CS6474: Software Testing Laboratory (Spring 2023)

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Contents

1 JMeter

The Apache JMeter is pure Java open source software, which was first developed by Stefano Mazzocchi of the Apache Software Foundation, designed to load test functional behavior and measure performance. You can use JMeter to analyze and measure the performance of web application or a variety of services. Performance Testing means testing a web application against heavy load, multiple and concurrent user traffic. JMeter originally is used for testing Web Application or FTP application

How does JMeter perform tests?

- Creates a request and sends the request to the server
- Collects responses from the server and visualizes the details in a chart or graph
- Processes the response from the server
- Generates test results in several formats such as text, XML, JSON for the tester to analyze data

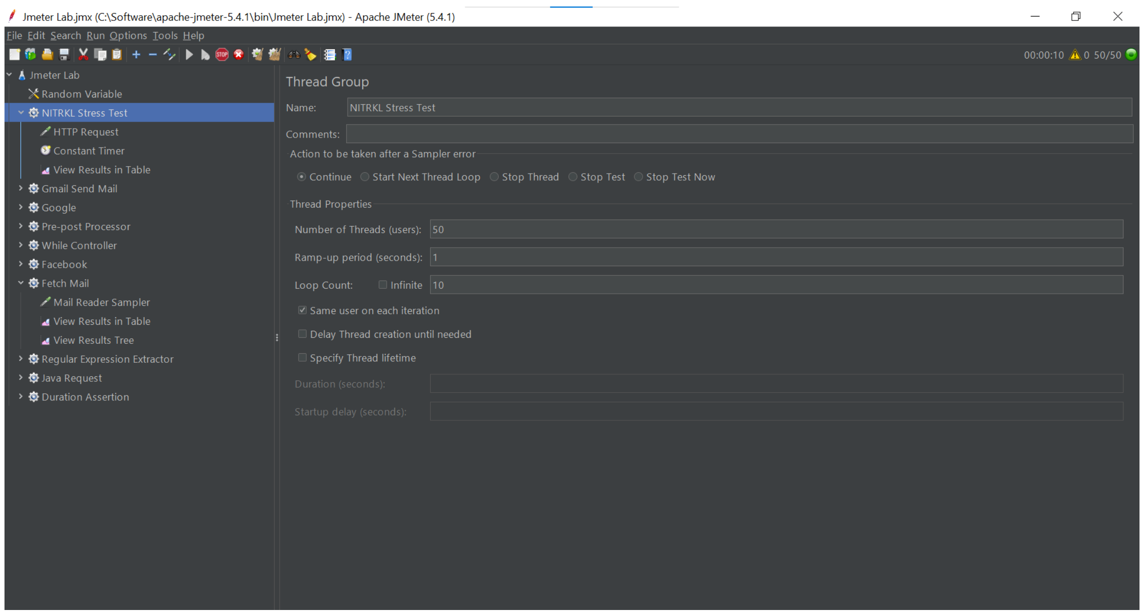
Advantages of JMeter

- Easy to use without extensive knowledge of programming. It has a user-friendly UI and one can also use CLI.
- Provides integration with Jenkins and reporting
- Easy installation on any operating system
- Key features like the Thread Group, helps to see whether software performance is good.
- Test IDE allows test recording from browsers or native applications
- Allows API testing, Database Testing, and MQ testing with ease
- When there's a high number of TPS, one can achieve more transactions per second given the hyper-limitations

Disadvantages of JMeter

- Automation is difficult with JMeter
- JMeter output reports are difficult to understand without training
- It doesn't support JavaScript and AJAX requests.
- Complex applications that use dynamic content or use JS to alter requests can be difficult to test using JMeter.
- It's difficult to get data from one place or to perform customizations.

1.1 NITRKL Stress Testing Using Constant Timer



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
    - HTTP Request
    - Constant Timer
    - View Results in Table
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
    - Mail Reader Sampler
    - View Results in Table
    - View Results Tree
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

Thread Group

Name: NITRKL Stress Test

Comments:

Action to be taken after a Sampler error: [✓ Continue] Start Next Thread Loop, Stop Thread, Stop Test, Stop Test Now

Thread Properties

Number of Threads (users): 50

Ramp-up period (seconds): 1

Loop Count: Infinite 10

[✓] Same user on each iteration

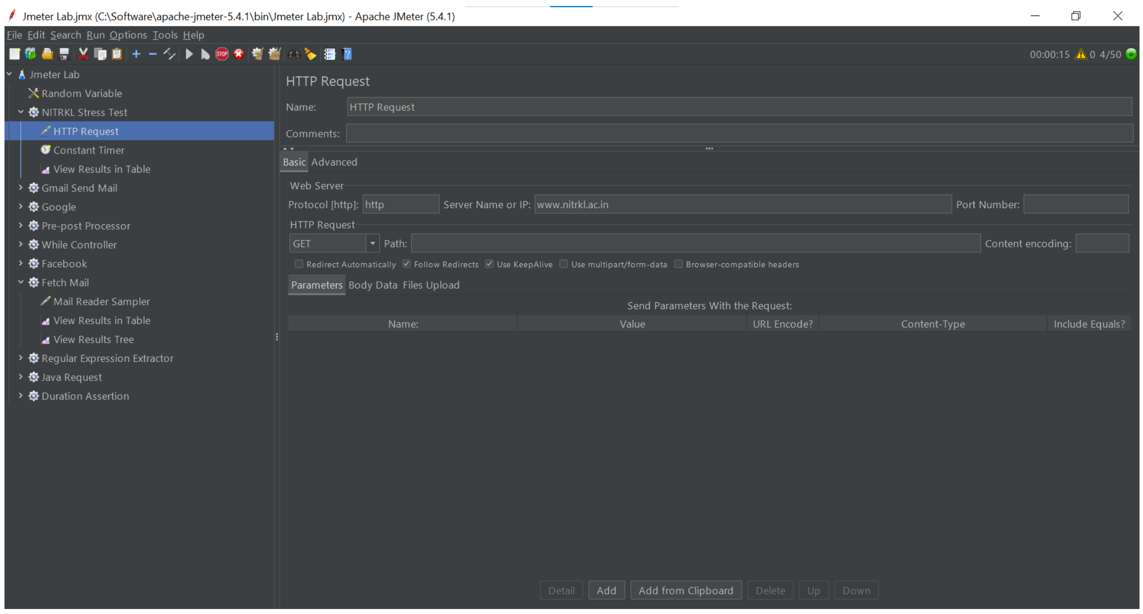
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 1:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

- Jmeter Lab
  - Random Variable
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    - View Results Tree
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: http Server Name or IP: www.nitrkl.ac.in Port Number:

HTTP Request

GET Path: Content encoding:

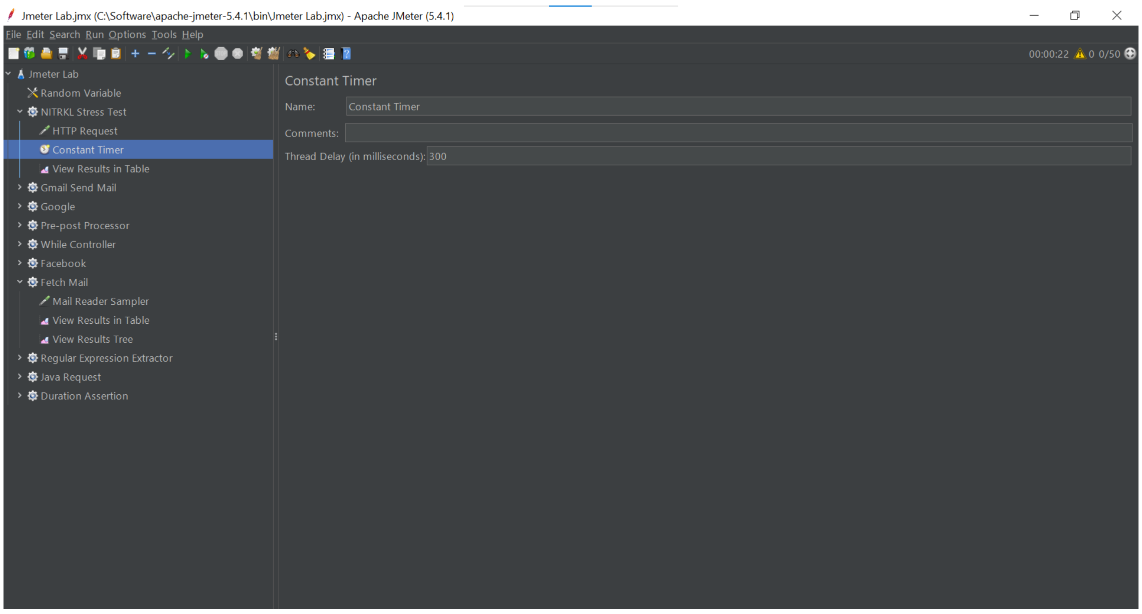
Redirect Automatically [✓ Follow Redirects] [✓ Use KeepAlive] Use multipart/form-data Browser-compatible headers

Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Figure 2:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

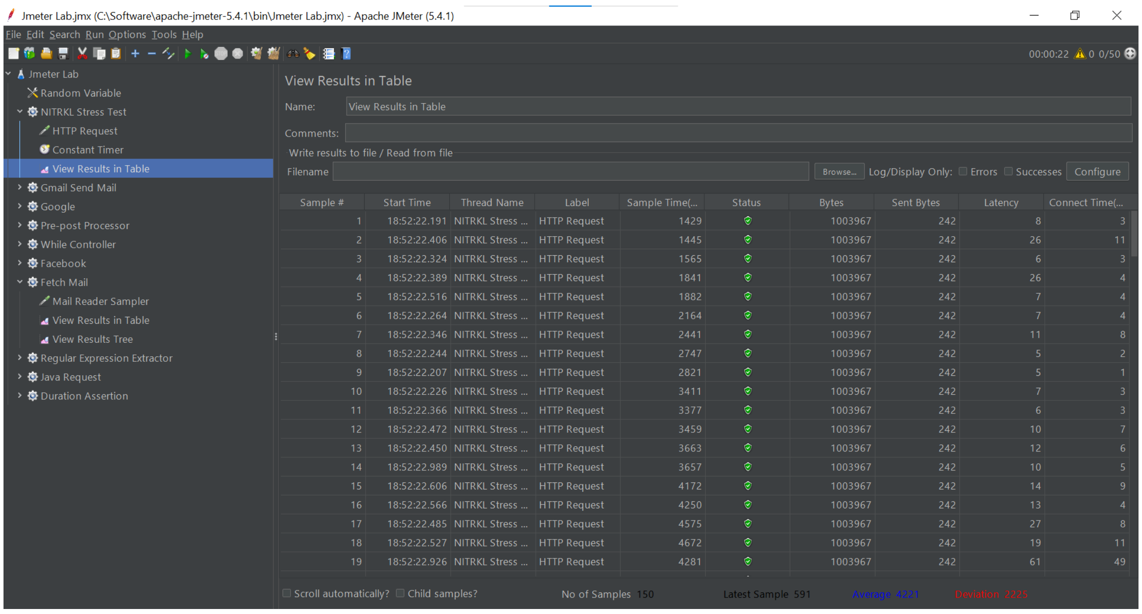
Constant Timer

Name: Constant Timer

Comments:

Thread Delay (in milliseconds): 300

Figure 3:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

Filename

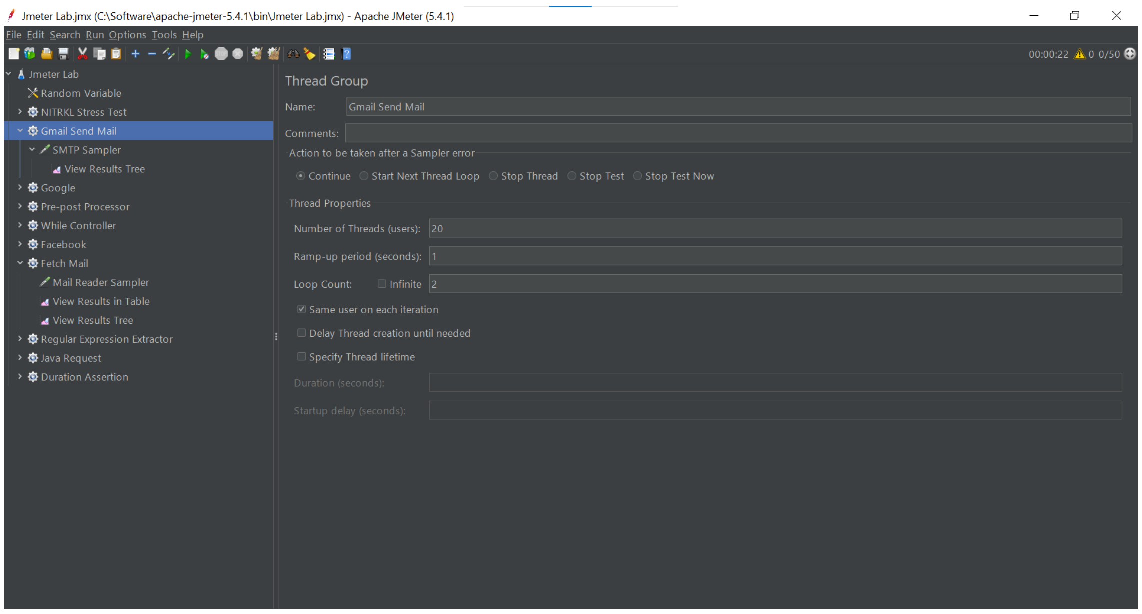
Log/Display Only: ☐ Errors ☐ Successes

Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time(...
1	18:52:22.191	NITRKL Stress ...	HTTP Request	1429	✓	1003967	242	8	3
2	18:52:22.406	NITRKL Stress ...	HTTP Request	1445	✓	1003967	242	26	11
3	18:52:22.324	NITRKL Stress ...	HTTP Request	1565	✓	1003967	242	6	3
4	18:52:22.389	NITRKL Stress ...	HTTP Request	1841	✓	1003967	242	26	4
5	18:52:22.516	NITRKL Stress ...	HTTP Request	1882	✓	1003967	242	7	4
6	18:52:22.264	NITRKL Stress ...	HTTP Request	2164	✓	1003967	242	7	4
7	18:52:22.346	NITRKL Stress ...	HTTP Request	2441	✓	1003967	242	11	8
8	18:52:22.244	NITRKL Stress ...	HTTP Request	2747	✓	1003967	242	5	2
9	18:52:22.207	NITRKL Stress ...	HTTP Request	2821	✓	1003967	242	5	1
10	18:52:22.226	NITRKL Stress ...	HTTP Request	3411	✓	1003967	242	7	3
11	18:52:22.366	NITRKL Stress ...	HTTP Request	3377	✓	1003967	242	6	3
12	18:52:22.472	NITRKL Stress ...	HTTP Request	3459	✓	1003967	242	10	7
13	18:52:22.450	NITRKL Stress ...	HTTP Request	3663	✓	1003967	242	12	6
14	18:52:22.989	NITRKL Stress ...	HTTP Request	3657	✓	1003967	242	10	5
15	18:52:22.606	NITRKL Stress ...	HTTP Request	4172	✓	1003967	242	14	9
16	18:52:22.566	NITRKL Stress ...	HTTP Request	4250	✓	1003967	242	13	4
17	18:52:22.485	NITRKL Stress ...	HTTP Request	4575	✓	1003967	242	27	8
18	18:52:22.527	NITRKL Stress ...	HTTP Request	4672	✓	1003967	242	19	11
19	18:52:22.926	NITRKL Stress ...	HTTP Request	4281	✓	1003967	242	61	49

