



JMeter com Grafana e Prometheus

Agenda

- ▶ **01** Testes de Performance
- ▶ **02** JMeter
- ▶ **03** Prometheus
- ▶ **04** Grafana
- ▶ **05** Integrando as 3 ferramentas

Quem sou eu?

🎓 Formada em **Sistemas de Informação** na USP.

💖 Apaixonada por **QA** desde sempre, mas trabalho na área oficialmente desde 2018.

📜 Tenho as certificações CTFL, CTFL-AT, **CTFL-PT**, CTAL-TTA, CTAL-TAE.

💻 Trabalho atualmente na **Avalara** como SDET.





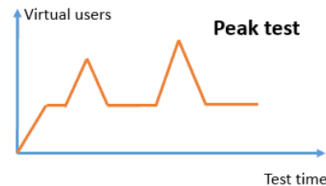
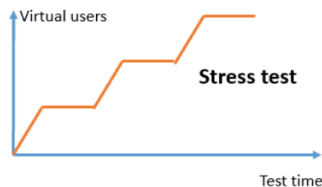
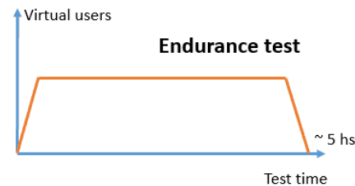
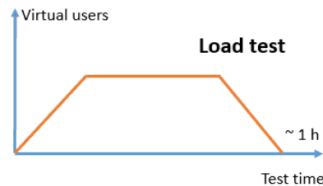
1. Testes de Performance

Testes de Performance

- Definido pela ISO-25010 como uma característica não funcional:
 - **Comportamento do tempo**
 - **Utilização de recursos**
 - **Capacidade**
- Os testes devem ser alinhados às expectativas dos stakeholders (Usuários, Arquitetos do sistema, Produto, Operação, etc.);
- Os testes devem ser **reprodutíveis**;
- Os testes devem ser realizados em ambientes similares ao ambiente de produção.

Tipos de Testes de Performance

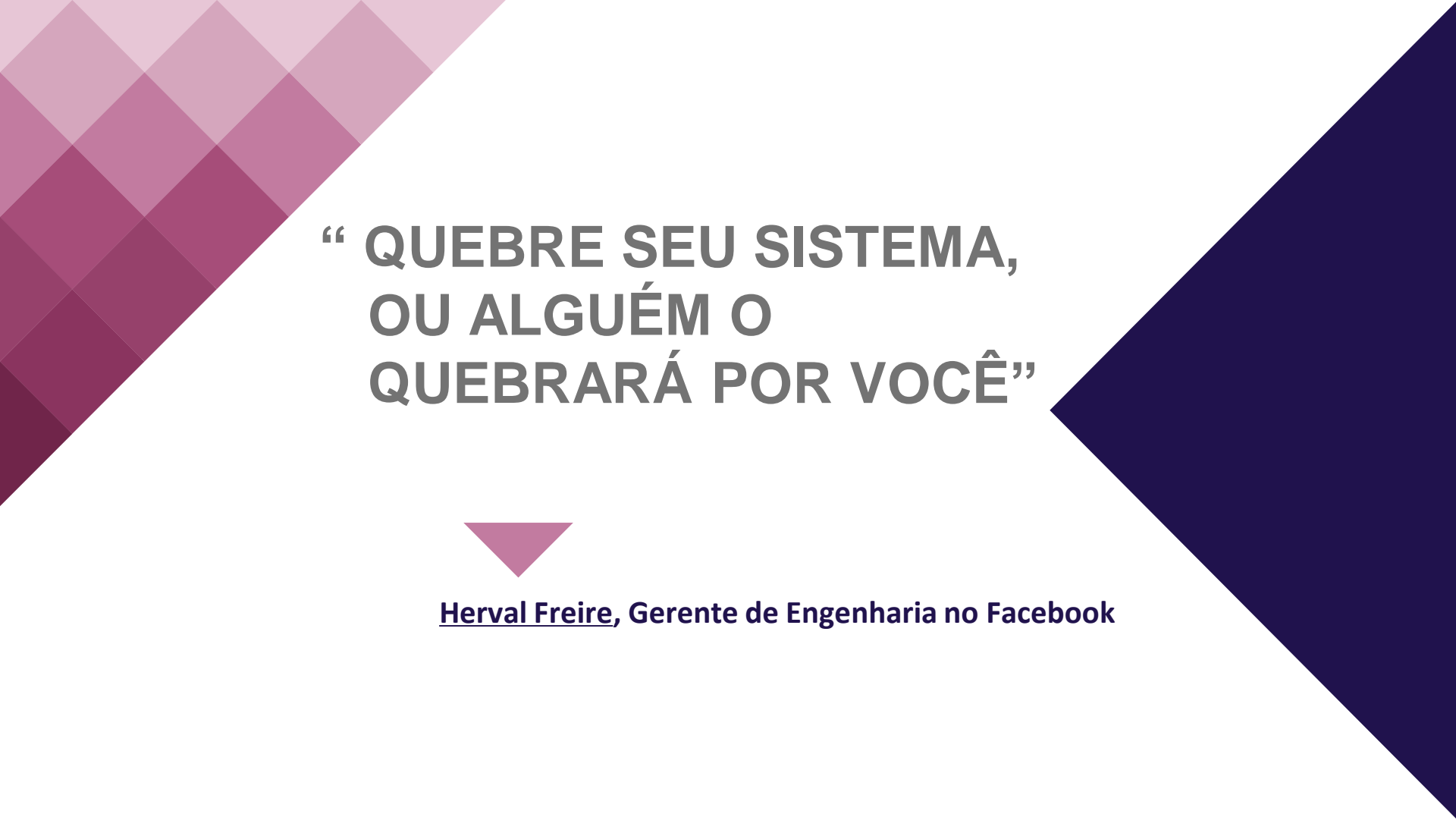
- Teste de Carga (Load Testing)
- Teste de Estresse (Stress Testing)
- Teste de Pico (Spike Testing)
- Teste de Resistência (Endurance Testing)



