CC LAB-02

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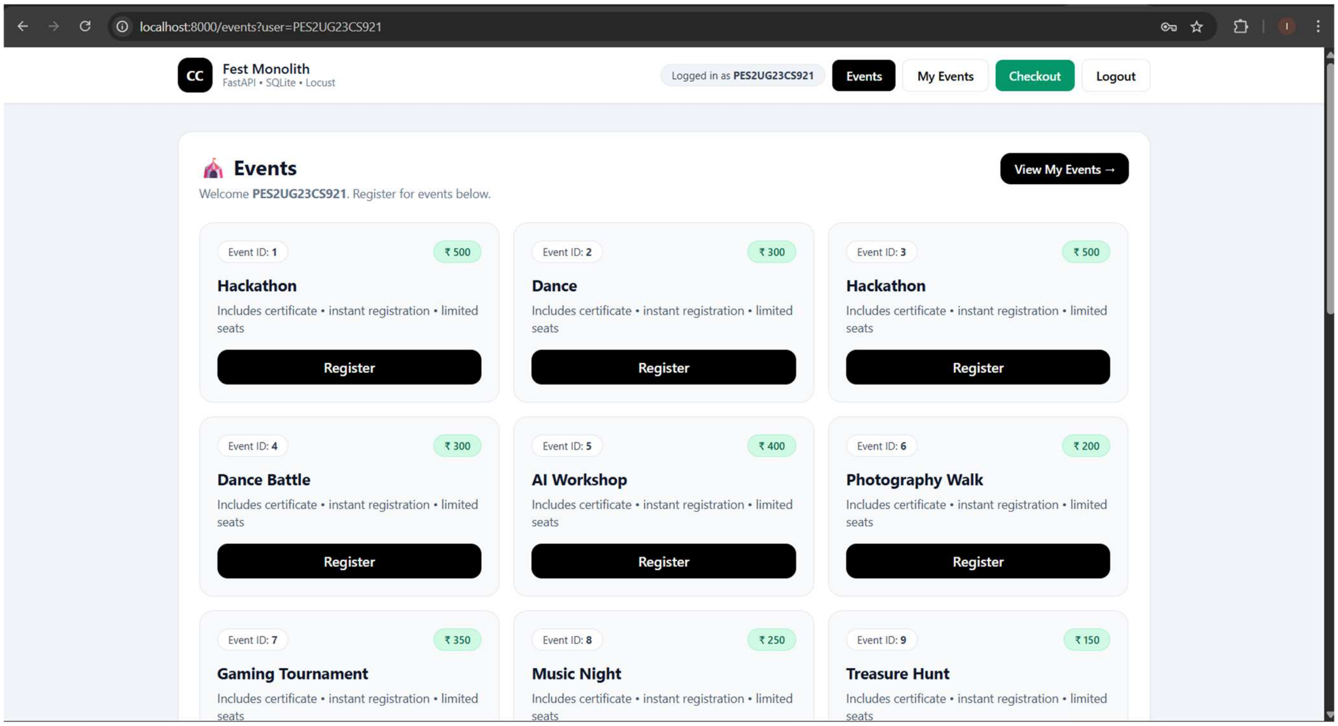
SRN: PES2UG23CS921

SEC: J

SS1



Logged in as **PES2UG23CS921**

Events

Welcome **PES2UG23CS921**. Register for events below.

