

# Flight Management System

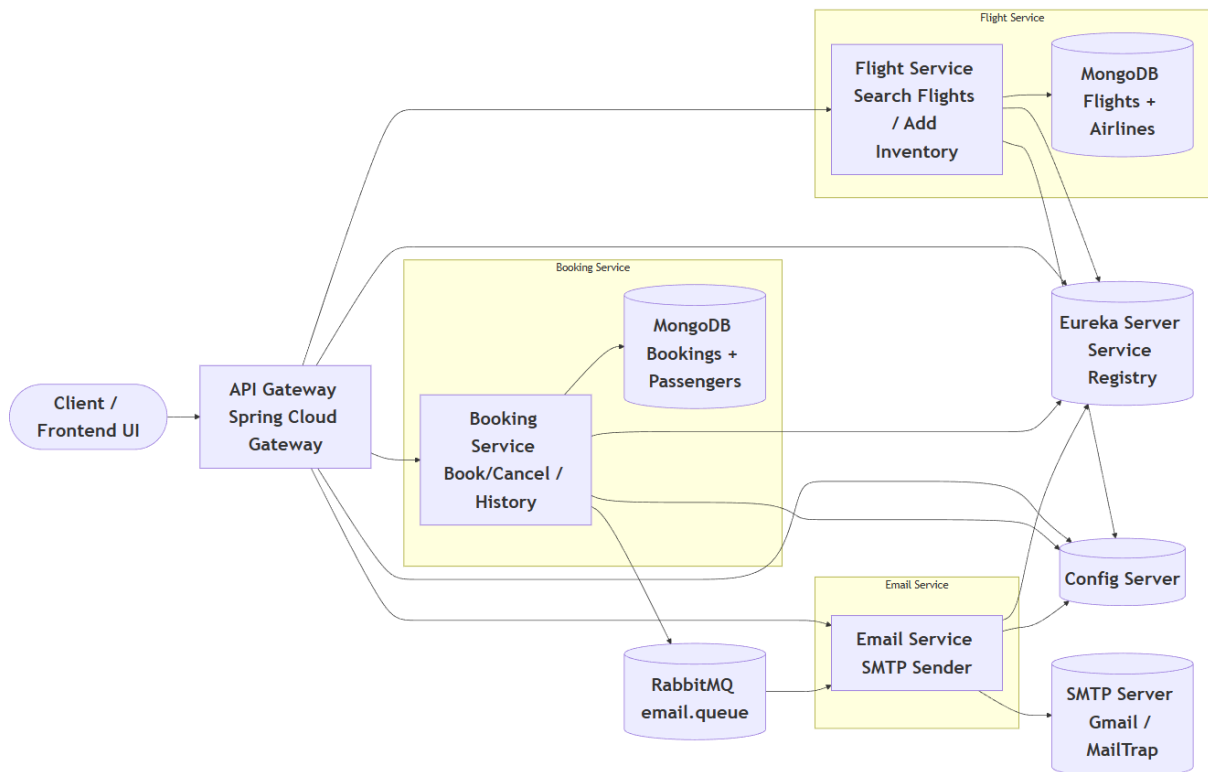
## MicroServices

### Week - 6

### Assignment

### Project Report

The Architecture: -



## These are my services which are registered in service registry

Application	AMIs	Availability Zones	Status
API-GATEWAY	n/a (1)	(1)	UP (1) - <a href="#">DESKTOP-U2KN9DC:api-gateway:8080</a>
BOOKING-SERVICE	n/a (1)	(1)	UP (1) - <a href="#">DESKTOP-U2KN9DC:booking-service:8082</a>
EMAIL-SERVICE	n/a (1)	(1)	UP (1) - <a href="#">DESKTOP-U2KN9DC:email-service:8084</a>
FLIGHT-SERVICE	n/a (1)	(1)	UP (1) - <a href="#">DESKTOP-U2KN9DC:flight-service:8081</a>
FMS-CONFIG-SERVER	n/a (1)	(1)	UP (1) - <a href="#">DESKTOP-U2KN9DC:fms-config-server:8888</a>

