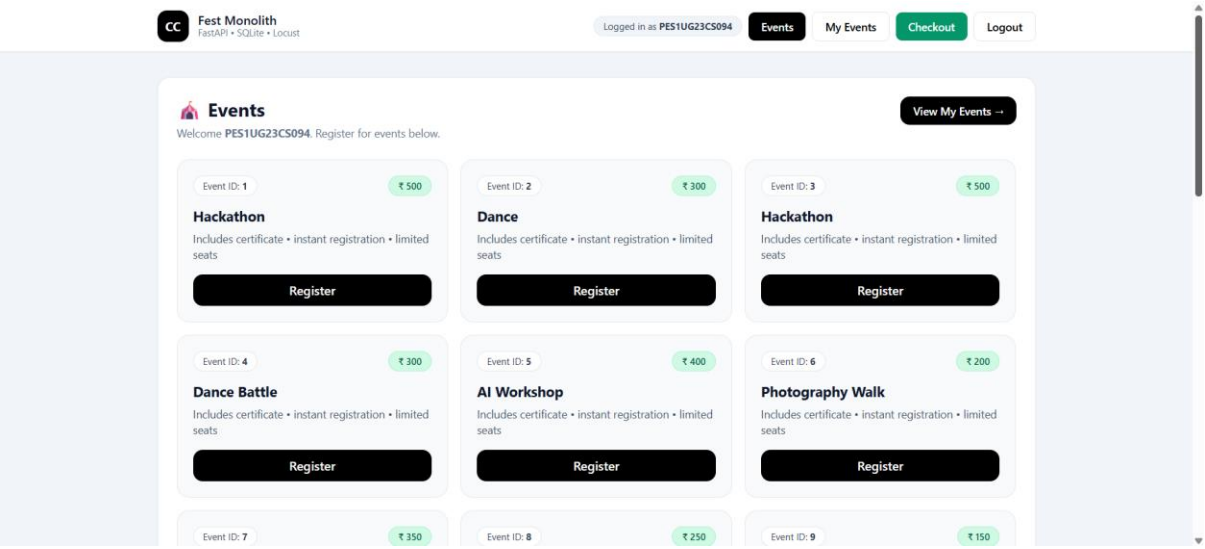
CLOUD COMPUTING LAB

NAME: APARAJITHA CHANDAN

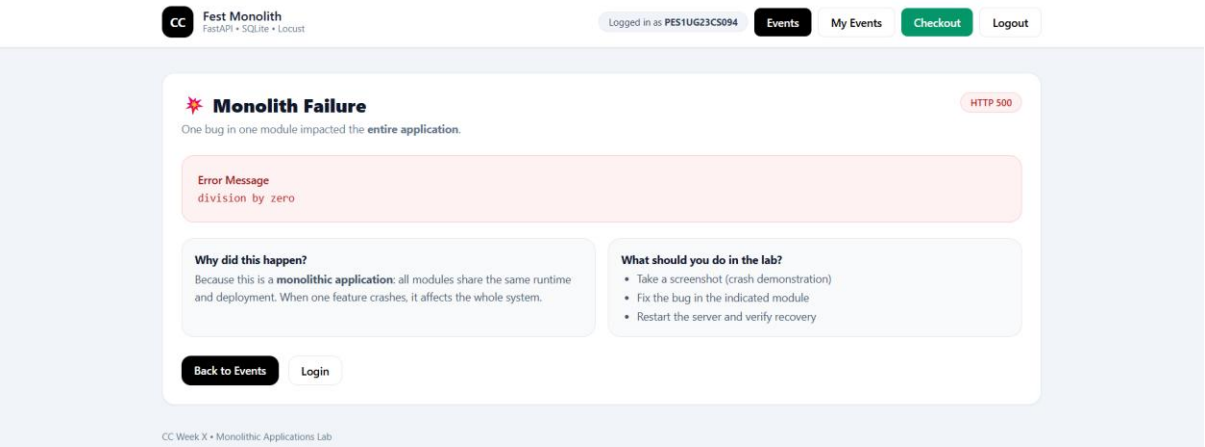
SRN: PES1UG23CS094

MONOLITH ARCHITECTURE

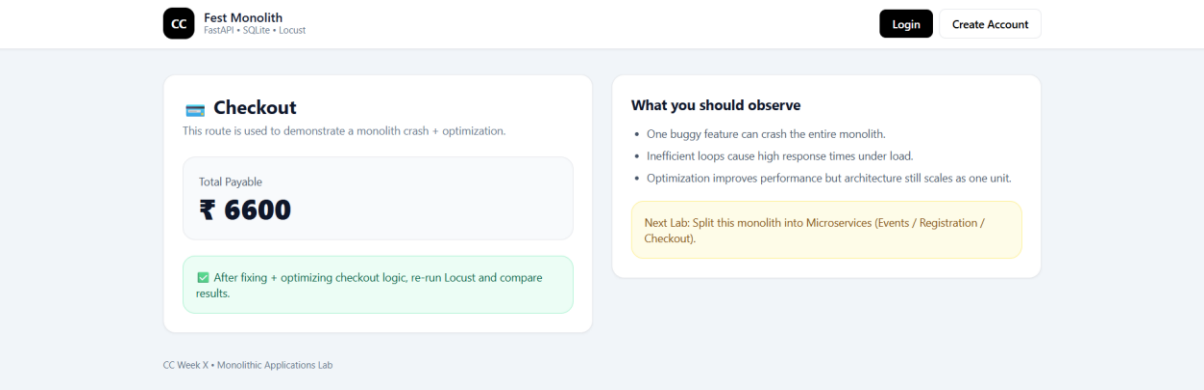
SS1



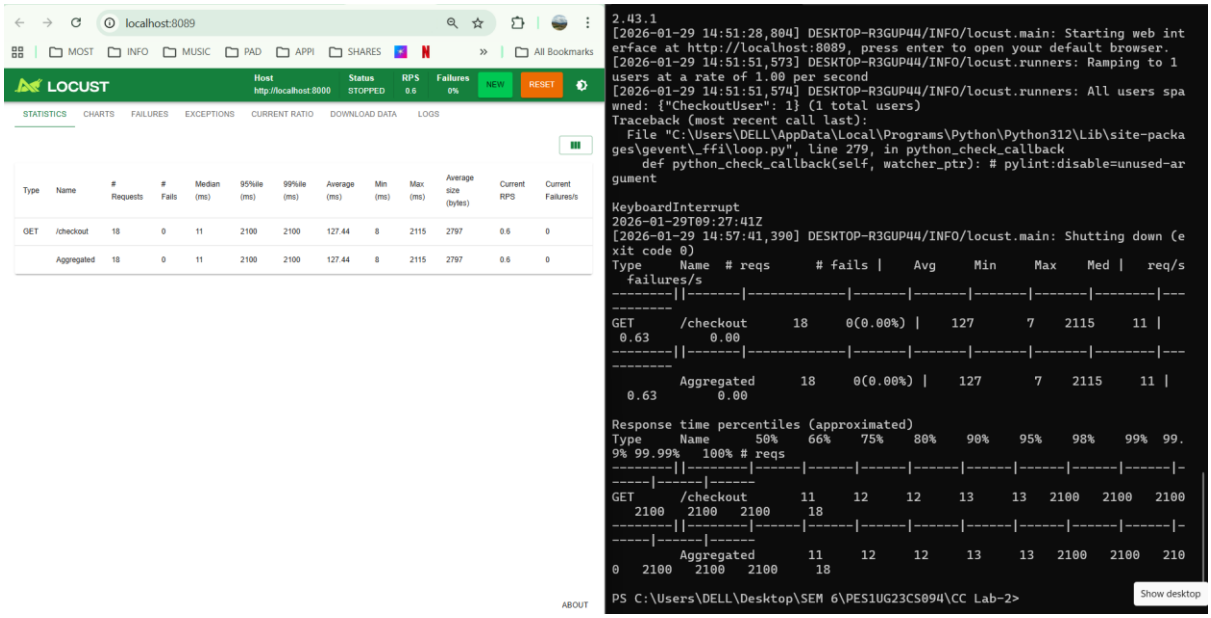
SS2



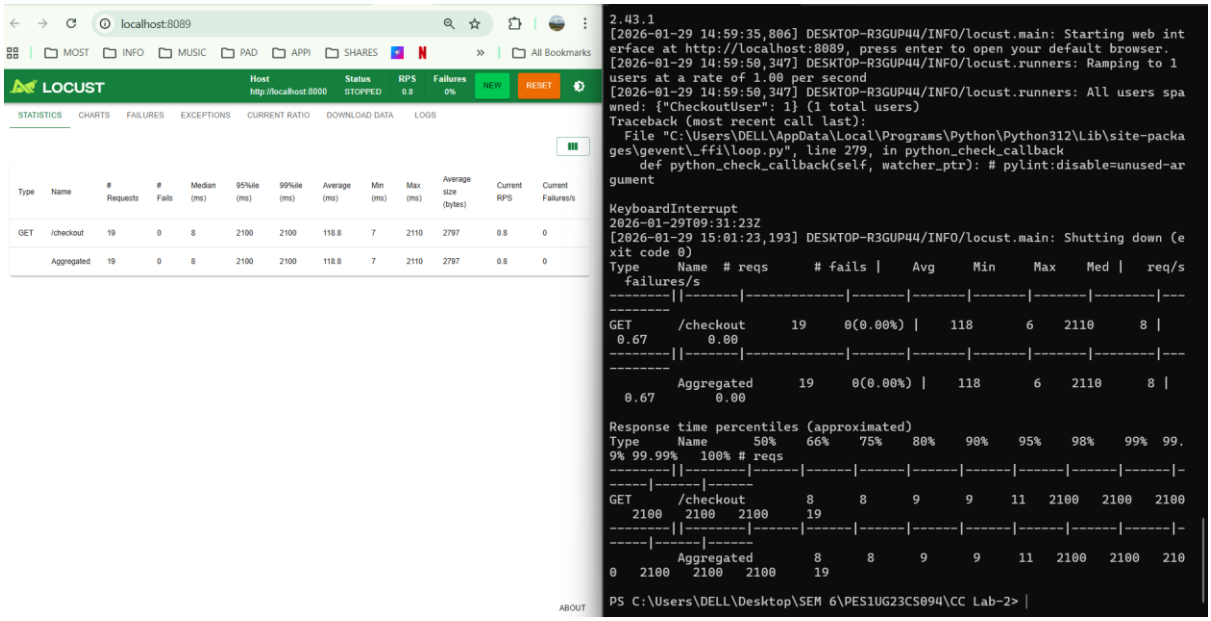
SS3


CC
Fest Monolith
FastAPI • SQLite • Locust
Login
Create Account
Checkout
This route is used to demonstrate a monolith crash + optimization.
Total Payable
₹ 6600
After fixing + optimizing checkout logic, re-run Locust and compare results.
What you should observe
One buggy feature can crash the entire monolith.
Inefficient loops cause high response times under load.
Optimization improves performance but architecture still scales as one unit.
Next Lab: Split this monolith into Microservices (Events / Registration / Checkout).
CC Week X • Monolithic Applications Lab

