

Cloud Computing Lab-2 Monolithic Architecture

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Section: 6F

Screenshot 1

The screenshot shows a web application interface for event registration. At the top, there is a header bar with the logo 'Fest Monolith' (FastAPI + SQLite + Locust), user information 'Logged in as PES2UG23CS916', and navigation links for 'Events', 'My Events', 'Checkout', and 'Logout'. Below the header, a section titled 'Events' displays six event listings arranged in two rows of three. Each event card includes the event ID, price, event name, a brief description, and a 'Register' button.

Event ID	Price	Event Name	Description	Action
1	₹ 500	Hackathon	Includes certificate • instant registration • limited seats	Register
2	₹ 300	Dance	Includes certificate • instant registration • limited seats	Register
3	₹ 500	Hackathon	Includes certificate • instant registration • limited seats	Register
4	₹ 300	Dance Battle	Includes certificate • instant registration • limited seats	Register
5	₹ 400	AI Workshop	Includes certificate • instant registration • limited seats	Register
6	₹ 200	Photography Walk	Includes certificate • instant registration • limited seats	Register

Screenshot 2

The screenshot shows a 'Monolith Failure' page. At the top, there's a navigation bar with the 'Fest Monolith' logo, 'Login', and 'Create Account'. Below the header, a red box highlights an 'HTTP 500' error. The main content area has a title 'Monolith Failure' with a star icon. It states: 'One bug in one module impacted the entire application.' A pink box contains the 'Error Message': 'division by zero'. Another pink box asks 'Why did this happen?' and explains: 'Because this is a monolithic application: all modules share the same runtime and deployment. When one feature crashes, it affects the whole system.' A third pink box lists 'What should you do in the lab?': 'Take a screenshot (crash demonstration)', 'Fix the bug in the indicated module', and 'Restart the server and verify recovery'. At the bottom, there are 'Back to Events' and 'Login' buttons.

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Screenshot 3

The screenshot shows a 'Checkout' page. At the top, there's a navigation bar with the 'Fest Monolith' logo, 'Login', and 'Create Account'. The main content area features a large 'Total Payable' section with a ₹ 6600 amount. Below it, a green box contains a tip: 'After fixing + optimizing checkout logic, re-run Locust and compare results.' To the right, a yellow box titled 'What you should observe' lists: 'One buggy feature can crash the entire monolith.', 'Inefficient loops cause high response times under load.', and 'Optimization improves performance but architecture still scales as one unit.' At the bottom, there's a note: 'Next Lab: Split this monolith into Microservices (Events / Registration / Checkout).'

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Screenshot 4

The screenshot shows a development environment with two main windows. On the left is a code editor with files like 'main.py', '_init_.py', and 'checkout_locustfile.py'. The code in 'checkout_locustfile.py' includes a 'checkout_logic()' function. On the right is a Locust monitoring interface showing statistics for a 'checkout' task. The 'STATISTICS' tab displays the following data:

Type	Name	# Requests	# fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Cum Fails
GET	checkout	19	0	9	2000	2000	115.2	4	2039	297	0
	Aggregated	19	0	9	2000	2000	115.2	4	2039	297	0