### General Info

Name	Value
total-avail-memory	80mb
num-of-cpus	12
current-memory-usage	54mb (67%)
server-uptime	00:00
registered-replicas	<a href="http://localhost:8761/eureka/">http://localhost:8761/eureka/</a>
unavailable-replicas	<a href="http://localhost:8761/eureka/">http://localhost:8761/eureka/</a> ,
available-replicas	

### Instance Info

## I have used RabbitMQ as my Message Broker to send emails

Containers <a href="#">Give feedback</a>							
Container CPU usage ⓘ 0.65% / 1200% (12 CPUs available)				Container memory usage ⓘ 156MB / 6.54GB			
<input type="text" value="Search"/>				<input checked="" type="checkbox"/> Only show running containers			
<input type="checkbox"/>	Name	Container ID	Image	Port(s)	CPU (%)	Last started	Actions
<input type="checkbox"/>	rabbitmq	d62f89d2be6b	<a href="#">rabbitmq:3-management</a>	<a href="#">15672:15672</a> <a href="#">Show all ports (2)</a>	0.27%	5 hours ago	

## Queues

▼ All queues (1)

Pagination

Page  of 1 - Filter:  ☐ Regex ?

Overview					Messages			Message rates			+/-
Virtual host	Name	Type	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
/	email.queue	classic	D	running	0	0	0	0.00/s	0.00/s	0.00/s	

► Add a new queue

## Connections

▼ All connections (2)

Pagination

Page  of 1 - Filter:  ☐ Regex ?

Overview			Details			Network		+/-
Name	User name	State	SSL / TLS	Protocol	Channels	From client	To client	
172.17.0.1:43606 rabbitConnectionFactory#3909a854:0	guest	running	○	AMQP 0-9-1	1	0 B/s	0 B/s	
172.17.0.1:58122 rabbitConnectionFactory#14fded9d:0	guest	running	○	AMQP 0-9-1	1	2 B/s	2 B/s	

# This is the email that it will send when you book or cancel a ticket

## Booking Confirmed Inbox x



joelphilip208@gmail.com

to joel ▾

Your flight booking is confirmed.

PNR: F54F5B8B



Mail Delivery Subsystem <mailer-daemon@googlemail.com>

to me ▾



### Address not found

Your message wasn't delivered to **joel@example.com** because the domain [example.com](#) couldn't be found. Check for typos or unnecessary spaces and try again.

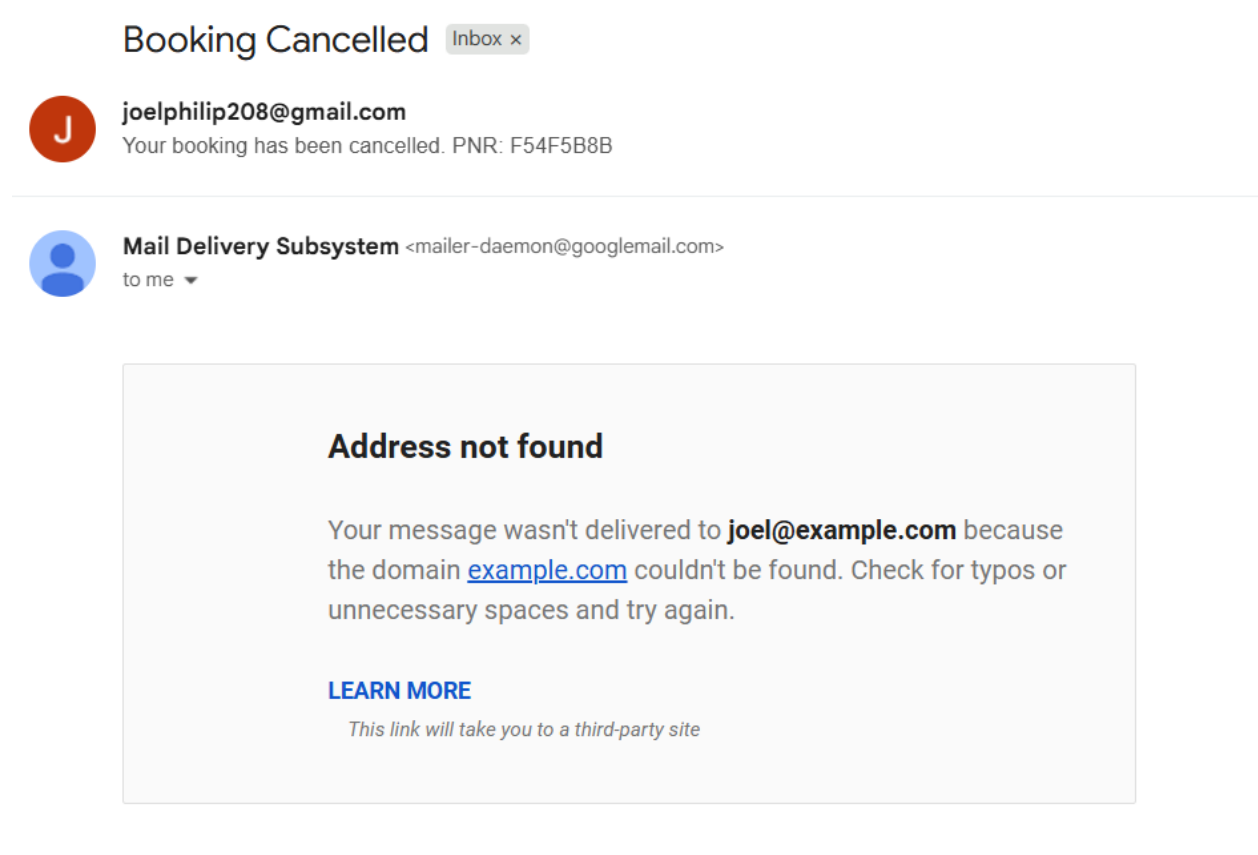
[LEARN MORE](#)