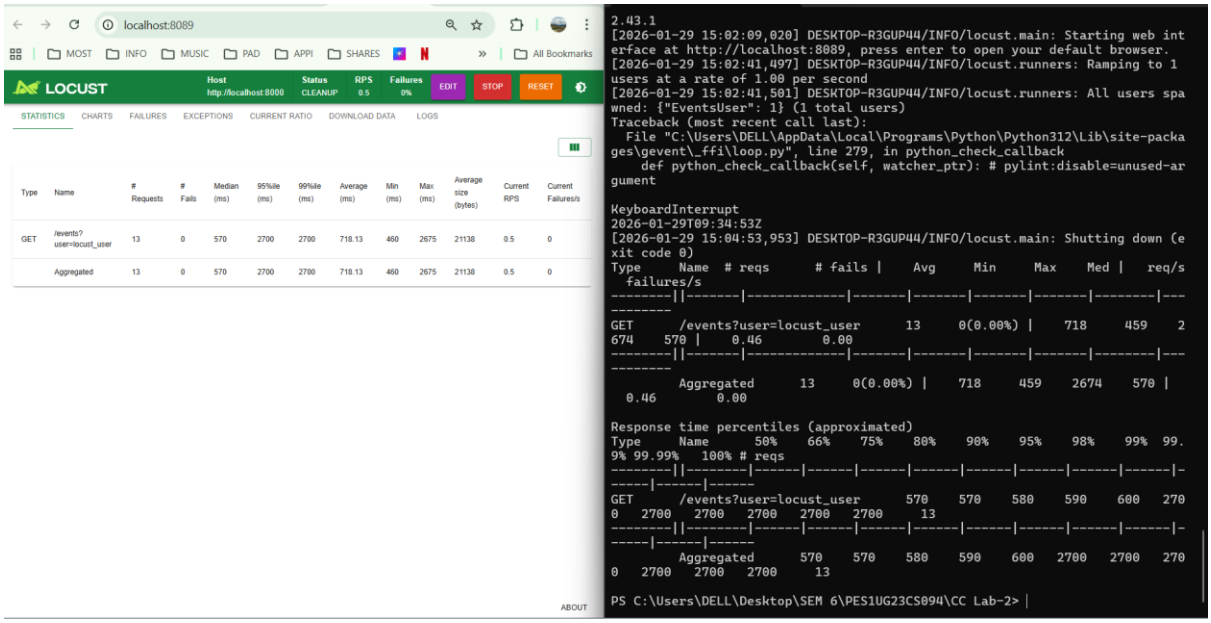
SS4


localhost:8089
LOCUST
STATISTICS
CHARTS
FAILURES
EXCEPTIONS
CURRENT RATIO
DOWNLOAD DATA
LOGS
ABOUT
2.43.1
[2026-01-29 14:51:28,804] DESKTOP-R3GUP44/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 14:51:51,573] DESKTOP-R3GUP44/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:51:51,574] DESKTOP-R3GUP44/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
File "C:\Users\DELL\AppData\Local\Programs\Python\Python312\Lib\site-packages\gevent_ffi\loop.py", line 279, in python_check_callback
def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-29T09:27:41Z
[2026-01-29 14:57:41,390] DESKTOP-R3GUP44/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /checkout 18 0(0.00%) | 127 7 2115 11 | 0.63 0.00
Aggregated 18 0(0.00%) | 127 7 2115 11 | 0.63 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /checkout 11 12 12 13 13 2100 2100 2100 2100 2100 2100 18
Aggregated 11 12 12 13 13 2100 2100 2100 2100 2100 2100 18
PS C:\Users\DELL\Desktop\SEM 6\PES1UG23CS094\CC Lab-2>
Show desktop

