Assignment 3 : Performance Test Planning

Student Name: Urvi Surti

Student ID: 8993413

Subject: Software Testing Methodologies (SENG8041)

Performance Test Plan

1. Executive Summary

The purpose of the test plan performance is to evaluate how well the demo e-commerce website(demoblaze.com) can handle various levels of traffic. Here , the goal is to test how the site is fast, stable and reliable for user's usage. The team plans to launch the site on June 1 so testing need to be completed before two weeks early. The tests will ensure that the website can handle both normal and high traffic conditions without slowing down.

2. Performance Requirements and Planning

2.1 Performance Requirements

- **Response Time:** Web pages must load under 2 seconds for normal load conditions.
- **Throughput:** The system must handle at least 3,000 requests per second at peak load.
- **Scalability:** The site must support a minimum of 40 active users without any lag and slowdowns.
- **Stability:** The system must maintain consistent performance without major slowdowns under continuous load.

2.1.1 Load Model

- Typical Traffic: 10 active users
- Peak Traffic: 40 active users
- Activity Breakdown: Product browsing (40%), Adding items to cart (30%), Checkout process (20%), Logging in/Registration (10%)

2.2 Performance Test Approach

2.2.1 Assumptions, Constraints, Dependencies, and Risks

- Testing is performed using BlazeMeter.
- Test setup must be similar to the real-time system.
- Test doesn’t include external services like payment systems.
- Network delays could affect how quickly we get responses.

2.2.2 Milestones

- **May 1 - 5:** Create test plan
- **May 6 - 10:** Prepare the test scripts and data
- **May 11 - 15:** Run tests
- **May 16 - 18:** Review results and write report
- **May 20:** Sign-off and submit final report

2.2.3 Test Organization

- **Performance Test Lead:** Manages test plan and testing process
- **Test Engineers:** Create scripts and run tests
- **Business Analysts:** Verify test scenarios that aligns with business goals

2.2.4 Performance Test Script Steps

1. Navigate to homepage
2. Explore product categories
3. Add products to the cart
4. Proceed to checkout
5. Complete login/registration process

2.2.5 Performance Test Data Planning

- Account details for login/registration
- Sample product IDs for cart operations
- Dummy payment details

2.2.6 Performance Test Scenario Runs

- **Test 1:** Low load (5 users)
- **Test 2:** Normal load (10 users)
- **Test 3:** Medium load (15 users)
- **Test 4:** High load (20 users)
- **Test 5:** Stress test (25 users)
- **Test 6:** Peak load (40 users)

2.2.7 Performance Test Environment

- **Application Server:** Hosted on AWS
- **Database:** MySQL
- **Testing Tool:** BlazeMeter
- **Network Setup:** Simulated using BlazeMeter locations

2.3 Performance Test Monitoring Tools and Metrics

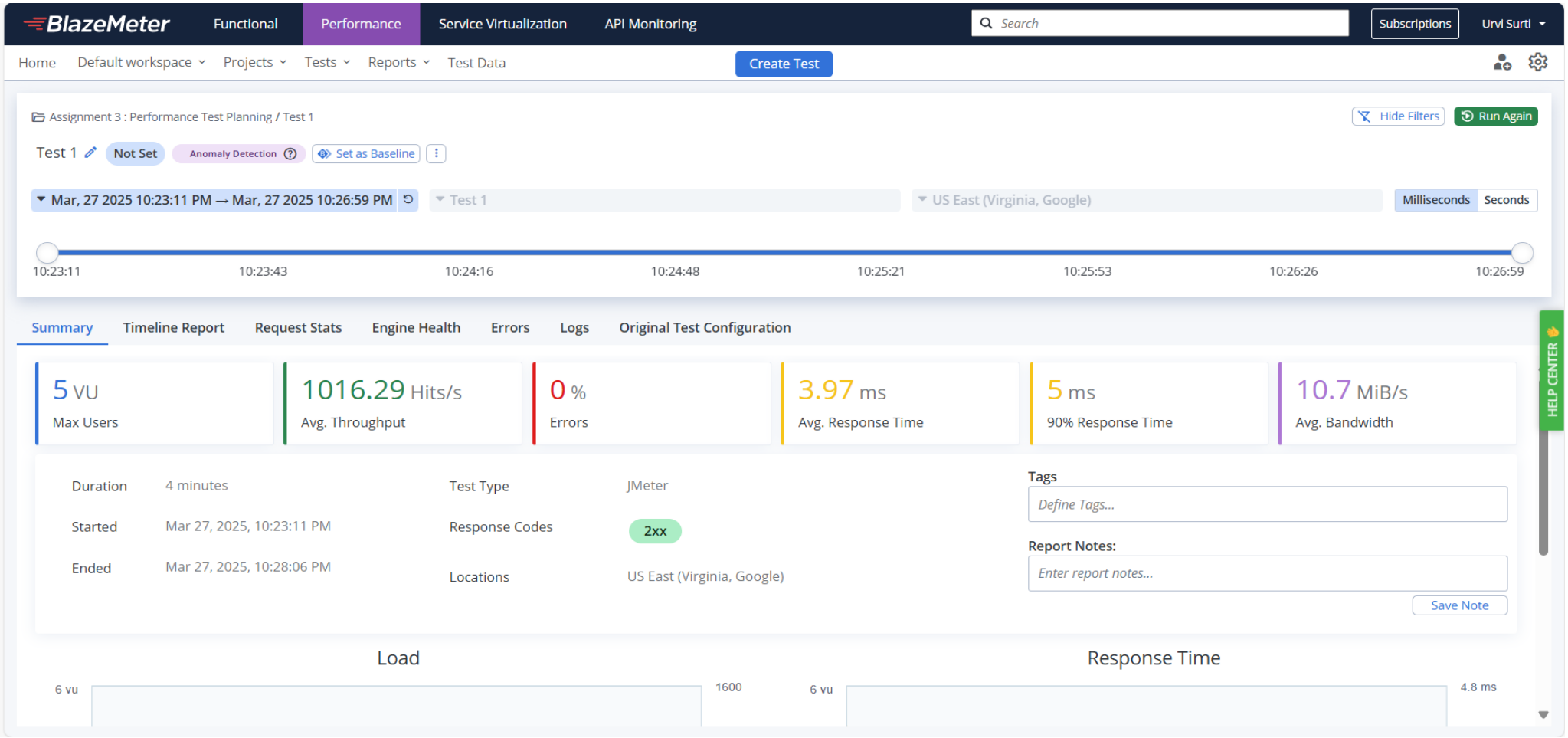
- Response Time (ms)
- Throughput (hits/sec)
- Error Rate (%)
- CPU & Memory Usage (%)
- Bandwidth Utilization (MB/s)