▲ This link will take you to a third-party site

```
: EMAIL SERVICE → Using SMTP user: joelphilip208@gmail.com
: Attempting to send email to: joel@example.com
: Email sent successfully to joel@example.com
: Received EmailEvent from RabbitMQ: EmailEvent[to=joel@example.com, subject=Booking Confirmed, body=Your flight booking is confirmed.

: EMAIL SERVICE → Using SMTP user: joelphilip208@gmail.com
: Attempting to send email to: joel@example.com
: Email sent successfully to joel@example.com
: Received EmailEvent from RabbitMQ: EmailEvent[to=joel@example.com, subject=Booking Cancelled, body=Your booking has been cancelled.
```

I have used SMTP to do it and I put my credentials in my run configurations



I have used newman tool to test my API end points and every request gave a valid response

```
C:\Users\Hp\OneDrive\Documents\Postman - Collections>newman --version
6.2.1

C:\Users\Hp\OneDrive\Documents\Postman - Collections>newman run FlightManagementSystem-Microservices.postman_collection.json
newman
```

## Flight Management System - Microservices

```
❑ Health Check
  ↳ API Gateway Health
    GET http://localhost:8080/actuator/health [200 OK, 114B, 235ms]

  ↳ Eureka Server UI
    GET http://localhost:8761 [200 OK, 6.08kB, 153ms]

❑ Flight Service (via API Gateway)
  ↳ Add Airline (Admin)
    POST http://localhost:8080/api/flight/airline [201 Created, 149B, 529ms]

  ↳ Add Flight Inventory (Admin)
    POST http://localhost:8080/api/flight/airline/692e070f58e0122b39e5e1d1/inventory [201 Created, 156B, 53ms]

  ↳ Search Flights (User)
    POST http://localhost:8080/api/flight/search [200 OK, 583B, 34ms]

  ↳ Get Flight Details
    GET http://localhost:8080/api/flight/details/692e07c458e0122b39e5e1d2 [200 OK, 342B, 18ms]

❑ Booking Service (via API Gateway)
  ↳ Book Flight
    POST http://localhost:8080/api/book/book [201 Created, 222B, 634ms]

  ↳ Cancel Booking
    DELETE http://localhost:8080/api/book/cancel/EC2AEC3E [200 OK, 155B, 83ms]

  ↳ Booking History
    GET http://localhost:8080/api/book/history/joel@example.com [200 OK, 595B, 28ms]

  ↳ Get Ticket
    GET http://localhost:8080/api/book/ticket/EC2AEC3E [200 OK, 648B, 36ms]
```

	executed	failed
iterations	1	0
requests	10	0
test-scripts	0	0
prerequisite-scripts	0	0
assertions	0	0
total run duration: 1007ms		
total data received: 8.21kB (approx)		
average response time: 16ms [min: 10ms, max: 29ms, s.d.: 6ms]		

