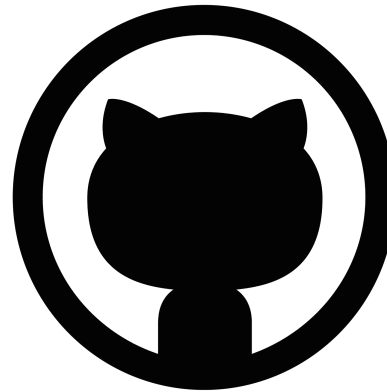


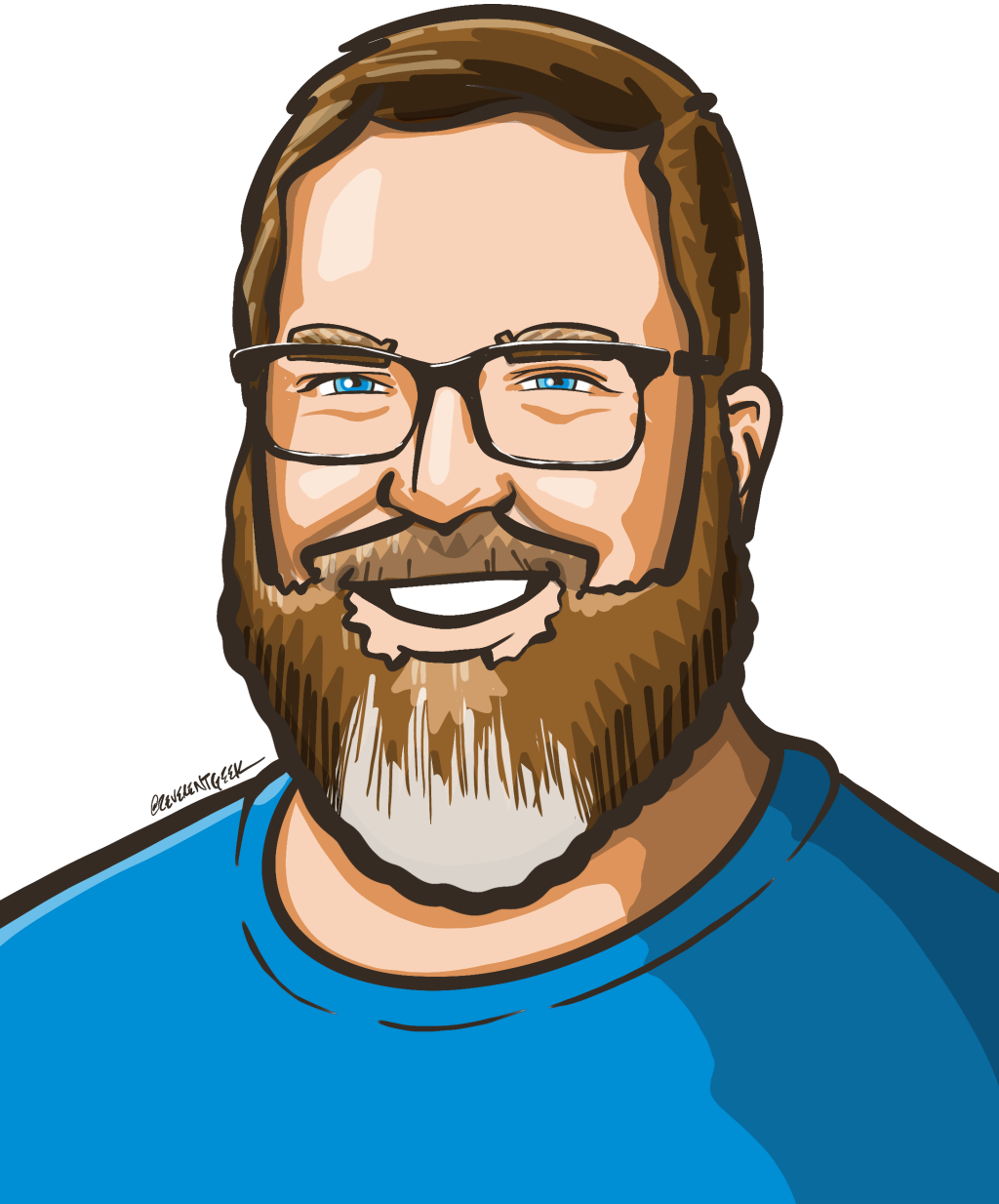
Continuous Load Testing with GitHub Actions



Chris Ayers



<https://github.com/Codebytes/load-testing>



Chris Ayers

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 GitHub: [Codebytes](https://github.com/Codebytes)

 Mastodon: [@Chrisayers@hachyderm.io](https://hachyderm.io/@Chrisayers)

 ~~Twitter: @Chris_L_Ayers~~

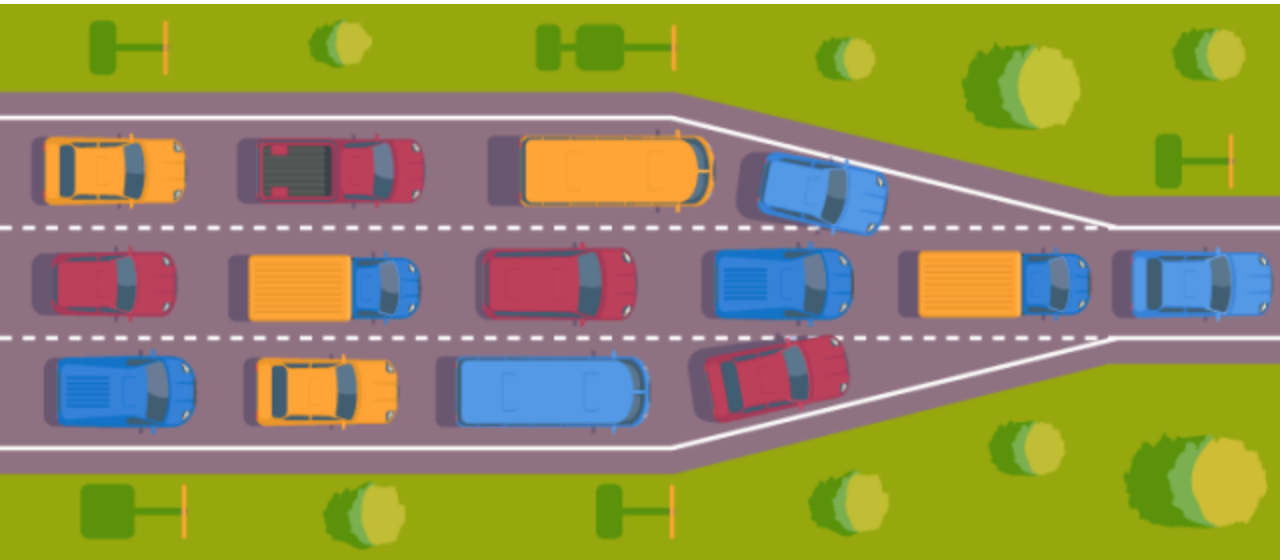
Agenda

- **What is Load Testing?**
- **What is JMeter?**
- **Infrastructure as Code (IaC) and Continuous Load Testing**
- **Benefits of Shift-Left Load Testing**
- **Conclusion and Q&A**

What is Load Testing?

