CASE STUDY

Is scaling always the right answer? Insights from Performance Testing with JMeter

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When an application faces heavy traffic, the first thought could be: **"Let's add more servers or resources!"** While this can sometimes help, it's not always the best solution.

My recent performance testing experiment with **JMeter** discloses that while scaling can improve some issues. In fact, it may hide the real problems into the system..

Let's look at why simply adding resources (scaling) is not enough what you can do to fix performance issues properly.

What is Performance Testing?

Performance testing is like giving your app a performance/load/stress test to see how it performs when many users using it at the same time.

- **Response Time:** How rapidly the app responds to a user.
- **Error Rate:** How frequently does the app fail to respond correctly.
- **Throughput:** How many requests the app can handle /per second.

Why Do We Add Resources (Scale)?

When performance issues appear, many teams first thought may be: **“Let’s add more servers to handle the load!”** which means:

- Adding servers/machines.
- Increasing the no. of containers/pods in Kubernetes.
- More CPU, memory/ storage to the app.

Scaling can help the app handle more users, but it’s not a magic fix for every problem.

Why Scaling Isn’t Always the Solution

Here are some reasons why scaling/adding resource (e.g., more servers or pods) doesn’t solve all performance issues

1. The real problems remain disappeared/hidden

Adding resources doesn’t fix bad code, slow database queries, or poor app design. These problems will still exist, even with more resources.

2. Shared resources turn into overloaded

Even if your app has more servers, it still depends on shared resources like databases or caches. If those can’t keep up, the system will still slow down.

3. It costs a lot

Scaling means spending more money on infrastructure, and if the app isn’t fixed, it’s like pouring water into a leaking bucket—wasteful and expensive.

4. Errors multiply

If the app has issues, like bugs/authentication errors, adding more resources can make the problem worse by spreading it across more servers.

A Better Approach: Fix First, Scale Later

Instead of scaling right away, focus on improving the system’s efficiency. Here’s how:

Instead of just adding more resources, try these steps to improve your app:

1. Optimize code and database query

- Identify the slow parts of the code and improve them.
- Use database indexing to make faster.

2. Use caching

- Use caching to save frequently-used data in tools like Redis or Memcached.
- This reduces the load on the database and speeds up responses for users.

3. Monitor your app

- Use tools like Grafana or Prometheus to see where the system is slow or failing.·
- Look at metrics like memory usage, request latency, and database performance.

4. Fix errors under load

- Investigate why it fails/errors when the app is busy and fix those issues.
- Add retry systems to handle temporary failures better.

5. Balance the load

- Use load balancers to spread traffic evenly across the servers or pods.

CPU, memory, or custom metrics (e.g., request latency).
- Be careful not to set over-scale—set limits to avoid wasting resources.

When to Scale

Scaling is useful when the app is already well-optimized, but traffic is genuinely too high to handle. For example:

- During busy/peak times (e.g., during a product launch or a live event)
- When the app's user base grows steadily over time.

In these cases, scaling works best when combined with proper optimization to avoid overspending or worsening existing issues.

Conclusion: Think Before You Scale

Scaling is useful, but it's not the first step to solving performance issues. Start by improving your app's code, database, and overall architecture. Once the system is efficient, you can scale to meet growing demand without wasting resources or money.

What's Your Experience?

Have you faced performance issues in your projects? How did you resolve them? Share your experiences and tips in the comments below—we'd love to hear from you.

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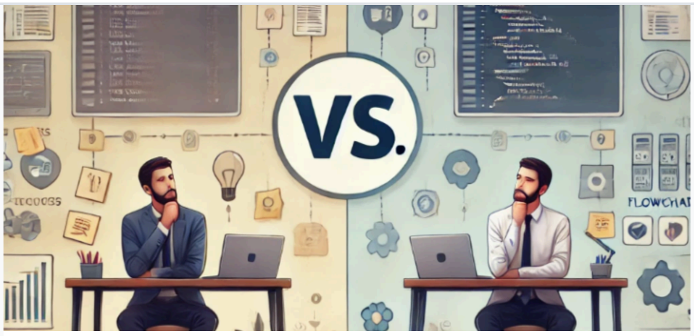

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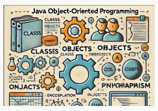

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