Code coverage is 95 %

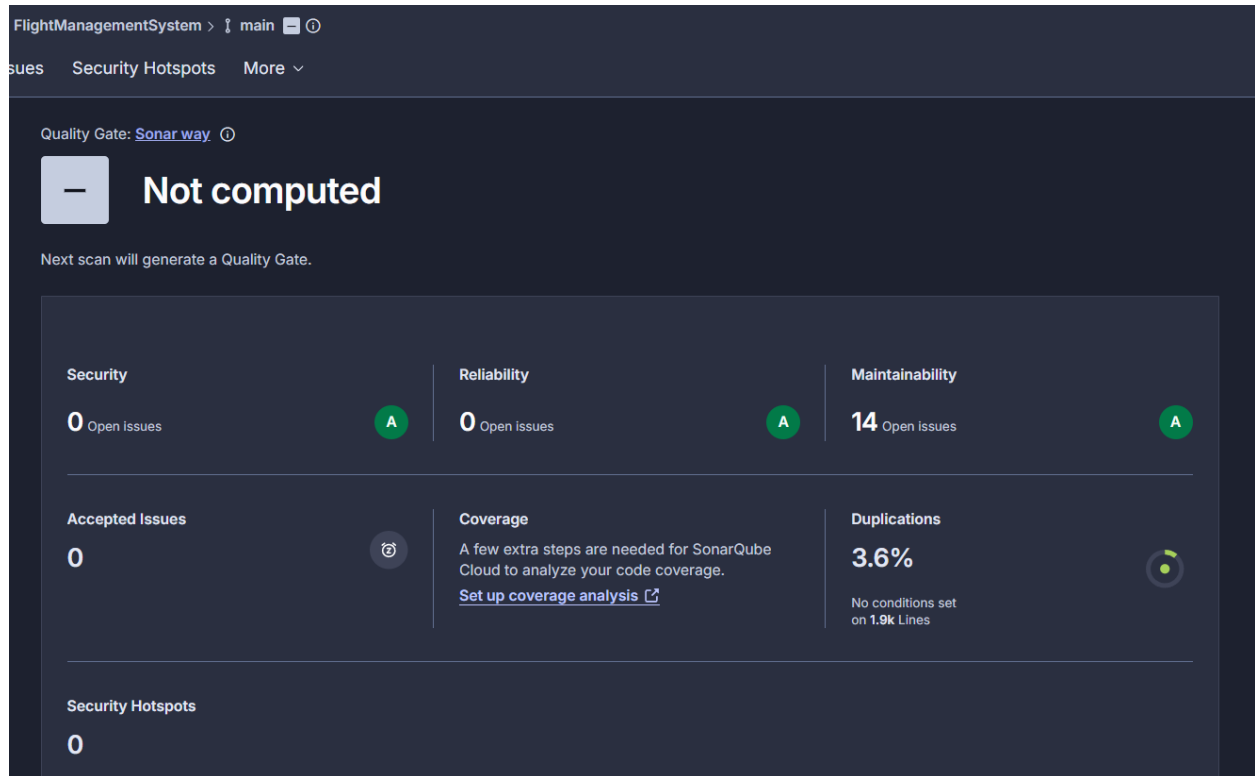
Created with [JaCoCo](#)

