

# GCI Impact

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## Runtime experiments: GCI vs NOGCI

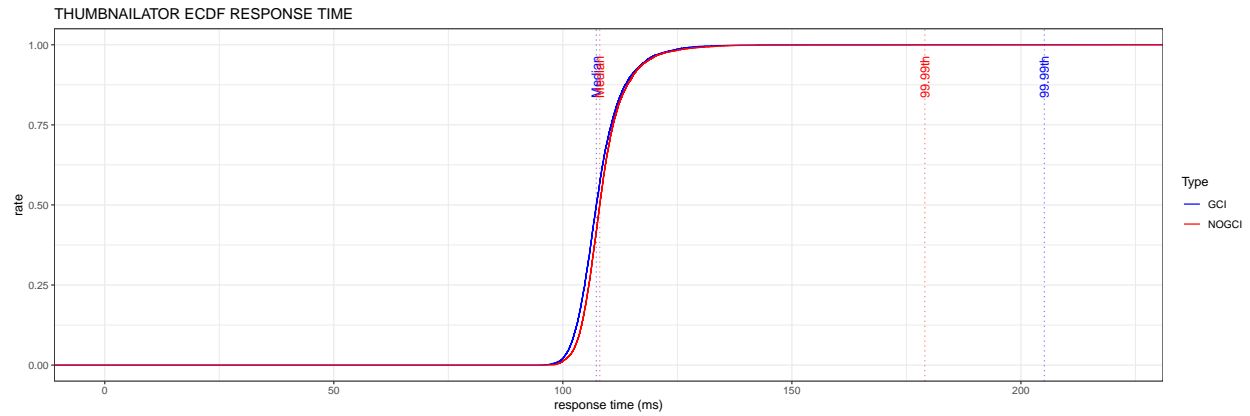
```
## Warning: package 'dplyr' was built under R version 3.6.1
```

```
## Warning: package 'ggplot2' was built under R version 3.6.1
```