☐ Scroll automatically? ☐ Child samples? No of Samples 150 Latest Sample 591 Average 4221 Deviation 2225

Figure 4:

1.2 Sending Mail to another mail using SMTP Sampler



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:00:22 0 0/50

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
    - SMTP Sampler
      - View Results Tree
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
    - Mail Reader Sampler
    - View Results in Table
    - View Results Tree
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

Thread Group

Name: Gmail Send Mail

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 20

Ramp-up period (seconds): 1

Loop Count: Infinite 2

[✓] Same user on each iteration

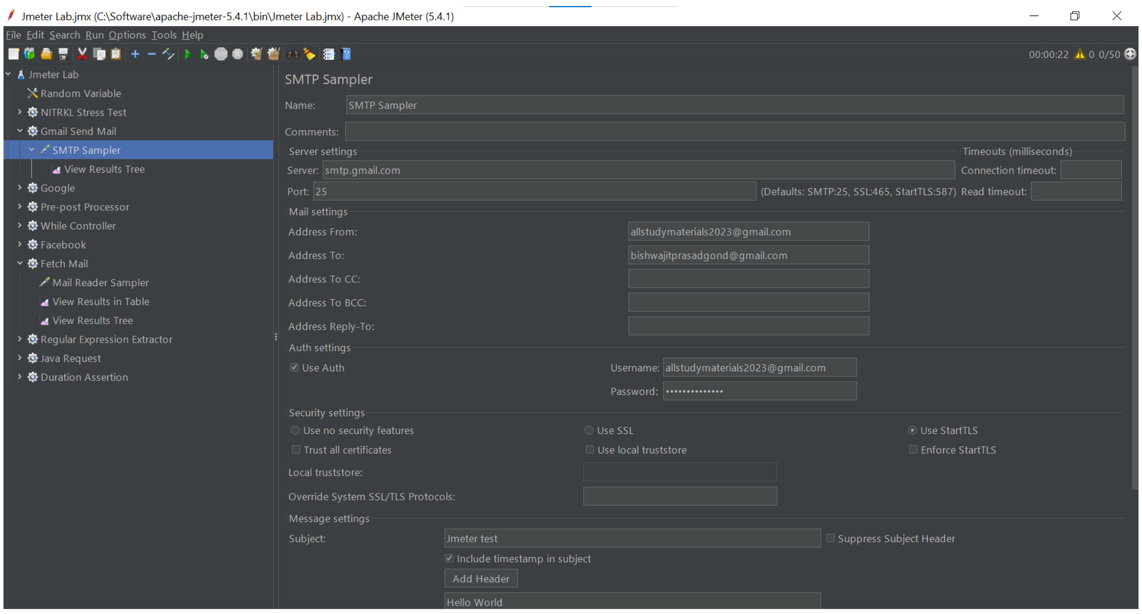
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 5:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:00:22 0 0/50

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
    - SMTP Sampler
      - View Results Tree
  - Google
  - Pre-post Processor
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  - Facebook
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    - View Results in Table
    - View Results Tree
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

SMTP Sampler

Name: SMTP Sampler

Comments:

Server settings

Server: smtp.gmail.com

Port: 25 (Defaults: SMTP:25, SSL:465, StartTLS:587)

Timeouts (milliseconds)

Connection timeout:

Read timeout:

Mail settings

Address From: allstudymaterials2023@gmail.com

Address To: bishwajitprasadgond@gmail.com

Address To CC:

Address To BCC:

Address Reply-To:

Auth settings

[✓] Use Auth

Username: allstudymaterials2023@gmail.com

Password: ••••••••••••••

Security settings

Use no security features Use SSL [✓ Use StartTLS]

Trust all certificates Use local truststore Enforce StartTLS

Local truststore:

Override System SSL/TLS Protocols:

Message settings

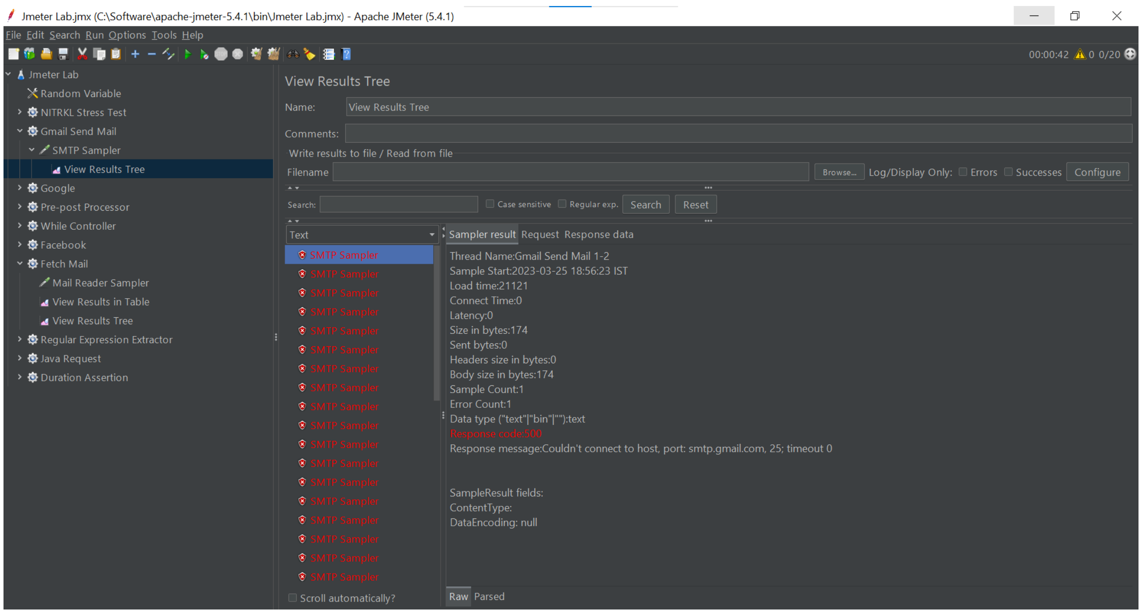
Subject: Jmeter test Suppress Subject Header

[✓] Include timestamp in subject

Add Header

Hello World

Figure 6:

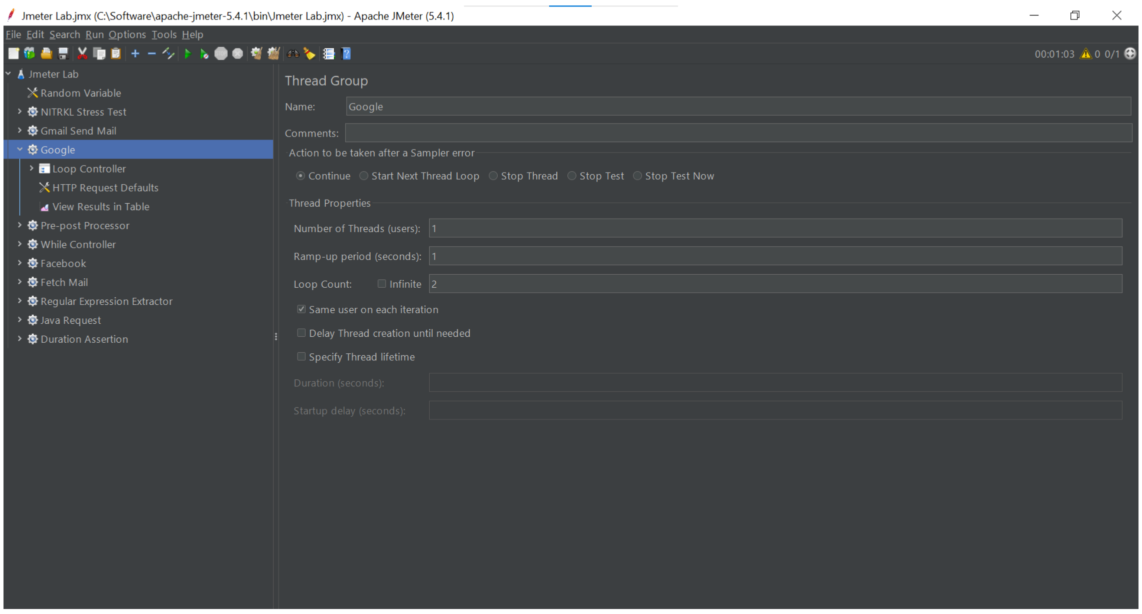


```
Thread Name:Gmail Send Mail 1-2
Sample Start:2023-03-25 18:56:23 IST
Load time:21121
Connect Time:0
Latency:0
Size in bytes:174
Sent bytes:0
Headers size in bytes:0
Body size in bytes:174
Sample Count:1
Error Count:1
Data type ("text"|"bin"|""):text
Response code:500
Response message:Couldn't connect to host, port: smtp.gmail.com, 25; timeout 0


SampleResult fields:
ContentType:
DataEncoding: null
```

Figure 7:

1.3 Using Loop Controller to Google.com


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:01:03 0 0/1

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
    - Loop Controller
    - HTTP Request Defaults
    - View Results in Table
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

Thread Group

Name: Google

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-up period (seconds): 1

Loop Count: Infinite 2

[✓] Same user on each iteration

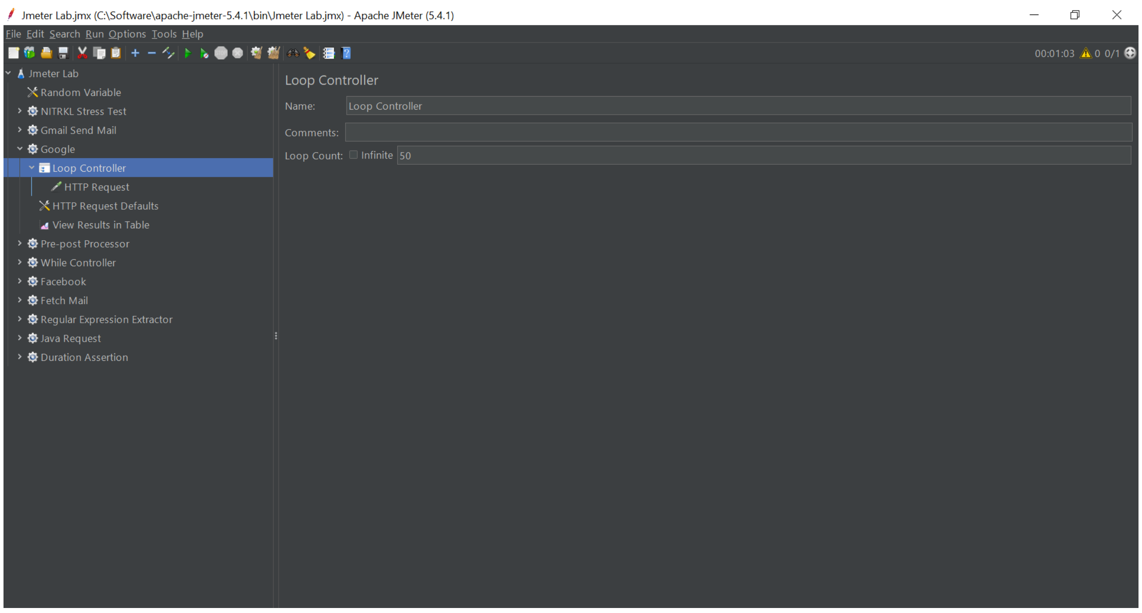
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 8:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:01:03 0 0/1

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
    - Loop Controller
      - HTTP Request
    - HTTP Request Defaults
    - View Results in Table
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion

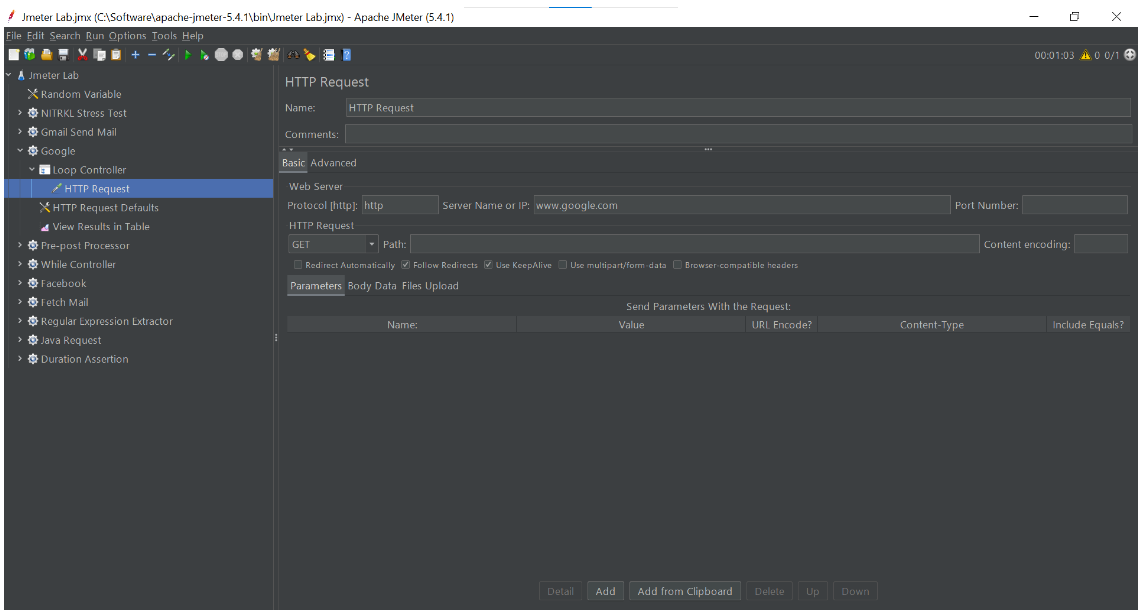
Loop Controller

Name: Loop Controller

Comments:

Loop Count: Infinite 50

Figure 9:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: http Server Name or IP: www.google.com Port Number:

HTTP Request

GET Path: Content encoding:

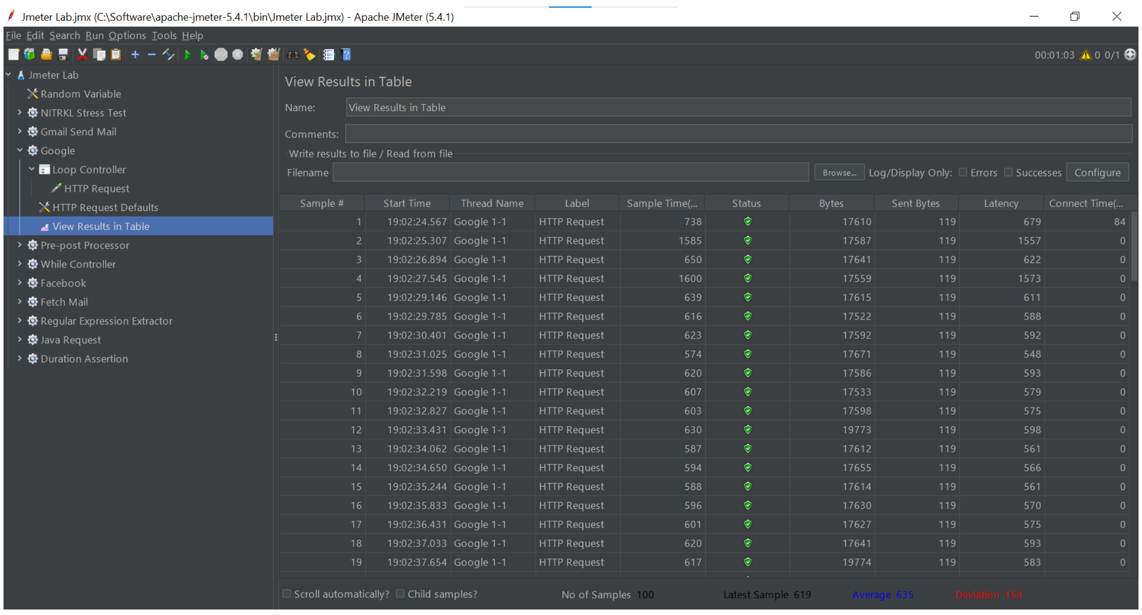
☐ Redirect Automatically ☑ Follow Redirects ☑ Use KeepAlive ☐ Use multipart/form-data ☐ Browser-compatible headers

Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Figure 10:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

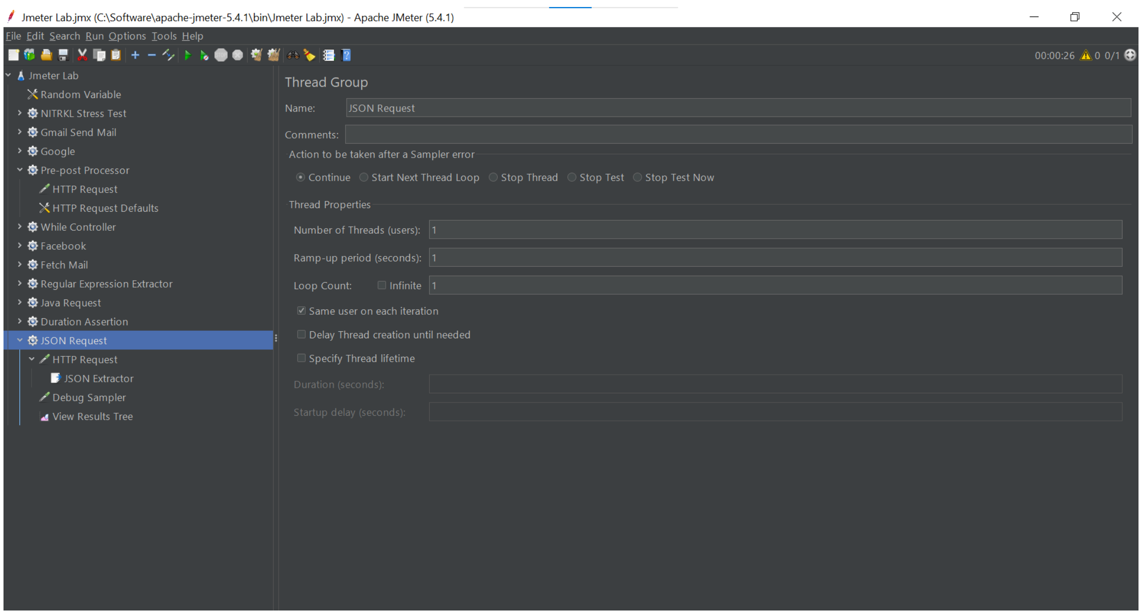
Filename Log/Display Only: ☐ Errors ☐ Successes

Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time(...
1	19:02:24.567	Google 1-1	HTTP Request	738	✓	17610	119	679	84
2	19:02:25.307	Google 1-1	HTTP Request	1585	✓	17587	119	1557	0
3	19:02:26.894	Google 1-1	HTTP Request	650	✓	17641	119	622	0
4	19:02:27.545	Google 1-1	HTTP Request	1600	✓	17559	119	1573	0
5	19:02:29.146	Google 1-1	HTTP Request	639	✓	17615	119	611	0
6	19:02:29.785	Google 1-1	HTTP Request	616	✓	17522	119	588	0
7	19:02:30.401	Google 1-1	HTTP Request	623	✓	17592	119	592	0
8	19:02:31.025	Google 1-1	HTTP Request	574	✓	17671	119	548	0
9	19:02:31.598	Google 1-1	HTTP Request	620	✓	17586	119	593	0
10	19:02:32.219	Google 1-1	HTTP Request	607	✓	17533	119	579	0
11	19:02:32.827	Google 1-1	HTTP Request	603	✓	17598	119	575	0
12	19:02:33.431	Google 1-1	HTTP Request	630	✓	19773	119	598	0
13	19:02:34.062	Google 1-1	HTTP Request	587	✓	17612	119	561	0
14	19:02:34.650	Google 1-1	HTTP Request	594	✓	17655	119	566	0
15	19:02:35.244	Google 1-1	HTTP Request	588	✓	17614	119	561	0
16	19:02:35.833	Google 1-1	HTTP Request	596	✓	17630	119	570	0
17	19:02:36.431	Google 1-1	HTTP Request	601	✓	17627	119	575	0
18	19:02:37.033	Google 1-1	HTTP Request	620	✓	17641	119	593	0
19	19:02:37.654	Google 1-1	HTTP Request	617	✓	19774	119	583	0

☐ Scroll automatically? ☐ Child samples? No of Samples 100 Latest Sample 619 Average 635 Deviation 154

Figure 11:

1.4 Json Extractor


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

Thread Group

Name: JSON Request

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-up period (seconds): 1

Loop Count: Infinite 1

[✓] Same user on each iteration

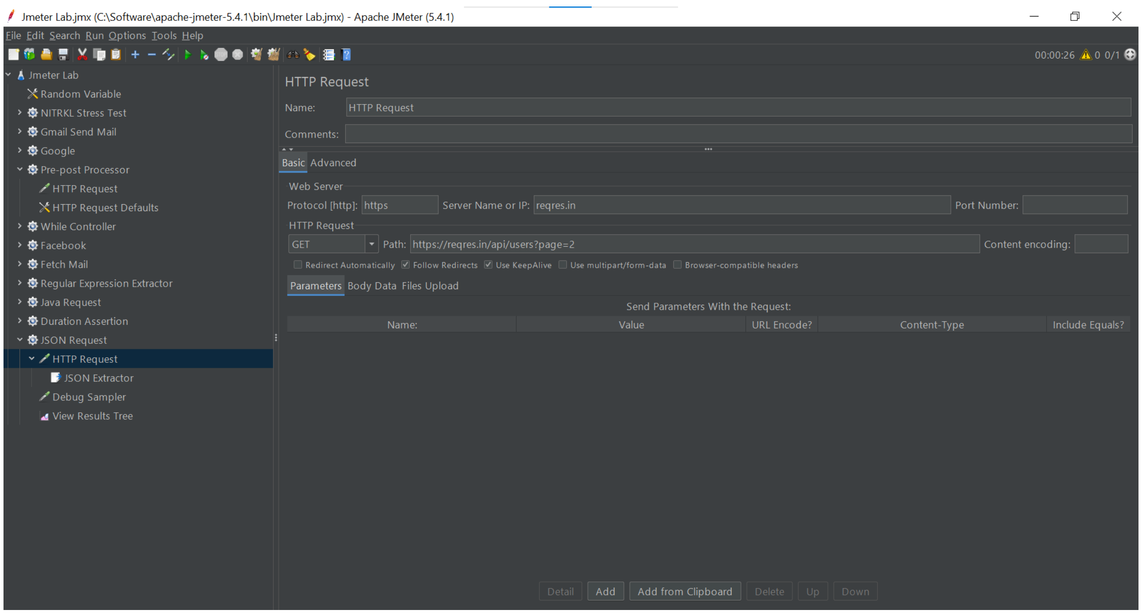
[ ] Delay Thread creation until needed

[ ] Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 12:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: https Server Name or IP: reqres.in Port Number:

HTTP Request

GET Path: https://reqres.in/api/users?page=2 Content encoding:

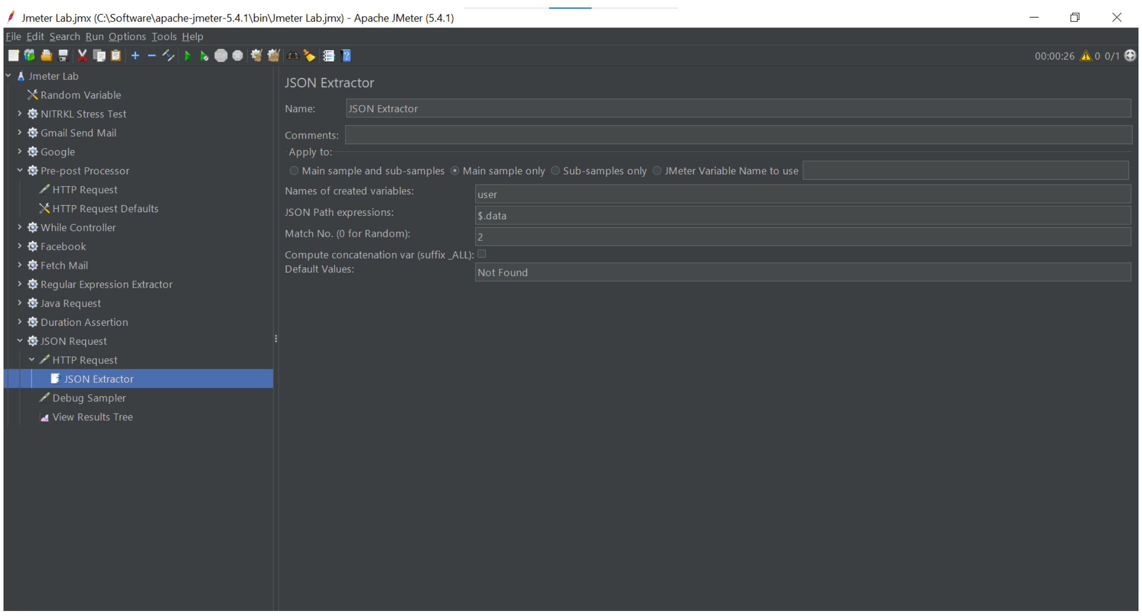
[ ] Redirect Automatically [✓] Follow Redirects [✓] Use KeepAlive [ ] Use multipart/form-data [ ] Browser-compatible headers

Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Figure 13:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

```
Jmeter Lab
  Random Variable
  NITRKL Stress Test
  Gmail Send Mail
  Google
  Pre-post Processor
    HTTP Request
    HTTP Request Defaults
  While Controller
  Facebook
  Fetch Mail
  Regular Expression Extractor
  Java Request
  Duration Assertion
  JSON Request
    HTTP Request
      JSON Extractor
    Debug Sampler
    View Results Tree
```

JSON Extractor

Name: JSON Extractor

Comments:

Apply to: ○ Main sample and sub-samples [✓ Main sample only] ○ Sub-samples only ○ JMeter Variable Name to use

Names of created variables: user

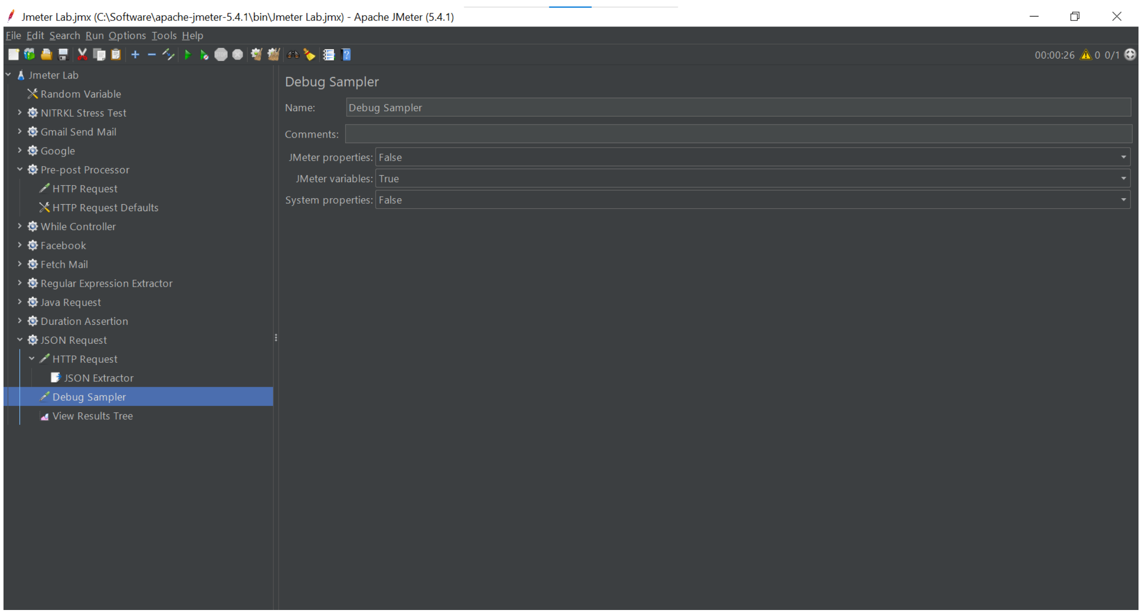
JSON Path expressions: $.data

Match No. (0 for Random): 2

Compute concatenation var (suffix _ALL): ☐

Default Values: Not Found

Figure 14:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

```
Jmeter Lab
  Random Variable
  NITRKL Stress Test
  Gmail Send Mail
  Google
  Pre-post Processor
    HTTP Request
    HTTP Request Defaults
  While Controller
  Facebook
  Fetch Mail
  Regular Expression Extractor
  Java Request
  Duration Assertion
  JSON Request
    HTTP Request
      JSON Extractor
    Debug Sampler
    View Results Tree
```