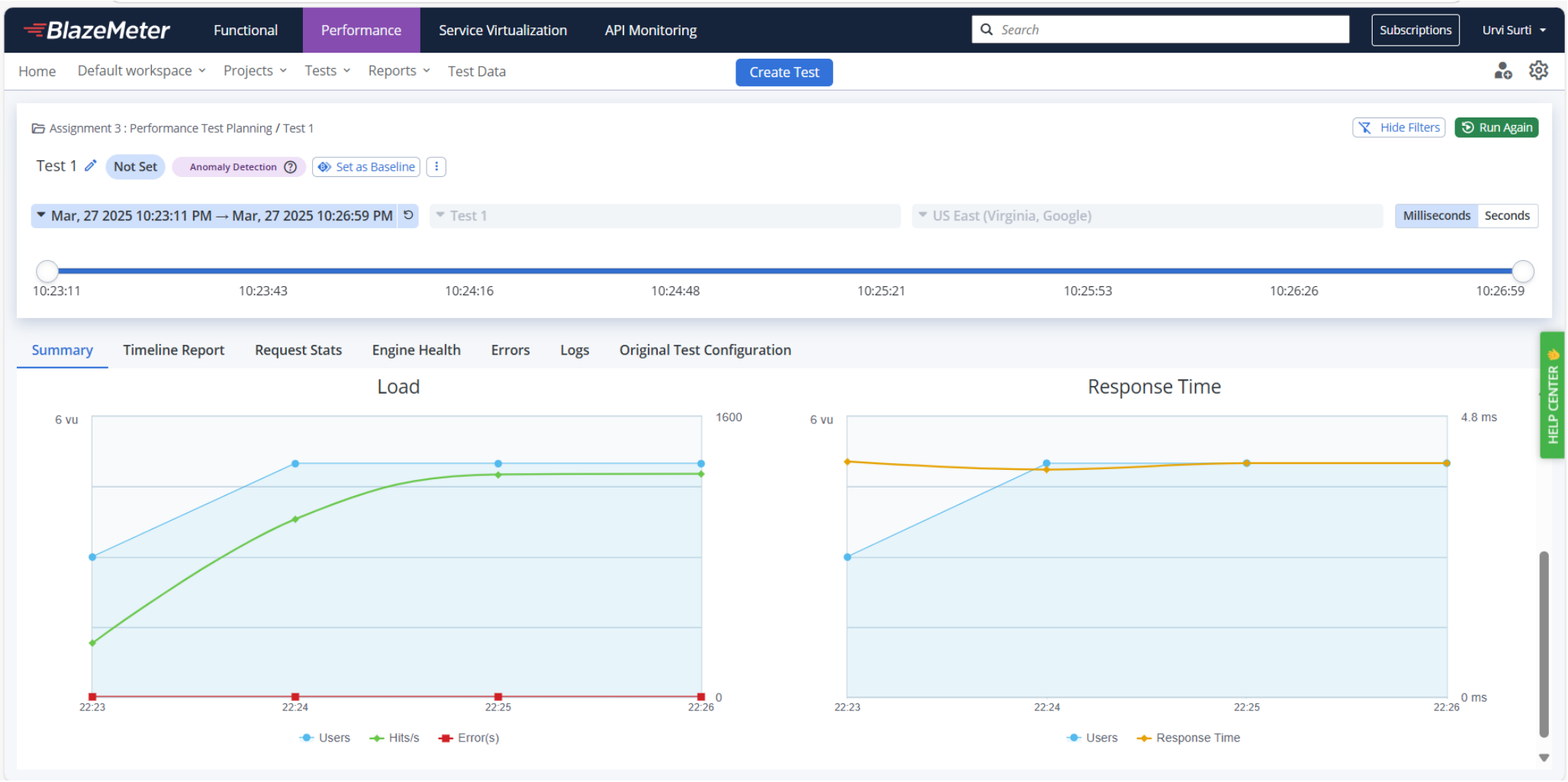
3. Execution and Analysis

3.1 Performance Test Results and Analysis

Test 1 : Baseline Load Test

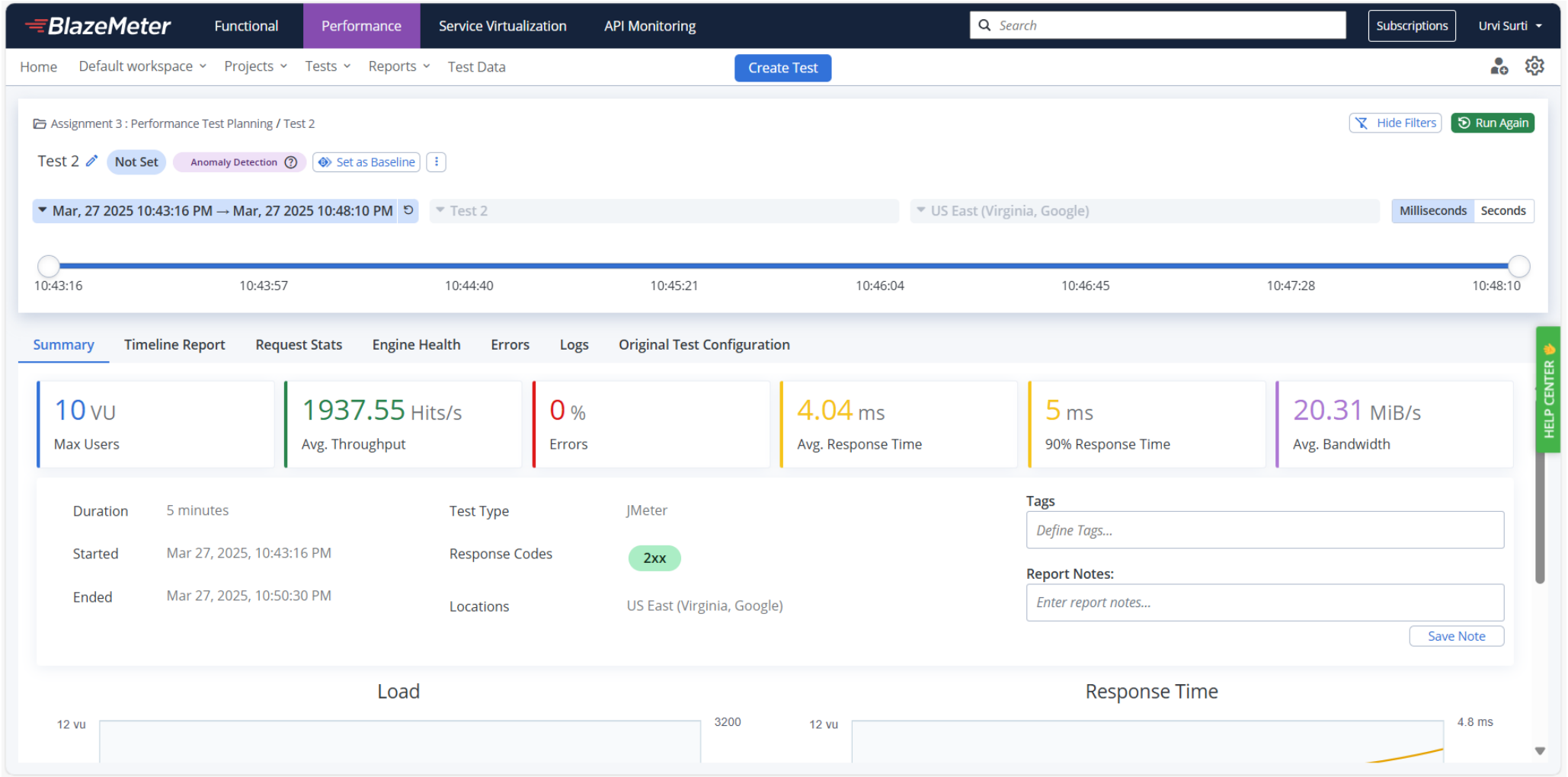
- **Configuration:** 5 Users, 4 min, JMeter, US East
- **Results:** Avg Throughput: 1016.29 hits/sec, Response Time: 3.97 ms
- **Analysis:** No errors, stable performance.