Screenshot 5

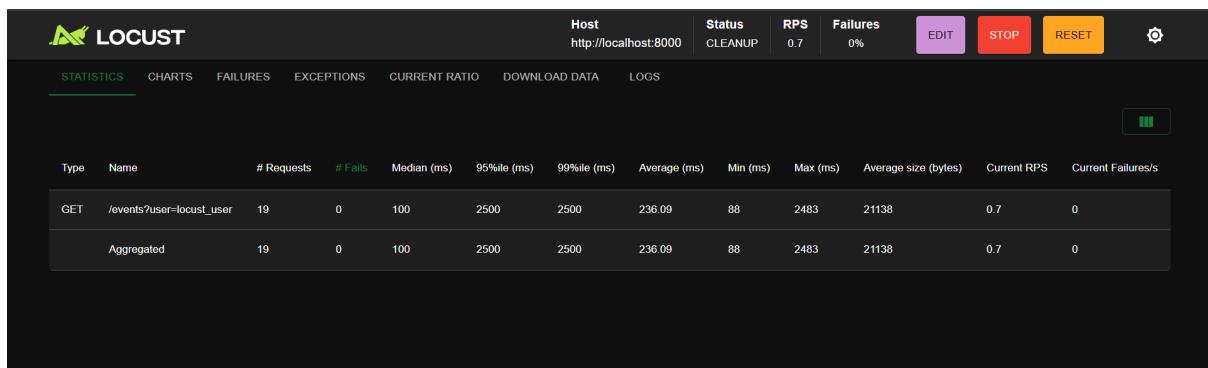
Screenshot 6

```
(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PE52UG23CS916\CC_LAB2> locust -f locust/events_locustfile.py
[2026-01-20 15:23:19,573] DESKTOP-NKI8957/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:23:19,574] DESKTOP-NKI8957/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:23:29,833] DESKTOP-NKI8957/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:23:29,836] DESKTOP-NKI8957/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "c:/Users/sudhiksha/Desktop/cloudlab/pe52ug23cs916\CC_LAB2\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
2026-01-20T09:54:08Z
[2026-01-20 15:24:08,201] DESKTOP-NKI8957/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%)| 236   88  2482  100   0.64   0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          19   0(0.00%)| 236   88  2482  100   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          100  110  110  120  200  2500  2500  2500  2500  2500  2500  19
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          100  110  110  120  200  2500  2500  2500  2500  2500  2500  19

(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PE52UG23CS916\CC_LAB2>
```



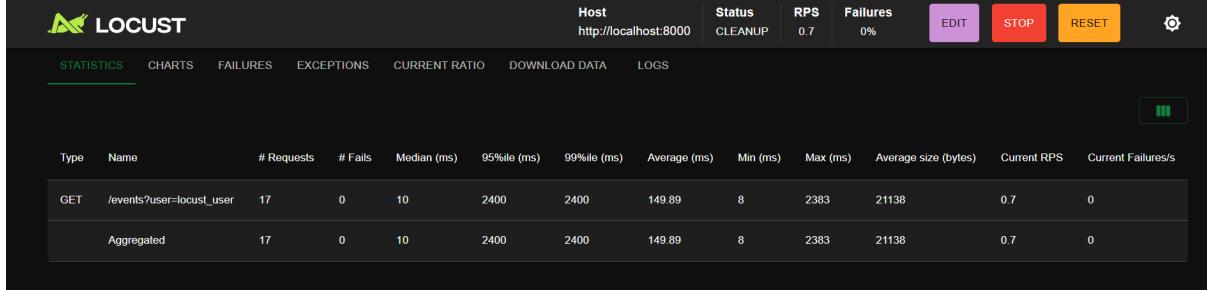
Screenshot 7

```
(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PES2UG23CS916\CC_LAB2> locust -f locust/events_locustfile.py
File "C:\Users\sudhiksha\Desktop\cloudlab\pes2ug23cs916\CC_LAB2\.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
2026-01-20T09:56:35Z
[2026-01-20 15:26:35,688] DESKTOP-NKI8957/INFO/locust.main: Shutting down (exit code 0)
      Type      Name      # reqs |  # fails |    Avg |    Min |    Max |   Med |  req/s | failures/s
      Type      Name      # reqs |  # fails |    Avg |    Min |    Max |   Med |  req/s | failures/s
      GET      /events?user=locust_user      17 | 0(0.00%) | 149 |     8 | 2382 |   10 | 0.59 |      0.00
      Aggregated      17 | 0(0.00%) | 149 |     8 | 2382 |   10 | 0.59 |      0.00

Response time percentiles (approximated)
      Type      Name      50% |    66% |    75% |    80% |    90% |    95% |    98% |    99% | 99.9% | 99.99% | 100% | # reqs
      Type      Name      50% |    66% |    75% |    80% |    90% |    95% |    98% |    99% | 99.9% | 99.99% | 100% | # reqs
      GET      /events?user=locust_user      10 |    11 |    12 |    12 |    19 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 17
      Aggregated      10 |    11 |    12 |    12 |    19 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 17

(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PES2UG23CS916\CC_LAB2> █
```