Event ID: **1** ₹ 500

Hackathon

Includes certificate • instant registration • limited seats

Event ID: **2** ₹ 300

Dance

Includes certificate • instant registration • limited seats

Event ID: **3** ₹ 500

Hackathon

Includes certificate • instant registration • limited seats

Event ID: **4** ₹ 300

Dance Battle

Includes certificate • instant registration • limited seats

Event ID: **5** ₹ 400

AI Workshop

Includes certificate • instant registration • limited seats

Event ID: **6** ₹ 200

Photography Walk

Includes certificate • instant registration • limited seats

Event ID: **7** ₹ 350

Gaming Tournament

Includes certificate • instant registration • limited seats

Event ID: **8** ₹ 250

Music Night

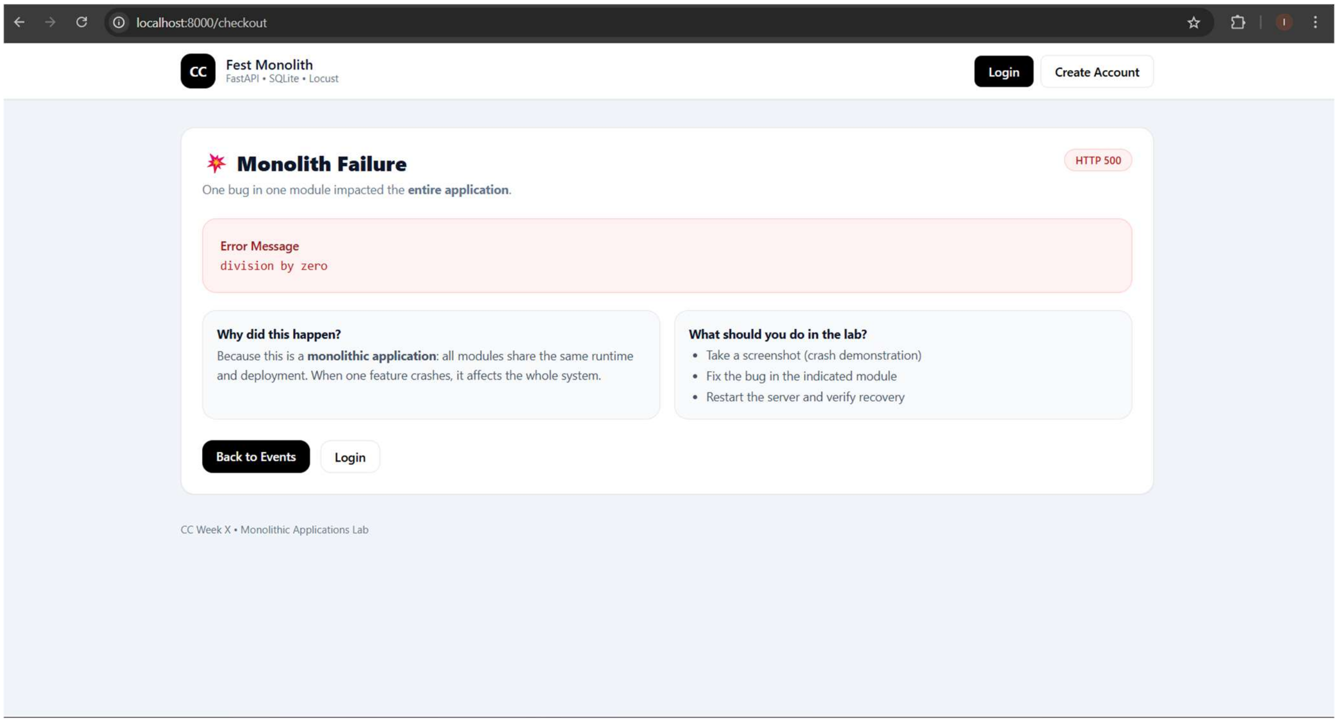
Includes certificate • instant registration • limited seats

Event ID: **9** ₹ 150

Treasure Hunt

Includes certificate • instant registration • limited seats

SS2



Fest Monolith
FastAPI • SQLite • Locust

✸ **Monolith Failure**

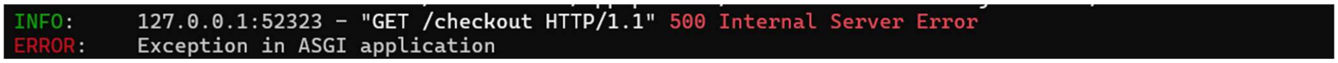
One bug in one module impacted the **entire application**.

Error Message
`division by zero`

Why did this happen?
Because this is a **monolithic application**: all modules share the same runtime and deployment. When one feature crashes, it affects the whole system.