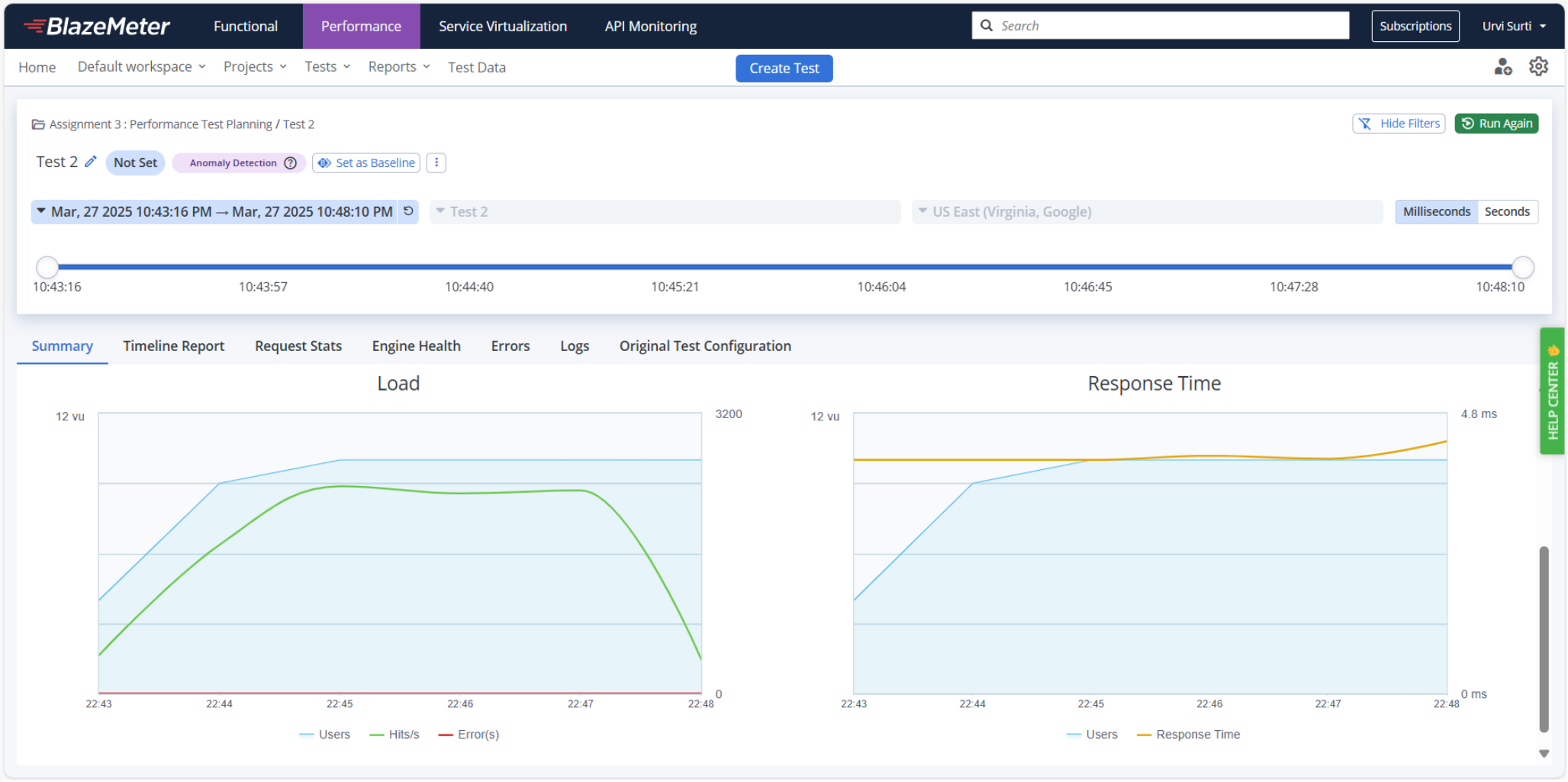



BlazeMeter
Functional
Performance
Service Virtualization
API Monitoring
Search
Subscriptions
Urvi Surti
Home
Default workspace
Projects
Tests
Reports
Test Data
Create Test
Assignment 3 : Performance Test Planning / Test 1
Hide Filters
Run Again
Test 1
Not Set
Anomaly Detection
Set as Baseline
Mar, 27 2025 10:23:11 PM → Mar, 27 2025 10:26:59 PM
Test 1
US East (Virginia, Google)
Milliseconds
Seconds
10:23:11
10:23:43
10:24:16
10:24:48
10:25:21
10:25:53
10:26:26
10:26:59
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
6 vu
1600
0
22:23
22:24
22:25
22:26
Users
Hits/s
Error(s)
Response Time
6 vu
4.8 ms
0 ms
22:23
22:24
22:25
22:26
Users
Response Time
HELP CENTER

Test 2 : Normal Traffic Simulation

- **Configuration:** 10 Users, 5 min, JMeter, US East
- **Results:** Avg Throughput: 1937.55 hits/sec, Response Time: 4.04 ms
- **Analysis:** Scaled well, no errors observed.