Fonte: <https://abstracta.us/blog/performance-testing/types-performance-tests/>

Razões para testar a performance

- Quanto mais rápido o site, mais receita ele irá gerar;
- Resolver as falhas antes de ir para o mercado;
- Aumentar a robustez do aplicativo;
- Melhorar a escalabilidade (capacidade de crescer de forma eficiente);
- Melhorar a estabilidade e confiabilidade.



**“ QUEBRE SEU SISTEMA,
OU ALGUÉM O
QUEBRARÁ POR VOCÊ”**



Herval Freire, Gerente de Engenharia no Facebook

Aproximadamente 1.100.000 resultados (0,55 segundos)

<https://oglobo.globo.com> > Economia ▾

Apagão e lentidão na Black Friday causam perdas de R\$ 24 ...

28 de nov. de 2018 — SÃO PAULO — A **Black Friday** de 2018 bateu recordes de faturamento e vendas no Brasil. Em cinco dias de descontos em boa parte dos varejistas ...

<https://www.istoedinheiro.com.br> > e-commerce-perde... ▾

Lojas virtuais perdem pelo menos R\$ 23,9 milhões durante a ...

29 de nov. de 2018 — Dia dos Solteiros, **Black Friday** e Cyber Monday são dias para ficar de ... resultando em perda de faturamento de pelo menos R\$ 23,9 milhões ...

<https://www.supervarejo.com.br> > materias > black-frid... ▾

Black Friday: perda de R\$ 18 milhões em 12 horas



Procurada, a plataforma enviou o seguinte comunicado:

Houve uma queda no serviço de conteúdos ao vivo do Globoplay na manhã desta quinta-feira, com duração de 15 minutos, como efeito de um grande número de acessos simultâneos às câmeras do BBB. Em ocasiões onde há um pico extraordinário de pessoas entrando ao mesmo tempo na plataforma em um intervalo muito curto de tempo, acontece o que chamamos de efeito rajada, efeito sem soluções de mitigação prontas no mercado. O problema afetou quem tentava acessar as câmeras ou trocar de canal. Quem já estava assistindo ao conteúdo não foi afetado.

⁽⁴⁾ Redação E-Commerce Brasil

E-commerces perdem ao menos R\$ 48,7 milhões na Black Friday e Cyber Monday

Sexta-feira, 04 de dezembro de 2020 • [BLACK FRIDAY, OPERAÇÃO, RELATÓRIOS](#)

🕒 Tempo de leitura: 7 minutos •

★★★★★ 4/5.0

A lentidão e a instabilidade dos **e-commerces** durante a **Black Friday** e a **Cyber Monday** custou ao varejo online brasileiro ao menos R\$ 48,7 milhões, segundo levantamento da Sofist. Em 2020, a empresa acompanhou 105 lojas virtuais a partir das 22h da quinta-feira (26) até as 23h59 de segunda-feira (30), período que engloba tanto a Black Friday quanto a Cyber Monday).

No estudo, a Sofist considerou que um site estava indisponível quando era impossível navegar pela loja. Qualquer um dos seguintes fatores poderia causar uma indisponibilidade: problemas técnicos, como páginas de erro; uso de página de espera, também conhecida como “tampão”; e demora excessiva (timeout), quando o site não termina de carregar mesmo após 45 segundos do acesso inicial.



