

# LAB 2- MONOLITHIC ARCHITECTURE

---

Name: Megha Dhanya

SRN: PES2UG23CS336

Section: F

---

SS1:

The screenshot shows a web browser window with the URL `localhost:8000/events?user=PES2UG23CS336`. The page title is "Fest Monolith" and it displays a list of six events:

Event ID	Event Name	Price
1	Hackathon	₹ 500
2	Dance	₹ 300
3	Hackathon	₹ 500
4	Dance Battle	₹ 300
5	AI Workshop	₹ 400
6	Photography Walk	₹ 200

Each event card includes a "Register" button.

SS2:

The screenshot shows a web browser window with the URL `localhost:8000/checkout`. The title bar includes standard icons for back, forward, search, and refresh, along with links for 'New folder', 'Gmail', 'YouTube', 'Maps', and 'Translate'. On the right side of the title bar are icons for star, copy, save, download, and more, followed by 'All Bookmarks'. Below the title bar, there's a navigation bar with a 'CC' logo, the text 'Fest Monolith', and links for 'FastAPI • SQLite • Locust', 'Login', and 'Create Account'. The main content area has a red header with the text 'Monolith Failure' and a red button on the right labeled 'HTTP 500'. Below this, a pink box contains the error message 'division by zero'. To the left, a box asks 'Why did this happen?' with the answer: 'Because this is a monolithic application: all modules share the same runtime and deployment. When one feature crashes, it affects the whole system.' To the right, a box asks 'What should you do in the lab?' with the following steps: 'Take a screenshot (crash demonstration)', 'Fix the bug in the indicated module', and 'Restart the server and verify recovery'. At the bottom left are buttons for 'Back to Events' and 'Login', and at the bottom center is the text 'CC Week X • Monolithic Applications Lab'.

```
total= checkout_logic()
File "C:\Users\megha\PES2UG23CS336\CC Lab-2\checkout\__init__.py", line 10, in checkout_logic
    1 / 0
    ~~^~~
ZeroDivisionError: division by zero
```

SS3:

The screenshot shows a web browser window with the URL `localhost:8000/checkout`. The title bar and navigation icons are identical to the previous screenshot. The main content area features a 'Checkout' section with a blue icon. Below it, a box states: 'This route is used to demonstrate a monolith crash + optimization.' It displays a large total amount of '₹ 6600'. A green box below contains the instruction: 'After fixing + optimizing checkout logic, re-run Locust and compare results.' To the right, a 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.' A yellow box at the bottom right suggests the next step: 'Next Lab: Split this monolith into Microservices (Events / Registration / Checkout).'. At the bottom center is the text 'CC Week X • Monolithic Applications Lab'.

```
←[32mINFO←[0m: 127.0.0.1:63784 - "←[1mGET /checkout HTTP/1.1←[0m" ←[32m200 OK←[0m
```

SS4:

Locust Web Interface Screenshot:

- Host:** http://localhost:8000
- Status:** RUNNING
- Users:** 1
- RPS:** 0
- Failures:** 0%