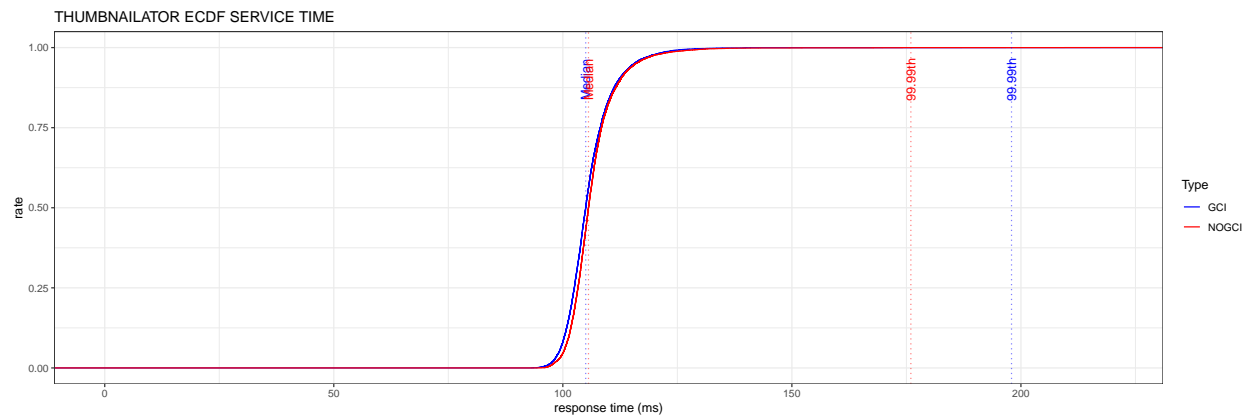
## Descrição

- **script de execução dos experimentos.**
- Número de requisições: 5 mil, **código.**
- Lógica de negócio da função: **Redimensionamento de uma imagem.**
- Escala de redimensionamento: 0.1.
- Tamanho da imagem: 131kb.
- comando para levantar a JVM:
  - GCI: `entrypoint_port=8082 scale=0.1 image_url=https://i0.wp.com/107.6.131.211/wp-content/uploads/2016/01/pics-012.jpg taskset 0x1 nice -20 nohup java -server -Xms512m -Xmx512m -XX:MaxMetaspaceSize=52429k -XX:ReservedCodeCacheSize=26214k -Xshare:on -XX:-TieredCompilation -XX:+UseSerialGC -Djava.net.preferIPv4Stack=true -XX:NewRatio=1 -Xloggc:/home/ubuntu/gci-faas-sim/experiment/results/gci1-thumb-gc.log -Djvmtilib=/home/ubuntu/gci-faas-sim/gci-files/libgc.so -javaagent:/home/ubuntu/gci-faas-sim/gci-files/gciagent-0.1-jar-with-dependencies.jar=8500 -jar /home/ubuntu/gci-faas-sim/runtime/thumb-func/target/thumbnailator-server-maven-0.0.1-SNAPSHOT.jar >/home/ubuntu/gci-faas-sim/experiment/results/gci1-thumb-stdout.log 2>/home/ubuntu/gci-faas-sim/experiment/results/gci1-thumb-stderr.log & taskset 0x2 nice -20 /home/ubuntu/gci-faas-sim/gci-files/gci-proxy -port=8080 -target=127.0.0.1:8082 -gci_target=127.0.0.1:8500 -ygen=52428800 >/home/ubuntu/gci-faas-sim/experiment/results/gci1-proxy-stdout.log 2>/home/ubuntu/gci-faas-sim/experiment/results/gci1-proxy-stderr.log &`
  - NOGCI: `entrypoint_port=8080 scale=0.1 image_url=https://i0.wp.com/107.6.131.211/wp-content/uploads/2016/01/pics-012.jpg taskset 0x1 nice -20 java -server -Xms512m -Xmx512m -XX:MaxMetaspaceSize=52429k -XX:ReservedCodeCacheSize=26214k -Xshare:on -XX:-TieredCompilation -XX:+UseSerialGC -Djava.net.preferIPv4Stack=true -Xloggc:/home/ubuntu/gci-faas-sim/experiment/results/nogci1-thumb-gc.log -jar /home/ubuntu/gci-faas-sim/runtime/thumb-func/target/thumbnailator-server-maven-0.0.1-SNAPSHOT.jar >/home/ubuntu/gci-faas-sim/experiment/results/nogci1-thumb-stdout.log 2>/home/ubuntu/gci-faas-sim/experiment/results/nogci1-thumb-stderr.log &`

## ECDF for response time



## ECDF for service time



## summary table of confidence interval for response time

##	stats	gci.cii	gci.cis	nogci.cii	nogci.cis
## 1	avg	110.0	110.0	110.00	110.0
## 2	p50	107.2	107.4	108.00	108.2
## 3	p95	117.8	118.5	118.10	119.0
## 4	p99	125.6	127.5	127.40	130.1
## 5	p999	136.7	144.5	141.20	173.7
## 6	p9999	165.6	232.8	176.10	242.9
## 7	p99999	216.0	220.8	204.00	215.3
## 8	dist	108.8	113.4	96.01	107.1

Os valores em colunas com .cii são referentes à valores limite inferior do intervalo de confiança. O valores em colunas com .cis são referentes à valores limite superior do intervalo de confiança.

## GCI: comparing response time vs service time, both in milliseconds

##	stats	gci.st.cii	gci.st.cis	gci.rs.cii	gci.rs.cis
## 1	avg	110.0	110.0	110.0	110.0
## 2	p50	104.9	105.1	107.2	107.4
## 3	p95	115.1	116.0	117.8	118.5
## 4	p99	122.8	124.9	125.6	127.5

## 5	p999	133.7	140.5	136.7	144.5
## 6	p9999	160.0	235.5	165.6	232.8
## 7	p99999	212.7	219.2	216.0	220.8
## 8	dist	107.8	114.1	108.8	113.4

Os valores em colunas com .st são referentes à valores de tempo de serviço. O valores em colunas com .rt são referentes à valores de tempo de serviço. Como esperado, rt é ou maior que st ou não diferente estatisticamente.

#### NOGCI: comparing response time vs service time, both in milliseconds

##	stats	nogci.st.cii	nogci.st.cis	nogci.rt.cii	nogci.rt.cis
## 1	avg	110.0	110.0	110.0	110.0
## 2	p50	105.5	105.7	107.2	107.4
## 3	p95	115.5	116.5	117.8	118.5
## 4	p99	124.7	127.7	125.6	127.5
## 5	p999	138.8	171.3	136.7	144.5
## 6	p9999	173.9	240.9	165.6	232.8
## 7	p99999	201.3	212.8	216.0	220.8
## 8	dist	95.8	107.1	108.8	113.4

Os valores em colunas com .st são referentes à valores de tempo de serviço. O valores em colunas com .rt são referentes à valores de tempo de serviço. Como esperado, rt é ou maior que st ou não diferente estatisticamente.