2. JMeter

JMeter

- Open Source;
- Baseado em Java;
- Originalmente feita para testes Web, mas hoje possui diferentes tipos de protocolos (HTTPs, JDBC, SOAP/REST, SMTP(S), POP3(S) and IMAP(S), etc.);
- Permite testes distribuídos;
- Permite utilização de recorder/player;
- Possui biblioteca de plugins.



3. Prometheus

Prometheus

- Open Source;
- Coleta e armazena suas métricas como dados de série temporal, ou seja, as informações das métricas são armazenadas com o carimbo de data / hora em que foram registradas, junto com pares de valores-chave opcionais chamados rótulos.



4. Grafana

Grafana

- Open Source;
- Suporta integração com diferentes fonte de dados (Data Sources) que seguem o formato time-series (série temporal):
 - [Alertmanager](#), [AWS CloudWatch](#), [Azure Monitor](#), [Elasticsearch](#), [Google Cloud Monitoring](#), [InfluxDB](#), [Loki](#),
[Microsoft SQL Server \(MSSQL\)](#), [MySQL](#), [PostgreSQL](#), **[Prometheus](#)**;
- Permite que você consulte, visualize, alerte e explore suas métricas, não importa onde estejam armazenadas, transformandos em belos gráficos e visualizações.



5. Integrando as 3 ferramentas

jmeter.apache.org/download_jmeter.cgi

Apache JMeter 5.4.1 (Requires Java 8+)

Binaries









[apache-jmeter-5.4.1.tgz sha512 pgp](#)

[apache-jmeter-5.4.1.zip sha512 pgp](#)

Source

[apache-jmeter-5.4.1_src.tgz sha512 pgp](#)

[apache-jmeter-5.4.1_src.zip sha512 pgp](#)

This PC > Downloads > apache-jmeter-5.4.1 > apache-jmeter-5.4.1 > bin				
Name	Date modified	Type	Size	
examples	01/02/1980 00:00	File folder		
report-template	01/02/1980 00:00	File folder		
templates	01/02/1980 00:00	File folder		
 ApacheJMeter.jar	01/02/1980 00:00	Executable Jar File	14 KB	
 BeanShellAssertion.bshrc	01/02/1980 00:00	BSHRC File	2 KB	
 BeanShellFunction.bshrc	01/02/1980 00:00	BSHRC File	3 KB	
 BeanShellListeners.bshrc	01/02/1980 00:00	BSHRC File	2 KB	
 BeanShellSampler.bshrc	01/02/1980 00:00	BSHRC File	3 KB	
 create-rmi-keystore.bat	01/02/1980 00:00	Windows Batch File	2 KB	
 create-rmi-keystore.sh	01/02/1980 00:00	Shell Script	2 KB	
 ...	01/02/1980 00:00	PARAMETERS FILE	2 KB	



Prometheus



Grafana

Apache JMeter (5.2.1)



File Edit Search Run Options Tools Help



00:00:00



0 0/0

Test Plan

Test Plan

Name: Test Plan

Comments:

User Defined Variables

Name:	Value

Detail

Add

Add from Clipboard

Delete

Up

Down

☐ Run Thread Groups consecutively (i.e. one at a time)

☒ Run tearDown Thread Groups after shutdown of main threads

☐ Functional Test Mode (i.e. save Response Data and Sampler Data)

Selecting Functional Test Mode may adversely affect performance.

Add directory or jar to classpath

Browse...

Delete

Clear

Library

Operating system Architecture

prometheus

The Prometheus monitoring system and time series

2.29.2 / 2021-08-27 [Release notes](#)

File name

[prometheus-2.29.2.darwin-amd64.tar.gz](#)

[prometheus-2.29.2.linux-amd64.tar.gz](#)

[prometheus-2.29.2.windows-amd64.zip](#)

📁 > This PC > Downloads > prometheus-2.29.2.windows-amd64 > prometheus-2.29.2.windows-amd64

Name	Date modified	Type
📁 console_libraries	01/09/2021 14:34	File folder
📁 consoles	01/09/2021 14:34	File folder
📁 data	20/09/2021 19:04	File folder
📄 jmeter.log	04/09/2021 20:04	Text Document
📄 LICENSE	01/09/2021 14:34	File
📄 NOTICE	01/09/2021 14:34	File
📄 prometheus.exe	01/09/2021 14:34	Application
📄 prometheus.yml	04/09/2021 20:17	YML File
📄 promtool.exe	01/09/2021 14:34	Application



cmd - prometheus.exe --config.file=prometheus.yml (Admin)

```
C:\Users\beatriz.navarro
```

```
λ cd C:\Users\beatriz.navarro\Downloads\prometheus-2.29.2.windows-amd64\prometheus-2.29.2.windows-amd64
```

```
C:\Users\beatriz.navarro\Downloads\prometheus-2.29.2.windows-amd64\prometheus-2.29.2.windows-amd64
```