**Logs (Terminal Output):**

```
C:\Users\megha\PES2UG23CS336\CC Lab-2>.\venv\Scripts\activate
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
[2026-01-20 14:43:40,009] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:43:40,011] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:45:09,303] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:45:09,305] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\lib\site-packages\gevent\ffiloop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-20T09:16:06Z
[2026-01-20 14:46:06,526] M/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	2	0	10	2200	1102.4	10	2195	2797	0	0
	Aggregated	2	0	10	2200	1102.4	10	2195	2797	0	0

**ABOUT:**

SS4:

Locust Web Interface Screenshot:

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

**Logs (Terminal Output):**

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
[2026-01-20 14:56:33,297] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:56:33,298] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:57:26,492] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:57:26,497] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\lib\site-packages\gevent\ffiloop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-20T09:29:21Z
[2026-01-20 14:59:21,017] M/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s	
GET	/checkout	20	0	8	2000	2000	111.61	7	2048	2797	0.7	0
	Aggregated	20	0	8	2000	2000	111.61	7	2048	2797	0.7	0

**ABOUT:**

Locust Web Interface Screenshot:

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

**Logs (Terminal Output):**

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
[2026-01-20 14:56:33,297] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:56:33,298] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:57:26,492] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:57:26,497] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\lib\site-packages\gevent\ffiloop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-20T09:29:21Z
[2026-01-20 14:59:21,017] M/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%)	111	7	2048	8	0.69	0.00
	Aggregated	20	0(0.00%)	111	7	2048	8	0.69	0.00

**Response time percentiles (approximated):**

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# r
GET	/checkout	8	10	11	16	19	2000	2000	2000	2000	2000	2000	2000
	Aggregated	8	10	11	16	19	2000	2000	2000	2000	2000	2000	2000

**(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>**

localhost:8089

All Bookmarks

# LOCUST

STATISTICS CHARTS FAILURES EXCEPTIONS CURRENT >

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Ave (ms)
GET	/checkout	20	0	8	2000	2000	111
	Aggregated	20	0	8	2000	2000	111

Response time percentiles (approximated)

Type	Name	6%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/checkout	10	11	16	19	2000	2000	2000	2000	2000	2000	20
	Aggregated	10	11	16	19	2000	2000	2000	2000	2000	2000	20

(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>

SS6:

The screenshot shows the Locust UI interface. At the top, there's a header with the Locust logo, the host URL "http://localhost:8000", and status indicators: "STOPPED", "0.5 RPS", and "0% Failures". Below the header is a navigation bar with tabs: STATISTICS (highlighted in green), CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, and LOGS. The main content area displays a table of test results. The table has columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s. One row shows a GET request to "/events?user=locust\_user" with 15 requests, 0 fails, and 0.5 RPS. Another row shows an Aggregated summary with the same values. At the bottom right, there's a "ABOUT" link.

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	480	2500	2500	640.18	365	2548	21138	0.5	0
Aggregated												
		15	0	480	2500	2500	640.18	365	2548	21138	0.5	0

SS7:

The screenshot shows the Locust web interface at <http://localhost:8089>. The top navigation bar includes links for New folder, Gmail, YouTube, Maps, Translate, and All Bookmarks. The main header displays the Locust logo, the host as <http://localhost:8000>, the status as STOPPED, RPS 0.7, and Failures 0%. Buttons for NEW (green) and RESET (orange) are also present.

The interface has tabs for STATISTICS, CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, and LOGS. The STATISTICS tab is selected, showing a table of performance metrics for a single user scenario. The table includes columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s.

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	13	2000	2000	120.58	8	2032	21138	0.7	0
	Aggregated	19	0	13	2000	2000	120.58	8	2032	21138	0.7	0

Below the table, there is a section titled "ABOUT" which contains the command used to run the Locust file and the log output from the Locust process.

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/events_locustfile.py
[2026-01-20 15:42:34,441] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:42:34,442] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:42:49,777] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:42:49,780] M/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.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
2026-01-20T10:15:51Z
[2026-01-20 15:45:51,380] M/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    2032    13 | 0.66    0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                         19    0(0.00%) | 120     7    2032    13 | 0.66    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          13    19    19    23    36    2000   2000   2000   2000  2000   2000   19
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                         13    19    19    23    36    2000   2000   2000   2000  2000   2000   19
```

SS8:

The screenshot shows the Locust web interface at [localhost:8089](http://localhost:8089). The host is <http://localhost:8000> and the status is STOPPED with 0 RPS and 0% failures. The navigation bar includes links for NEW, RESET, and a gear icon.

The main content is the STATISTICS tab, which displays a table of performance metrics for a single request type, /my-events?user=locust\_user, with 18 requests. The table includes columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s.

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	18	0	150	2200	2200	272.37	122	2177	3144	0.6	0
Aggregated		18	0	150	2200	2200	272.37	122	2177	3144	0.6	0

SS9:

The screenshot shows the Locust web interface at [localhost:8089](http://localhost:8089). The host is <http://localhost:8000> and the status is STOPPED with 0.7 RPS and 0% failures. The navigation bar includes links for NEW, RESET, and a gear icon.

The main content is the STATISTICS tab, which displays a table of performance metrics for a single request type, /my-events?user=locust\_user, with 19 requests. The table includes columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s.

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	19	2100	2100	126.55	7	2094	3144	0.7	0
Aggregated		19	0	19	2100	2100	126.55	7	2094	3144	0.7	0

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab->2>
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab->locust -f locust/myevents_locustfile.py
[2026-01-20 15:49:21,707] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:49:21,708] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:49:58,690] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:49:58,712] M/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\lib\site-packages\gevent\_\_ffilib\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument

KeyboardInterrupt
2026-01-20 10:22:22Z
[2026-01-20 15:52:22,421] M/INFO/locust.main: Shutting down (exit code 0)
-----|-----# reqs|-----# fails|-----Avg|-----Min|-----Max|-----Med|-----req/s|-----failures/s|-----|
Type  Name          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET   /my-events?user=locust_user          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
                                            |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Response time percentiles (approximated)
-----|-----50%|-----66%|-----75%|-----80%|-----90%|-----95%|-----98%|-----99%|-----99.9%|-----99.99%|-----100%|-----# reqs|-----|
Type  Name          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET   /my-events?user=locust_user          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated          |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
                                            |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>
```

## Explanations of Optimizations:

## 1. Route /events

## Bottleneck:

The route contained unnecessary CPU intensive computation that delayed each request.

## Change made:

Removed redundant looping logic that did not contribute to the response i.e removing the waste loop

## Why performance improved:

Eliminating unnecessary processing reduced execution time and improved response latency.

## 2. Route /my-events

## Bottleneck:

Artificial delay was introduced through redundant looping, increasing request processing time.

## Change made:

Removed the unnecessary loop while keeping database logic unchanged.

## Why performance improved:

Reducing CPU usage per request lowered response time and improved throughput under load.