Evaluating an application, system, or network performance under *specific load conditions* or *increasing levels of load*





Load Testing

- Helps identify bottlenecks
- Ensure reliability
- Verify capacity

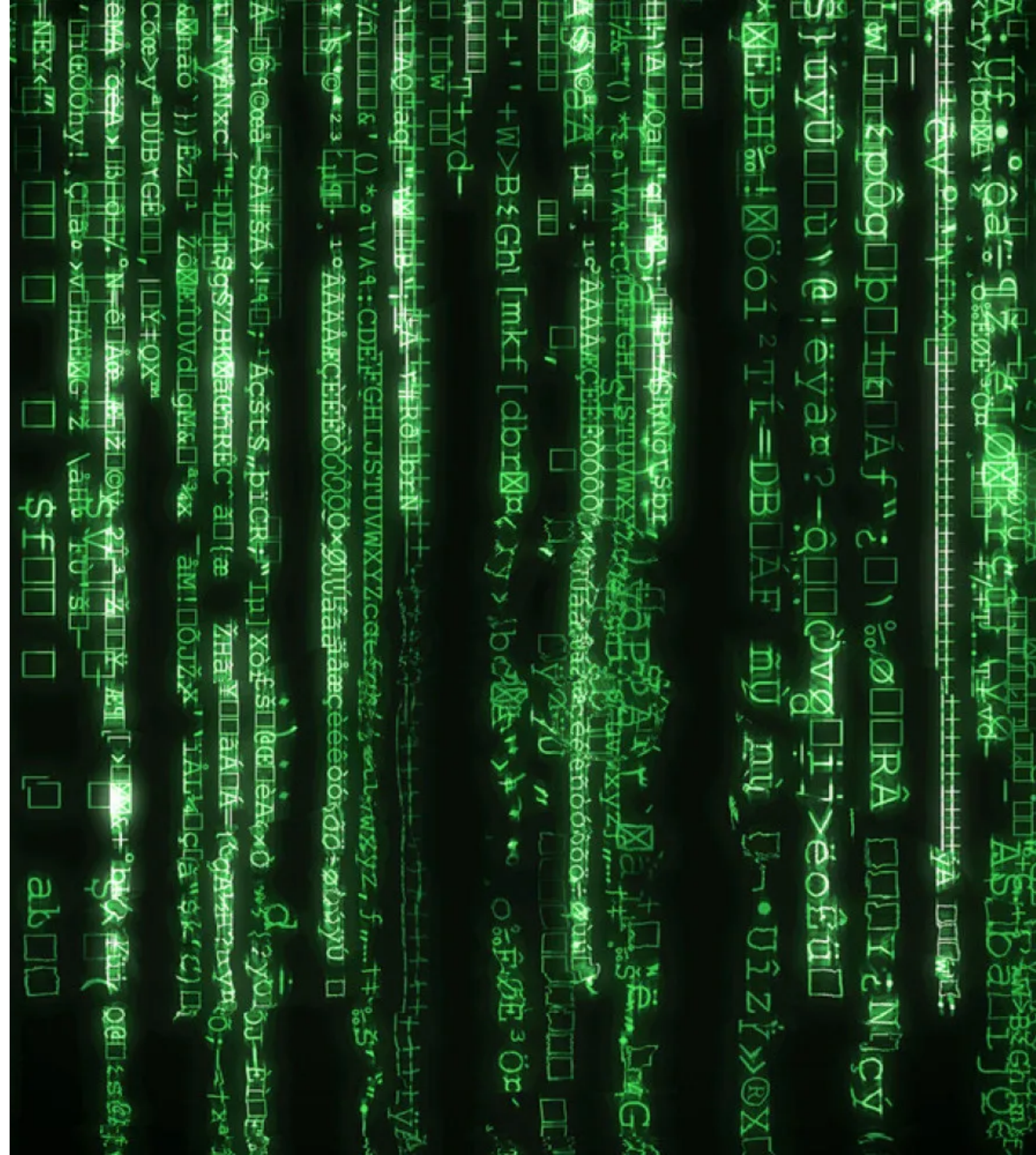
PERFORMANCE IS EVERYWHERE



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Simulated Traffic

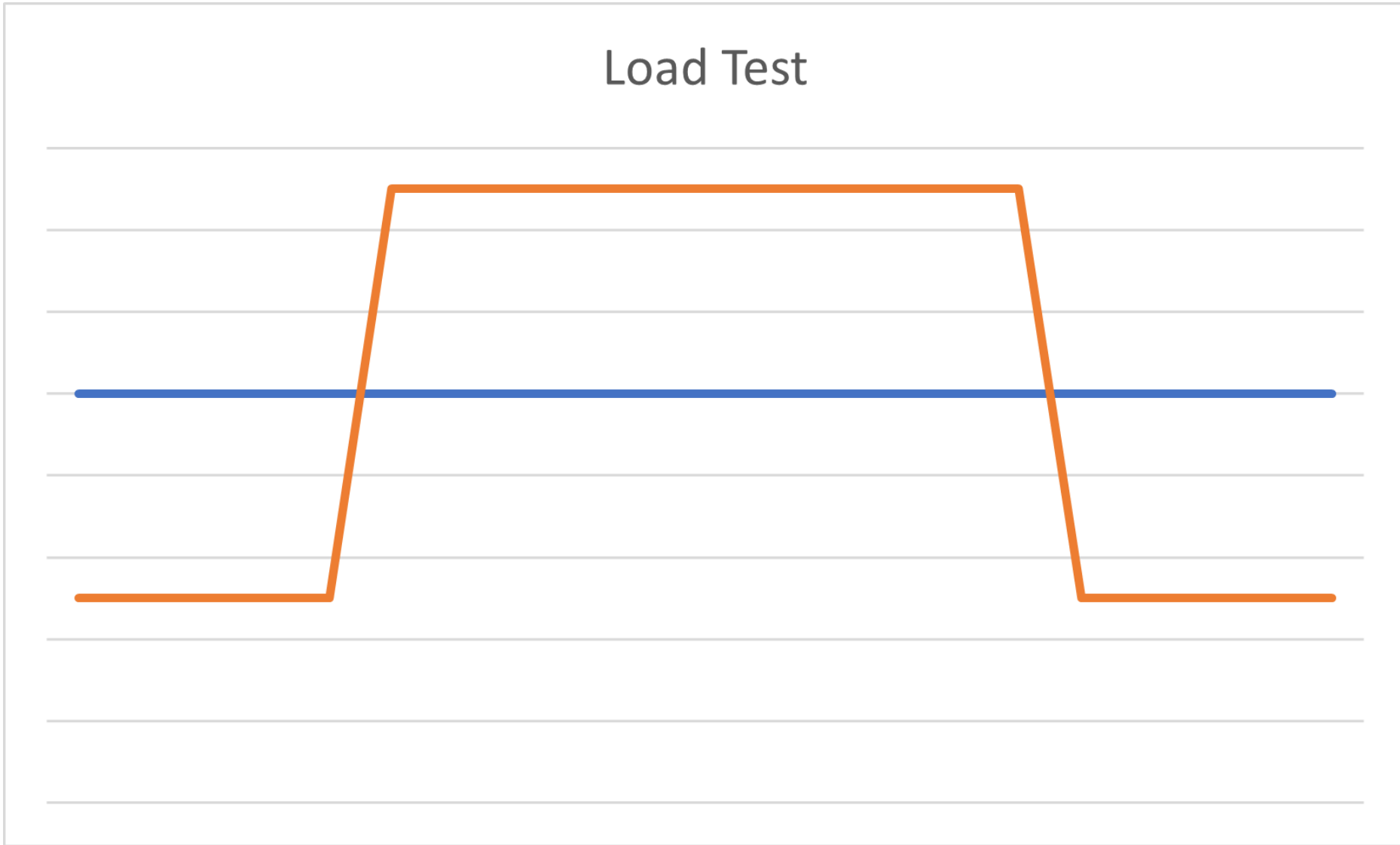
Involves simulating real-world usage scenarios and gradually increasing load to observe system behavior