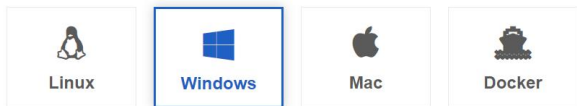
```
λ prometheus.exe --config.file=prometheus.yml
```

```
level=info ts=2021-09-20T20:04:09.554Z caller=main.go:390 msg="No time or size retention was set so using the default time
level=info ts=2021-09-20T20:04:09.595Z caller=main.go:428 msg="Starting Prometheus" version="(version=2.29.2, branch=HEAD,
017f2feb66730c67ed8)"
level=info ts=2021-09-20T20:04:09.595Z caller=main.go:433 build_context="(go=go1.16.7, user=root@e5e77da87f9c, date=202108
level=info ts=2021-09-20T20:04:09.595Z caller=main.go:434 host_details=(windows)
level=info ts=2021-09-20T20:04:09.595Z caller=main.go:435 fd_limits=N/A
level=info ts=2021-09-20T20:04:09.595Z caller=main.go:436 vm_limits=N/A
```



← → ↻ grafana.com/grafana/download?platform=windows

Overview Deployment options Plugins Dashboards **Download** About Resources



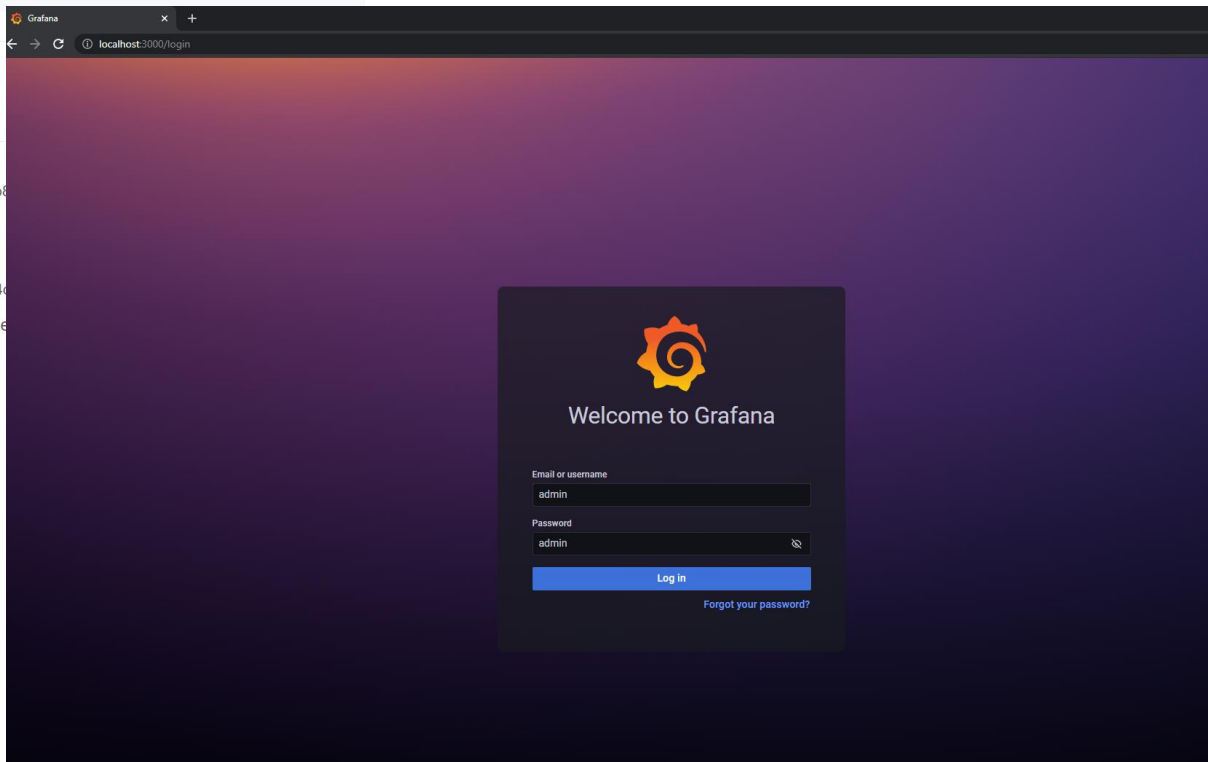
Windows Installer (64 Bit) SHA256: cdd4e86cb82b6067d23ee75572528f9e27b8

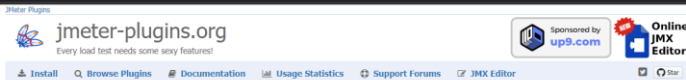
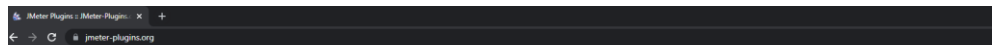
[Download the installer](#) (grafana-enterprise-8.1.2.windows-amd64.msi) and run it.

