# The Need for Speed: Application Performance Testing with JMeter

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# Prepare for Launch

Important product launch in the making. We need to be prepared.

- How will it perform?
- Will it be reliable?
- What’s the impact on infrastructure?

# Performance Testing

Understanding the behavior of our new product feature.

## Load Test
How many users can we handle and still meet SLA target.

## Stress Test
Identify the breaking point

## Endurance Test
Run for 24 hours and look for degradation

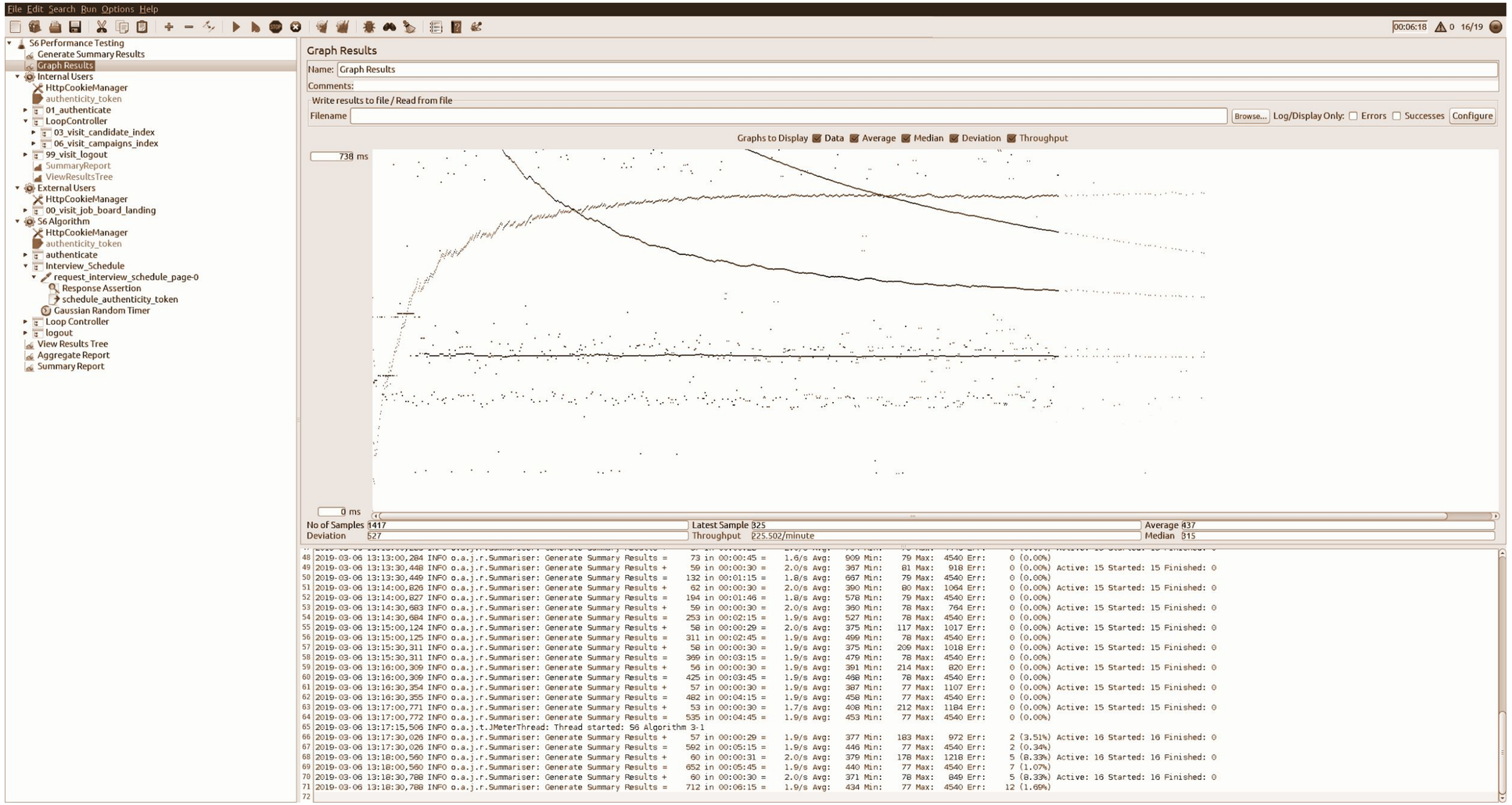
# What is JMeter?

A project maintained by the Apache Software Foundation.

JMeter is an open-source tool used to develop and execute load tests on a variety of protocols and technologies.

JMeter helps us measure and understand performance of our most critical application features.