Screenshot 8

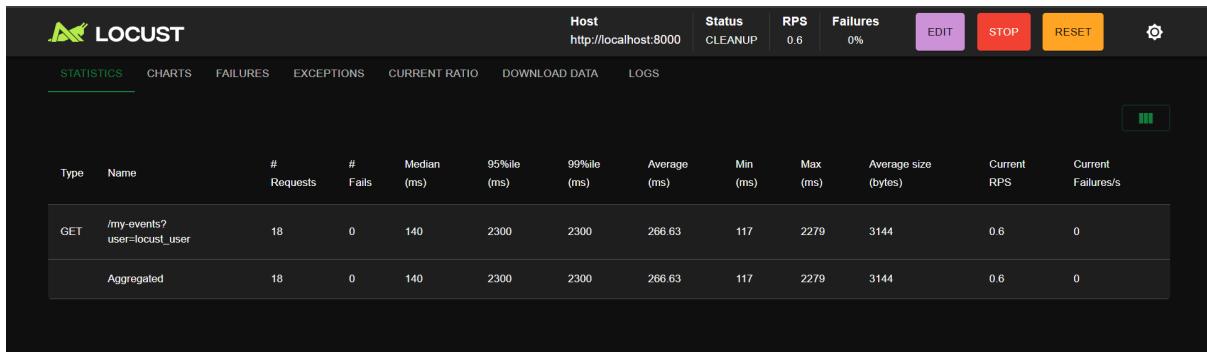
```

(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PES2UG23CS916\CC_LAB2> locust -f locust/myevents_locustfile.py
[2026-01-20 15:28:21,192] DESKTOP-NKI8957/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:28:21,192] DESKTOP-NKI8957/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:28:31,496] DESKTOP-NKI8957/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:28:31,527] DESKTOP-NKI8957/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:/Users/sudhiksha/Desktop/cloudlab/pes2ug23cs916\CC_LAB2\venv\Lib\site-packages\gevent\_ffl\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument

KeyboardInterrupt
2026-01-20T09:59:08Z
[2026-01-20 15:29:08,526] DESKTOP-NKI8957/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          18   0 (0.00%) | 266   117   2279   140 | 0.63      0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         18   0 (0.00%) | 266   117   2279   140 | 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      /my-events/user-locust_user          140   160   160   160   200   2300   2300   2300   2300   2300   2300   18
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         140   160   160   160   200   2300   2300   2300   2300   2300   2300   18

```



Screenshot 9

The screenshot shows two parts: a terminal window and a web browser.

Terminal Output:

```
(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PES2UG23CS916\CC_LAB2> locust -f locust/myevents_locustfile.py
[2026-01-20 15:30:56,830] DESKTOP-NKI8957/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:30:56,831] DESKTOP-NKI8957/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:31:07,379] DESKTOP-NKI8957/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:31:07,385] DESKTOP-NKI8957/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
• Traceback (most recent call last):
  File "C:/Users/sudhiksha/Desktop/cloudlab/pes2ug23cs916\CC_LAB2\.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
2026-01-20T10:02:03Z
[2026-01-20 15:32:03,019] DESKTOP-NKI8957/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	20	0(0.00%)	112	3	2070	8	0.68	0.00
	Aggregated	20	0(0.00%)	112	3	2070	8	0.68	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	12	44	2100	2100	2100	2100	2100	2100	20
	Aggregated	8	9	9	12	44	2100	2100	2100	2100	2100	2100	20

(.venv) PS C:\Users\sudhiksha\Desktop\cloudlab\PES2UG23CS916\CC_LAB2>

Locust Web Interface:

The interface shows a summary table with the following data:

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	20	0	8	2100	2100	112.5	3	2071	3144	0.7	0
	Aggregated	20	0	8	2100	2100	112.5	3	2071	3144	0.7	0

Optimisations:

For events:

1. What was the bottleneck?

The route had an unnecessary CPU-intensive loop that ran millions of iterations for every request, even though it did not affect the response.

2. What change did you make?

Removed the wasteful loop:

```
for i in range(3000000):
```

```
waste += i % 3
```

3. Why did the performance improve?

The server no longer wastes CPU cycles on meaningless computation, so requests are processed faster, reducing average response time.

For my-events:

1. What was the bottleneck?

The route contained a dummy loop with 1.5 million iterations, which added artificial delay to every request.

2. What change did you make?

Removed the dummy loop:

```
for _ in range(1500000):  
    dummy += 1
```

3. Why did the performance improve?

By eliminating unnecessary processing, the route now returns results immediately after the database query, lowering response time and improving throughput.