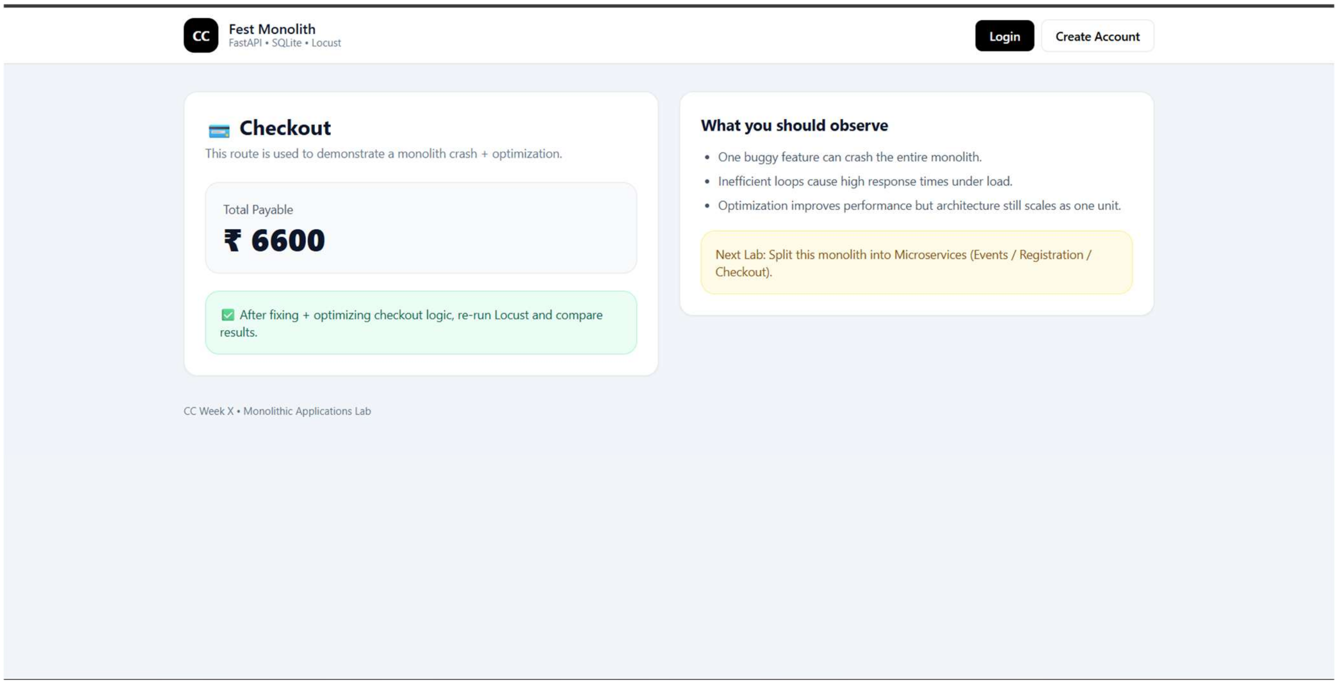
What should you do in the lab?
- Take a screenshot (crash demonstration)
- Fix the bug in the indicated module
- Restart the server and verify recovery

CC Week X • Monolithic Applications Lab



```
INFO:     127.0.0.1:52323 - "GET /checkout HTTP/1.1" 500 Internal Server Error
ERROR:    Exception in ASGI application
```

SS3



Fest Monolith
FastAPI • SQLite • Locust

💳 **Checkout**

This route is used to demonstrate a monolith crash + optimization.