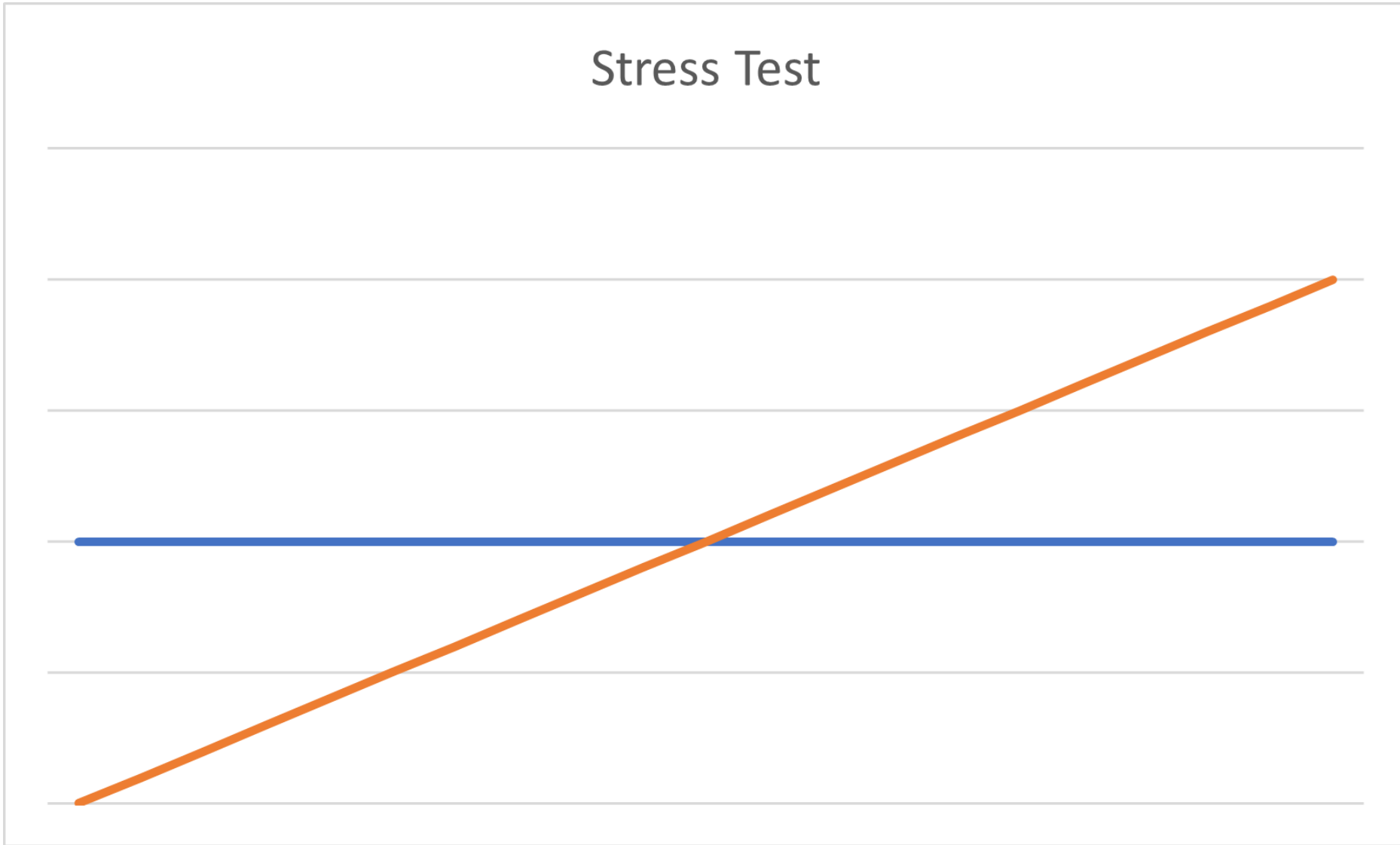
Types of Load Tests

There is nuance in the types of load tests

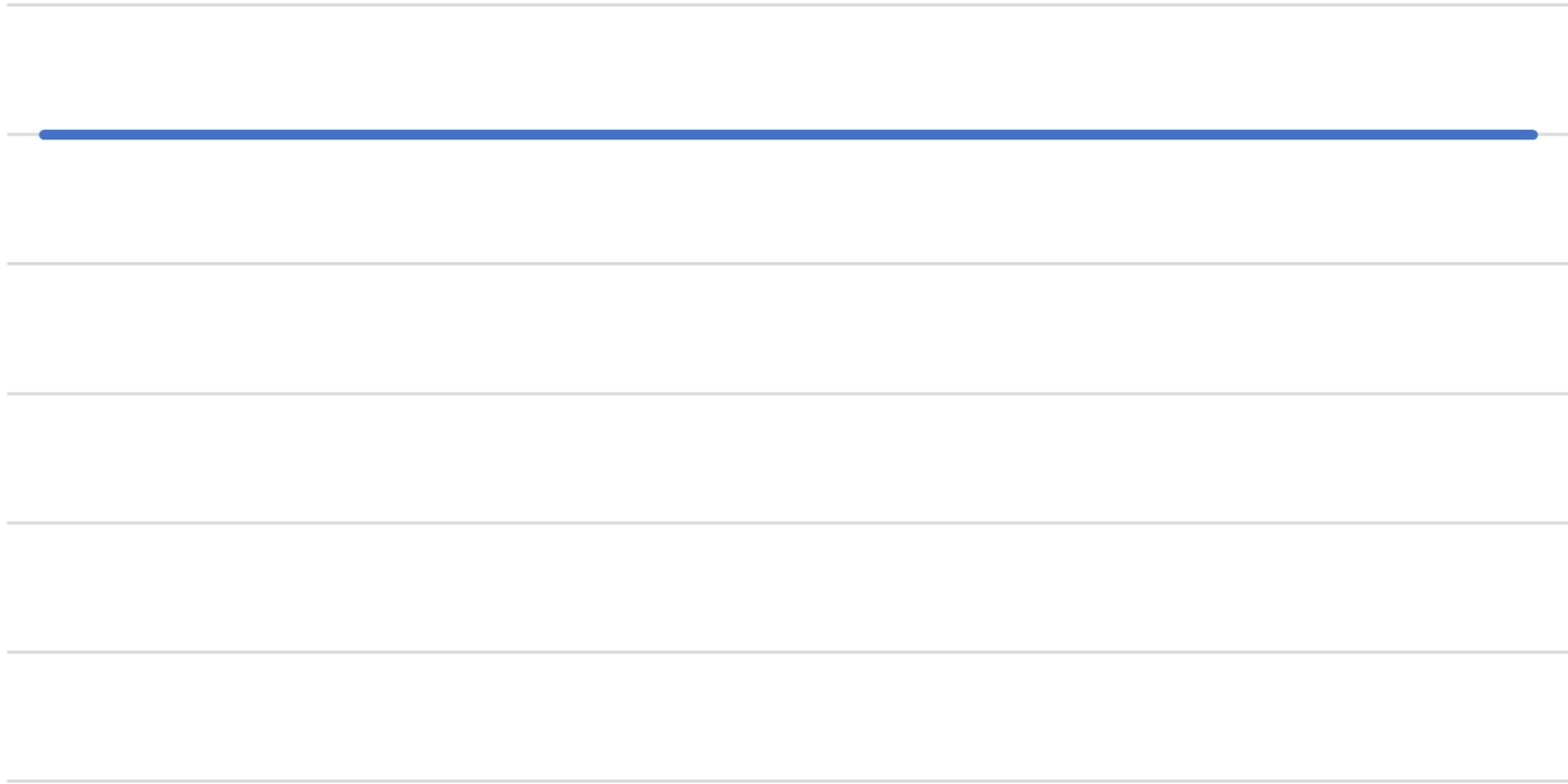
Load Test



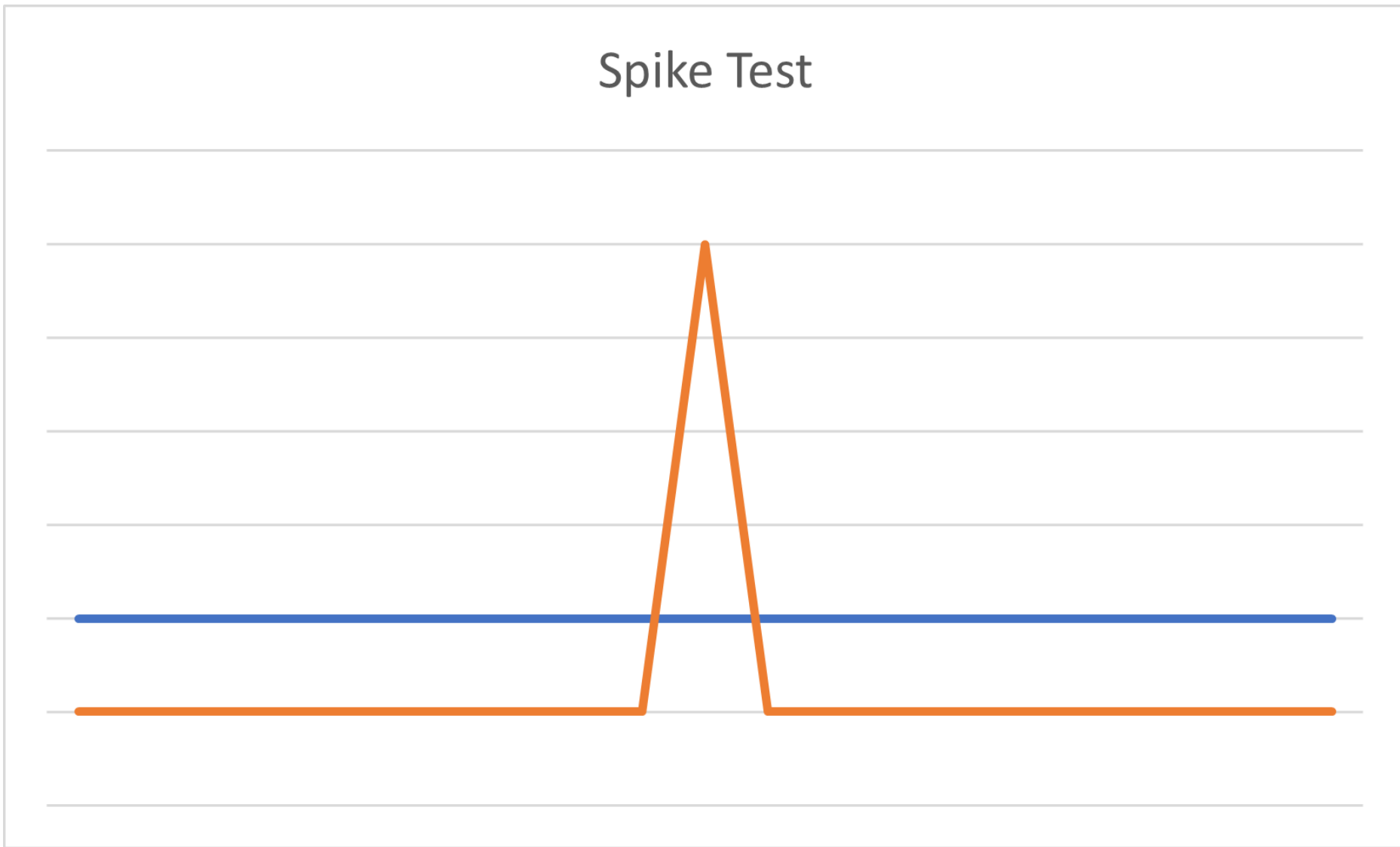
Stress Test



Soak Test



Spike Test



Key Concepts of Load Testing

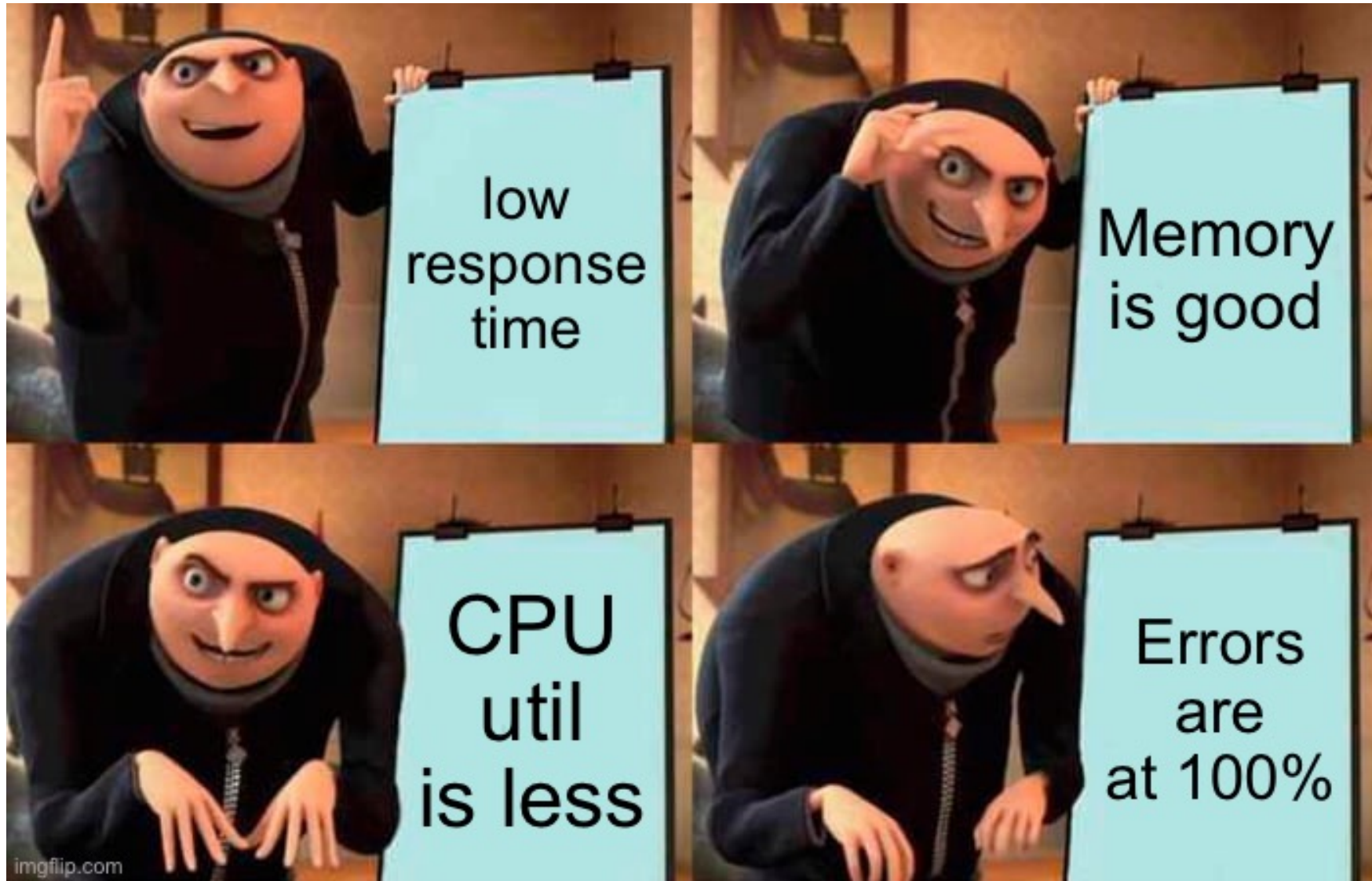
- **Virtual users:** Simulate concurrent connections to mimic real-world user traffic
- **Ramp-up time:** Time taken to reach the full number of virtual users
- **Response time:** Time from sending a request to receiving the last response
- **Latency:** Time from sending a request to receiving the first response

