

React Doctor – Full Proposal

1. Project Idea Explanation

React Doctor is a performance analysis tool for React applications. It detects slow components, unnecessary re-renders, and provides clear optimization suggestions. Unlike existing tools, React Doctor also integrates networking insights to give a complete picture of app performance. Developers can see actionable recommendations, improving efficiency and reducing debugging time.

How React Doctor Works

1. Run the app with React Doctor CLI: `npx react-doctor analyze`.
2. React Doctor monitors component renders in real-time.
3. Tracks network requests, including latency and payload sizes.
4. Generates a detailed report with slow components, network bottlenecks, and suggestions.
5. Optionally, view results in a visual dashboard with timelines and heatmaps.

The Problem

React developers often spend hours debugging slow components and network issues. Current tools like React DevTools show numbers but don't provide actionable guidance. Teams need a tool that diagnoses both frontend and network performance issues efficiently.

Project Development Phases

- Phase 1: MVP CLI tool for component profiling and basic network logging (3 weeks).
- Phase 2: Visual dashboard with timelines and heatmaps (1 month).
- Phase 3: Advanced features including network throttling simulation and static analysis (1-2 months).
- Phase 4: Chrome Extension or VS Code plugin for real-time suggestions (optional).

Feature	Description
Component Profiling	Track unnecessary re-renders and slow components
Basic Network Logging	Track API requests, latency, and payload sizes
Report Generation	PDF/JSON reports with actionable suggestions

2. Networking Features

Adding networking features enhances React Doctor by providing insights into API performance and app behavior under different network conditions. These features allow developers to identify slow endpoints, duplicate calls, large payloads, CORS issues, and simulate slow or offline networks.

1. Network Request Logging: Track API calls, latency, and response sizes.
2. Duplicate API Call Detection: Identify repeated requests that can be cached.
3. Slow Endpoint Warnings: Highlight APIs that exceed latency thresholds.
4. Large Payload Detection: Suggest compression or pagination for big responses.
5. CORS and HTTPS Checks: Detect security or cross-origin issues.
6. Network Throttling Simulation: Test app behavior under 3G/4G/offline conditions.
7. Offline Mode Testing: Verify PWA or error handling support.
8. Retry Logic Analysis: Detect excessive automatic retries.
9. Network Timeline Dashboard: Visualize component render → API request → response → UI update.
10. API Dependency Map: Show which components depend on which APIs.
11. API Failure Tracking: Log failed requests with status codes and messages.
12. Alerts & Notifications: Optional email or Slack alerts for critical errors.

Final Vision

React Doctor provides a complete performance monitoring solution for React applications, combining both component and network analysis. It saves time, improves code quality, and can evolve into a visual dashboard or browser extension for real-time insights. With networking features, developers gain a full understanding of what slows down their app and how to fix it efficiently.