Debug Sampler

Name: Debug Sampler

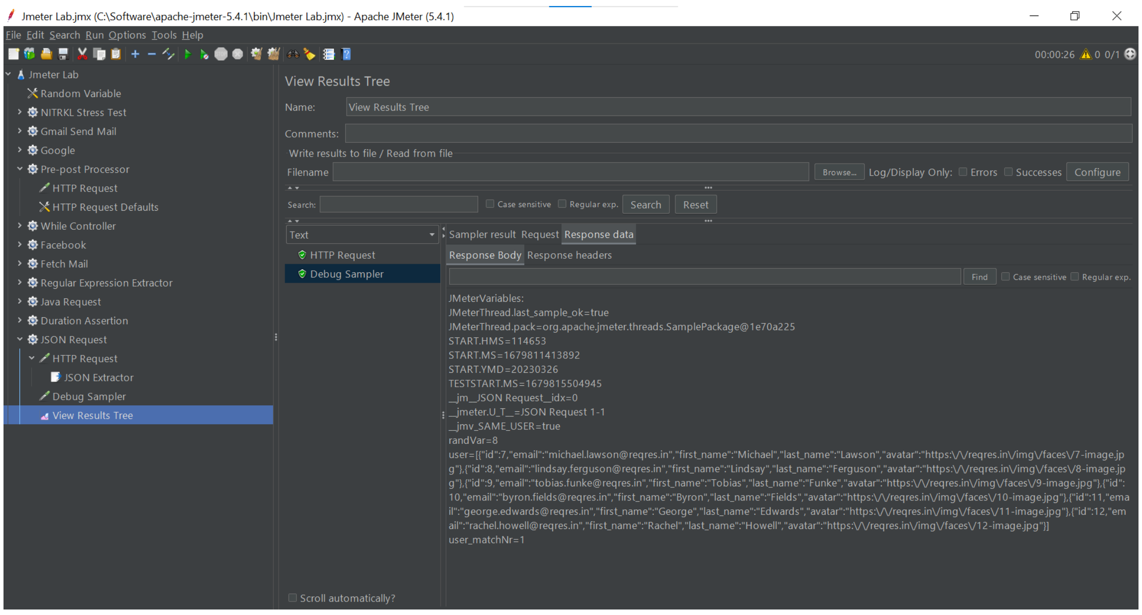
Comments:

JMeter properties: False

JMeter variables: True

System properties: False

Figure 15:



Name: View Results Tree

Comments:

Filename

Log/Display Only: ☐ Errors ☐ Successes Configure

Search:

Text

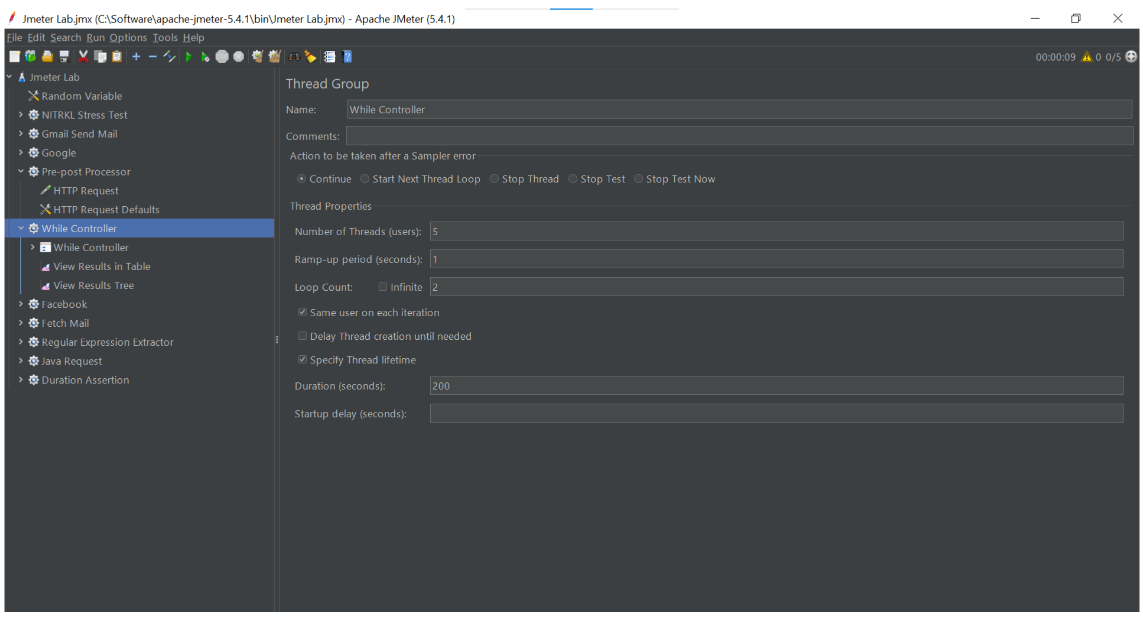
HTTP Request

Debug Sampler

```
JMeterVariables:
JMeterThread.last_sample_ok=true
JMeterThread.pack=org.apache.jmeter.threads.SamplePackage@1e70a225
START.HMS=114653
START.MS=1679811413892
START.YMD=20230326
TESTSTART.MS=1679815504945
__jm__JSON Request__idx=0
__jmeter.U_T__=JSON Request 1-1
__jmv_SAME_USER=true
randVar=8
user=[{"id":7,"email":"michael.lawson@reqres.in","first_name":"Michael","last_name":"Lawson","avatar":"https:\/\/reqres.in\/img\/faces\/7-image.jp
g"},{"id":8,"email":"lindsay.ferguson@reqres.in","first_name":"Lindsay","last_name":"Ferguson","avatar":"https:\/\/reqres.in\/img\/faces\/8-image.jp
g"},{"id":9,"email":"tobias.funke@reqres.in","first_name":"Tobias","last_name":"Funke","avatar":"https:\/\/reqres.in\/img\/faces\/9-image.jpg"},{"id":
10,"email":"byron.fields@reqres.in","first_name":"Byron","last_name":"Fields","avatar":"https:\/\/reqres.in\/img\/faces\/10-image.jpg"},{"id":11,"ema
il":"george.edwards@reqres.in","first_name":"George","last_name":"Edwards","avatar":"https:\/\/reqres.in\/img\/faces\/11-image.jpg"},{"id":12,"em
ail":"rachel.howell@reqres.in","first_name":"Rachel","last_name":"Howell","avatar":"https:\/\/reqres.in\/img\/faces\/12-image.jpg"}]
user_matchNr=1
```

Figure 16:

1.5 While Controller


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

Thread Group

Name: While Controller

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 5

Ramp-up period (seconds): 1

Loop Count: ☐ Infinite 2

☑ Same user on each iteration

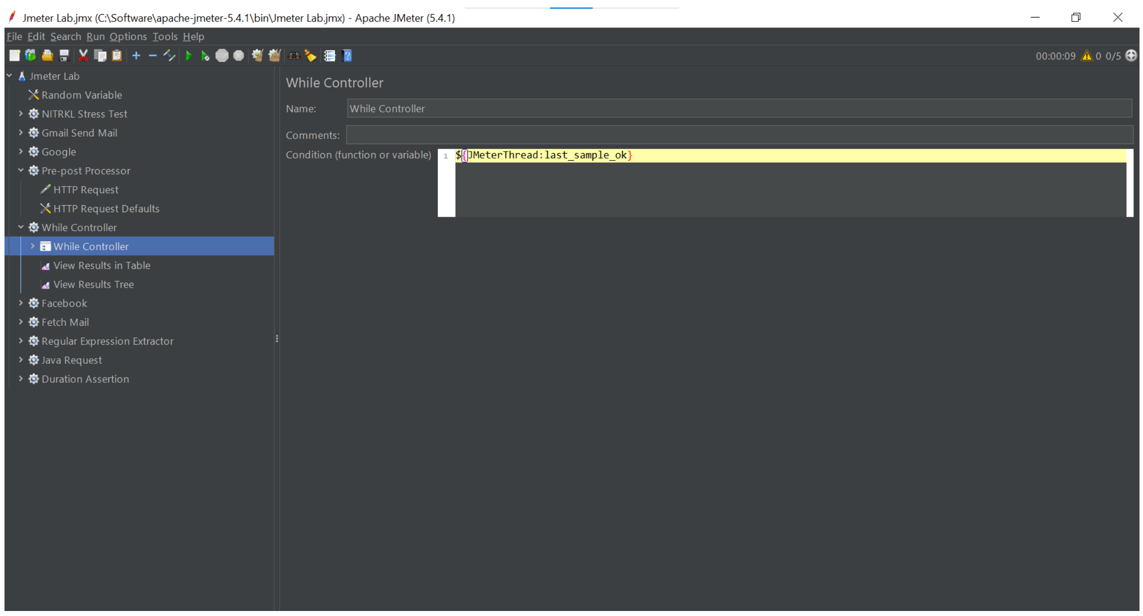
☐ Delay Thread creation until needed

☑ Specify Thread lifetime

Duration (seconds): 200

Startup delay (seconds):

Figure 17:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

While Controller

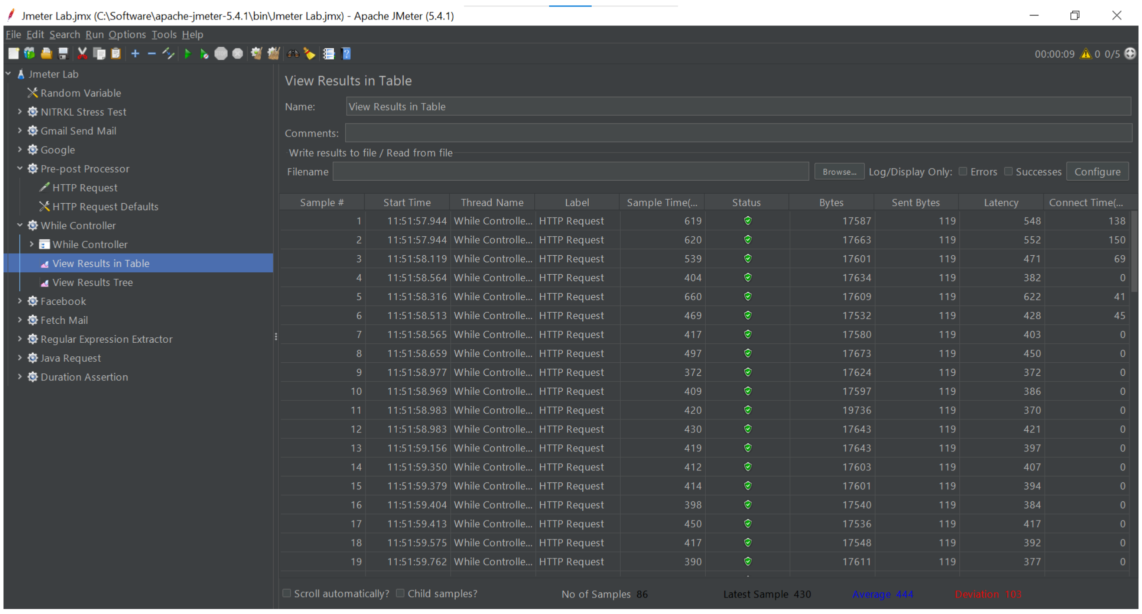
Name: While Controller

Comments:

Condition (function or variable)

```
${JMeterThread:last_sample_ok}
```

Figure 18:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results in Table

Name: View Results in Table

Comments:

