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# Load testing

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Stavanger Software Developers Meetup - 26. April 2022



**What goes through your mind when your  
boss, customer or client asks:**

**“You are absolutely confident that this can  
scale, right?”**

# Agenda

- Why load testing?
- Tools for load testing
- Common gotchas when load testing
- Demo-taim
  - Some preparations
  - Simple web server
  - Advanced web server with stable load
  - Advanced web server with exponential load
- Summary & questions

# Why load testing?

A few questions that load testing can help us answer:

- What is the capacity of my system?
- Does my auto-scaling work as expected?
- How does the system behave when it's overloaded?

*A load test by itself cannot give you where the bottlenecks are, but it's essential to be able to generate loads to introspect the systems to locate the bottlenecks and improve them!*

# Tools for load testing

There are (probably) hundreds of tools for load testing. Don't overanalyze it until you are more experienced!

Here are some of the more popular ones:

- [k6.io](https://k6.io) (Go)
- [Gatling](https://gatling.io) (Java/Kotlin/Scala)
- [Netling](https://netling.com) (.net)
- [Locust](https://locust.io) (Python)
- [jMeter](https://jmeter.apache.org) (Java)

Comparing features, pros and cons of each one is easily a two-day course.

**Common  
gotcha  
when load  
testing:**

**Testing the  
load tester!**

**Are you load testing your target?**

**Or are you load testing your load testing tools and  
infrastructure?**

*Demo locust vs k6*

# Common gotcha when load testing:

## Testing the load tester!

**Are you load testing your target?**

**Or are you load testing your load testing tools and  
infrastructure?**

*Locust:*

*5700 requests/sec while pinning 1 CPU core to 100%*

*Web server: 83% CPU*

*K6:*

*32.000 requests/sec at 500% CPU*

*Web server: 230% CPU*





# Preparations

## Installing tools

**We're gonna use my favorite tool, k6.**

**It does not store metrics or visualize them. We'll use Grafana and InfluxDB for that.**

```
git clone git@github.com:StianOvrevage/ssdm-april22-loadtesting.git
```

```
bash installtools.sh
```

```
bash starttools.sh
```

**Open grafana at <http://localhost:3000> and log in with admin/admin. Import the dashboard with ID 4411**

# Simple web server

This is a very simple web server that answers requests as fast as possible.

Console window 1 - resource monitoring

```
top
```

Console window 2 - grafana & influxdb

```
bash starttools.sh
```

Console window 3 - load target

```
go run webserver/main-simple.go
```

Console window 4 - load test

```
k6 run --out influxdb=http://localhost:8086/myk6db --vus  
60 --duration 20s k6/script-advanced.js
```

# Advanced web server

Can only handle 200 requests at a time.

Each request takes a random time within a normal distribution.

If server is busy requests have a 10% chance of failing and 90% chance of waiting.

**60 concurrent users**

Console window 3 - load target

```
go run webserver/main-advanced.go
```

Console window 4 - load test

```
k6 run --out influxdb=http://localhost:8086/myk6db --vus  
60 --duration 20s k6/script-advanced.js
```

# Advanced web server

Can only handle 200 requests at a time.

Each request takes a random time within a normal distribution.

If server is busy requests have a 10% chance of failing and 90% chance of waiting.

**Increasing load exponentially from 20 to 640 concurrent users over 100 seconds.**

Console window 4 - load test

```
k6 run --out influxdb=http://localhost:8086/myk6db  
k6/script-advanced.js
```

**When a system is congested there are only  
two outcomes:**

- **Increased latency**
- **Increased failure rate**

# Questions?

## Summary:

- Load testing is very easy to get started with
- Ensure you are testing what you think you are testing
- Distributed systems might not behave like you expect

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# Thanks for listening!

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Presentation and code:  
[github.com/StianOvrevage/ssdm-april22-loadtesting](https://github.com/StianOvrevage/ssdm-april22-loadtesting)