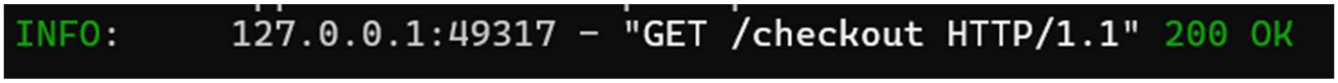
Total Payable
₹ 6600

✅ 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

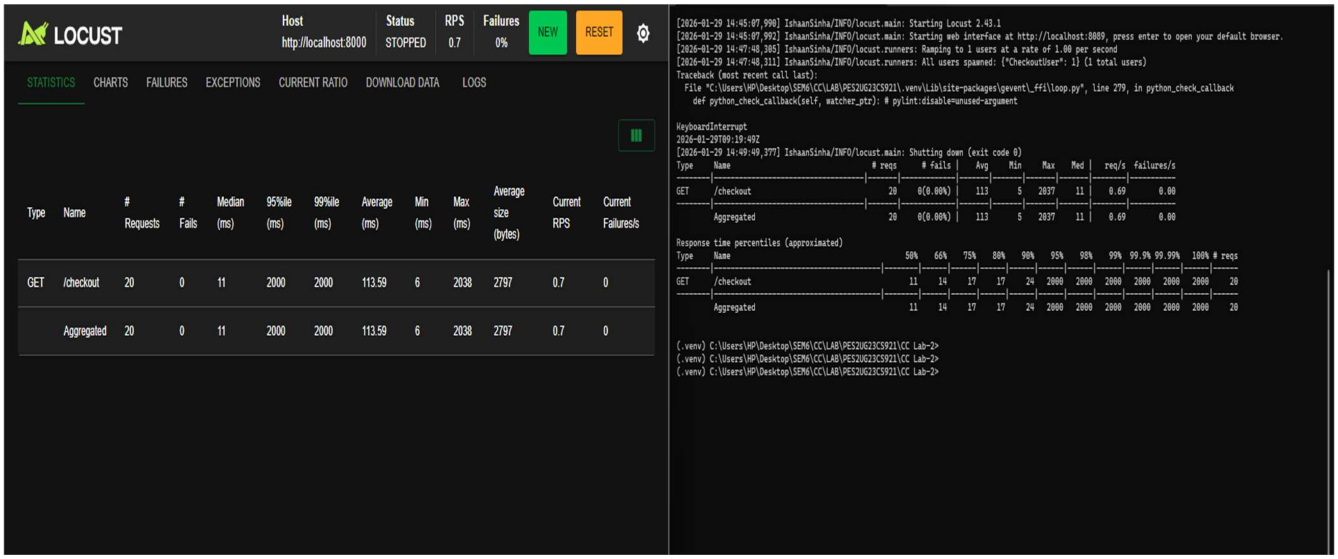


```
INFO:     127.0.0.1:49317 - "GET /checkout HTTP/1.1" 200 OK
```

SS4

locust -f locust/checkout_locustfile.py

Before



Host	Status	RPS	Failures
http://localhost:8000	STOPPED	0.7	0%

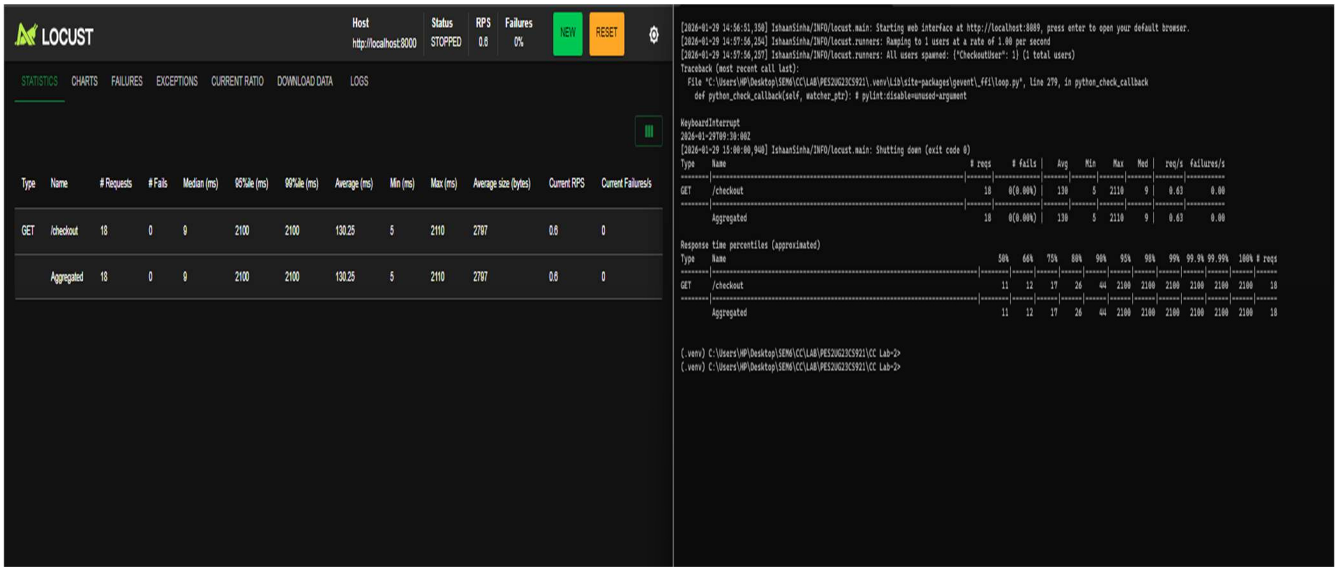
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	20	0	11	2000	2000	113.59	6	2038	2797	0.7	0
	Aggregated	20	0	11	2000	2000	113.59	6	2038	2797	0.7	0

```
[2026-01-29 14:45:07,990] IshaanSinha/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 14:45:07,992] IshaanSinha/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 14:47:48,305] IshaanSinha/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:47:48,311] IshaanSinha/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\.venv\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
2026-01-29T09:19:49Z
[2026-01-29 14:49:49,377] IshaanSinha/INFO/locust.main: Shutting down (exit code 0)
Type     Name                                    # reqs      # fails |    Avg     Min     Max     Med |   req/s  failures/s
--------|--------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
GET      /checkout                                   20     0(0.00%) |    113       5    2037      11 |    0.69        0.00
--------|--------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                  20     0(0.00%) |    113       5    2037      11 |    0.69        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     14     17     17     24   2000   2000   2000   2000   2000   2000     20
--------|--------------------------------------------|--------|------|------|------|------|------|------|------|------|------|------|------
         Aggregated                                       11     14     17     17     24   2000   2000   2000   2000   2000   2000     20


(.venv) C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\CC Lab-2>
(.venv) C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\CC Lab-2>
(.venv) C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\CC Lab-2>
```