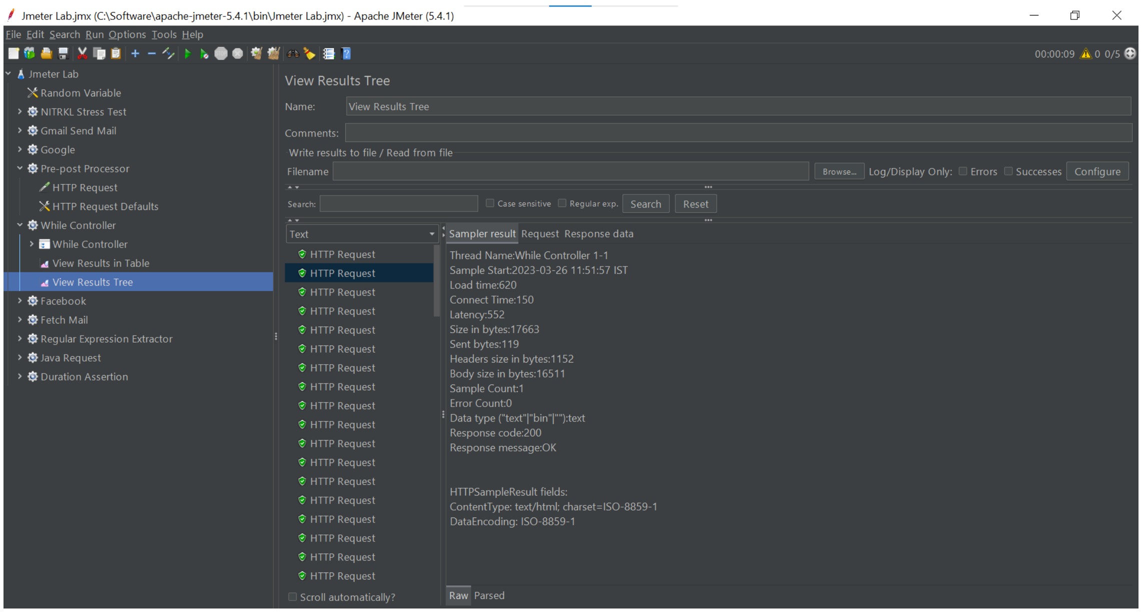
Write results to file / Read from file

Filename

Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time(...
1	11:51:57.944	While Controlle...	HTTP Request	619	✓	17587	119	548	138
2	11:51:57.944	While Controlle...	HTTP Request	620	✓	17663	119	552	150
3	11:51:58.119	While Controlle...	HTTP Request	539	✓	17601	119	471	69
4	11:51:58.564	While Controlle...	HTTP Request	404	✓	17634	119	382	0
5	11:51:58.316	While Controlle...	HTTP Request	660	✓	17609	119	622	41
6	11:51:58.513	While Controlle...	HTTP Request	469	✓	17532	119	428	45
7	11:51:58.565	While Controlle...	HTTP Request	417	✓	17580	119	403	0
8	11:51:58.659	While Controlle...	HTTP Request	497	✓	17673	119	450	0
9	11:51:58.977	While Controlle...	HTTP Request	372	✓	17624	119	372	0
10	11:51:58.969	While Controlle...	HTTP Request	409	✓	17597	119	386	0
11	11:51:58.983	While Controlle...	HTTP Request	420	✓	19736	119	370	0
12	11:51:58.983	While Controlle...	HTTP Request	430	✓	17643	119	421	0
13	11:51:59.156	While Controlle...	HTTP Request	419	✓	17643	119	397	0
14	11:51:59.350	While Controlle...	HTTP Request	412	✓	17603	119	407	0
15	11:51:59.379	While Controlle...	HTTP Request	414	✓	17601	119	394	0
16	11:51:59.404	While Controlle...	HTTP Request	398	✓	17540	119	384	0
17	11:51:59.413	While Controlle...	HTTP Request	450	✓	17536	119	417	0
18	11:51:59.575	While Controlle...	HTTP Request	417	✓	17548	119	392	0
19	11:51:59.762	While Controlle...	HTTP Request	390	✓	17611	119	377	0

No of Samples 86 Latest Sample 430 Average 444 Deviation 103

Figure 19:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results Tree

Name: View Results Tree

Comments:

Write results to file / Read from file

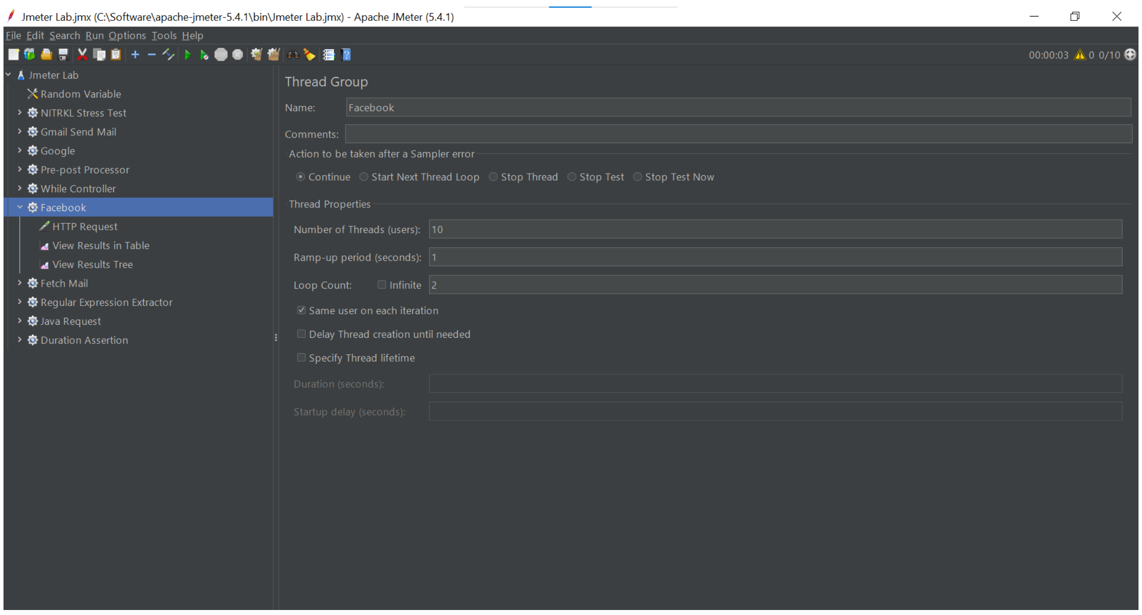
Filename

```
Thread Name:While Controller 1-1
Sample Start:2023-03-26 11:51:57 IST
Load time:620
Connect Time:150
Latency:552
Size in bytes:17663
Sent bytes:119
Headers size in bytes:1152
Body size in bytes:16511
Sample Count:1
Error Count:0
Data type ("text"|"bin"|""):text
Response code:200
Response message:OK


HTTPSampleResult fields:
ContentType: text/html; charset=ISO-8859-1
DataEncoding: ISO-8859-1
```

Figure 20:

1.6 Facebook


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

Thread Group

Name: Facebook

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 10

Ramp-up period (seconds): 1

Loop Count: ☐ Infinite 2

☑ Same user on each iteration

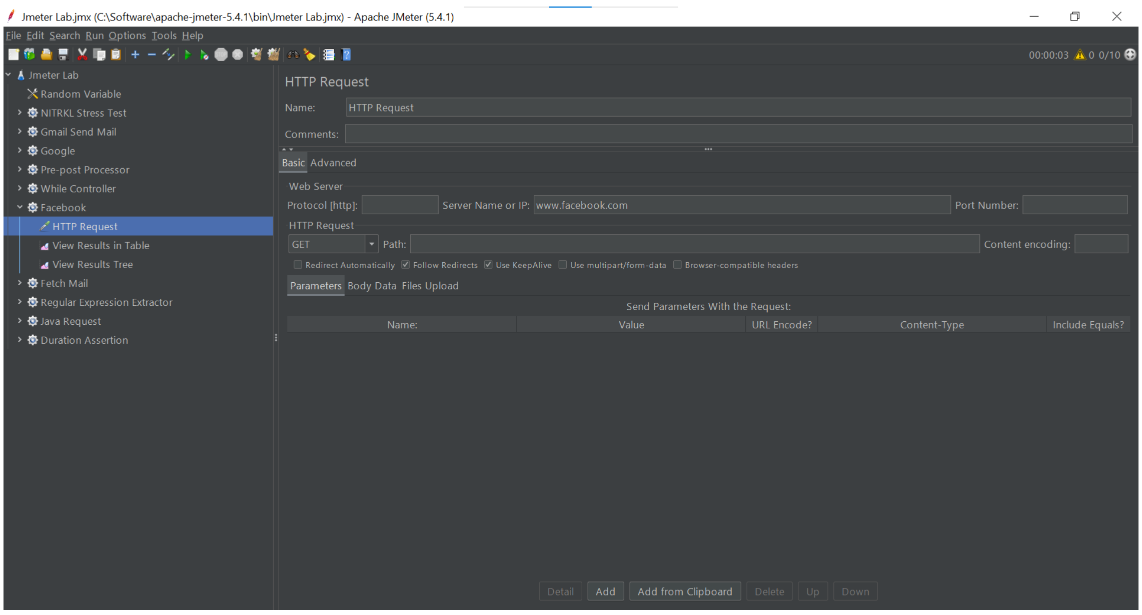
☐ Delay Thread creation until needed

☐ Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 21:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: Server Name or IP: www.facebook.com Port Number:

HTTP Request

GET Path: Content encoding:

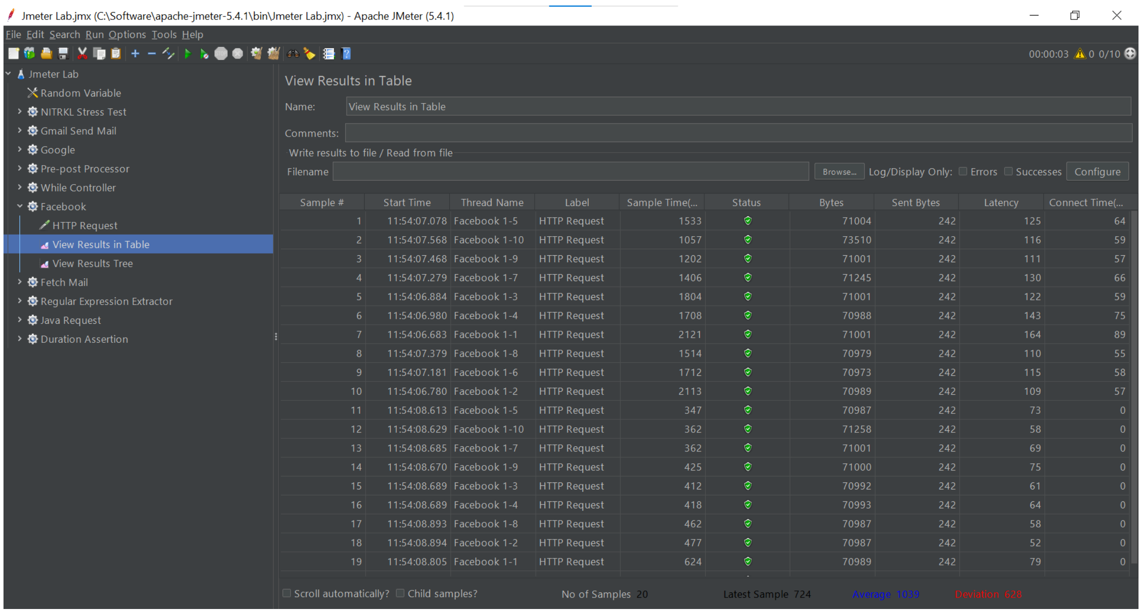
☐ Redirect Automatically ☑ Follow Redirects ☑ Use KeepAlive ☐ Use multipart/form-data ☐ Browser-compatible headers

Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Figure 22:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

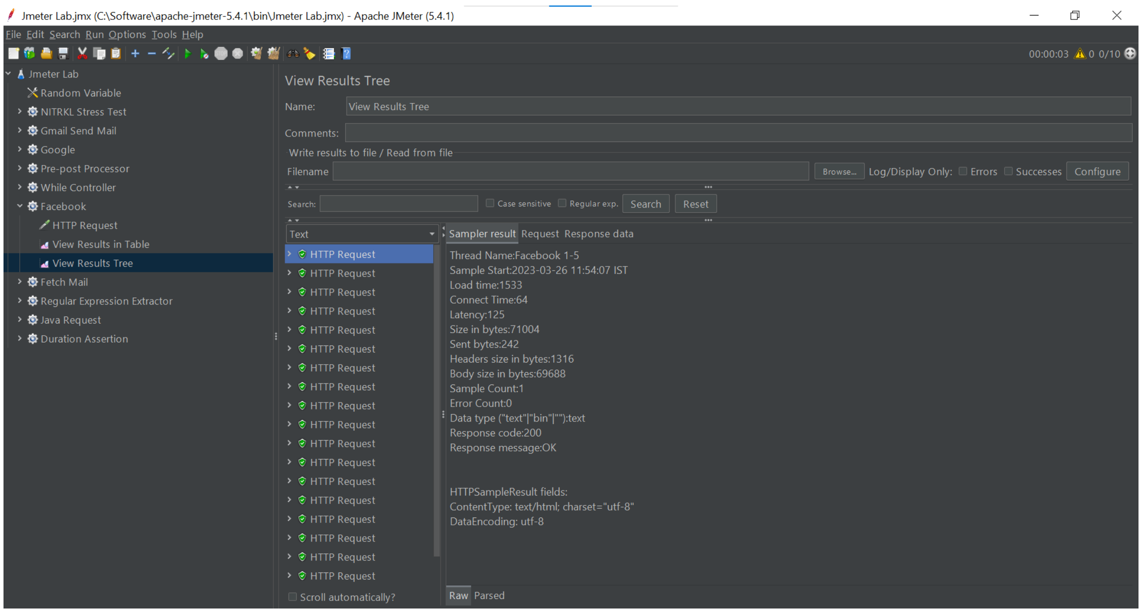
Filename

Log/Display Only: ☐ Errors ☐ Successes

Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time(...
1	11:54:07.078	Facebook 1-5	HTTP Request	1533	✓	71004	242	125	64
2	11:54:07.568	Facebook 1-10	HTTP Request	1057	✓	73510	242	116	59
3	11:54:07.468	Facebook 1-9	HTTP Request	1202	✓	71001	242	111	57
4	11:54:07.279	Facebook 1-7	HTTP Request	1406	✓	71245	242	130	66
5	11:54:06.884	Facebook 1-3	HTTP Request	1804	✓	71001	242	122	59
6	11:54:06.980	Facebook 1-4	HTTP Request	1708	✓	70988	242	143	75
7	11:54:06.683	Facebook 1-1	HTTP Request	2121	✓	71001	242	164	89
8	11:54:07.379	Facebook 1-8	HTTP Request	1514	✓	70979	242	110	55
9	11:54:07.181	Facebook 1-6	HTTP Request	1712	✓	70973	242	115	58
10	11:54:06.780	Facebook 1-2	HTTP Request	2113	✓	70989	242	109	57
11	11:54:08.613	Facebook 1-5	HTTP Request	347	✓	70987	242	73	0
12	11:54:08.629	Facebook 1-10	HTTP Request	362	✓	71258	242	58	0
13	11:54:08.685	Facebook 1-7	HTTP Request	362	✓	71001	242	69	0
14	11:54:08.670	Facebook 1-9	HTTP Request	425	✓	71000	242	75	0
15	11:54:08.689	Facebook 1-3	HTTP Request	412	✓	70992	242	61	0
16	11:54:08.689	Facebook 1-4	HTTP Request	418	✓	70993	242	64	0
17	11:54:08.893	Facebook 1-8	HTTP Request	462	✓	70987	242	58	0
18	11:54:08.894	Facebook 1-2	HTTP Request	477	✓	70987	242	52	0
19	11:54:08.805	Facebook 1-1	HTTP Request	624	✓	70989	242	79	0

☐ Scroll automatically? ☐ Child samples? No of Samples 20 Latest Sample 724 Average 1039 Deviation 628