Standalone Windows Binaries (64 Bit) SHA256: 8c714545a80365bde56f44

[Download the zip file](#) (grafana-enterprise-8.1.2.windows-amd64.zip) and follow the

Read the Windows [installation guide](#).





Custom Plugins for Apache JMeter™

This project is an independent set of plugins for Apache JMeter, the popular Open-Source load and performance testing tool.

This catalogue lets plugins available for use with Plugins Manager. If you're first time here, consider installing [Plugins Manager](#) into your JMeter.

prometheus

Prometheus Listener Plugin

A Jmeter plugin to expose sampled metrics to an endpoint to be scraped by Prometheus.

Download Versions: 0.6.0



ID: jmeter-prometheus
Users: 1144

© 2009-2021 Andrey Pikhilko and project contributors
Licensed under Apache 2.0 License

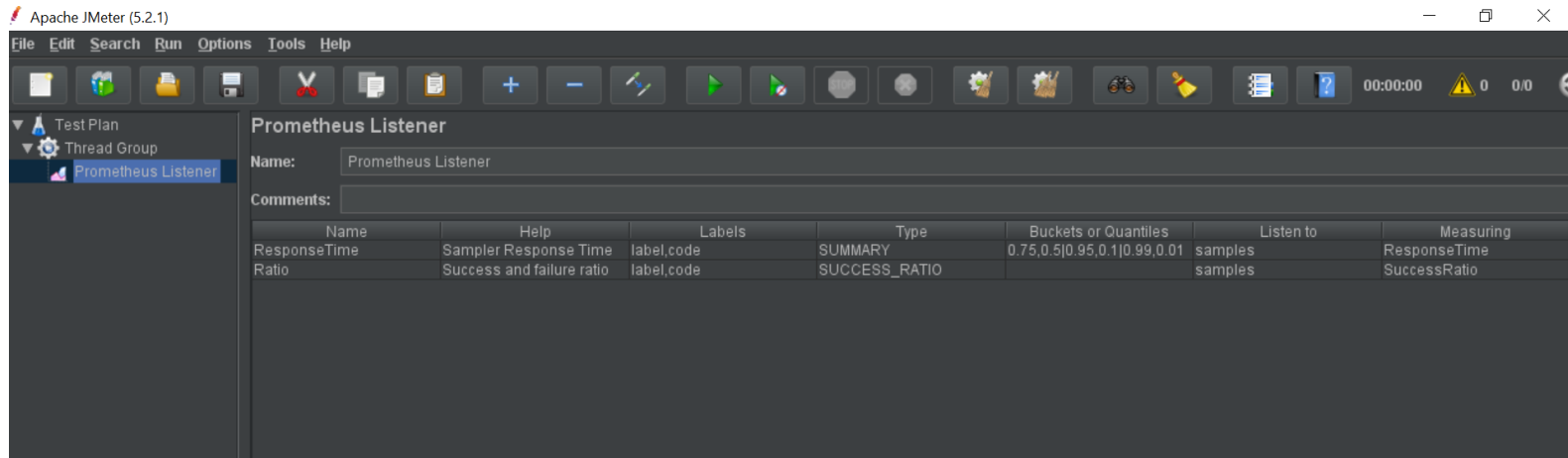
Windows (C:) > Users > beatriz.navarro > apache-jmeter-5.2.1 > lib > ext

- jmter-plugins-casutg-2.9.jar
- jmter-prometheus-plugin-0.6.1-SNAPSHOT.jar
- jmter-plugins-json-2.7.jar
- jmter-plugins-manager-1.4.jar
- ApacheJMeter_bolt.jar
- ApacheJMeter_components.jar
- ApacheJMeter_core.jar
- ApacheJMeter_ftp.jar
- ApacheJMeter_functions.jar
- ApacheJMeter_http.jar
- ApacheJMeter_java.jar
- ApacheJMeter_jdbc.jar
- ApacheJMeter_jms.jar
- ApacheJMeter_junit.jar
- ApacheJMeter_ldap.jar
- ApacheJMeter_mail.jar
- ApacheJMeter_mongodb.jar
- ApacheJMeter_native.jar
- ApacheJMeter_tcp.jar
- readme.txt



Listener

É um componente que apresenta os resultados dos requests em forma de árvores, gráficos, tabelas ou arquivos de log.