# JMeter in Action



# Key Features

## Simulates concurrent users

Control the number of virtual users sending requests

## Improved Reporting Capabilities

Automatically generate detailed reports upon test completion

## Headless CLI mode

Run JMeter scripts from the command line

## Distributed mode

Utilize multiple JMeter test clients to simulate high volume of users and unique requests

## Lots of Plugins

Extend testing and reporting functionality

## Test Script Recorder

Record requests and generate a JMeter test plan automatically

# Build a Plan

We'll use the JMeter IDE to construct a basic test plan with key components.

## Thread Groups

Define number of users and ramp-up period

## Samplers

Tells JMeter to send a request and wait for a response.
e.g. HTTP Request Sampler

## Listeners

Provide access to the sampler results.
Show details of sampler requests and responses

# Alterations to Our Plan

Let’s add a few more components.

- **Timers**
  Provide “think time” to simulate delays in between thread requests
- **Assertions**
  Test to make sure we’re getting the correct responses
- **Logic Controller**
  Organize Samplers and specify order and flow

# Authentication

How do we execute our test plans against CSRF protected sites?

## Config Elements

Add a cookie manager to store session information
HTTP Headers

## Post Processor

Extract Regular Expressions
Reuse parsed values

# Reporting

Using JMeter built-in reporting dashboard in lieu of Listeners

- Dynamic HTML reports
- Generate reports from previous results files
- Headless execution argument

# Headless Execution

```
jmeter -n -t ./performance-test.jmx \
    -l results.csv -e -o ./results-report/ \
    -Jjmeter.reportgenerator.report_title="Performance Testing" \
    -Jjmeter.reportgenerator.overall_granularity=60000 \
    -Jjmeter.reportgenerator.apdex_satisfied_threshold=500 \
    -Jjmeter.reportgenerator.apdex_tolerated_threshold=2000 \
    -Jjmeter.reportgenerator.exporter.html.series_filter="^(Scenario)(-success|-failure)?$"
```

# Best Practices

## Run tests in headless mode

Running in JMeter IDE is nice, but not scalable. Automate your test execution.

## Use Assertions

Make sure your requests are valid and returning proper responses

## Run for 1 hour minimum

Collect as many data points possible

## Publish those reports

Make sure all stakeholders can review the results

## Look at the big picture

It’s important to look at other components and external services that your test requests will interact with

## Limit the Listeners

Too many listeners can impact JMeter performance causing misleading results

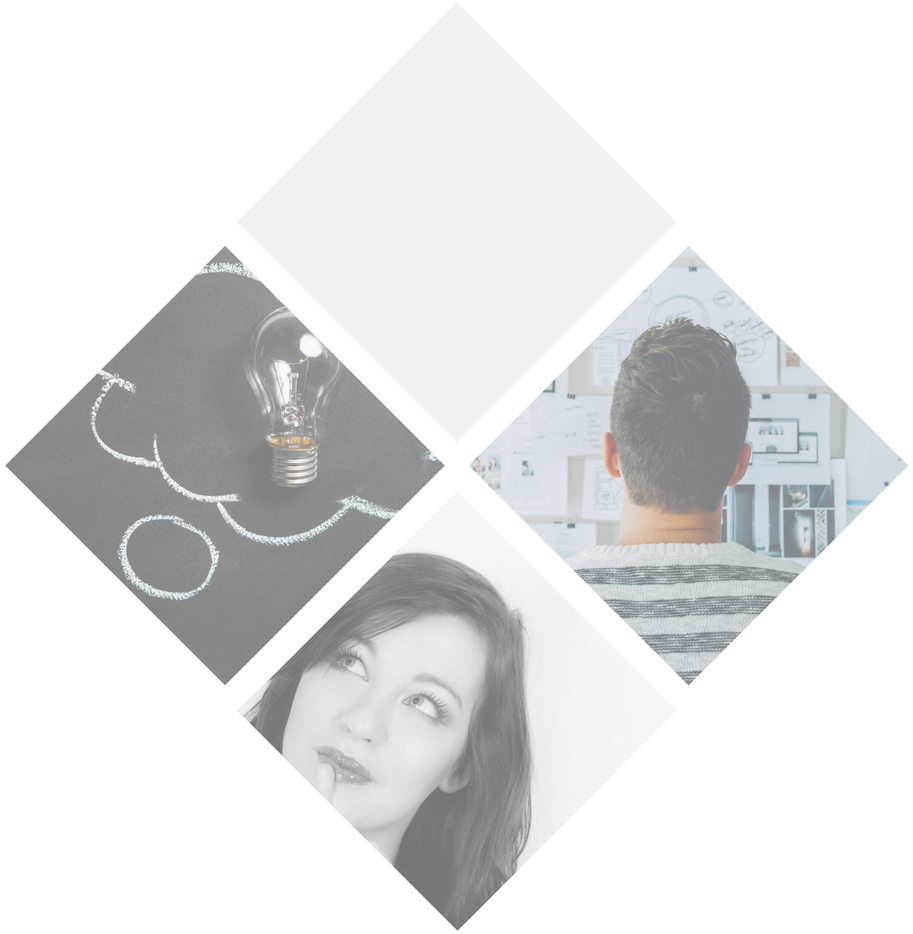
# Other Considerations

How can we take this to the next level?

