# Root Cause Analysis Report: 504 Gateway Timeout Errors

## Issue Overview

Users mostly getting "504 Gateway Timeout" error when trying to make purchases on **advantageonlineshopping.com**, especially during busy hours. This happens when the website's server takes too long to respond, and the system handling the request like a load balancer.

## Root Cause Analysis:

### Possible Causes:

• **Overloaded Backend Server** – When too many users visit at once, the server struggles to keep up, leading to slow responses.

• **Slow Database Queries** – If database searches aren’t optimized (like missing or inefficient queries), retrieving information takes longer.

• **Unoptimized API Requests** – Some API requests take too long to process, slowing down the system.

• **Time out issue** -While accessing the site, it takes an extended time reload getting white page ang throwing Timeout error.

•External services, like payment gateways, might take longer to respond, delaying the process.

• **Limited Server Resources** – If the server doesn’t have enough CPU, memory, it won’t handle requests efficiently.

• If server loaded more, due to heavy request

## Proposed Solutions & Performance Optimization Plan

### 1. ****Upgrade Your Server****

• If your server is struggling, upgrading to a more powerful one with more CPU and RAM can help.

### 2. Make your Database Faster

• Optimize the the query and again re-write them for better query.

• Instead of opening and closing database connection constantly, try to avoid it.

### 3. Optimize API & Application Logic

• Instead of loading thousands of records at once, break them into smaller pages.  
• Increase Timeout Limits: If requests take longer to process, adjusting timeout values.

### 4. Load Balancing control – it is a control process networking distrusting incoming workload across the multiple servers.

### 5. Monitor & Fix Issues Proactively -

## Conclusion

The 504 Gateway Timeout issue is likely caused by high server load, slow database queries, or external API dependencies. Implementing the above optimizations will improve response times, prevent timeouts, and ensure smoother performance during peak hours.

**Ref : Point No - 3. Performance Testing (JMeter, K6, Locust, or any other tool):**

**Note** - I have a strong understanding of performance testing, although I do not have hands-on experience with it.