File Edit Search Run Options Tools Help

00:00:00 0 0/0

Github

- 10 Minutos - 5 users
 - GET https://github.com/
 - GET beatriznavarro
 - Main prometheus listener**

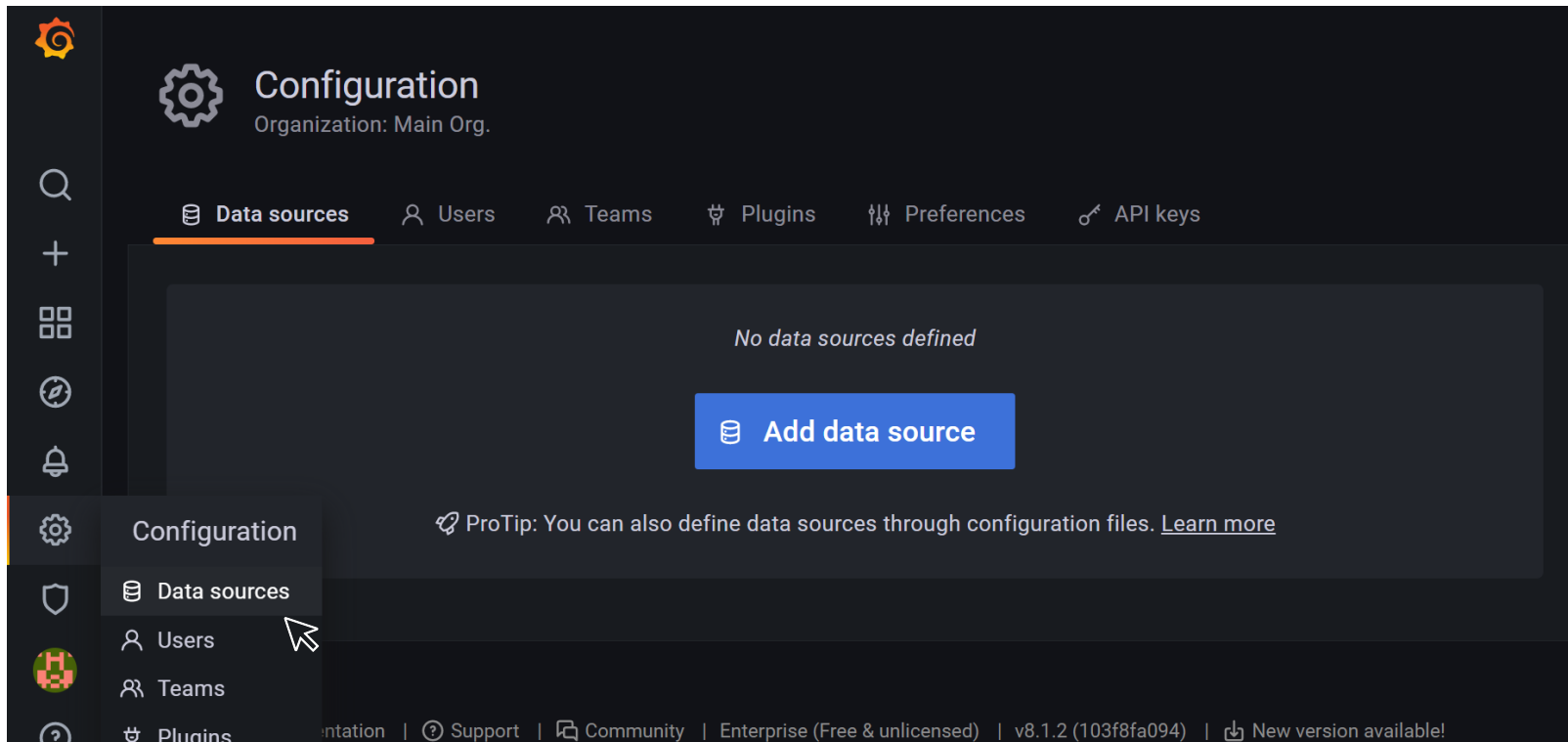
Prometheus Listener

Name: Main prometheus listener

Comments: This listener "measures" everything, sometimes in summaries, sometimes in histograms.

Name	Help	Labels	Type	Buckets or Quantiles	Listen to	Measuring
rt as hist	the response time f...	category,label,code	HISTOGRAM	100,500,1000,3000	samples	ResponseTime
rt as summary	the response time f...	category,label,code	SUMMARY	0.75,0.5 0.95,0.1 0....	samples	ResponseTime
count total	the total number of ...	category,label,code	COUNTER		samples	CountTotal
success total	the total number of ...	category,label,code	COUNTER	0.75,0.5 0.95,0.1 0....	samples	SuccessTotal
rtsize as hist	the response size f...	category,label,code	HISTOGRAM	100,500,1000,3000	samples	ResponseSize
can fail	success ratio of th...	category,label,code	SUCCESS_RATIO		samples	SuccessRatio
latency as hist	the latency (ttfb) for...	category,label,code	HISTOGRAM	100,500,1000,3000	samples	Latency
rt count	default help string	category,label,code	COUNTER		samples	ResponseTime
assertions	default help string	category,label,code	SUCCESS_RATIO		assertions	SuccessRatio
fail total	default help string	category,label,code	COUNTER		samples	FailureTotal
latency as sum	default help string	category,label,code	SUMMARY	0.75,0.5 0.95,0.1 0....	samples	ResponseTime
latency count	default help string	category,label,code	COUNTER	0.75,0.5 0.95,0.1 0....	samples	ResponseTime