## Automated Performance Testing
Add performance tests to build/deploy pipeline

## BlazeMeter
Performance testing as a service

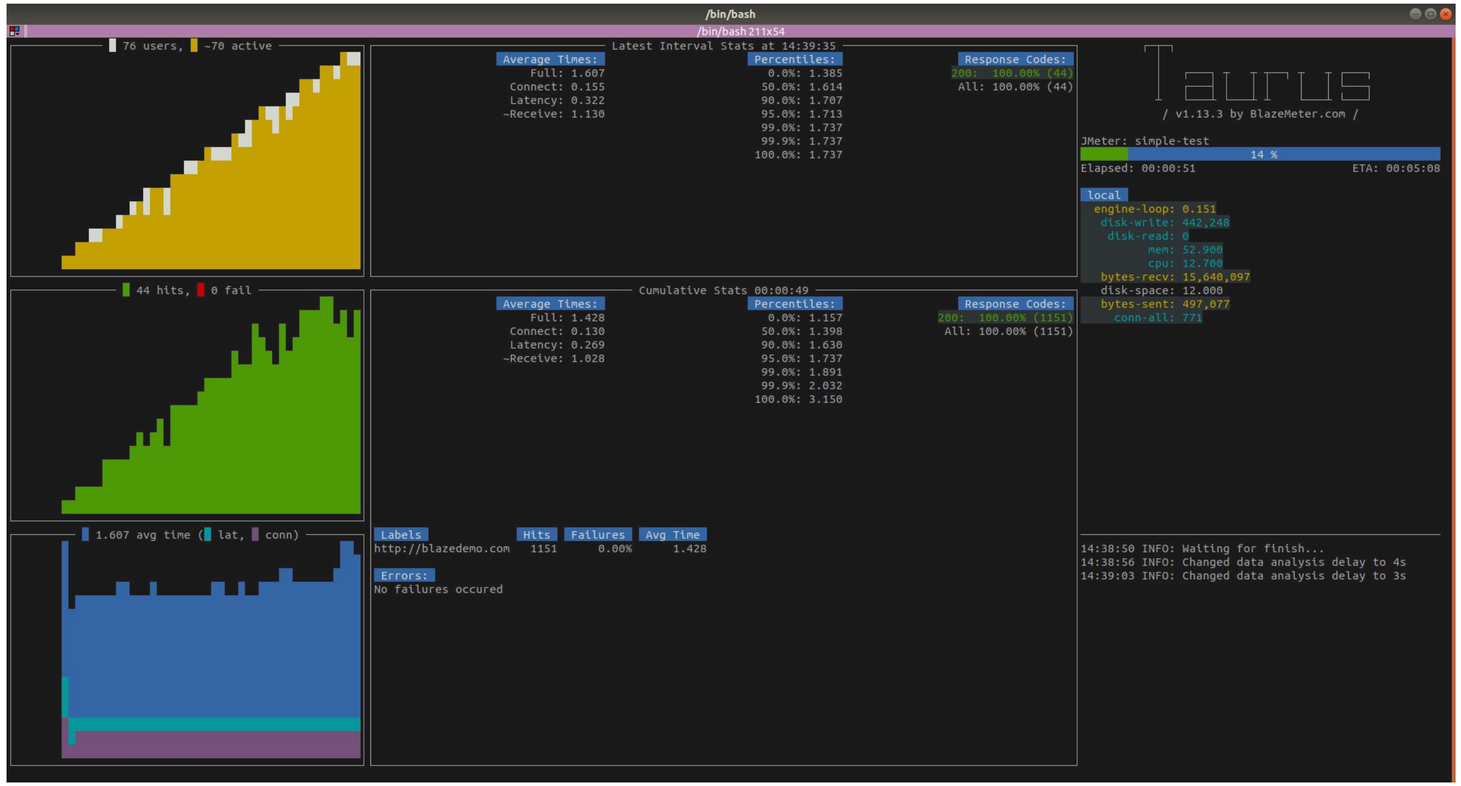
## Taurus
Simplifies test automation
Quickly build tests with yaml files



# Simple Taurus Configuration

```
execution:
- concurrency: 100
  ramp-up: 1m
  hold-for: 60m
  scenario: simple-test

scenarios:
  simple-test:
    requests:
    - http://blazedemo.com
```






# Questions?

# Additional Resources

- https://github.com/chicagodevsecops/meetup-2019-03-06
- https://jmeter.apache.org/
- https://www.blazemeter.com/blog
- https://gettaurus.org/
- https://jmeter-plugins.org/