Figure 23:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

View Results Tree

Name: View Results Tree

Comments:

Write results to file / Read from file

Filename

Log/Display Only: ☐ Errors ☐ Successes

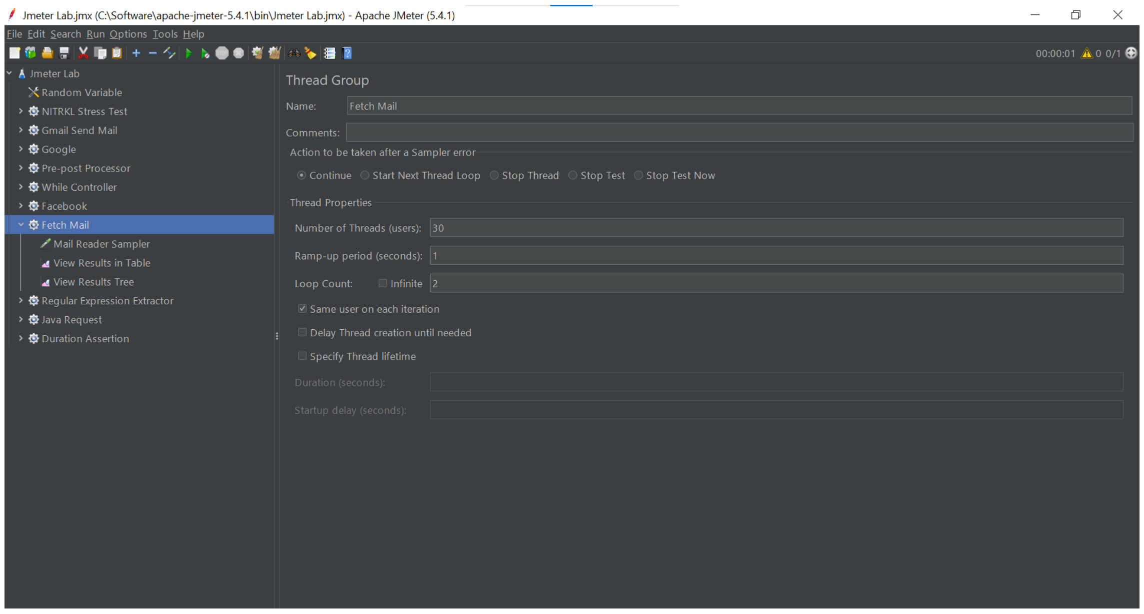
Sampler result Request Response data

```
Thread Name:Facebook 1-5
Sample Start:2023-03-26 11:54:07 IST
Load time:1533
Connect Time:64
Latency:125
Size in bytes:71004
Sent bytes:242
Headers size in bytes:1316
Body size in bytes:69688
Sample Count:1
Error Count:0
Data type ("text"|"bin"|""):text
Response code:200
Response message:OK


HTTPSampleResult fields:
ContentType: text/html; charset="utf-8"
DataEncoding: utf-8
```

Figure 24:

1.7 Mail Reader Sampler


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)
File Edit Search Run Options Tools Help
00:00:01 0 0/1

Jmeter Lab
- Random Variable
- NITRKL Stress Test
- Gmail Send Mail
- Google
- Pre-post Processor
- While Controller
- Facebook
- Fetch Mail
  - Mail Reader Sampler
  - View Results in Table
  - View Results Tree
- Regular Expression Extractor
- Java Request
- Duration Assertion

Thread Group

Name: Fetch Mail

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 30

Ramp-up period (seconds): 1

Loop Count: Infinite 2

[✓] Same user on each iteration

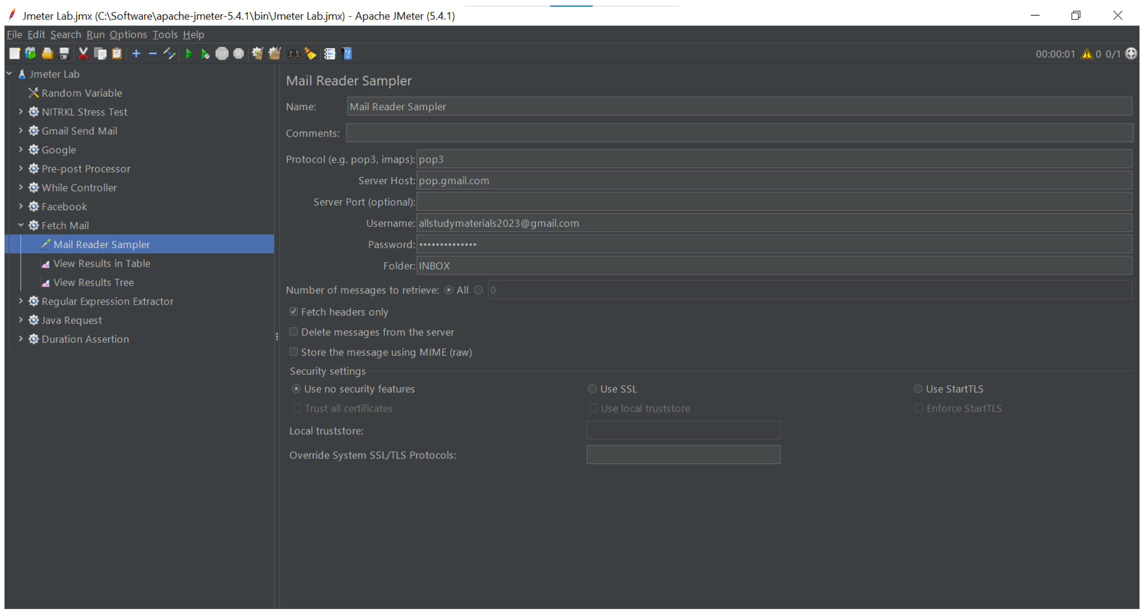
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 25:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)
File Edit Search Run Options Tools Help
00:00:01 0 0/1

Jmeter Lab
- Random Variable
- NITRKL Stress Test
- Gmail Send Mail
- Google
- Pre-post Processor
- While Controller
- Facebook
- Fetch Mail
  - Mail Reader Sampler
  - View Results in Table
  - View Results Tree
- Regular Expression Extractor
- Java Request
- Duration Assertion

Mail Reader Sampler

Name: Mail Reader Sampler

Comments:

Protocol (e.g. pop3, imaps): pop3

Server Host: pop.gmail.com

Server Port (optional):

Username: allstudymaterials2023@gmail.com

Password: ••••••••••••••

Folder: INBOX

Number of messages to retrieve: [✓ All] 0

[✓] Fetch headers only

Delete messages from the server

Store the message using MIME (raw)

Security settings

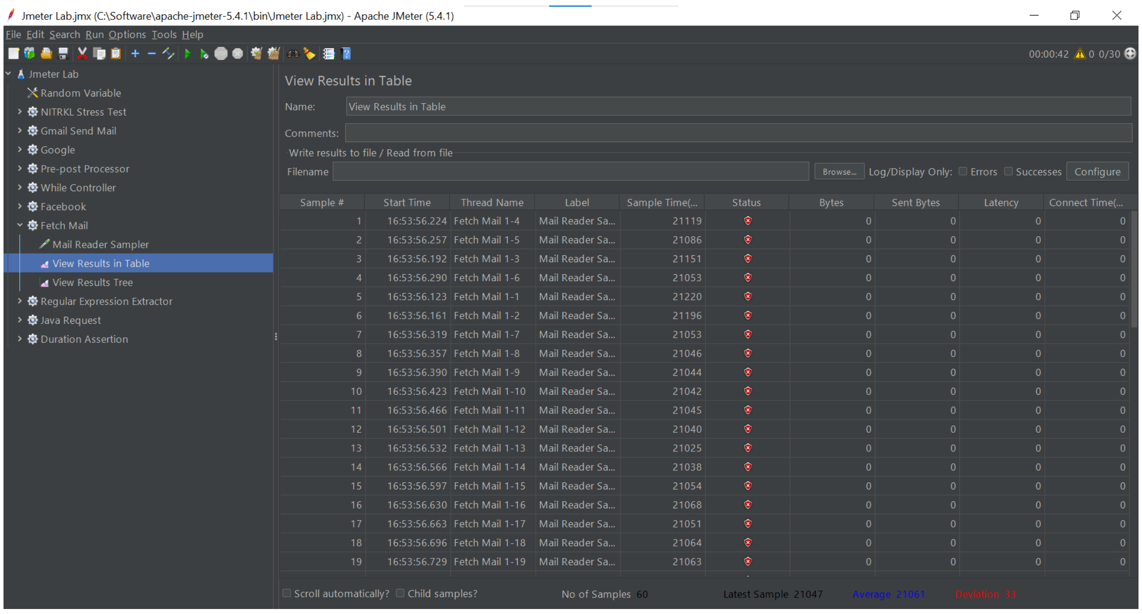
[✓ Use no security features] Use SSL Use StartTLS

Trust all certificates Use local truststore Enforce StartTLS

Local truststore:

Override System SSL/TLS Protocols:

Figure 26:



View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

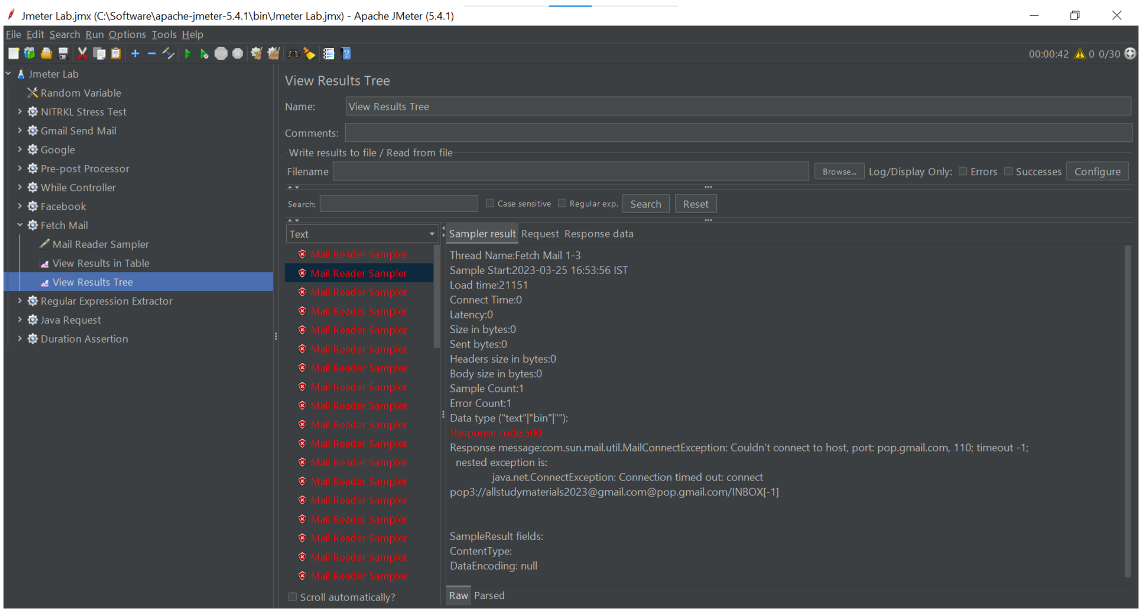
Filename

Log/Display Only: ☐ Errors ☐ Successes

Sample #	Start Time	Thread Name	Label	Sample Time(...	Status	Bytes	Sent Bytes	Latency	Connect Time(...
1	16:53:56.224	Fetch Mail 1-4	Mail Reader Sa...	21119	✗	0	0	0	0
2	16:53:56.257	Fetch Mail 1-5	Mail Reader Sa...	21086	✗	0	0	0	0
3	16:53:56.192	Fetch Mail 1-3	Mail Reader Sa...	21151	✗	0	0	0	0
4	16:53:56.290	Fetch Mail 1-6	Mail Reader Sa...	21053	✗	0	0	0	0
5	16:53:56.123	Fetch Mail 1-1	Mail Reader Sa...	21220	✗	0	0	0	0
6	16:53:56.161	Fetch Mail 1-2	Mail Reader Sa...	21196	✗	0	0	0	0
7	16:53:56.319	Fetch Mail 1-7	Mail Reader Sa...	21053	✗	0	0	0	0
8	16:53:56.357	Fetch Mail 1-8	Mail Reader Sa...	21046	✗	0	0	0	0
9	16:53:56.390	Fetch Mail 1-9	Mail Reader Sa...	21044	✗	0	0	0	0
10	16:53:56.423	Fetch Mail 1-10	Mail Reader Sa...	21042	✗	0	0	0	0
11	16:53:56.466	Fetch Mail 1-11	Mail Reader Sa...	21045	✗	0	0	0	0
12	16:53:56.501	Fetch Mail 1-12	Mail Reader Sa...	21040	✗	0	0	0	0
13	16:53:56.532	Fetch Mail 1-13	Mail Reader Sa...	21025	✗	0	0	0	0
14	16:53:56.566	Fetch Mail 1-14	Mail Reader Sa...	21038	✗	0	0	0	0
15	16:53:56.597	Fetch Mail 1-15	Mail Reader Sa...	21054	✗	0	0	0	0
16	16:53:56.630	Fetch Mail 1-16	Mail Reader Sa...	21068	✗	0	0	0	0
17	16:53:56.663	Fetch Mail 1-17	Mail Reader Sa...	21051	✗	0	0	0	0
18	16:53:56.696	Fetch Mail 1-18	Mail Reader Sa...	21064	✗	0	0	0	0
19	16:53:56.729	Fetch Mail 1-19	Mail Reader Sa...	21063	✗	0	0	0	0

☐ Scroll automatically? ☐ Child samples? No of Samples 60 Latest Sample 21047 Average 21061 Deviation 33

Figure 27:



View Results Tree

Name: View Results Tree

Comments:

Write results to file / Read from file

Filename

Log/Display Only: ☐ Errors ☐ Successes

Search: ☐ Case sensitive ☐ Regular exp.

Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler
Mail Reader Sampler

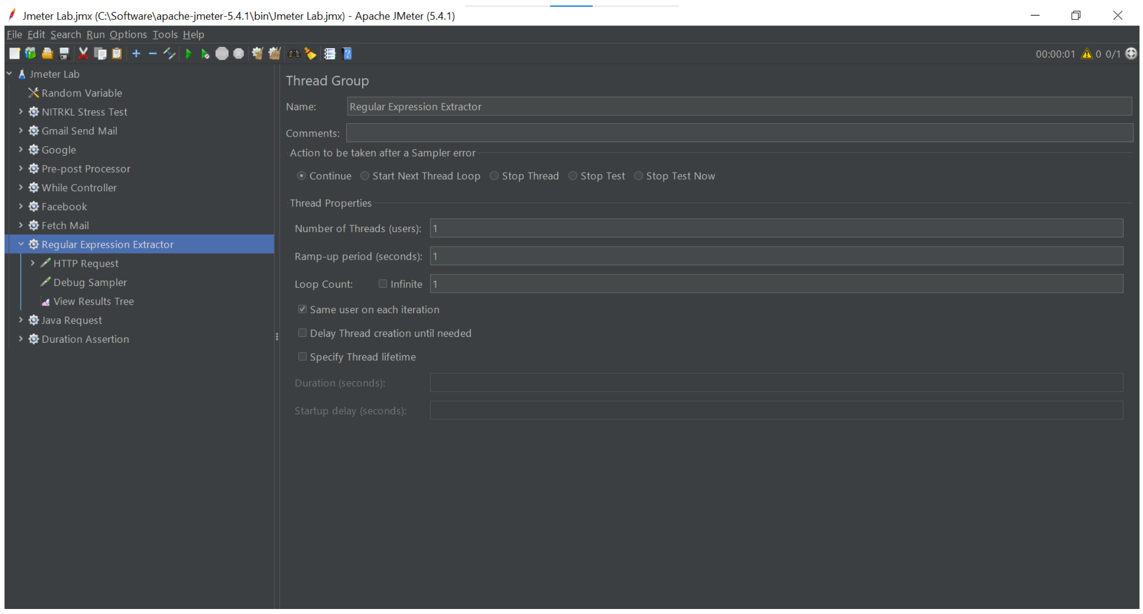
```
Thread Name:Fetch Mail 1-3
Sample Start:2023-03-25 16:53:56 IST
Load time:21151
Connect Time:0
Latency:0
Size in bytes:0
Sent bytes:0
Headers size in bytes:0
Body size in bytes:0
Sample Count:1
Error Count:1
Data type ("text"|"bin"|""):
Response code:500
Response message:com.sun.mail.util.MailConnectException: Couldn't connect to host, port: pop.gmail.com, 110; timeout -1;
  nested exception is:
	java.net.ConnectException: Connection timed out: connect
pop3://allstudymaterials2023@gmail.com@pop.gmail.com/INBOX[-1]


SampleResult fields:
ContentType:
DataEncoding: null
```

☐ Scroll automatically?

Figure 28:

1.8 Regular Expression Extractor


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:00:01 0 0/1

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
    - HTTP Request
    - Debug Sampler
    - View Results Tree
  - Java Request
  - Duration Assertion

Thread Group

Name: Regular Expression Extractor

Comments:

Action to be taken after a Sampler error: (●) Continue ( ) Start Next Thread Loop ( ) Stop Thread ( ) Stop Test ( ) Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-up period (seconds): 1

Loop Count: ☐ Infinite 1

☑ Same user on each iteration

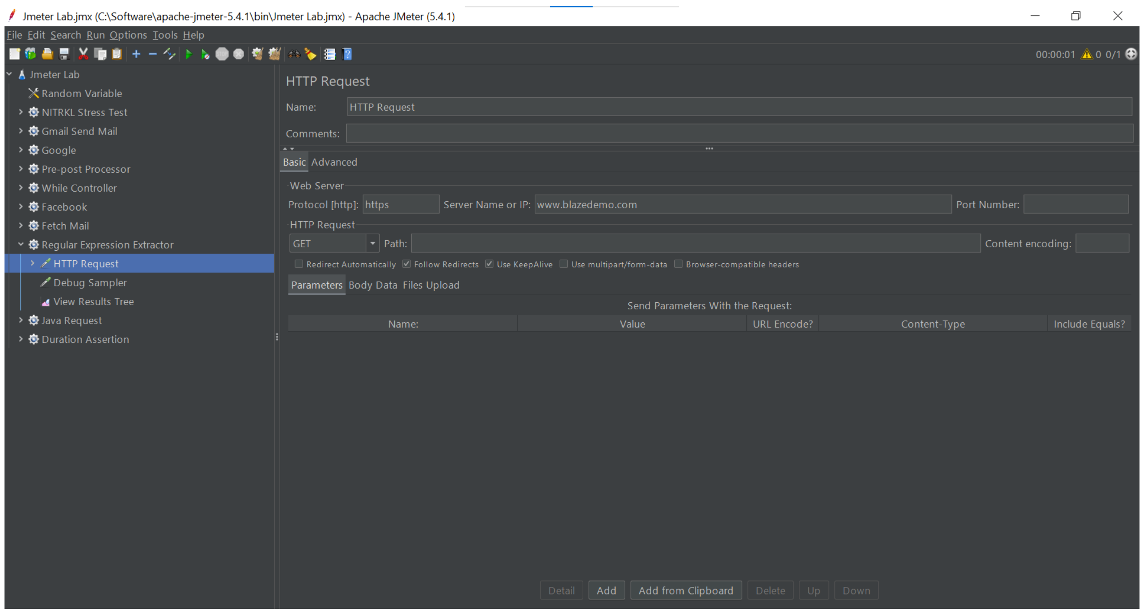
☐ Delay Thread creation until needed

☐ Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 29:


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

File Edit Search Run Options Tools Help

00:00:01 0 0/1

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
    - HTTP Request
    - Debug Sampler
    - View Results Tree
  - Java Request
  - Duration Assertion

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: https Server Name or IP: www.blazedemo.com Port Number:

HTTP Request

GET Path: Content encoding:

☐ Redirect Automatically ☑ Follow Redirects ☑ Use KeepAlive ☐ Use multipart/form-data ☐ Browser-compatible headers

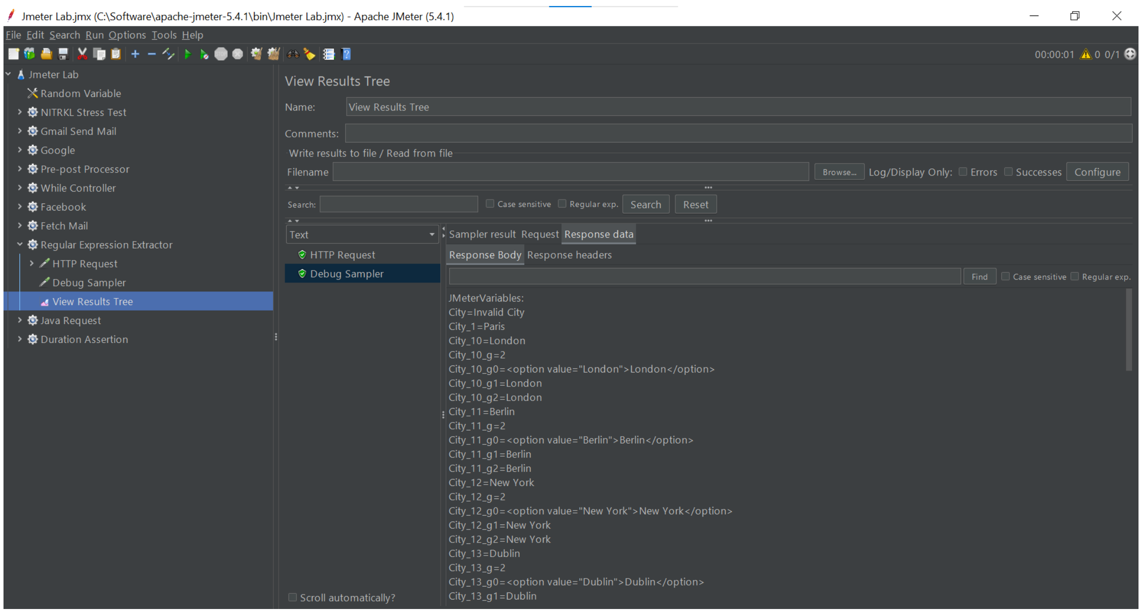
Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Detail Add Add from Clipboard Delete Up Down

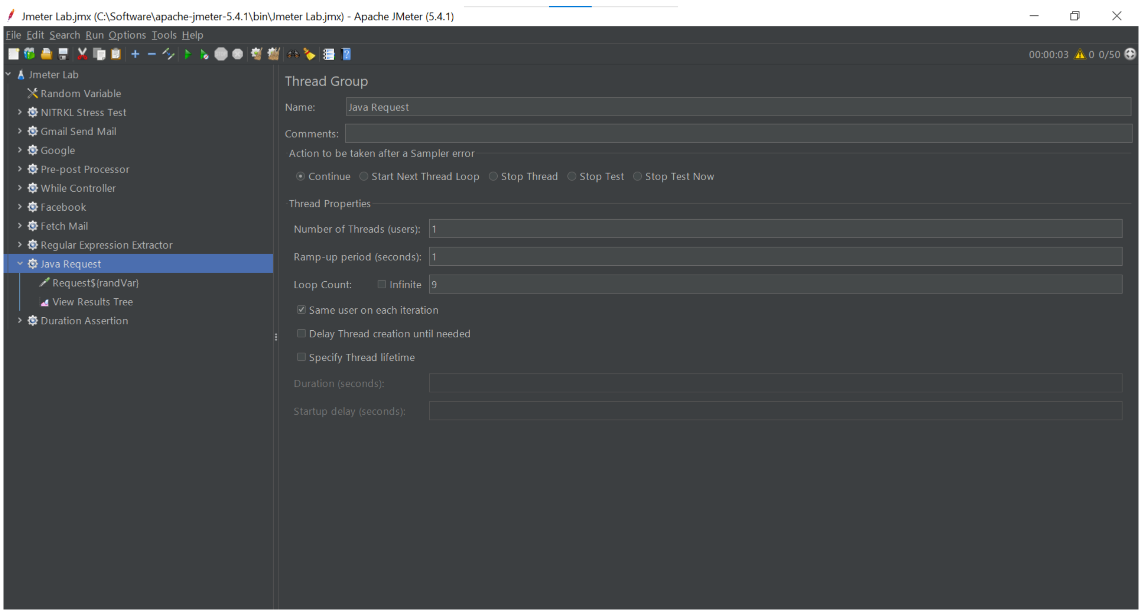
Figure 30:



```
JMeterVariables:
City=Invalid City
City_1=Paris
City_10=London
City_10_g=2
City_10_g0=<option value="London">London</option>
City_10_g1=London
City_10_g2=London
City_11=Berlin
City_11_g=2
City_11_g0=<option value="Berlin">Berlin</option>
City_11_g1=Berlin
City_11_g2=Berlin
City_12=New York
City_12_g=2
City_12_g0=<option value="New York">New York</option>
City_12_g1=New York
City_12_g2=New York
City_13=Dublin
City_13_g=2
City_13_g0=<option value="Dublin">Dublin</option>
City_13_g1=Dublin
```

Figure 31:

1.9 Java Request



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
  - Java Request
    - Request$(randVar)
    - View Results Tree
  - Duration Assertion

Thread Group

Name: Java Request

Comments:

Action to be taken after a Sampler error

[✓ Continue] Start Next Thread Loop Stop Thread Stop Test Stop Test Now

Thread Properties

Number of Threads (users): 1

Ramp-up period (seconds): 1

Loop Count: Infinite 9

[✓ Same user on each iteration]

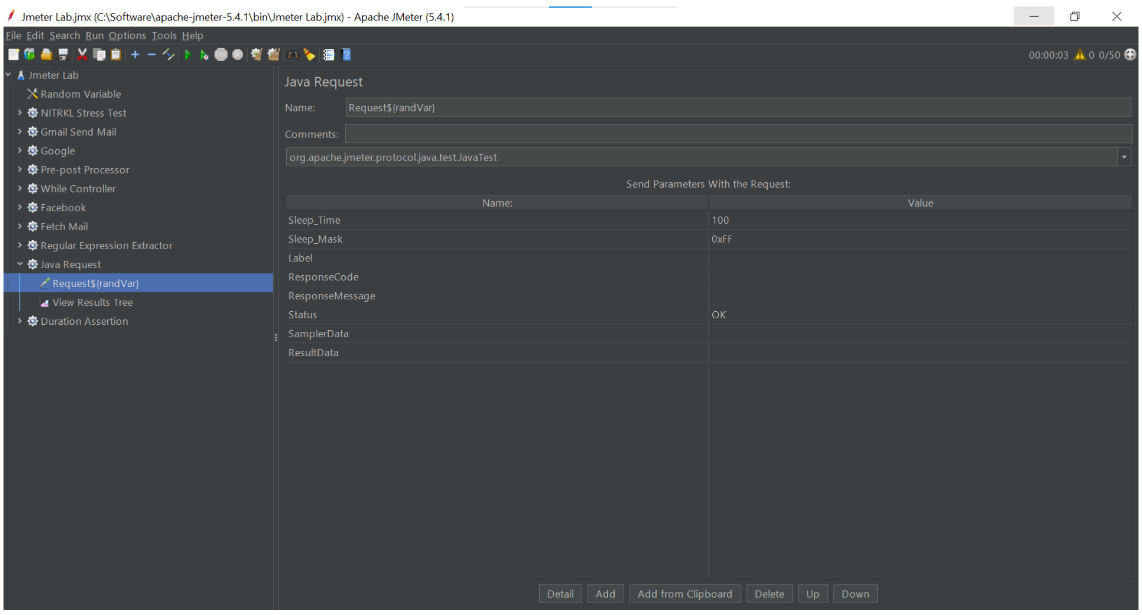
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 32:



Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
  - Java Request
    - Request$(randVar)
    - View Results Tree
  - Duration Assertion

Java Request

Name: Request$(randVar)