Add Delete



The image shows the Grafana Configuration page for the 'Main Org.' organization. The left sidebar contains navigation icons for settings, search, add, dashboard, explore, and notifications. The main header area includes the 'Configuration' title and a sub-header 'Organization: Main Org.'. Below this is a horizontal menu with tabs for 'Data sources', 'Users', 'Teams', 'Plugins', 'Preferences', and 'API keys'. The 'Data sources' tab is selected and highlighted with an orange underline. The main content area displays the message 'No data sources defined' and a large blue button labeled 'Add data source'. A 'ProTip' message at the bottom states: 'You can also define data sources through configuration files. [Learn more](#)'. The footer contains links for 'Documentation', 'Support', 'Community', 'Enterprise (Free & unlicensed)', version information 'v8.1.2 (103f8fa094)', and a 'New version available!' notification.

Configuration

Organization: Main Org.


- Data sources
- Users
- Teams
- Plugins
- Preferences
- API keys


No data sources defined

Add data source

ProTip: You can also define data sources through configuration files. [Learn more](#)

Documentation | Support | Community | Enterprise (Free & unlicensed) | v8.1.2 (103f8fa094) | New version available!



 **Data Sources / Prometheus**
Type: Prometheus

⌵ **Settings** ⌵ Dashboards


Name ⓘ Prometheus-QALadies Default ☒


HTTP

URL ⓘ	http://localhost:9090
Access ⓘ	Server (default) Help >
Whitelisted Cookies ⓘ	New tag (enter key to add)
Timeout ⓘ	

Auth


Basic auth	<input type="checkbox"/>	With Credentials ⓘ	<input type="checkbox"/>
TLS Client Auth	<input type="checkbox"/>	With CA Cert ⓘ	<input type="checkbox"/>
Skip TLS Verify	<input type="checkbox"/>		
Forward OAuth Identity ⓘ	<input type="checkbox"/>		



 **Configuration**
Organization: Main Org.

🔍 **Data sources** 👤 Users 👥 Teams ⚙️ Plugins ⌵ Preferences 🔑 API keys

🔍 prome

 **Prometheus-QALadies**
Prometheus | http://localhost:9090 | **default**



github.com/jmeter-prometheus-plugin/docs/ x +

github.com/johrstrom/jmeter-prometheus-plugin/tree/master/docs/examples

Search or jump to... Pull requests Issues Marketplace Explore

johrstrom / jmeter-prometheus-plugin

<> Code Issues 18 Pull requests Actions Projects Wiki Security

master jmeter-prometheus-plugin / docs / examples /

GiovanniPaoloGibilisco Feature/add default metrics (#73) ...

grafana.json Feature/ad

simple_prometheus_example.jmx #51 functio

New dashboard

Add panel

Create empty panel Add a new row

Dashboard Folder Import

Add a panel from the panel library

Last 6 hours



Prometheus



Grafana

```
C:\Users\beatriz.navarro\Desktop
```

```
λ jmeter -n -t github.jmx -l testresults.log -e -o testresults
```

```
Creating summariser <summary>
```

```
Created the tree successfully using github.jmx
```

```
Starting standalone test @ Mon Sep 20 19:11:32 BRT 2021 (1632175892938)
```

```
Waiting for possible Shutdown/StopTestRunner...
```

```
summary + 1 in 00:00:02 = 0,7/s
```

```
summary + 1010 in 00:00:25 = 40,1/s
```

```
summary - 1011 in 00:00:27 = 37,8/s
```

```
localhost:9270 x +
localhost:9270
# HELP assertions_success default help string
# TYPE assertions_success counter
# HELP assertions_failure default help string
# TYPE assertions_failure counter
# HELP assertions_total default help string
# TYPE assertions_total counter
# HELP success_total the total number of successful samplers
# TYPE success_total counter
success_total{category="null",label="GET beatriznavarro",code="200",} 108.0
success_total{category="null",label="GET https://github.com/",code="200",} 108.0
# HELP fail_total default help string
# TYPE fail_total counter
# HELP jvm_classes_loaded The number of classes that are currently loaded in the JVM
# TYPE jvm_classes_loaded gauge
jvm_classes_loaded 5400.0
# HELP jvm_classes_loaded_total The total number of classes that have been loaded since the JVM has started
execution
# TYPE jvm_classes_loaded_total counter
jvm_classes_loaded_total 5400.0
# HELP jvm_classes_unloaded_total The total number of classes that have been unloaded since the JVM has started
execution
# TYPE jvm_classes_unloaded_total counter
jvm_classes_unloaded_total 0.0
```



