

10 users

```
chuanhuihe@chuanhuis-MacBook-Air e1 % python -m locust -f locustfile.py \
--host=http://localhost:8080 \
--users 10 \
--spawn-rate 5 \
--run-time 10s \
--headless
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/INFO/locust.main: Starting Locust 2.34.0
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/WARNING/locust.main: Python 3.9 support is deprecated and will be removed soon
[2025-11-12 09:47:23,633] chuanhuis-MacBook-Air/INFO/locust.main: Run time limit set to 10 seconds
Type  Name  # reqs  # fails | Avg  Min  Max  Med | req/s  failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
Aggregated  0  0(0.00%) | 0  0  0  0 | 0.00  0.00

=====
🔥 Load test started!
=====
Target host: http://localhost:8080
User count: 10
=====

[2025-11-12 09:47:23,634] chuanhuis-MacBook-Air/INFO/locust.runners: Ramping to 10 users at a rate of 5.00 per second
● User user_3427 online
● User user_2371 online
● User user_9631 online
● User user_5848 online
● User user_4725 online
[2025-11-12 09:47:24,634] chuanhuis-MacBook-Air/INFO/locust.runners: All users spawned: {"CouponGrabUser": 10} (10 total users)
● User user_868 online
● User user_7937 online
● User user_6039 online
● User user_8361 online
● User user_9516 online
Type  Name  # reqs  # fails | Avg  Min  Max  Med | req/s  failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
GET  /admin/stats  249  0(0.00%) | 1  0  13  2 | 0.00  0.00
POST /api/coupon/grab 1218  0(0.00%) | 1  1  0  19 | 1  0.00  0.00
POST /api/like  699  0(0.00%) | 1  0  18  1 | 0.00  0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
Aggregated  2166  0(0.00%) | 1  0  19  1 | 0.00  0.00

Type  Name  # reqs  # fails | Avg  Min  Max  Med | req/s  failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
GET  /admin/stats  551  0(0.00%) | 1  0  19  2 | 74.00  0.00
POST /api/coupon/grab 2860  0(0.00%) | 1  1  0  19 | 1  349.50  0.00
POST /api/like  1690  0(0.00%) | 1  0  19  1 | 198.00  0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
Aggregated  5101  0(0.00%) | 1  0  19  1 | 621.50  0.00

Type  Name  # reqs  # fails | Avg  Min  Max  Med | req/s  failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
GET  /admin/stats  885  0(0.00%) | 1  0  19  1 | 115.25  0.00
POST /api/coupon/grab 4455  0(0.00%) | 1  1  0  19 | 1  584.50  0.00
POST /api/like  2712  0(0.00%) | 1  0  19  1 | 345.00  0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
Aggregated  8052  0(0.00%) | 1  0  19  1 | 1044.75  0.00

Type  Name  # reqs  # fails | Avg  Min  Max  Med | req/s  failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
GET  /admin/stats  1228  0(0.00%) | 1  0  19  1 | 130.17  0.00
POST /api/coupon/grab 6061  0(0.00%) | 1  1  0  19 | 1  659.67  0.00
POST /api/like  3703  0(0.00%) | 1  0  19  1 | 396.67  0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----
Aggregated  10992  0(0.00%) | 1  0  19  1 | 1186.50  0.00

[2025-11-12 09:47:33,517] chuanhuis-MacBook-Air/INFO/locust.main: --run-time limit reached, shutting down

=====
✅ Load test completed!
=====
```

Experiment Design

Objective

Determine whether event filtering reduces queue buildup and worker load without impacting system reliability or user-facing performance.