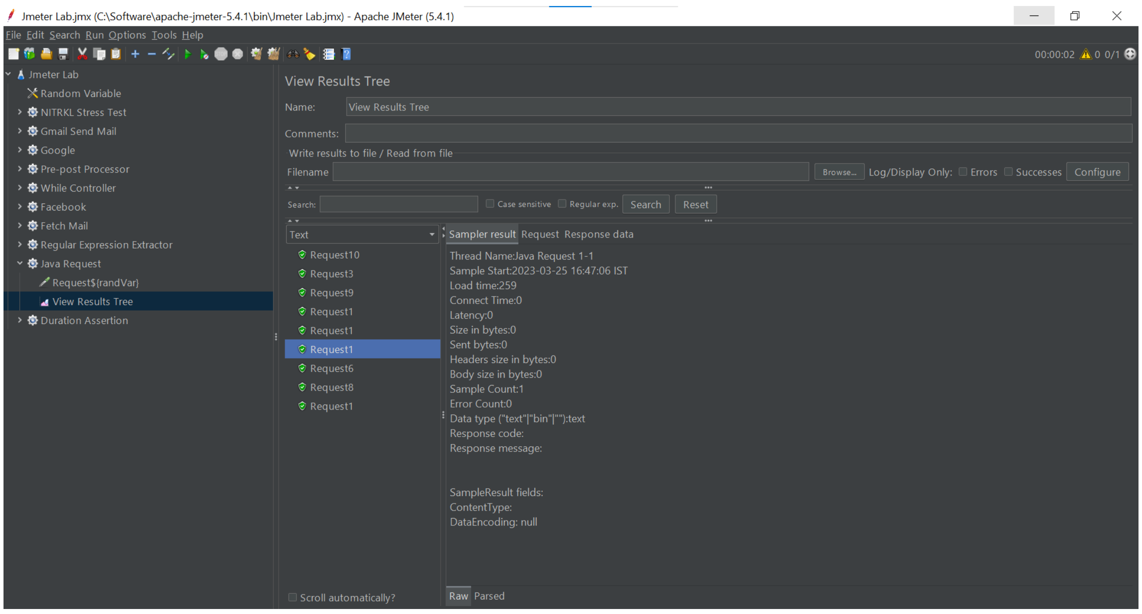
Comments:

org.apache.jmeter.protocol.java.test.JavaTest

Send Parameters With the Request:

Name:	Value
Sleep_Time	100
Sleep_Mask	0xFF
Label	
ResponseCode	
ResponseMessage	
Status	OK
SamplerData	
ResultData	

Figure 33:



Name: View Results Tree

Comments:

Filename

Search:

Text

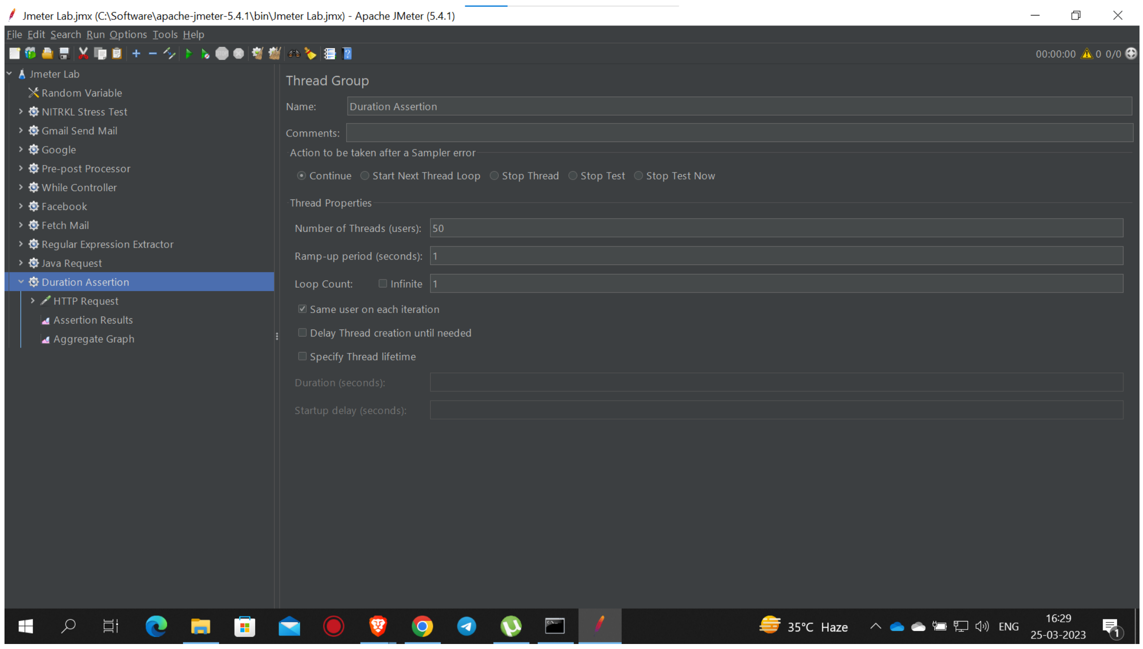
Request10
Request3
Request9
Request1
Request1
Request1
Request6
Request8
Request1

```
Thread Name:Java Request 1-1
Sample Start:2023-03-25 16:47:06 IST
Load time:259
Connect Time:0
Latency:0
Size in bytes:0
Sent bytes:0
Headers size in bytes:0
Body size in bytes:0
Sample Count:1
Error Count:0
Data type ("text"|"bin"|""):text
Response code:
Response message:


SampleResult fields:
ContentType:
DataEncoding: null
```

Figure 34:

1.10 Duration Assertion


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

- Jmeter Lab
  - Random Variable
  - NITRKL Stress Test
  - Gmail Send Mail
  - Google
  - Pre-post Processor
  - While Controller
  - Facebook
  - Fetch Mail
  - Regular Expression Extractor
  - Java Request
  - Duration Assertion
    - HTTP Request
    - Assertion Results
    - Aggregate Graph

Thread Group

Name: Duration Assertion

Comments:

Action to be taken after a Sampler error: [✓ Continue] Start Next Thread Loop / Stop Thread / Stop Test / Stop Test Now

Thread Properties

Number of Threads (users): 50

Ramp-up period (seconds): 1

Loop Count: Infinite 1

[✓] Same user on each iteration

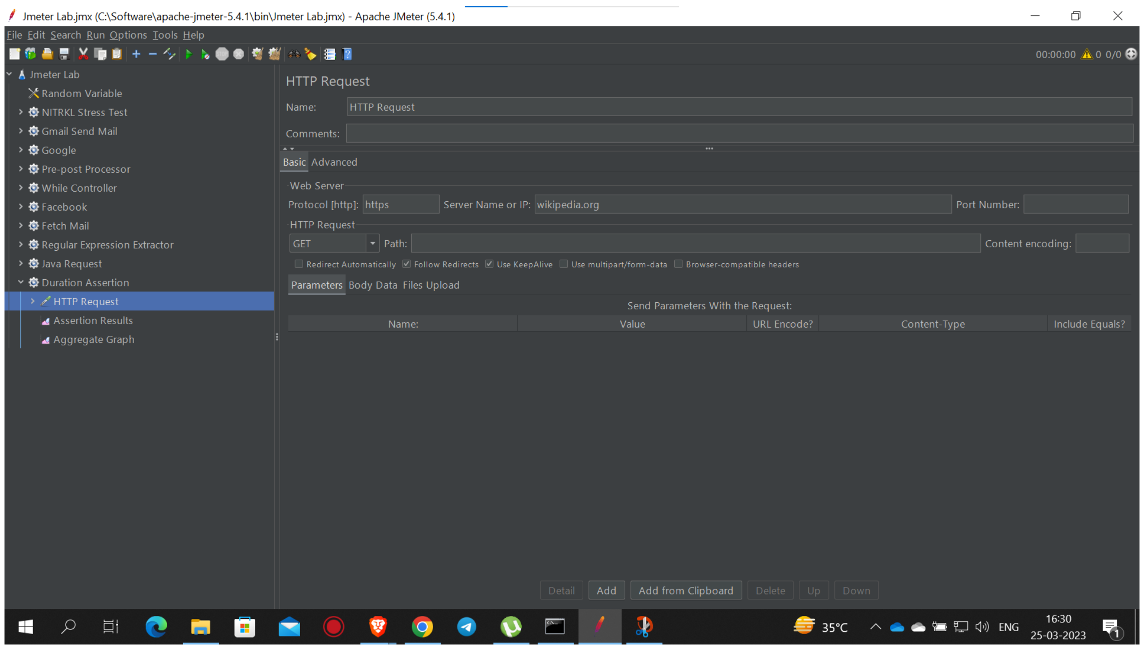
Delay Thread creation until needed

Specify Thread lifetime

Duration (seconds):

Startup delay (seconds):

Figure 35: Thread Group


Jmeter Lab.jmx (C:\Software\apache-jmeter-5.4.1\bin\Jmeter Lab.jmx) - Apache JMeter (5.4.1)

HTTP Request

Name: HTTP Request

Comments:

Basic Advanced

Web Server

Protocol [http]: https Server Name or IP: wikipedia.org Port Number:

HTTP Request

GET Path: Content encoding:

Redirect Automatically [✓ Follow Redirects] [✓ Use KeepAlive] Use multipart/form-data Browser-compatible headers

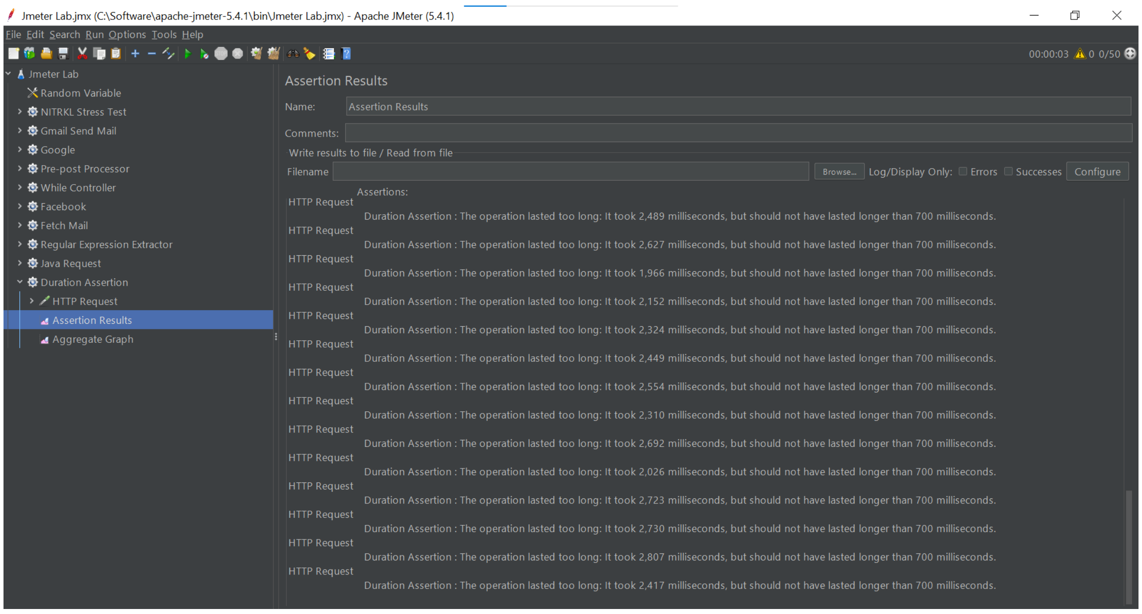
Parameters Body Data Files Upload

Send Parameters With the Request:

Name:	Value	URL Encode?	Content-Type	Include Equals?

Detail Add Add from Clipboard Delete Up Down

Figure 36: HTTP Request



Assertion Results

Name: Assertion Results

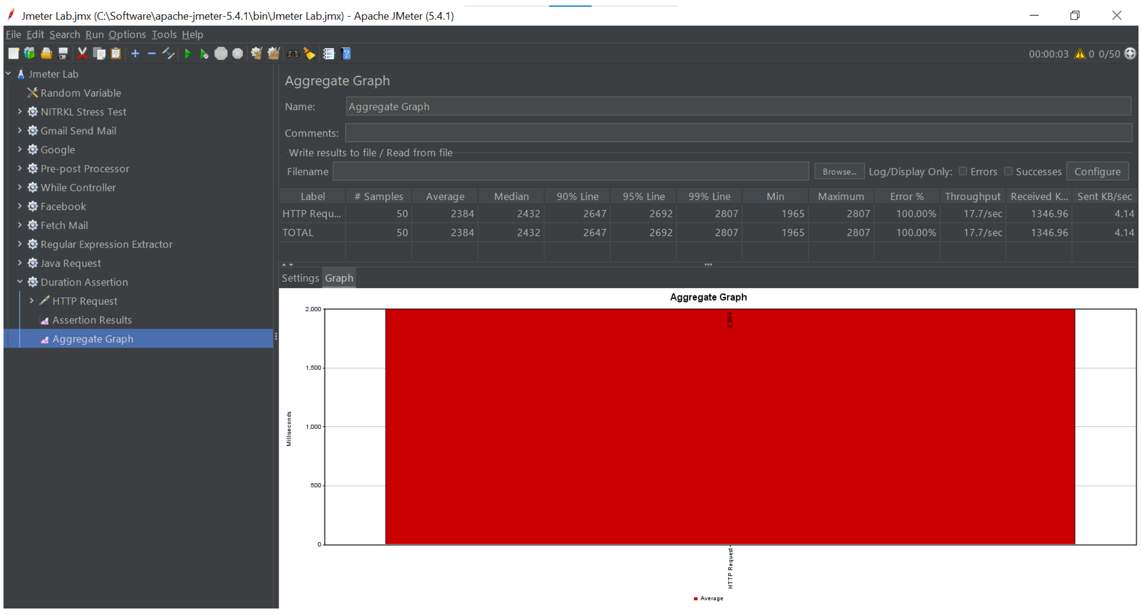
Comments:

Write results to file / Read from file

Filename [ ] Browse... Log/Display Only: ☐ Errors ☐ Successes Configure

```
Assertions:
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,489 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,627 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 1,966 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,152 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,324 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,449 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,554 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,310 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,692 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,026 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,723 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,730 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,807 milliseconds, but should not have lasted longer than 700 milliseconds.
HTTP Request
    Duration Assertion : The operation lasted too long: It took 2,417 milliseconds, but should not have lasted longer than 700 milliseconds.
```

Figure 37: Assertion Results



Aggregate Graph

Name: Aggregate Graph

Comments:

Write results to file / Read from file

Filename [ ] Browse... Log/Display Only: ☐ Errors ☐ Successes Configure

Label	# Samples	Average	Median	90% Line	95% Line	99% Line	Min	Maximum	Error %	Throughput	Received K...	Sent KB/sec
HTTP Requ...	50	2384	2432	2647	2692	2807	1965	2807	100.00%	17.7/sec	1346.96	4.14
TOTAL	50	2384	2432	2647	2692	2807	1965	2807	100.00%	17.7/sec	1346.96	4.14

Figure 38: Graph