#### checking errors

## GCI - number of response time values greater then its service time values: 0

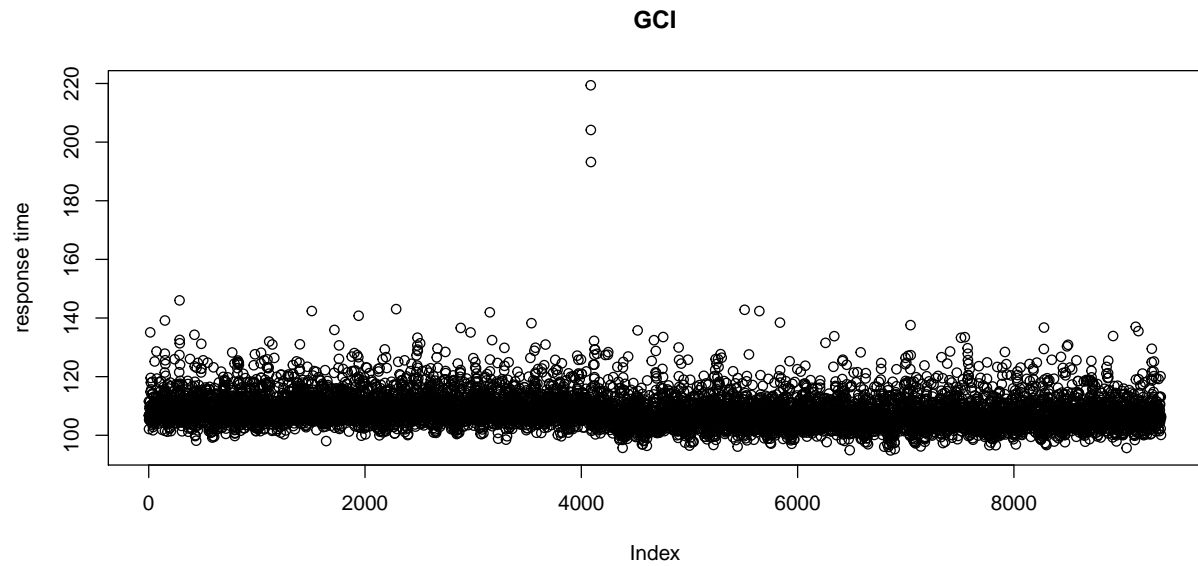
## NOGCI - number of response time values greater then its service time values: 0

#### comparing difference between response time and service time for GCI vs NOGCI

##	stats	gci.st.cii	gci.st.cis	nogci.rt.cii	nogci.rt.cis
## 1	avg	2.300	2.400	2.400	2.500
## 2	p50	2.199	2.213	2.309	2.329
## 3	p95	3.284	3.363	3.459	3.552
## 4	p99	4.164	4.400	4.253	4.566
## 5	p999	5.684	7.758	5.742	7.405
## 6	p9999	8.310	24.980	8.007	16.240
## 7	p99999	15.760	18.410	12.790	13.790
## 8	dist	13.560	16.200	10.480	11.460

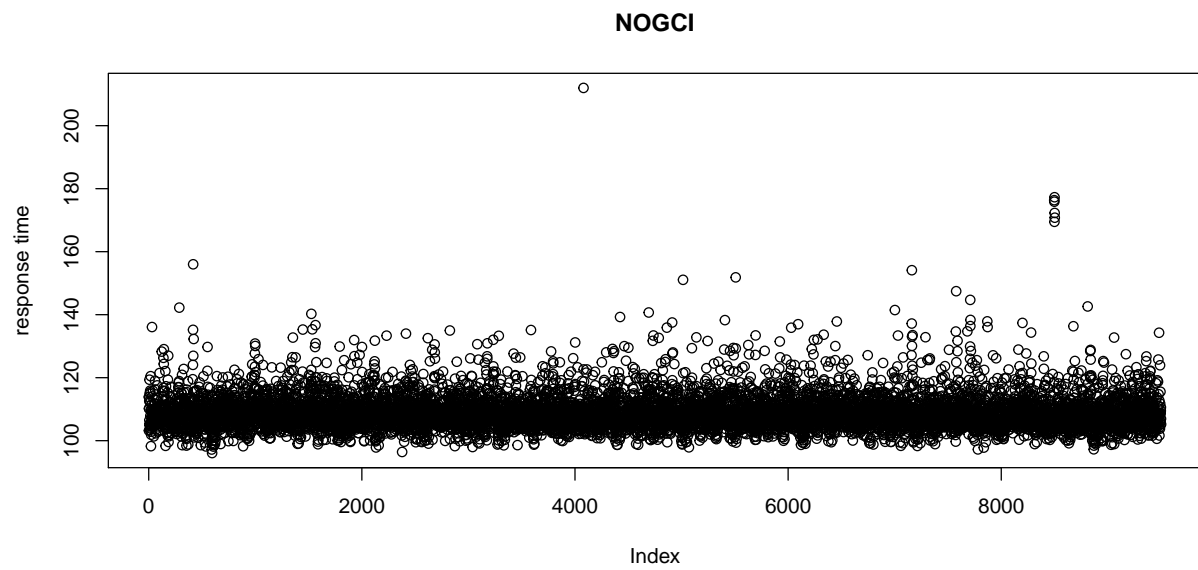
Esta tabela está mais para validação do que para uma análise de fato. Esperamos que os valores aqui não sejam grandes/significativos.

**GCI: plot response time**



Este plot é apenas para evidenciar que não há mais as anomalias que antes identificamos.

**NOGCI: plot response time**



Este plot é apenas para evidenciar que não há mais as anomalias que antes identificamos.