# Code Coverage is 95%

Created with JaCoCo 0.8.10.2023042409

# SonarQube Report

Before :-

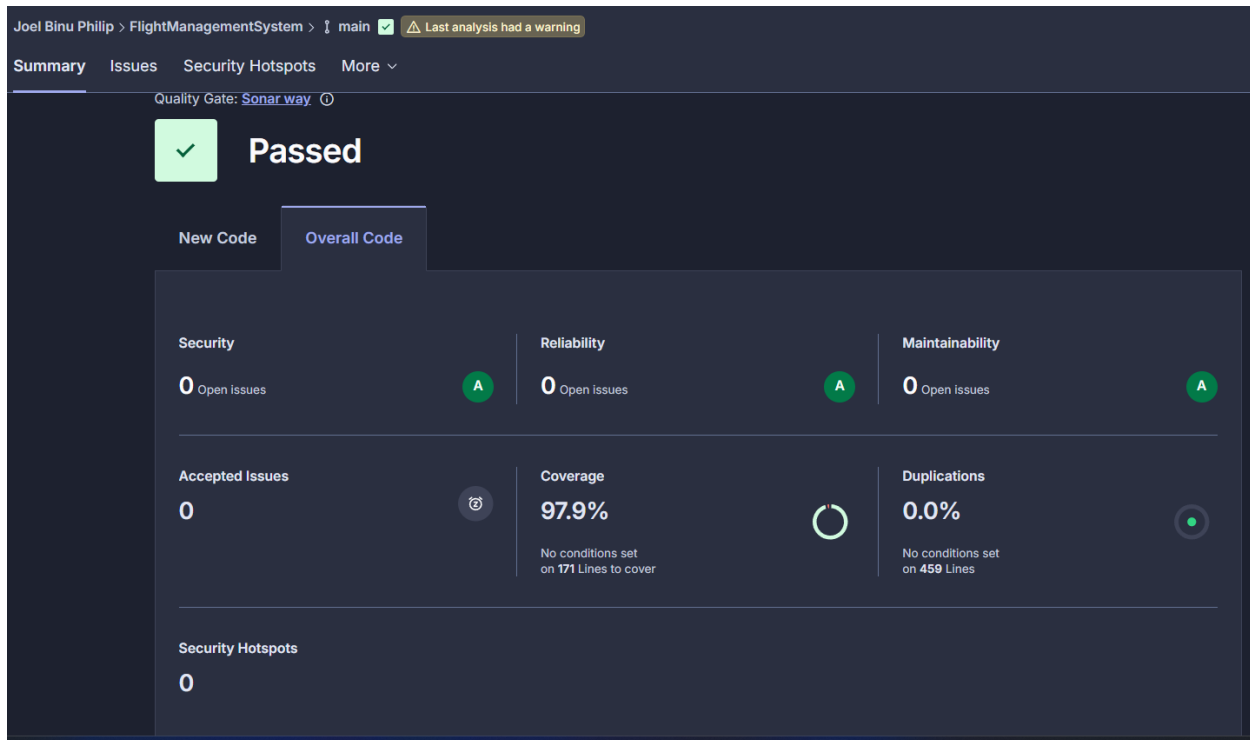


## Issue fixing history graph





After :-



## JMeter Load Testing Using CLI

### 20 threads

```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results20.jtl -e -o report20
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:23:55 IST (1764640435750)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary + 217 in 00:00:04 = 51.3/s Avg: 5 Min: 3 Max: 35 Err: 0 (0.00%) Active: 1 Started: 73 Finished: 72
summary + 293 in 00:00:06 = 51.2/s Avg: 4 Min: 3 Max: 10 Err: 0 (0.00%) Active: 0 Started: 170 Finished: 170
summary = 510 in 00:00:10 = 51.2/s Avg: 5 Min: 3 Max: 35 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:24:05 IST (1764640445783)
... end of run
```