SS5

locust -f locust/checkout_locustfile.py

After



Host	Status	RPS	Failures
http://localhost:8000	STOPPED	0.6	0%

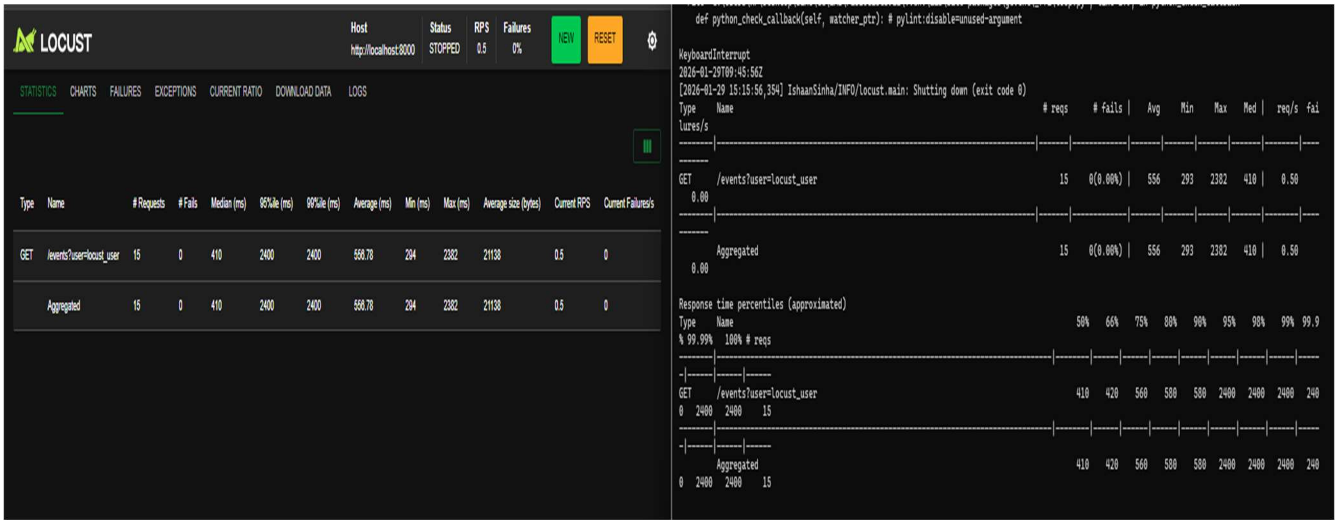
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	18	0	9	2100	2100	130.25	5	2110	2797	0.6	0
	Aggregated	18	0	9	2100	2100	130.25	5	2110	2797	0.6	0

```
[2026-01-29 14:56:51,350] IshaanSinha/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 14:57:56,254] IshaanSinha/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:57:56,257] IshaanSinha/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\.venv\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
2026-01-29T09:30:00Z
[2026-01-29 15:00:00,940] IshaanSinha/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%) |    130       5    2110       9 |    0.63        0.00
--------|--------------------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                                                18     0(0.00%) |    130       5    2110       9 |    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     17     26     44   2100   2100   2100   2100   2100   2100     18
--------|--------------------------------------------------------------------------|--------|------|------|------|------|------|------|------|------|------|------|------
         Aggregated                                                                     11     12     17     26     44   2100   2100   2100   2100   2100   2100     18


(.venv) C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\CC Lab-2>
(.venv) C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\CC Lab-2>
```