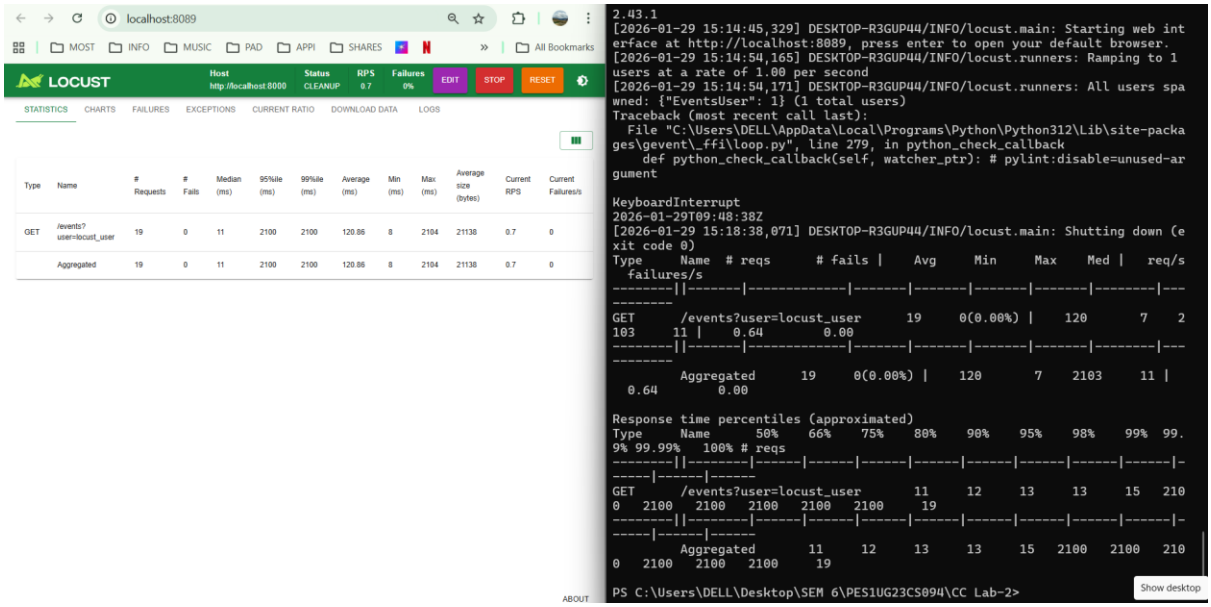
SS5


localhost:8089
LOCUST
Host http://localhost:8000
Status STOPPED
RPS 0.8
Failures 0%
NEW
RESET
STATISTICS
CHARTS
FAILURES
EXCEPTIONS
CURRENT RATIO
DOWNLOAD DATA
LOGS
Type Name # Requests # Fails Median (ms) 95%ile (ms) 99%ile (ms) Average (ms) Min (ms) Max (ms) Average size (bytes) Current RPS Current Failures/s
GET /checkout 19 0 8 2100 2100 118.8 7 2110 2797 0.8 0
Aggregated 19 0 8 2100 2100 118.8 7 2110 2797 0.8 0
ABOUT
2.43.1
[2026-01-29 14:59:35,806] DESKTOP-R3GUP44/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 14:59:50,347] DESKTOP-R3GUP44/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:59:50,347] DESKTOP-R3GUP44/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
File "C:\Users\DELL\AppData\Local\Programs\Python\Python312\Lib\site-packages\gevent_ffi\loop.py", line 279, in python_check_callback
def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-29T09:31:23Z
[2026-01-29 15:01:23,193] DESKTOP-R3GUP44/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /checkout 19 0(0.00%) | 118 6 2110 8 | 0.67 0.00
Aggregated 19 0(0.00%) | 118 6 2110 8 | 0.67 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /checkout 8 8 9 9 11 2100 2100 2100 2100 2100 19
Aggregated 8 8 9 9 11 2100 2100 2100 2100 2100 19
PS C:\Users\DELL\Desktop\SEM 6\PES1UG23CS094\CC Lab-2>

