\_ENV=production tsc -b && vite build",  
 "lint": "eslint . --ext ts,tsx --report-unused-disable-directives --max-warnings 0",  
 "preview": "vite preview --host 0.0.0.0 --port ${PORT:-3000}",  
 "start": "vite preview --host 0.0.0.0 --port ${PORT:-3000}",  
 "type-check": "tsc --noEmit",  
 "postinstall": "[ \"$NODE\_ENV\" = \"production\" ] && pnpm prune --prod || echo 'Skipping production pruning'"  
}

## Troubleshooting Common Issues

### Memory-Related Errors

* If encountering OOM (Out of Memory) errors, check for:
  + Large dependencies that can be optimized
  + Memory leaks in the application
  + Build process consuming too much memory

### Build Failures

* Ensure the build command is executable in a clean environment
* Verify that all dependencies are properly declared in package.json
* Check for type errors that might be failing the TypeScript compilation

### Runtime Errors

* Inspect the application logs for runtime errors
* Ensure all required environment variables are properly set
* Verify that the start command correctly serves the built application

## References

* [Railway Documentation](https://docs.railway.app/)
* [Nixpacks Documentation](https://nixpacks.com/docs)
* [Vite Deployment Guide](https://vitejs.dev/guide/static-deploy.html)
* [pnpm Best Practices](https://pnpm.io/best-practices)

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