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Default workspace
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Reports
Test Data
Create Test
Assignment 3 : Performance Test Planning / Test 2
Hide Filters
Run Again
Test 2
Not Set
Anomaly Detection
Set as Baseline
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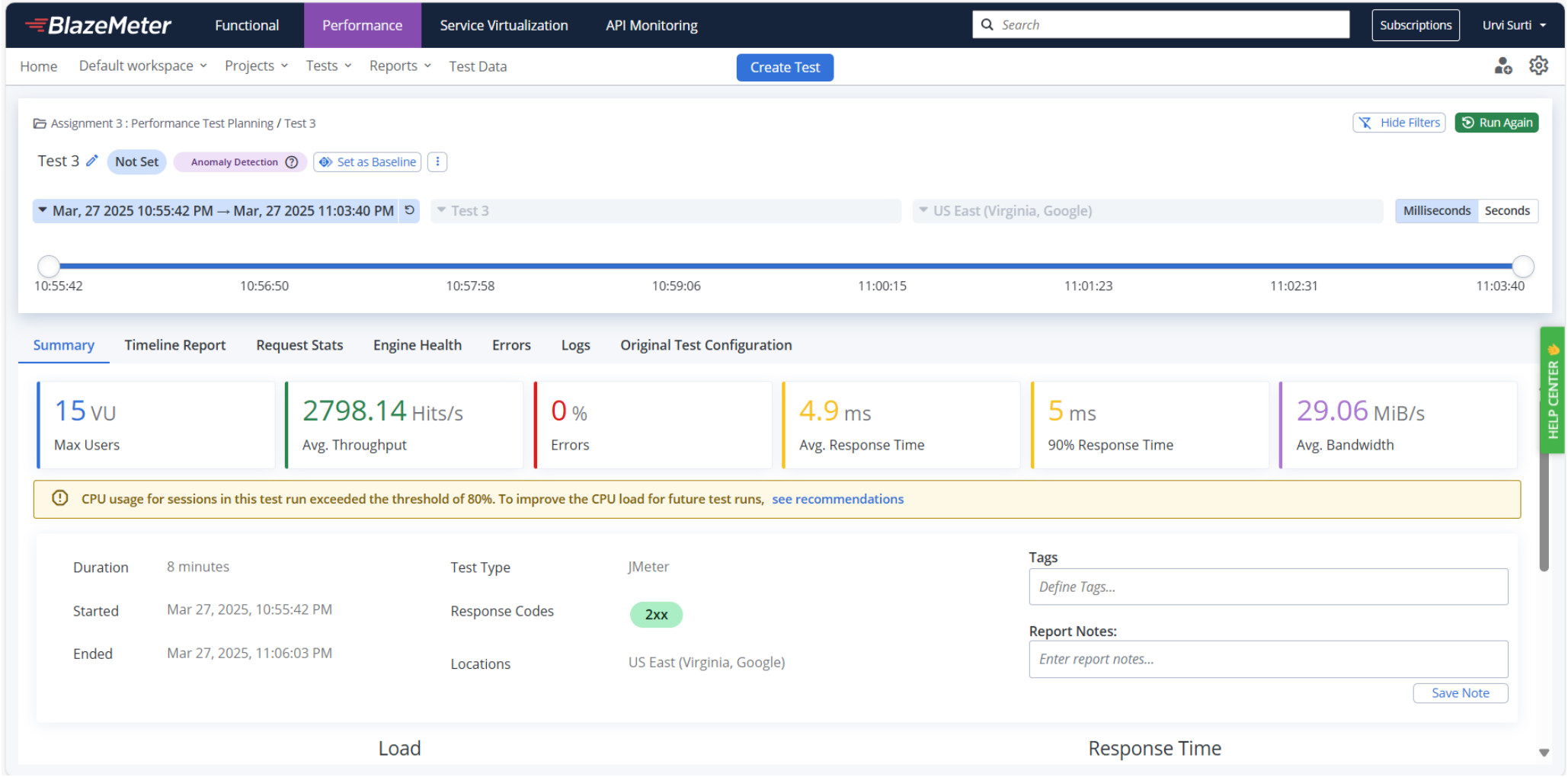
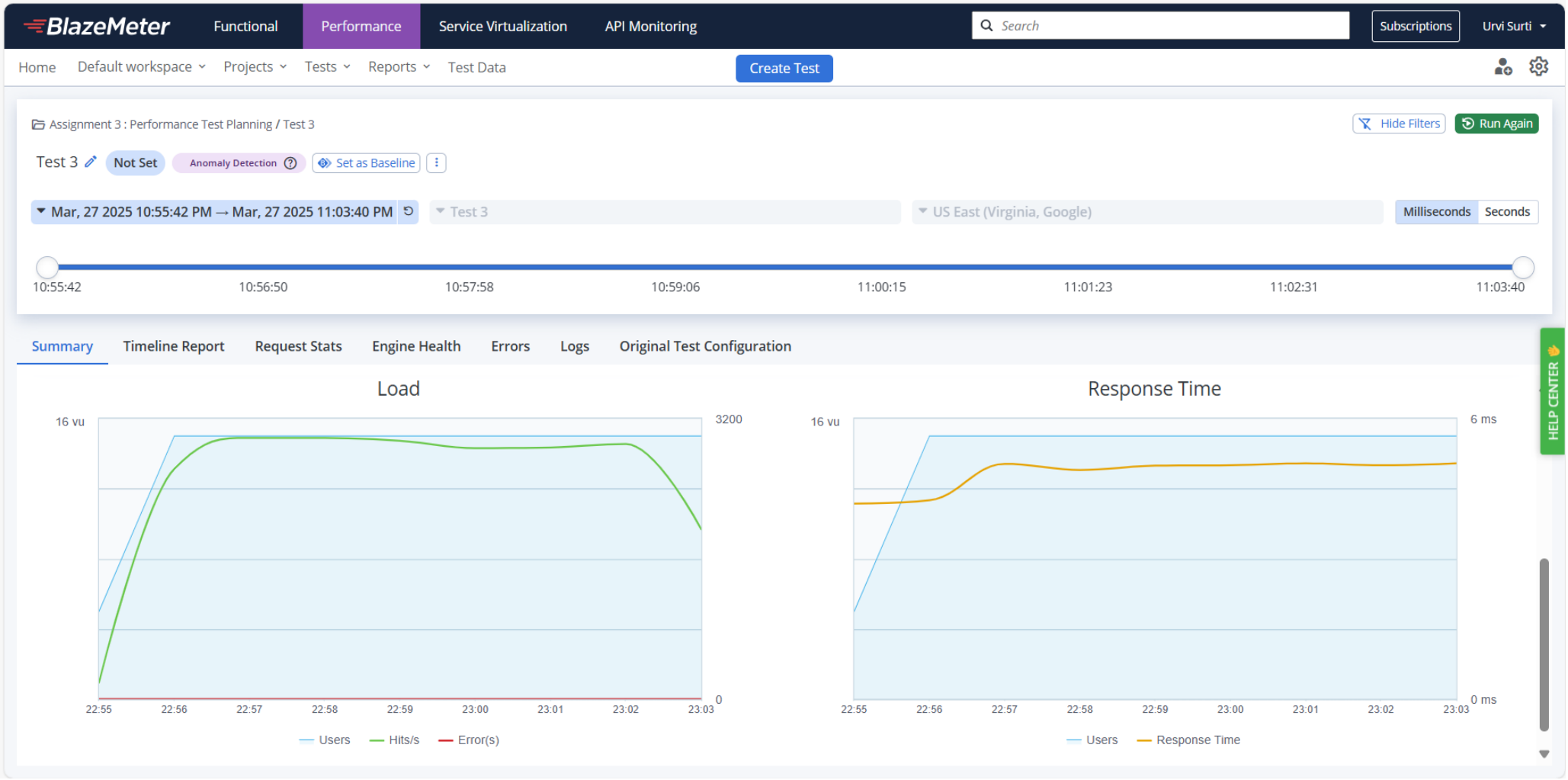
Test 2
US East (Virginia, Google)
Milliseconds
Seconds
10:43:16
10:43:57
10:44:40
10:45:21
10:46:04
10:46:45
10:47:28
10:48:10
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
12 vu
3200
0
22:43
22:44
22:45
22:46
22:47
22:48
Users
Hits/s
Error(s)
Response Time
12 vu
4.8 ms
0 ms
22:43
22:44
22:45
22:46
22:47
22:48
Users
Response Time
HELP CENTER

Test 3 : Moderate Load Test

- **Configuration:** 15 Users, 8 min
- **Results:** Avg Throughput: 2798.14 hits/sec, Response Time: 4.9 ms
- **Analysis:** High CPU usage warning (>80%).