SS6

locust -f locust/events_locustfile.py

Before



Host http://localhost:8000
Status STOPPED
RPS 0.5
Failures 0%

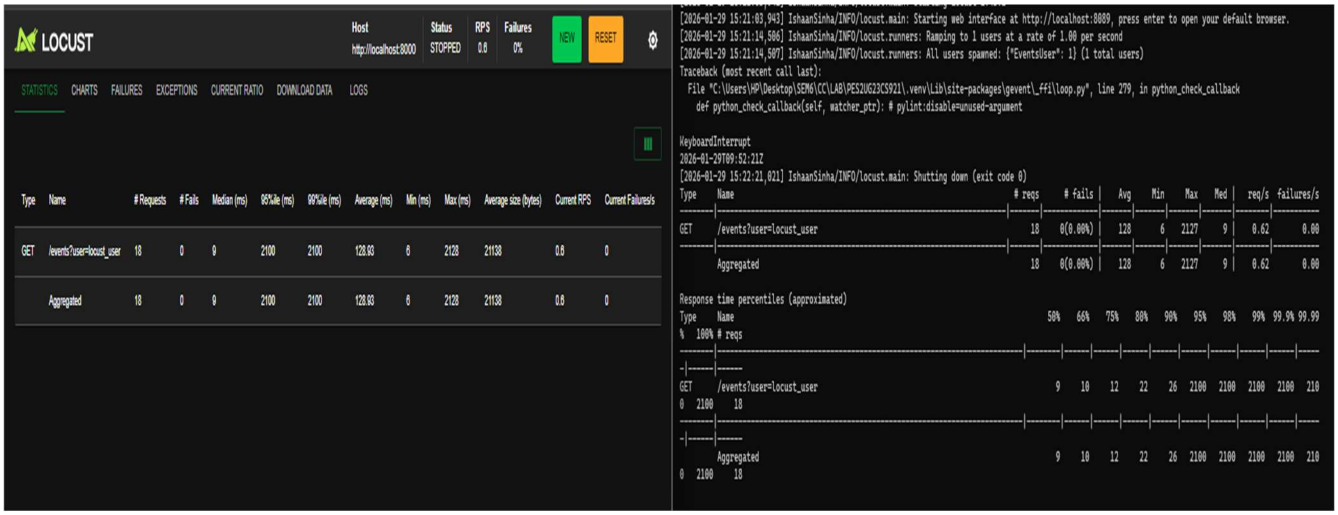
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	15	0	410	2400	2400	556.78	294	2382	21138	0.5	0
	Aggregated	15	0	410	2400	2400	556.78	294	2382	21138	0.5	0

```
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument

KeyboardInterrupt
2026-01-29T09:45:56Z
[2026-01-29 15:15:56,354] IshaanSinha/INFO/locust.main: Shutting down (exit code 0)
Type     Name                                                          # reqs      # fails |    Avg     Min     Max    Med |   req/s  fai
lures/s
--------|------------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|----
-------
GET      /events?user=locust_user                                         15     0(0.00%) |    556     293    2382    410 |    0.50
    0.00
--------|------------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|----
-------
         Aggregated                                                       15     0(0.00%) |    556     293    2382    410 |    0.50
    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                                              410    420    560    580    580   2400   2400   2400   240
0   2400   2400     15
--------|------------------------------------------------------------|--------|------|------|------|------|------|------|------|-----
-|------|------|------
         Aggregated                                                            410    420    560    580    580   2400   2400   2400   240
0   2400   2400     15
```