Prometheus



Grafana





Prometheus



Grafana



General / QALadies ★ 🔔



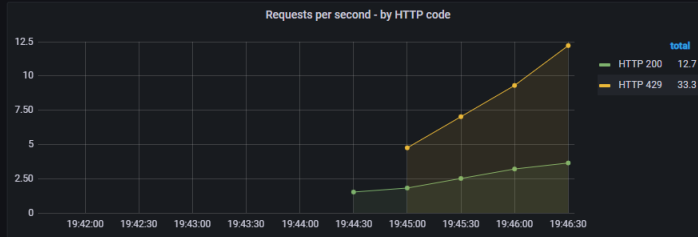
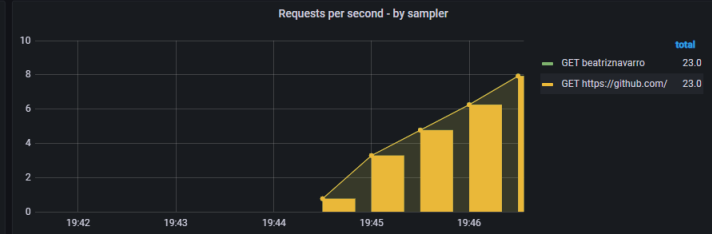
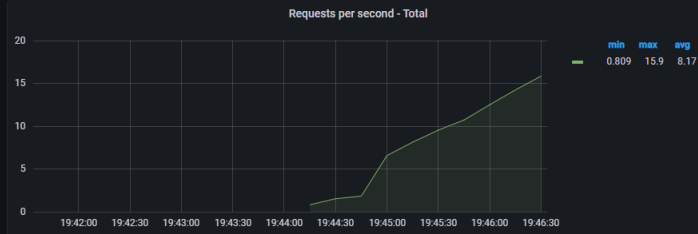
Last 5 minutes



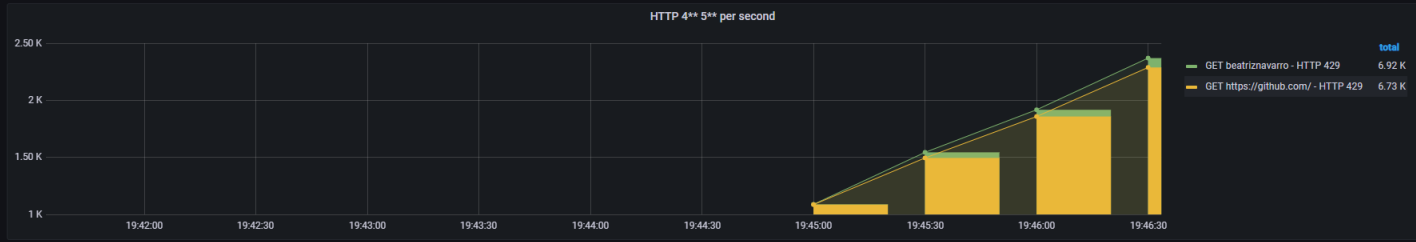
5s



Requests per second



Errors



Test and Report information

Source file	"testresults.log"
Start Time	"06/09/21 16:14"
End Time	"06/09/21 16:24"
Filter for display	"=

APDEX (Application Performance Index)

Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
0.097	500 ms	1 sec 500 ms	Total
0.072	500 ms	1 sec 500 ms	GET beatriznavarro
0.122	500 ms	1 sec 500 ms	GET https://github.com/

Requests Summary



Statistics

Requests		Executions			Response Times (ms)						Throughput	Network (KB/sec)	
Label	#Samples	KO	Error %	Average	Min	Max	90th pct	95th pct	99th pct	Transactions/s	Received	Sent	
Total	30657	27678	90.28%	94.43	16	21045	143.00	172.00	280.00	51.09	864.21	6.73	
GET beatriznavarro	15327	14230	92.84%	90.30	16	21029	136.00	159.00	230.72	25.58	49.21	3.87	
GET https://github.com/	15330	13448	87.72%	98.57	16	21045	143.90	171.00	277.00	25.55	815.07	2.87	

Errors

Type of error	Number of errors	% in errors	% in all samples
---------------	------------------	-------------	------------------

Referências

<https://beatriznavarro.medium.com/jmeter-prometheus-grafana-d38fa92488c0>

<https://bstqb.org.br/b9/sobre-ctfl-pt>

<https://dev.to/qainsights/jmeter-prometheus-and-grafana-integration-312n>

<https://github.com/johrstrom/jmeter-prometheus-plugin>

<https://grafana.com/grafana/dashboards/2492>

<https://prometheus.io/docs/prometheus/latest/querying/basics/>

Obrigada!

Perguntas?