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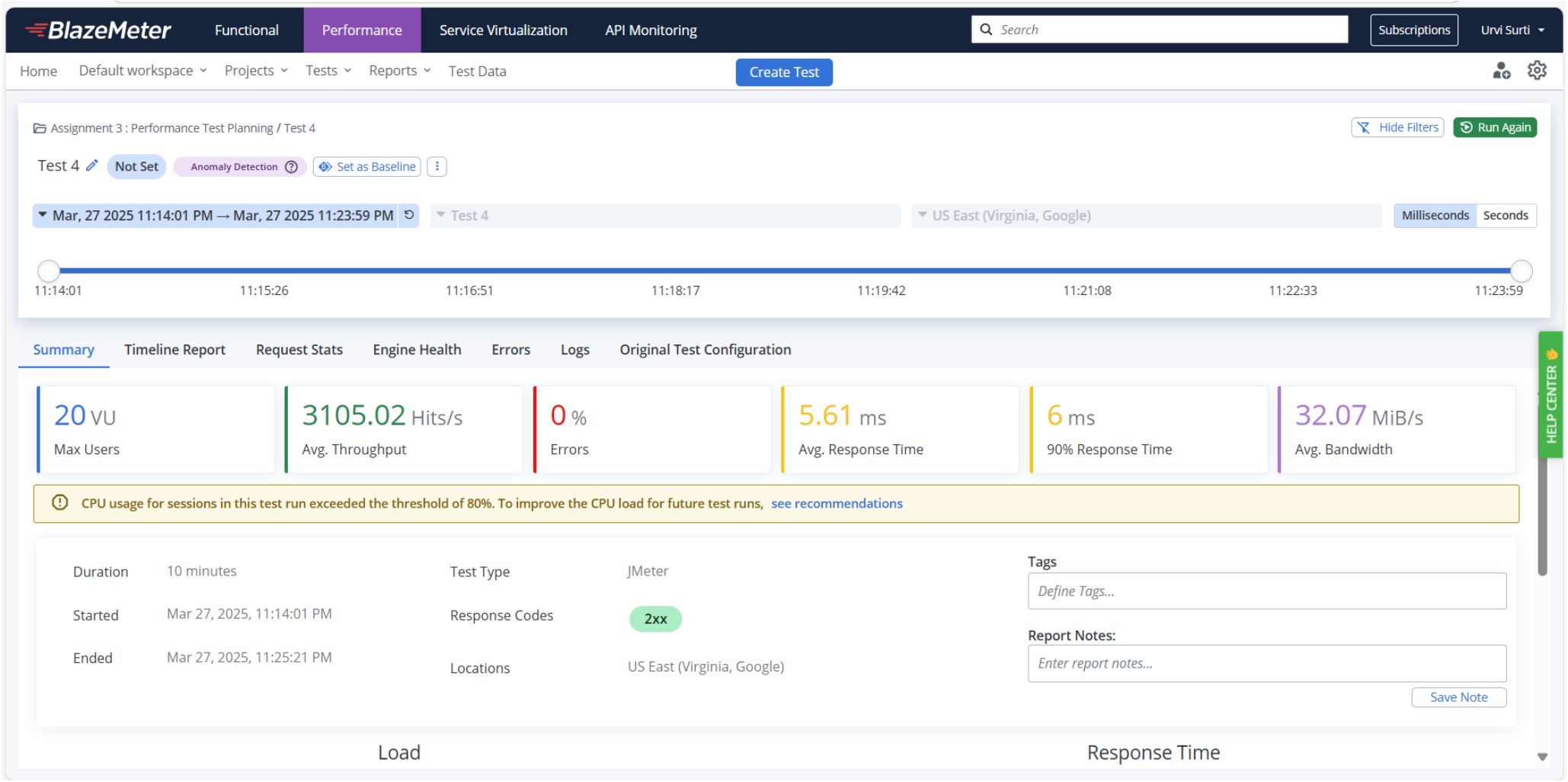
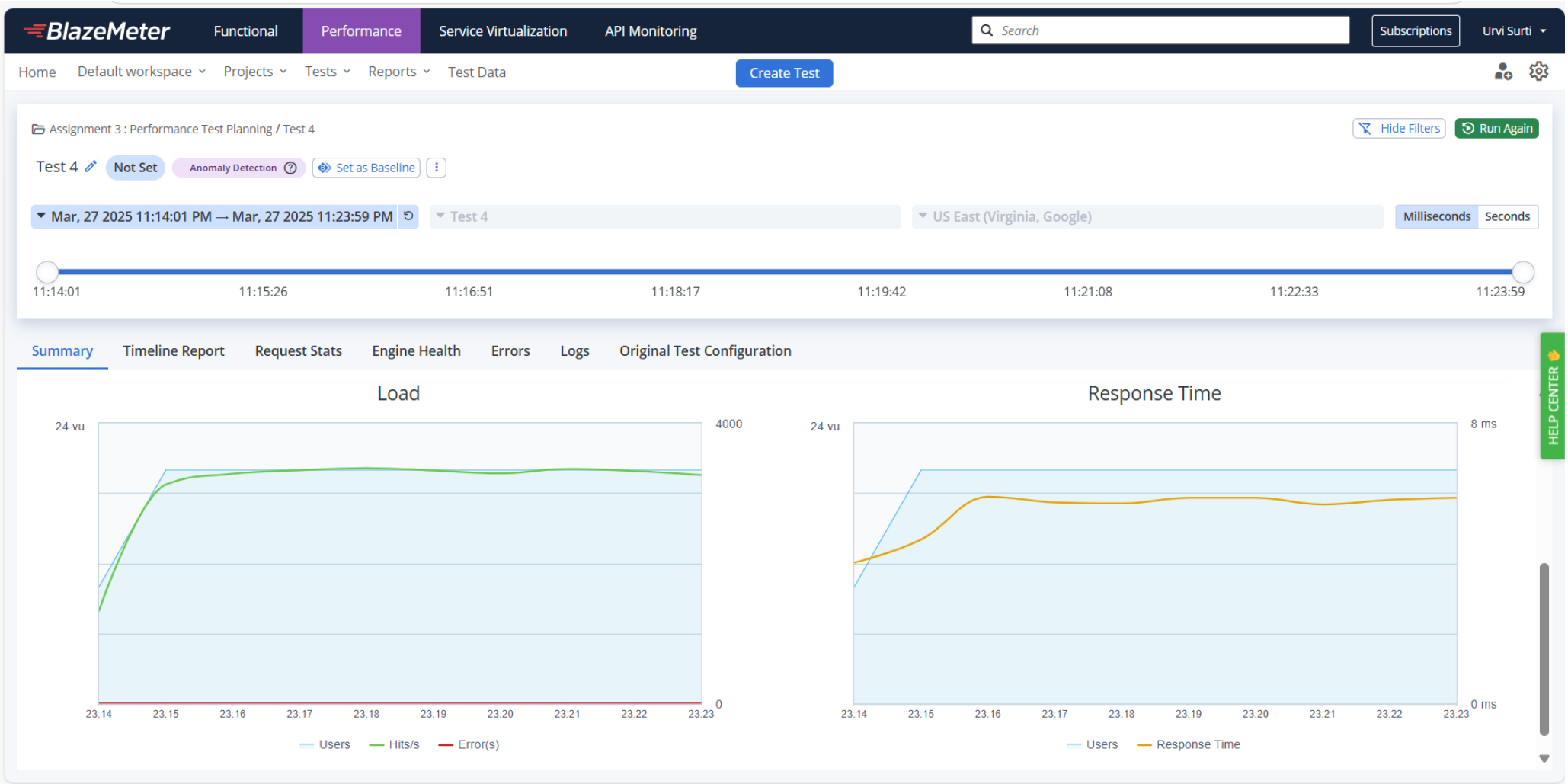
Test Data
Create Test
Assignment 3 : Performance Test Planning / Test 3
Hide Filters
Run Again
Test 3
Not Set
Anomaly Detection
Set as Baseline
Mar, 27 2025 10:55:42 PM → Mar, 27 2025 11:03:40 PM
Test 3
US East (Virginia, Google)
Milliseconds
Seconds
10:55:42
10:56:50
10:57:58
10:59:06
11:00:15
11:01:23
11:02:31
11:03:40
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
16 vu
3200
0
22:55
22:56
22:57
22:58
22:59
23:00
23:01
23:02
23:03
Users
Hits/s
Error(s)
Response Time
16 vu
6 ms
0 ms
22:55
22:56
22:57
22:58
22:59
23:00
23:01
23:02
23:03
Users
Response Time
HELP CENTER