SS7

locust -f locust/events_locustfile.py

After



Host http://localhost:8000
Status STOPPED
RPS 0.6
Failures 0%

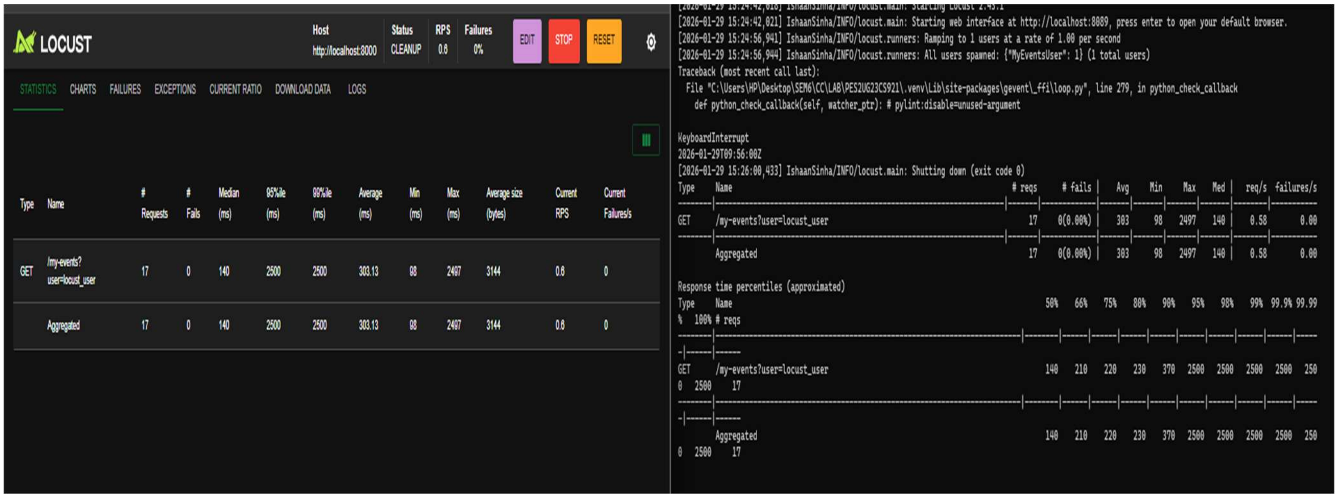
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	18	0	9	2100	2100	128.93	6	2128	21138	0.6	0
	Aggregated	18	0	9	2100	2100	128.93	6	2128	21138	0.6	0

```
[2026-01-29 15:21:03,943] IshaanSinha/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 15:21:14,506] IshaanSinha/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:21:14,507] IshaanSinha/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\.venv\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
2026-01-29T09:52:21Z
[2026-01-29 15:22:21,021] IshaanSinha/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                                    18     0(0.00%) |    128       6    2127      9 |    0.62        0.00
--------|-------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                                  18     0(0.00%) |    128       6    2127      9 |    0.62        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                                           9     10     12     22     26   2100   2100   2100   2100    210
0   2100     18
--------|-------------------------------------------------------|--------|------|------|------|------|------|------|------|------|-----
-|------|------
         Aggregated                                                         9     10     12     22     26   2100   2100   2100   2100    210
0   2100     18
```