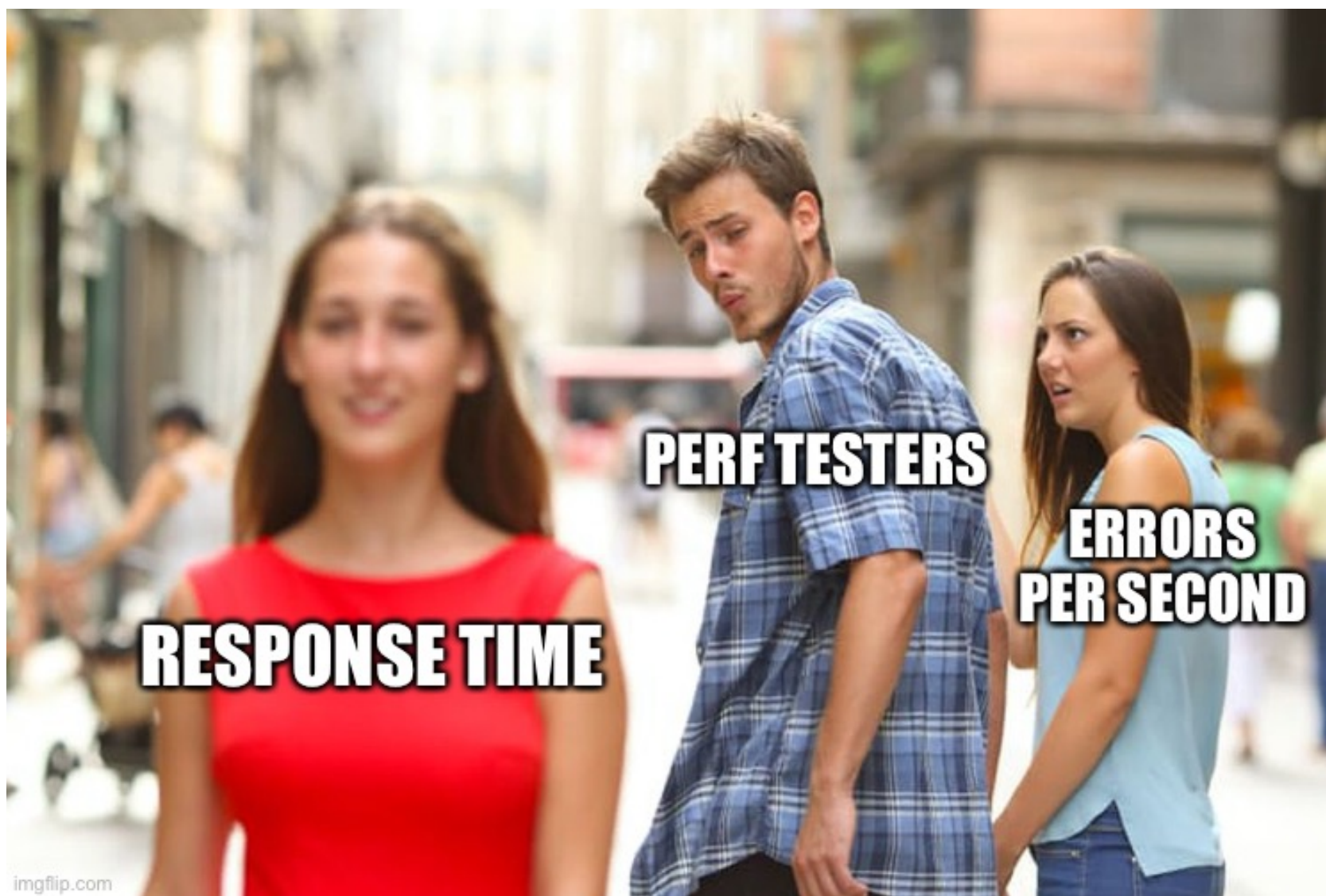
Key Concepts of Load Testing

Requests per second (RPS): Total number of requests generated per second during the test

$$\text{RPS} = (\text{number of requests}) / (\text{total time in seconds})$$

$$\text{Virtual users} = (\text{RPS}) * (\text{latency in seconds})$$





What is JMeter?

- Apache open-source load testing tool
- Java-based and supported on all major platforms
- One of the most popular load testing tools with a large user community



JMeter Capabilities

- Supports a wide range of protocols, including:
 - HTTP
 - SOAP
 - LDAP
 - SMTP
 - JDBC
- Provides an IDE for building and debugging load tests (GUI mode)
- Offers a CLI for executing load tests at scale (non-GUI mode)
- Includes integrated reporting and analysis tools

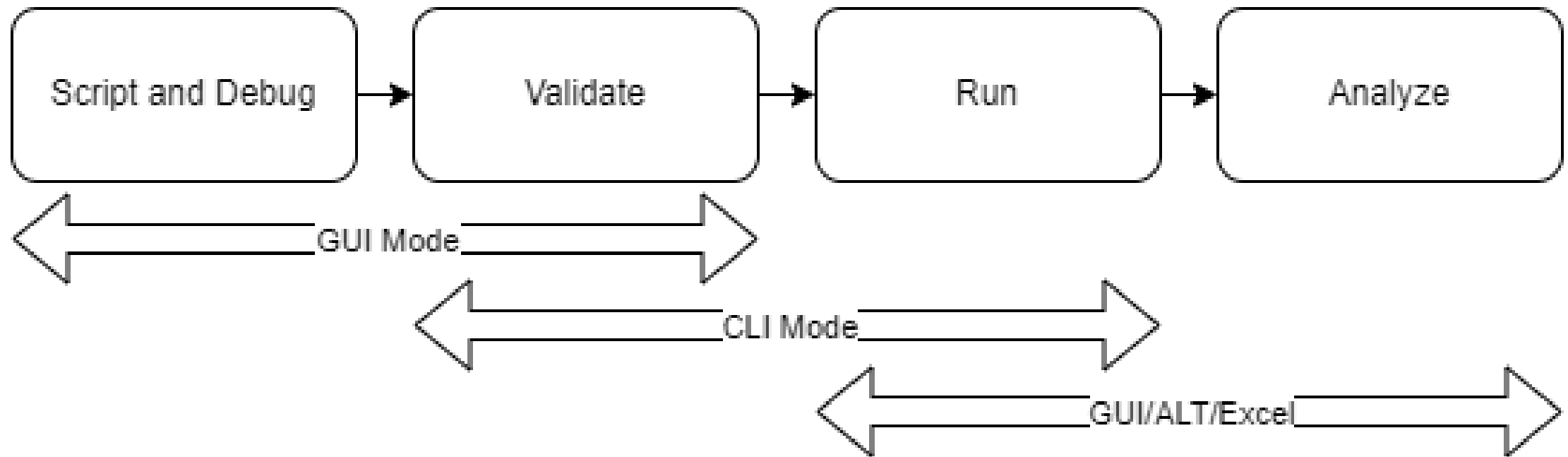
JMeter Limitations

- JMeter does not function as a browser:
 - It cannot execute JavaScript or render HTML/CSS
- As a result, JMeter's response times may not accurately reflect real-world browser response times
- Consider using browser-based testing tools or integrating browser metrics for a more accurate representation of user experience