Test 4 : High Traffic Endurance Test

- **Configuration:** 20 Users, 10 min
- **Results:** Avg Throughput: 3105.02 hits/sec, Response Time: 5.61 ms
- **Analysis:** Slight increase in response time, CPU bottleneck observed.

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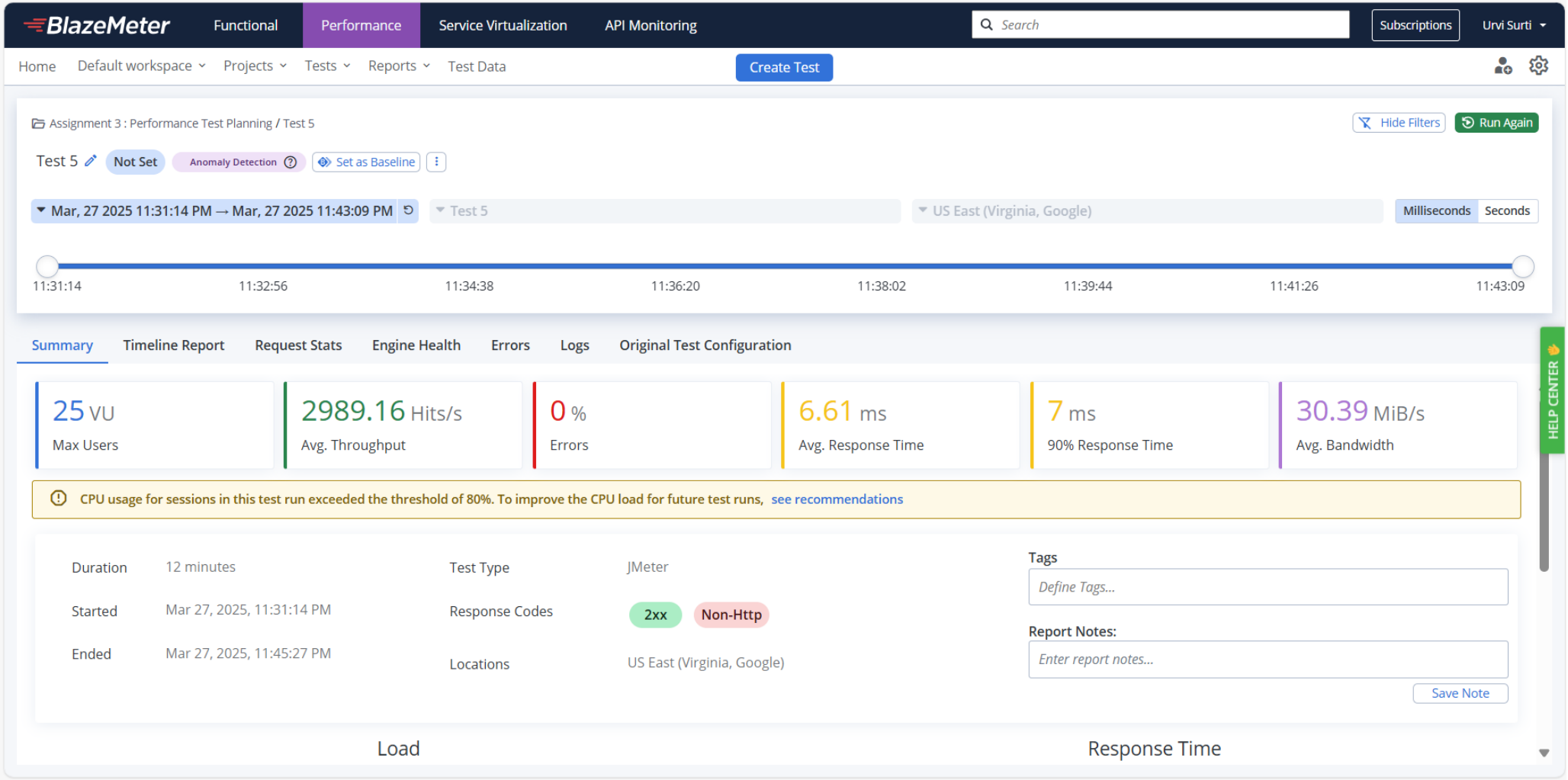
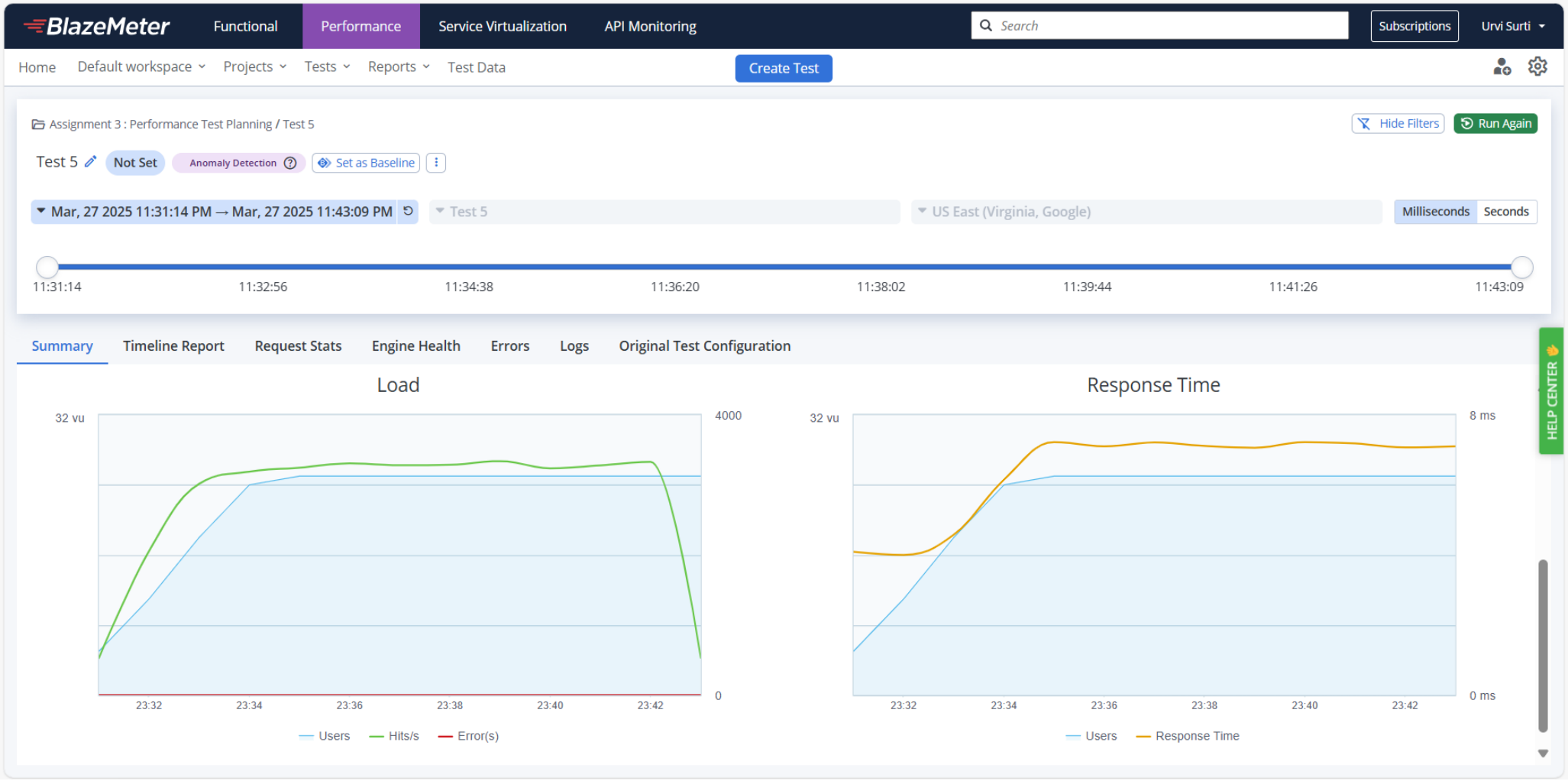
Create Test
Assignment 3 : Performance Test Planning / Test 4
Hide Filters
Run Again
Test 4
Not Set
Anomaly Detection
Set as Baseline
Mar, 27 2025 11:14:01 PM — Mar, 27 2025 11:23:59 PM
Test 4
US East (Virginia, Google)
Milliseconds
Seconds
11:14:01
11:15:26
11:16:51
11:18:17
11:19:42
11:21:08
11:22:33
11:23:59
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
24 vu
4000
0
23:14
23:15
23:16
23:17
23:18
23:19
23:20
23:21
23:22
23:23
Users
Hits/s
Error(s)
Response Time
24 vu
8 ms
0 ms
Users
Response Time
HELP CENTER

