

# Log File Analysis Report

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## 1. Observations

During the log file analysis, several key points were observed:

- A high number of failed requests, especially with 4xx (client errors like 404 Not Found) and 5xx (server-side issues like 503 Service Unavailable).
- Peak times showed increased error rates, indicating potential system overload.
- Repeated requests from the same IP suggest bot activity or possible brute force/DDoS attacks.
- Certain endpoints or files were slow to process, affecting response time.
- A noticeable amount of redirects (301/302), which may require URL structure optimization.

## 2. How to Reduce Failures

- For 4xx Errors:
  - Review and update all internal links and resources.
  - Create custom error pages to guide users properly.
  - Ensure proper access control to avoid unauthorized requests.
- For 5xx Errors:
  - Optimize server performance and handle high-load times with better resource management.
  - Use monitoring tools to proactively detect and resolve backend issues.
  - Implement protection tools like Fail2Ban and Cloudflare to block malicious traffic.

## 3. Suggestions to Improve System and Performance

- Monitoring & Analysis:
  - Use real-time monitoring tools like ELK Stack, Prometheus, and Grafana.
  - Set up automated alerts for error spikes or abnormal traffic patterns.
- Log Management:
  - Implement log rotation to manage file size and readability.
  - Use a structured and parse-friendly log format like JSON.
- Performance Optimization:
  - Use caching to reduce database load and improve speed.
  - Optimize backend code and reduce heavy queries
- Fine-tune server settings like KeepAlive and enable compression (e.g., GZIP).