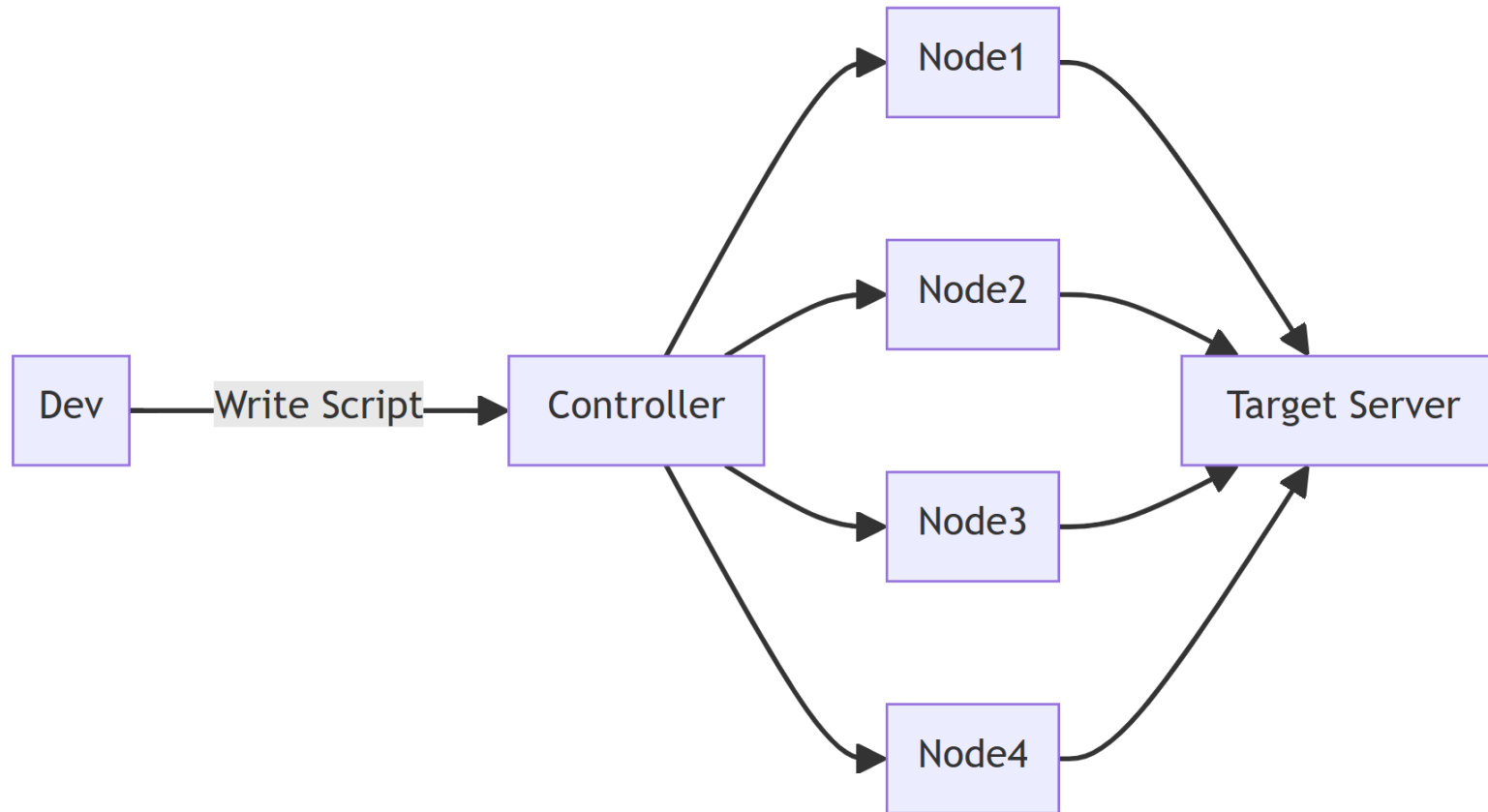
JMeter Workflow

- Plan
- Record/Script/Debug
- Customize parameters and settings
- Validate and run the test