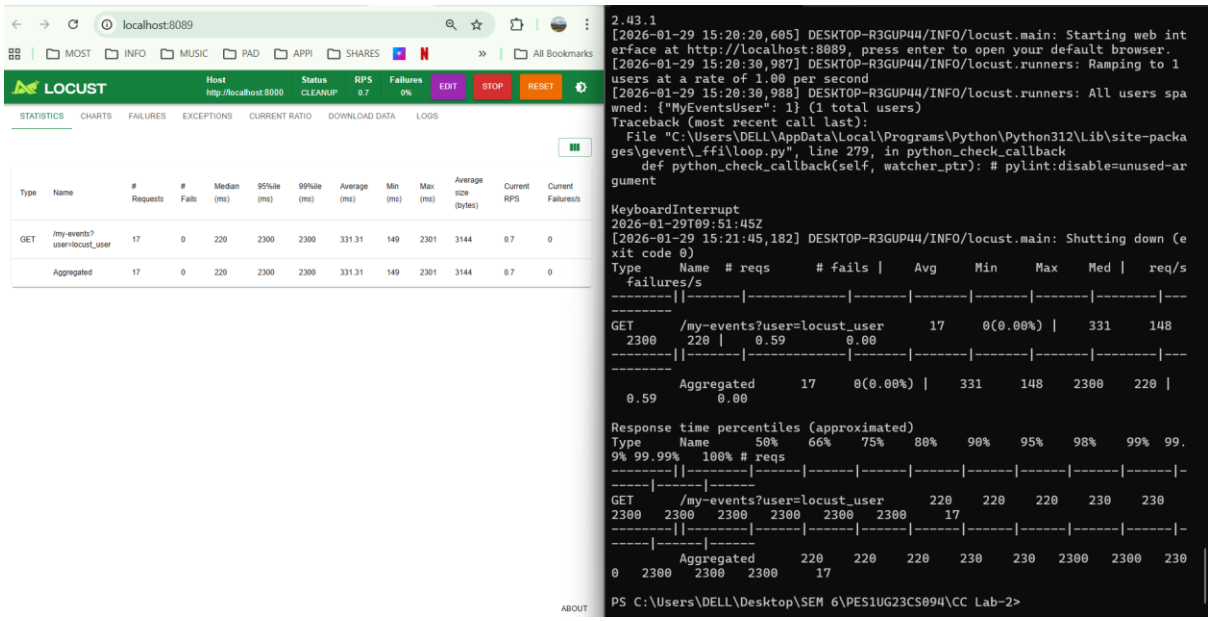
SS6


localhost:8089
LOCUST
Host http://localhost:8000
Status CLEANUP
RPS 0.5
Failures 0%
EDIT
STOP
RESET
STATISTICS
CHARTS
FAILURES
EXCEPTIONS
CURRENT RATIO
DOWNLOAD DATA
LOGS
Type Name # Requests # Fails Median (ms) 95%ile (ms) 99%ile (ms) Average (ms) Min (ms) Max (ms) Average size (bytes) Current RPS Current Failures/s
GET /events?user=locust_user 13 0 570 2700 2700 718.13 460 2675 21138 0.5 0
Aggregated 13 0 570 2700 2700 718.13 460 2675 21138 0.5 0
ABOUT
2.43.1
[2026-01-29 15:02:09,020] DESKTOP-R3GUP44/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 15:02:41,497] DESKTOP-R3GUP44/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:02:41,501] DESKTOP-R3GUP44/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
File "C:\Users\DELL\AppData\Local\Programs\Python\Python312\Lib\site-packages\gevent_ffi\loop.py", line 279, in python_check_callback
def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-29T09:34:53Z
[2026-01-29 15:04:53,953] DESKTOP-R3GUP44/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /events?user=locust_user 13 0(0.00%) | 718 459 2674 570 | 0.46 0.00
Aggregated 13 0(0.00%) | 718 459 2674 570 | 0.46 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /events?user=locust_user 570 570 580 590 600 2700 2700 2700 2700 2700 13
Aggregated 570 570 580 590 600 2700 2700 2700 2700 2700 13
PS C:\Users\DELL\Desktop\SEM 6\PES1UG23CS094\CC Lab-2>