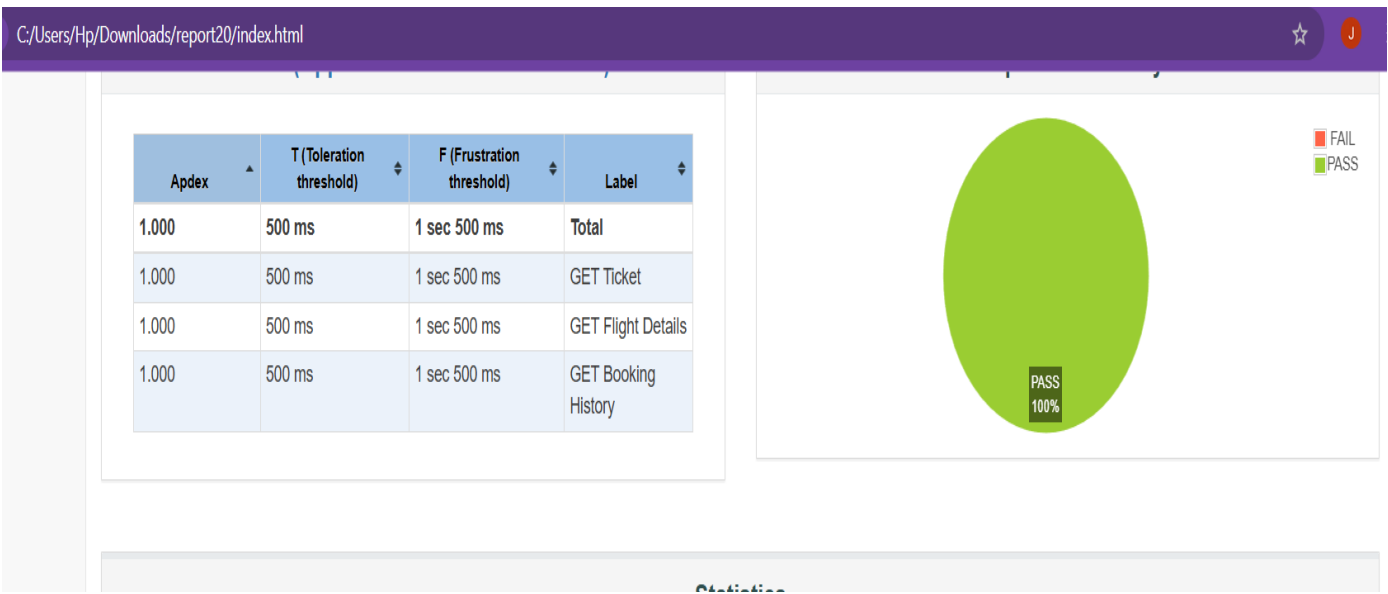
## 50 threads

```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results50.jtl -e -o report50
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:24:42 IST (1764640482536)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary = 510 in 00:00:10 = 51.2/s Avg: 5 Min: 3 Max: 36 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:24:52 IST (1764640492569)
... end of run
```

## 100 Threads

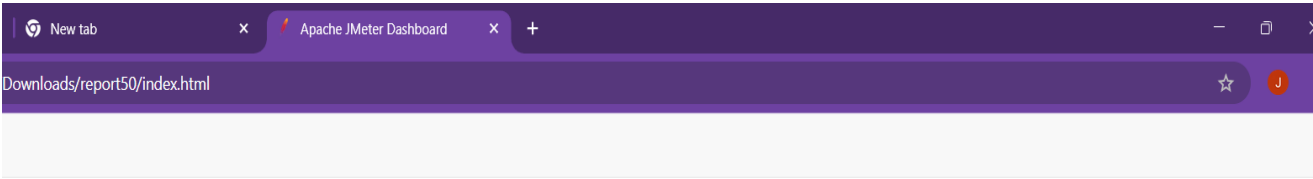
```
C:\Users\Hp\Downloads> "C:\Tools\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter.bat" -n -t working_plan.jmx -l results100.jtl -e -o report100
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using working_plan.jmx
Starting standalone test @ 2025 Dec 2 07:25:12 IST (1764640512339)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary = 510 in 00:00:10 = 51.2/s Avg: 4 Min: 2 Max: 32 Err: 0 (0.00%)
Tidying up ... @ 2025 Dec 2 07:25:22 IST (1764640522375)
... end of run
```

# 20 threads report



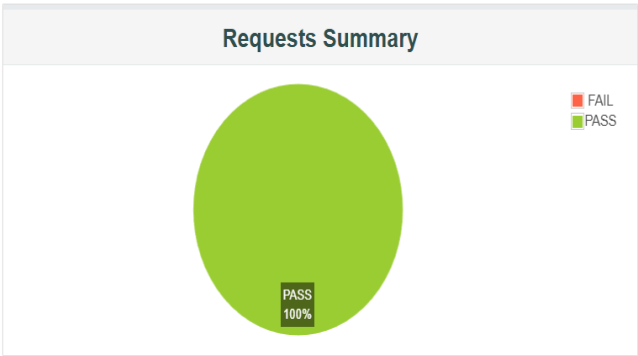
Statistics														
Requests		Executions		Response Times (ms)								Throughput	Network (KB/sec)	
Label	#Samples	FAIL	Error %	Average	Min	Max	Median	90th pct	95th pct	99th pct		Transactions/s	Received	Sent
Total	510	0	0.00%	5.28	3	35	4.00	7.90	8.00	10.00		51.87	28.37	7.36
GET Booking History	170	0	0.00%	3.86	3	6	4.00	4.90	5.00	6.00		17.36	10.64	2.46
GET Flight Details	170	0	0.00%	4.92	3	35	4.00	5.00	5.00	35.00		17.30	6.30	2.62
GET Ticket	170	0	0.00%	7.07	5	10	7.00	8.00	9.00	10.00		17.37	11.54	2.31