JMeter Workflow: Execution Modes



JMeter Testing Architecture



Manual Testing vs Testing in Pipelines

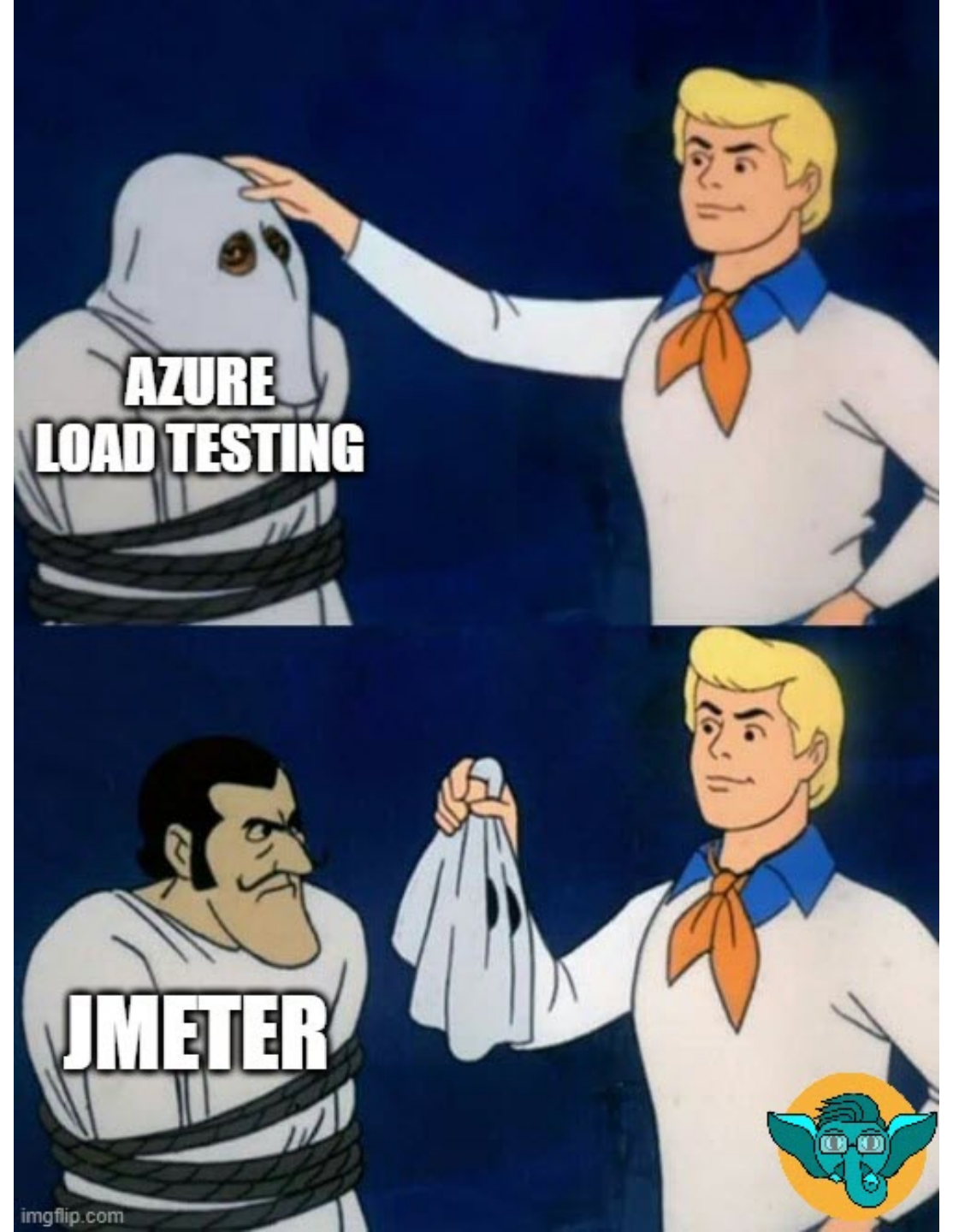
Manual Testing

- Time-consuming
- Prone to human error
- Inconsistent
- Limited scalability

Testing in Pipelines

- Automated
- Consistent
- Scalable
- Integrated with development processes

Azure Load Testing Service w/ JMeter



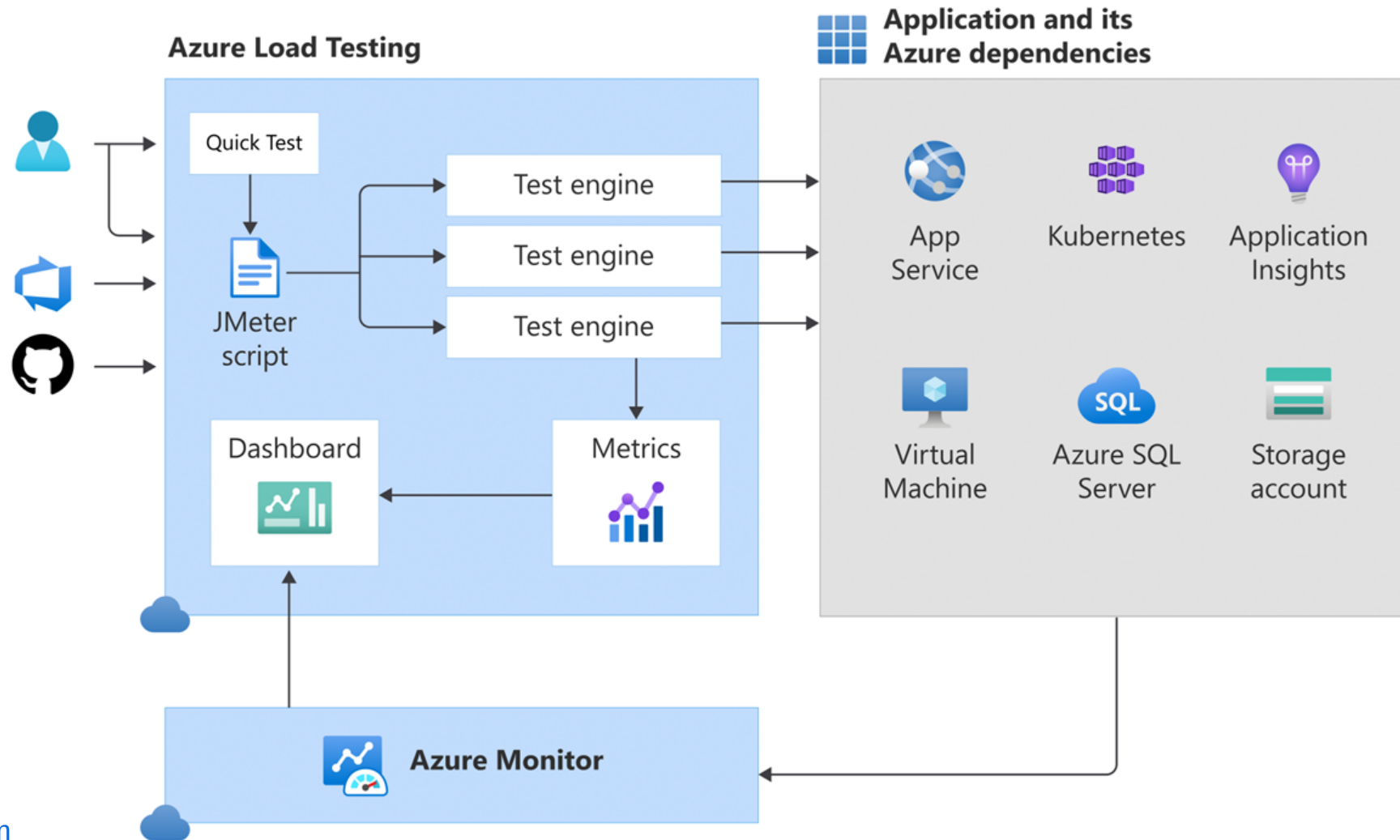
Azure Load Testing Service

- Azure Load Testing Service: Scalable, cloud-based platform for running JMeter tests
- Combines the power of JMeter with the scalability and reliability of Azure

Azure Load Testing Service

- Allows testing of private endpoints
- Provides integrated reporting and analysis tools
- Integrates with Azure Monitor and Application Insights

Azure Load Testing Service



Utilizing Azure Load Testing Service

- Upload JMeter test plan to Azure
- Configure test duration, load pattern, and number of users
- Monitor test progress and analyze results

Load Testing in the Cloud

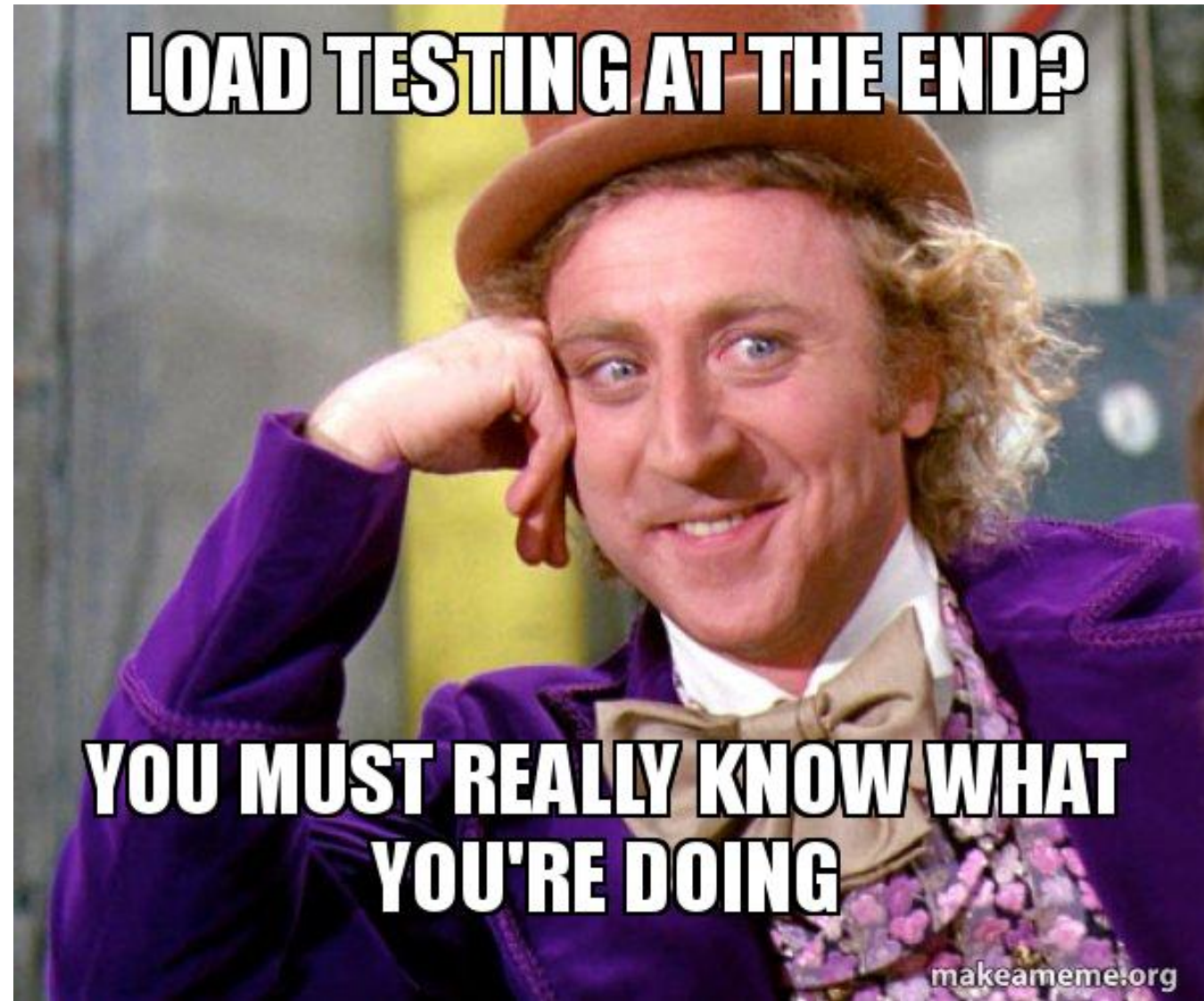
- Control Costs with Ephemeral Environments
 - Infrastructure as Code (IaC)
 - CI/CD Pipelines

Infrastructure as Code (IaC)

- IaC: Managing and provisioning infrastructure through code
- Enhances repeatability, consistency, and scalability
- Popular tools: Terraform, ARM Templates, Bicep Templates