SS8

locust -f locust/myevents_locustfile.py

Before



Host http://localhost:8000 | Status CLEANUP | RPS 0.6 | Failures 0%

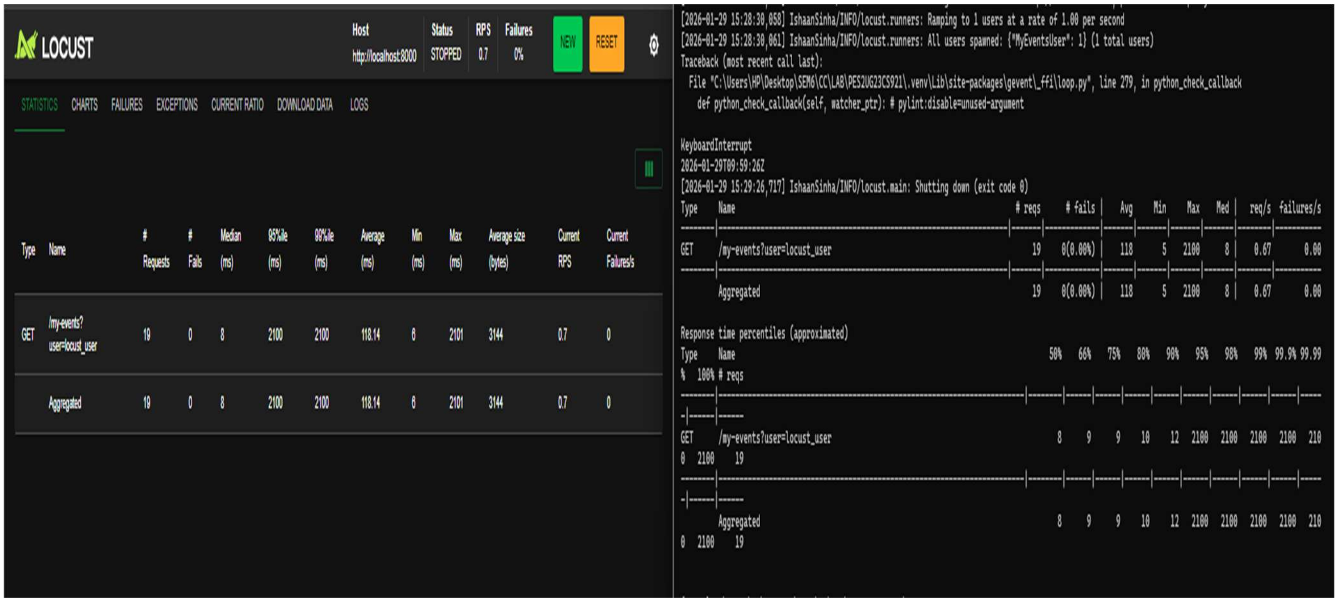
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/my-events?user=locust_user	17	0	140	2500	2500	303.13	98	2497	3144	0.6	0
	Aggregated	17	0	140	2500	2500	303.13	98	2497	3144	0.6	0

```
[2026-01-29 15:24:42,018] IshaanSinha/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:24:42,021] IshaanSinha/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-29 15:24:56,941] IshaanSinha/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:24:56,944] IshaanSinha/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\.venv\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
2026-01-29T09:56:00Z
[2026-01-29 15:26:00,433] IshaanSinha/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%) |    303      98    2497    140 |    0.58        0.00
--------|----------------------------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                                                        17     0(0.00%) |    303      98    2497    140 |    0.58        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                                                           140    210    220    230    370   2500   2500   2500   2500    250
0   2500     17
--------|--------------------------------------------------------------------------------|--------|------|------|------|------|------|------|------|------|-----
-|------|------
         Aggregated                                                                            140    210    220    230    370   2500   2500   2500   2500    250
0   2500     17
```

SS9

locust -f locust/myevents_locustfile.py

After



Host http://localhost:8000 | Status STOPPED | RPS 0.7 | Failures 0%

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	19	0	8	2100	2100	118.14	6	2101	3144	0.7	0
	Aggregated	19	0	8	2100	2100	118.14	6	2101	3144	0.7	0

```
[2026-01-29 15:28:30,058] IshaanSinha/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:28:30,061] IshaanSinha/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\HP\Desktop\SEM6\CC\LAB\PES2UG23CS921\.venv\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
2026-01-29T09:59:26Z
[2026-01-29 15:29:26,717] IshaanSinha/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                                                       19     0(0.00%) |    118       5    2100      8 |    0.67        0.00
--------|----------------------------------------------------------------------------|-------|-------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                                                        19     0(0.00%) |    118       5    2100      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      /my-events?user=locust_user                                                             8      9      9     10     12   2100   2100   2100   2100    210
0   2100     19
--------|--------------------------------------------------------------------------------|--------|------|------|------|------|------|------|------|------|-----
-|------|------
         Aggregated                                                                              8      9      9     10     12   2100   2100   2100   2100    210
0   2100     19
```

1. Route 1 : /events
    1. What was the bottleneck?

    In this route the code had an unnecessary loop which was cpu-intensive and had an unoptimized sql query (select*) which caused high response time and low throughput.

    2. What change did you make?

    Removed the unnecessary loop and optimized the sql query to fetch only required columns.

    3. Why did the performance improve?

       Eliminating loop reduced the cpu work and reducing database load , decreasing the execution time per request, allowing the server to handle more concurrent users efficiently.

2. Route 2 : /my-events

    1. What was the bottleneck?
       The my-events route had a delay due to a large dummy loop and a slow user-specific database access which did not had indexing.
    2. What change did you make?
       Removed the dummy loop and optimized the JOIN query, and added indexes on user-related columns in the registrations table.
    3. Why did the performance improve?
       Optimized queries and proper indexing reduced the query execution time which resulted in faster responses and improved scalability under multiple concurrent requests.

GitHub Repository :

https://github.com/IshaanSinha15/Fest-Monolith