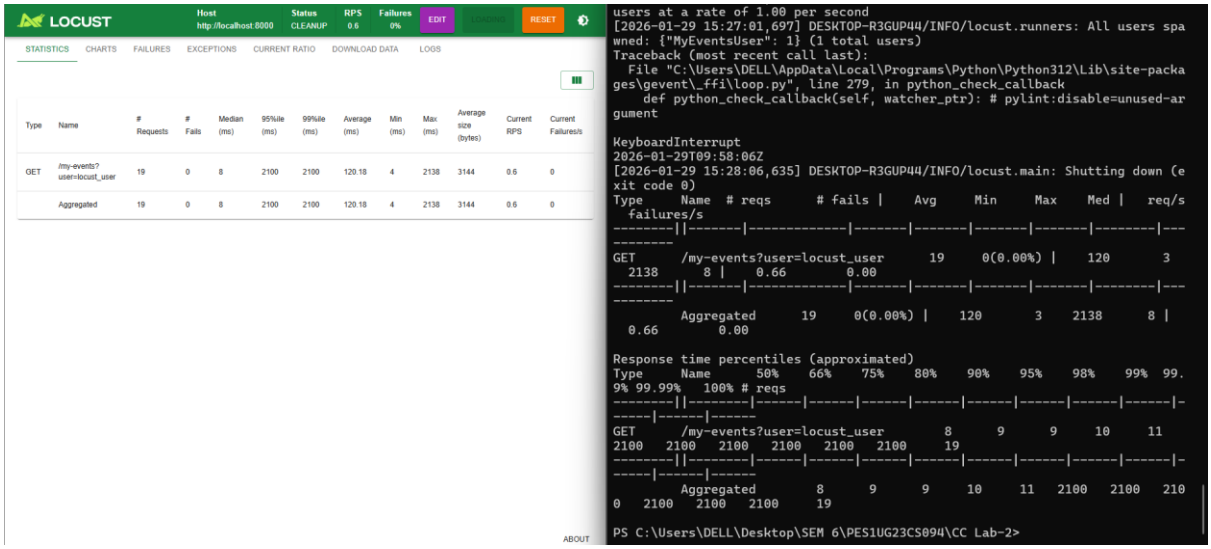
SS7


localhost:8089
LOCUST
Host http://localhost:8000
Status CLEANUP
RPS 0.7
Failures 0%
EDIT
STOP
RESET
STATISTICS
CHARTS
FAILURES
EXCEPTIONS
CURRENT RATIO
DOWNLOAD DATA
LOGS
Type Name # Requests # Fails Median (ms) 95%ile (ms) 99%ile (ms) Average (ms) Min (ms) Max (ms) Average size (bytes) Current RPS Current Failures/s
GET /events?user=locust_user 19 0 11 2100 2100 120.86 8 2104 21138 0.7 0
Aggregated 19 0 11 2100 2100 120.86 8 2104 21138 0.7 0
ABOUT
2.43.1
[2026-01-29 15:14:45,329] DESKTOP-R3GUP44/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 15:14:54,165] DESKTOP-R3GUP44/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:14:54,171] DESKTOP-R3GUP44/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
File "C:\Users\DELL\AppData\Local\Programs\Python\Python312\Lib\site-packages\gevent_ffi\loop.py", line 279, in python_check_callback
def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-29T09:48:38Z
[2026-01-29 15:18:38,071] DESKTOP-R3GUP44/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /events?user=locust_user 19 0(0.00%) | 120 7 2103 11 | 0.64 0.00
Aggregated 19 0(0.00%) | 120 7 2103 11 | 0.64 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /events?user=locust_user 11 12 13 13 15 2100 2100 2100 2100 2100 19
Aggregated 11 12 13 13 15 2100 2100 2100 2100 19
PS C:\Users\DELL\Desktop\SEM 6\PES1UG23CS094\CC Lab-2>
Show desktop

SS8


localhost:8089
LOCUST
Host http://localhost:8000
Status CLEANUP
RPS 0.7
Failures 0%
EDIT
STOP
RESET
STATISTICS
CHARTS
FAILURES
EXCEPTIONS
CURRENT RATIO
DOWNLOAD DATA
LOGS
Type Name # Requests # Fails Median (ms) 95%ile (ms) 99%ile (ms) Average (ms) Min (ms) Max (ms) Average size (bytes) Current RPS Current Failures/s
GET /my-events?user=locust_user 17 0 220 2300 2300 331.31 149 2301 3144 0.7 0
Aggregated 17 0 220 2300 2300 331.31 149 2301 3144 0.7 0
ABOUT
2.43.1
[2026-01-29 15:20:20,605] DESKTOP-R3GUP44/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 15:20:30,987] DESKTOP-R3GUP44/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:20:30,988] DESKTOP-R3GUP44/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
File "C:\Users\DELL\AppData\Local\Programs\Python\Python312\Lib\site-packages\gevent_ffi\loop.py", line 279, in python_check_callback
def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-29T09:51:45Z
[2026-01-29 15:21:45,182] DESKTOP-R3GUP44/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /my-events?user=locust_user 17 0(0.00%) | 331 148 2300 220 | 0.59 0.00
Aggregated 17 0(0.00%) | 331 148 2300 220 | 0.59 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /my-events?user=locust_user 220 220 220 230 230 2300 2300 2300 2300 2300 17
Aggregated 220 220 220 230 230 2300 2300 2300 2300 17
PS C:\Users\DELL\Desktop\SEM 6\PES1UG23CS094\CC Lab-2>

SS9



Route 1: /events

1.) **What was the bottleneck?**

The bottleneck was inefficient database access and redundant computation.

The route fetched all events and then repeatedly processed the same data in Python (extra loops / unnecessary logic), increasing response time under load.

2.) **What change did you make?**

Optimized the logic to process the event list only once

Removed redundant loops / recalculations

Ensured the database query returns only the required data

3.) **Why did the performance improve?**

By reducing unnecessary iterations and avoiding repeated work, the CPU time per request decreased.

This lowered response time and allowed the server to handle more concurrent users efficiently during Locust testing.

Route 2: /my-events

1.) What was the bottleneck?

The bottleneck was **repeated filtering and processing of user-specific events**, often done inside loops instead of at the database/query level. This caused higher latency when multiple users accessed the route simultaneously.

2.) What change did you make?

- Shifted filtering logic to a **single optimized database query**
- Removed **nested loops / redundant backtracking over the same data**
- Reused computed results instead of recalculating them

3.) Why did the performance improve?

Performing filtering at the database level and eliminating repeated traversal of data reduced both CPU and memory usage.
As a result, request throughput increased and average response time dropped significantly in Locust.

GITHUB REPO LINK

https://github.com/aparajitha2005/CC_LAB_MONOLITHIC_ARCHITECTURE