Test Configuration

- **Concurrent Users:** 500 virtual users
- **Test Duration:** 2 minutes per configuration
- **Services:** Coupon grab events and Like interaction events
- **Target Load:** ~2,400 requests/second
- **Infrastructure:** FastAPI backend, RabbitMQ message queue, Locust load testing

```
Total requests: 13780
Failures: 0
Failure rate: 0.00%
Average response time: 1.12 ms
P95 response time: 2.00 ms
P99 response time: 4.00 ms
RPS (requests per second): 1394.34
=====

[2025-11-12 09:47:33,536] chuanhuis-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type   Name   # reqs   # fails | Avg   Min   Max   Med | req/s failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET    /admin/stats 1521    0(0.00%) | 1     0     19    1  | 153.90 0.00
POST   /api/coupon/grab 7631    0(0.00%) | 1     1     0     0  | 20     1  | 772.15 0.00
POST   /api/like 4628    0(0.00%) | 1     0     19    1  | 468.29 0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated 13780    0(0.00%) | 1     0     20    1  | 1394.34 0.00

Response time percentiles (approximated)
Type   Name   50%   66%   75%   80%   90%   95%   98%   99%   99.9% 99.99% 100% # reqs
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET    /admin/stats 1     2     2     2     2     2     3     4     5     18    19    19    1521
POST   /api/coupon/grab 1     1     1     1     1     1     1     2     2     4     18    20    20    7631
POST   /api/like 1     1     1     1     1     1     2     2     4     17    19    19    4628
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated 1     1     1     1     1     2     2     3     4     18    19    20    13780

chuanhuihe@chuanhuis-MacBook-Air e1 %
```

500 users: no filter

```
● chuanhuihe@chuanhuis-MacBook-Air e1 % docker exec rabbitmq rabbitmqctl list_queues
Timeout: 60.0 seconds ...
Listing queues for vhost / ...
name      messages
event_queue 257898
```

Total requests: 289952

Failures: 0

Aggregated 170 180 180 190 200 230 290 340 560 670 890 289952

500 users: with filter

```
chuanhuihe@chuanhuis-MacBook-Air e1 % docker exec rabbitmq rabbitmqctl list_queues
Timeout: 60.0 seconds ...
Listing queues for vhost / ...
name      messages
event_queue 100351
```

=====

Total requests: 290257

Failures: 0

Failure rate: 0.00%

Average response time: 171.28 ms

P95 response time: 220.00 ms

P99 response time: 320.00 ms

RPS (requests per second): 2414.19

=====

[2025-11-12 17:12:00,666] chuanhuis-MacBook-Air/INFO/locust.main: writing html report to file: report_with_filter.html

[2025-11-12 17:12:00,668] chuanhuis-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)

| Type | Name | # reqs | # fails | Avg | Min | Max | Med | req/s | failures/s |
|------------|------------------|--------|----------|-------|-------|-------|-------|---------|------------|
| ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| GET | /admin/stats | 32182 | 0(0.00%) | 171 | 18 | 654 | 170 | 267.67 | 0.00 |
| POST | /api/coupon/grab | 161533 | 0(0.00%) | 171 | 7 | 946 | 170 | 1343.54 | 0.00 |
| POST | /api/like | 96542 | 0(0.00%) | 171 | 16 | 945 | 170 | 802.98 | 0.00 |
| ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Aggregated | | 290257 | 0(0.00%) | 171 | 7 | 946 | 170 | 2414.19 | 0.00 |

Response time percentiles (approximated)

| Type | Name | 50% | 66% | 75% | 80% | 90% | 95% | 98% | 99% | 99.9% | 99.99% | 100% | # reqs |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-------|--------|------|--------|
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-------|--------|------|--------|

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|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| GET | /admin/stats | 170 | 180 | 190 | 190 | 210 | 220 | 280 | 320 | 460 | 610 | 650 | 32182 |
|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|

| | | | | | | | | | | | | | |
|------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| POST | /api/coupon/grab | 170 | 180 | 190 | 190 | 210 | 220 | 280 | 320 | 460 | 760 | 950 | 161533 |
|------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|

| | | | | | | | | | | | | | |
|------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| POST | /api/like | 170 | 180 | 190 | 190 | 210 | 220 | 280 | 320 | 460 | 700 | 950 | 96542 |
|------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|

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|------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| Aggregated | | 170 | 180 | 190 | 190 | 210 | 220 | 280 | 320 | 460 | 700 | 950 | 290257 |
|------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|

Summary:

While the latency remains similar, only successful coupons are enqueued, thereby reducing memory consumption.