Continuous Load Testing on GitHub Actions

- GitHub Actions: Platform for automation and CI/CD
- Automate load testing as part of your development process
- Run tests against ephemeral environments created using IaC

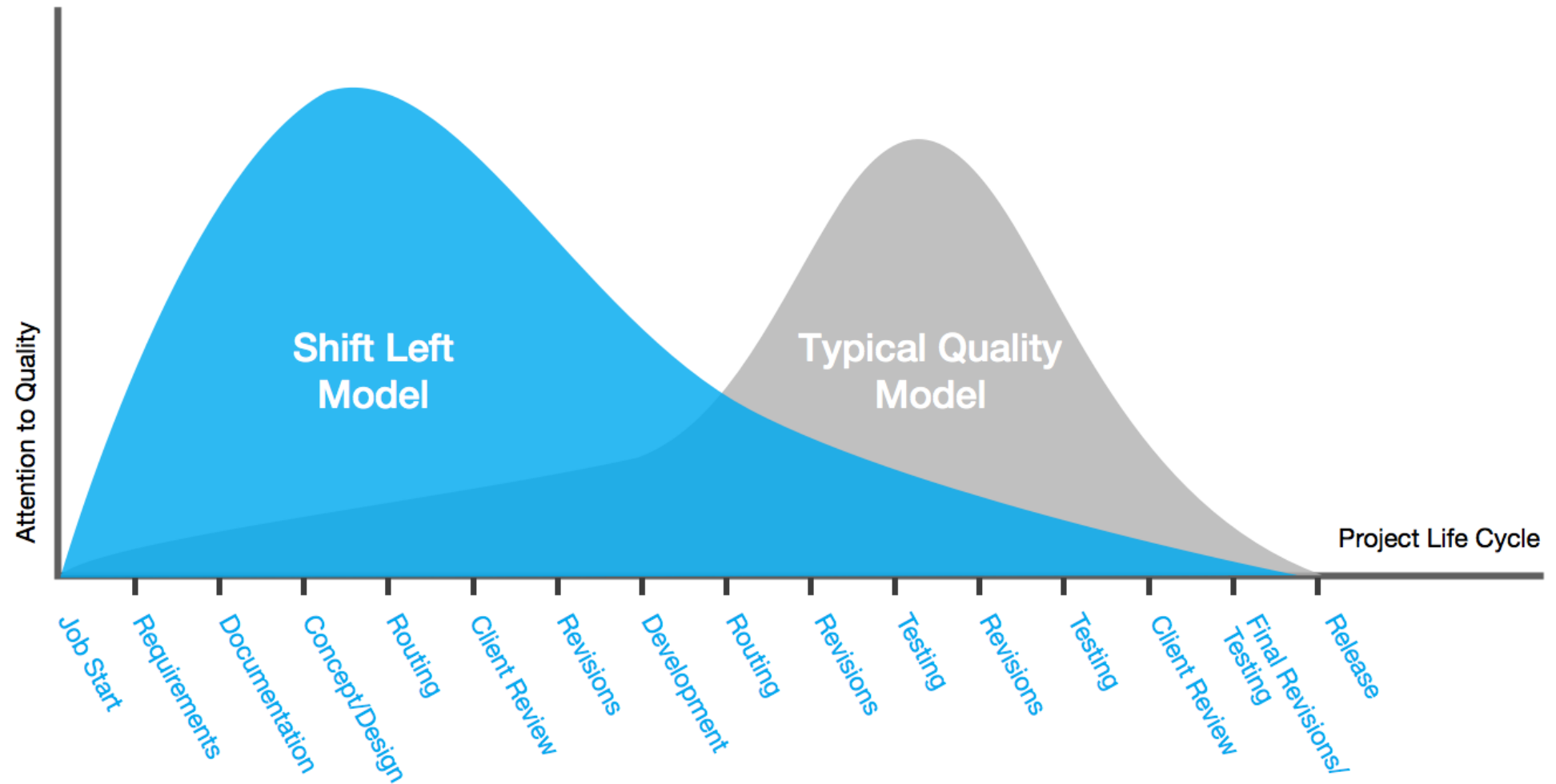


**WHAT IF I TOLD
YOU**

**YOU COULD HAVE BOTH SPEED AND
SAFETY**

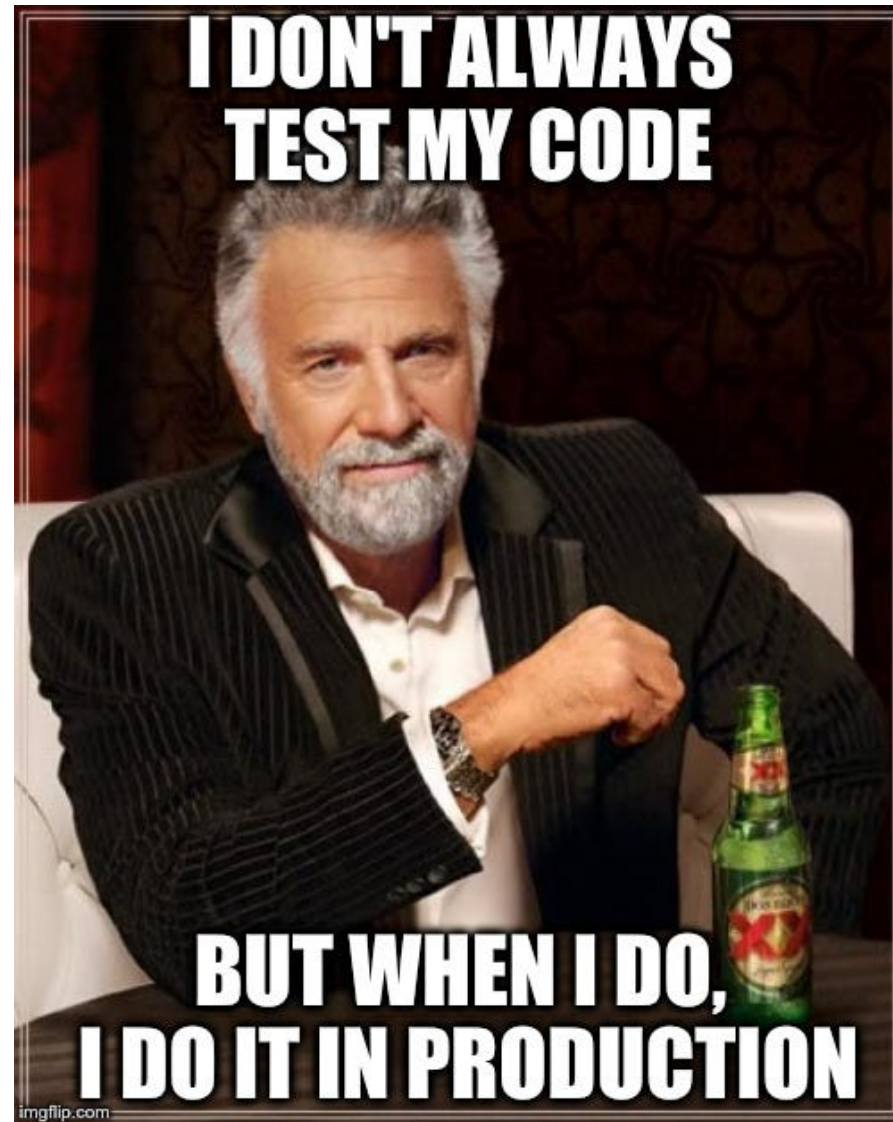
memegenerator.net

Shift Left



Benefits of Shift-Left Load Testing

- Early identification of performance bottlenecks
- Improved collaboration between developers, testers, and operations
- Reduced costs and increased confidence in solutions
- Faster feedback loop and shorter time to market



Demos

Questions



Resources

Links

- [Azure Load Testing](#)
- <https://aka.ms/malt-blogs>
- <https://github.com/codebytes/load-testing>

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