Test 5 : Stress Test

- **Configuration:** 25 Users, 12 min
- **Results:** Avg Throughput: 2989.16 hits/sec, Response Time: 6.61 ms
- **Analysis:** Response times increasing, system stability concerns.

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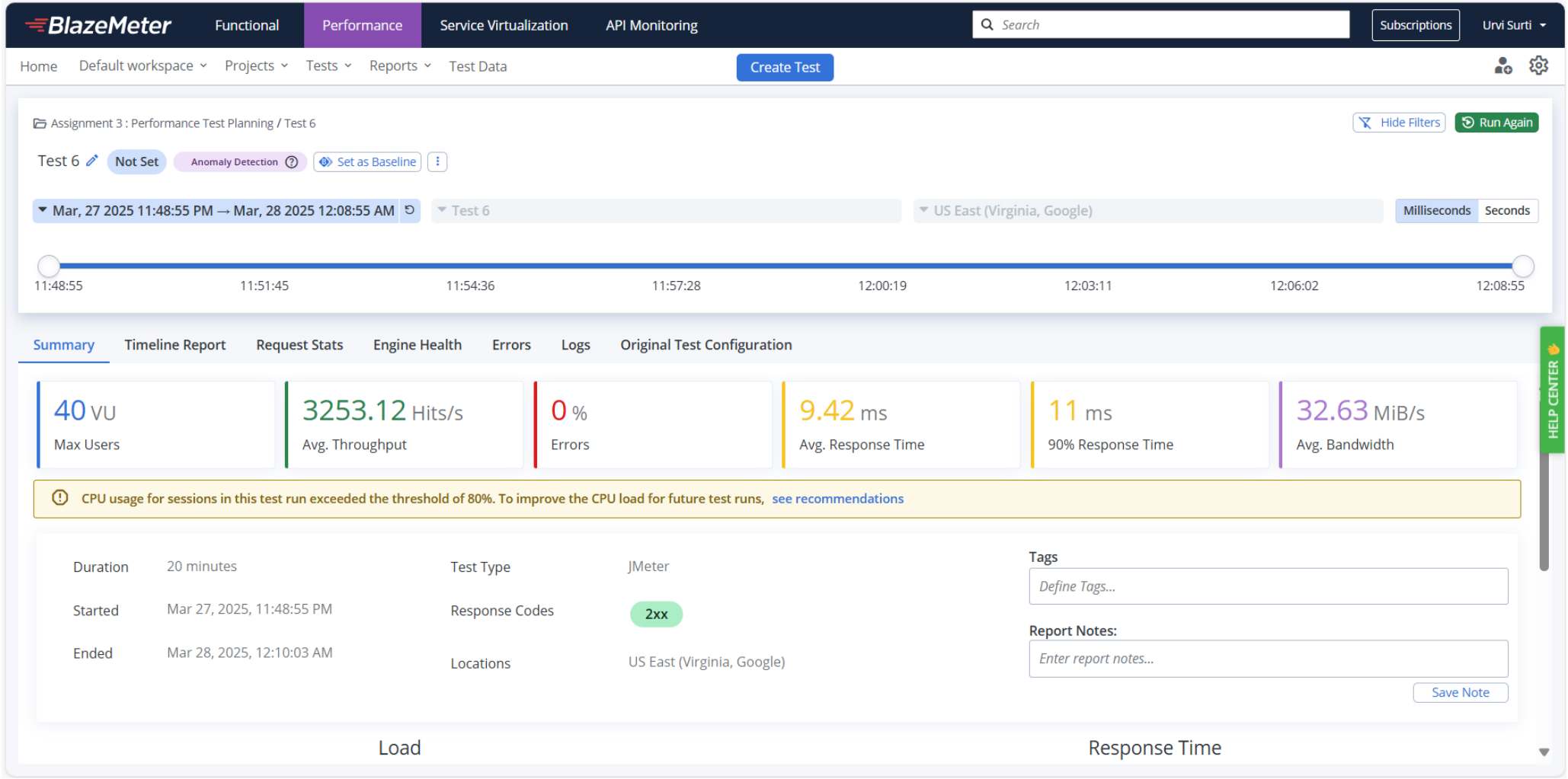
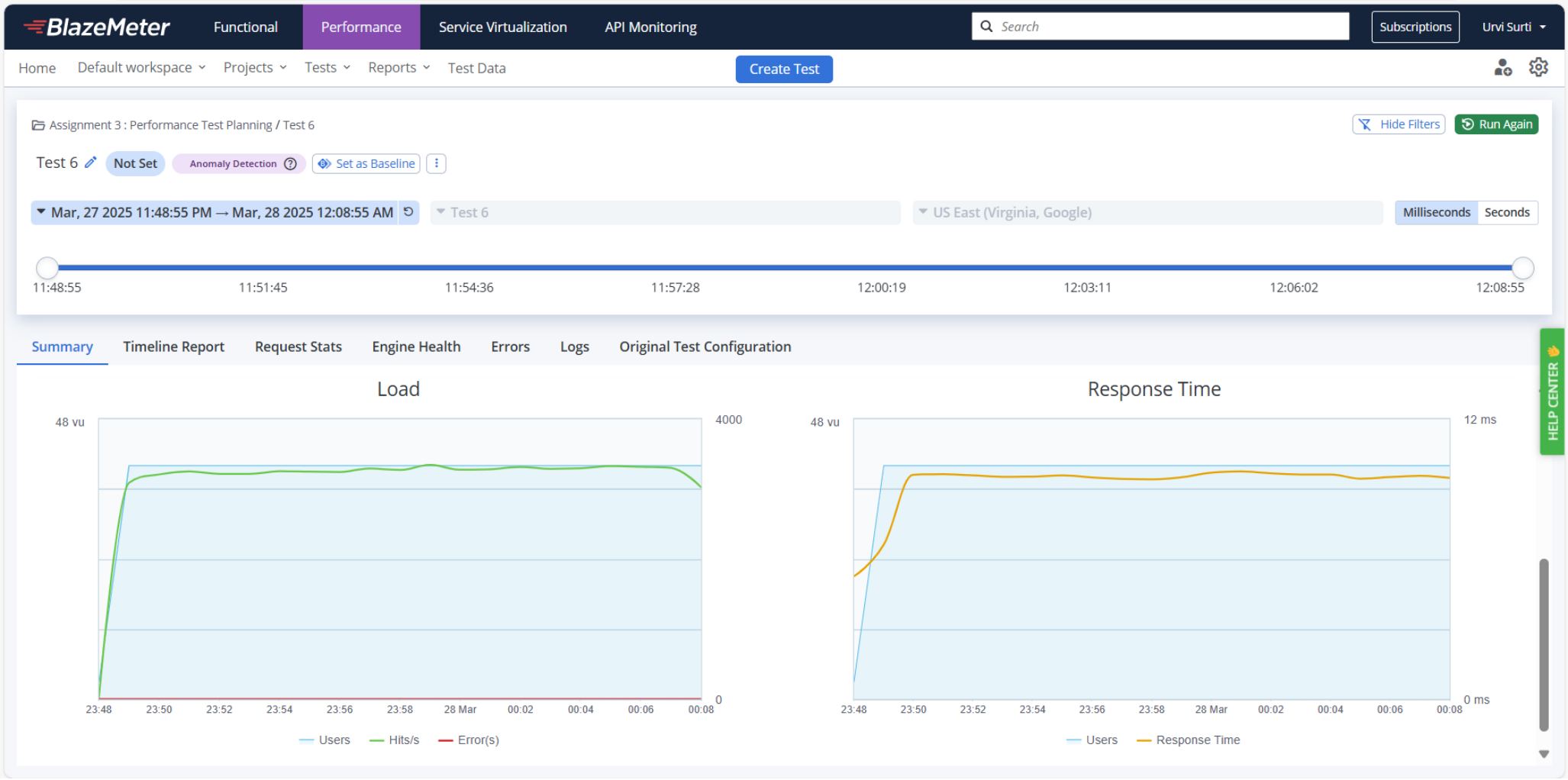
Create Test
Assignment 3 : Performance Test Planning / Test 5
Hide Filters
Run Again
Test 5
Not Set
Anomaly Detection
Set as Baseline
Mar, 27 2025 11:31:14 PM → Mar, 27 2025 11:43:09 PM
Test 5
US East (Virginia, Google)
Milliseconds
Seconds
11:31:14
11:32:56
11:34:38
11:36:20
11:38:02
11:39:44
11:41:26
11:43:09
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
32 vu
4000
0
23:32
23:34
23:36
23:38
23:40
23:42
Users
Hits/s
Error(s)
Response Time
32 vu
8 ms
0 ms
23:32
23:34
23:36
23:38
23:40
23:42
Users
Response Time
HELP CENTER

Test 6 : Peak Load Capacity Test

- **Configuration:** 40 Users, 20 min
- **Results:** Avg Throughput: 3253.12 hits/sec, Response Time: 9.42 ms
- **Analysis:** Response times degraded, CPU at limit.

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Assignment 3 : Performance Test Planning / Test 6
Hide Filters
Run Again
Test 6
Not Set
Anomaly Detection
Set as Baseline
Mar, 27 2025 11:48:55 PM → Mar, 28 2025 12:08:55 AM