# 50 Threads Report



Test and Report information	
Source file	"results50.jtl"
Start Time	"12/2/25, 7:24 AM"
End Time	"12/2/25, 7:24 AM"
Filter for display	""

APDEX (Application Performance Index)			
Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
1.000	500 ms	1 sec 500 ms	Total
1.000	500 ms	1 sec 500 ms	GET Ticket
1.000	500 ms	1 sec 500 ms	GET Flight Details
1.000	500 ms	1 sec 500 ms	GET Booking History



Statistics													
Requests	Executions			Response Times (ms)							Throughput	Network (KB/sec)	
Label ^	#Samples ^	FAIL ^	Error % ^	Average ^	Min ^	Max ^	Median ^	90th pct ^	95th pct ^	99th pct ^	Transactions/s ^	Received ^	Sent ^
Total	510	0	0.00%	5.17	3	36	4.00	7.00	8.00	9.00	51.88	28.38	7.36
GET Booking History	170	0	0.00%	3.85	3	6	4.00	5.00	5.00	6.00	17.37	10.64	2.46
GET Flight Details	170	0	0.00%	4.94	3	36	4.00	5.00	6.00	36.00	17.31	6.31	2.62
GET Ticket	170	0	0.00%	6.72	5	9	7.00	8.00	8.00	9.00	17.37	11.54	2.31

# 100 Threads

New tab

Apache JMeter Dashboard

Apache JMeter Dashboard

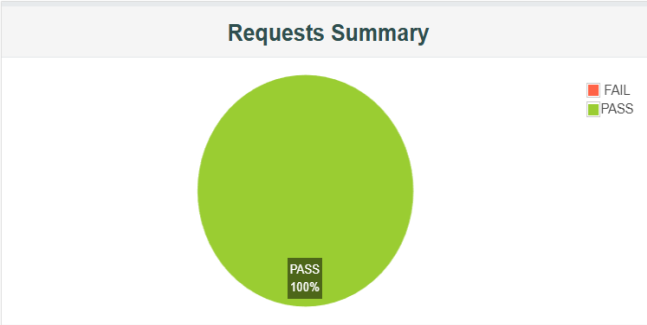
+

downloads/report100/index.html

☆ J

Test and Report information	
Source file	"results100.jtl"
Start Time	"12/2/25, 7:25 AM"
End Time	"12/2/25, 7:25 AM"
Filter for display	""

APDEX (Application Performance Index)			
Apdex	T (Toleration threshold)	F (Frustration threshold)	Label
1.000	500 ms	1 sec 500 ms	Total
1.000	500 ms	1 sec 500 ms	GET Ticket
1.000	500 ms	1 sec 500 ms	GET Flight Details
1.000	500 ms	1 sec 500 ms	GET Booking History



## Statistics

Requests	Executions			Response Times (ms)							Throughput	Network (KB/sec)	
Label ^	#Samples ^	FAIL ^	Error % ^	Average ^	Min ^	Max ^	Median ^	90th pct ^	95th pct ^	99th pct ^	Transactions/s ^	Received ^	Sent ^
Total	510	0	0.00%	4.87	2	32	4.00	7.00	7.00	10.00	51.88	28.37	7.36
GET Booking History	170	0	0.00%	3.65	2	7	4.00	4.00	5.00	7.00	17.36	10.63	2.46
GET Flight Details	170	0	0.00%	4.64	3	32	4.00	5.00	5.00	32.00	17.31	6.30	2.62
GET Ticket	170	0	0.00%	6.34	4	10	6.00	7.90	8.00	10.00	17.36	11.53	2.31