Test 6
US East (Virginia, Google)
Milliseconds
Seconds
11:48:55
11:51:45
11:54:36
11:57:28
12:00:19
12:03:11
12:06:02
12:08:55
Summary
Timeline Report
Request Stats
Engine Health
Errors
Logs
Original Test Configuration
Load
48 vu
4000
0
23:48
23:50
23:52
23:54
23:56
23:58
28 Mar
00:02
00:04
00:06
00:08
Users
Hits/s
Error(s)
Response Time
48 vu
12 ms
0 ms
Users
Response Time
HELP CENTER

Appendix A: Test Sign-off Sheet

Role	Name	Signature	Date
Test Lead	Jane Roberts Doe	J. R. Doe	16/05/2025
Business Analyst	Alex Thomas Lee	A. T. Lee	18/05/2025
QA Manager	John Henry Smith	J. H. Smith	20/05/2025

Appendix B: Record of Changes

Date	Change Description	Author
01/05/2025	Initial draft	Test Lead
11/05/2025	Revised test scenarios	Test Engineer
18/05/2025	Added monitoring tools section	QA Manager

Appendix C: Acronyms

- **VU:** Virtual Users
- **TPS:** Transactions Per Second
- **RT:** Response Time
- **CPU:** Central Processing Unit
- **RAM:** Random Access Memory

Appendix D: Glossary

- **Throughput:** Number of requests handled per second.
- **Response Time:** Time taken to process a request.
- **Scalability:** Ability of the system to handle an increasing number of users.
- **Bottleneck:** A performance-limiting factor in the system.