Overview

The load test was conducted on the `https://petstore.swagger.io/v2` API for **5 minutes** with **200 Virtual Users (VUs)**. The objective was to evaluate the performance of user management operations under heavy load, focusing on **Create**, **Search**, **Modify**, and **Delete** operations.

Key Results

- **Total Iterations Completed**: 11,260
- **Total Requests**: 67,560
- **Success Rate**: **99.62%** of checks passed (168,268 out of 168,900)
- **Failure Rate**: **17.25%** of requests failed (11,656 out of 67,560)

Detailed Operation Results

1. **Create User**:
    - **Status**: 100% Success
    - **Response Time**: <500ms
    - **ID Matches**: Passed
2. **Search User**:
    - **Status**: 98% Success (11147/11360 passed)
    - **Response Time**: <500ms
    - **User Details**: 98% Success (11147/11360 passed)
3. **Modify User**:
    - **Status**: 100% Success
    - **Response Time**: <500ms
4. **Search Modified User**:
    - **Status**: 98% Success (11145/11360 passed)
    - **First Name Updated**: 98% Success (11145/11360 passed)
5. **Delete User**:
    - **Status**: 98% Success (11088/11360 passed)
    - **Response Time**: <500ms
6. **Verify User Deletion**:
    - **Status**: 99% Success (11256/11360 passed)
    - **Response Time**: <500ms

Performance Metrics

1. **Average Request Duration**: `64.11 ms`
    - **90th Percentile**: `74.26 ms`
    - **95th Percentile**: `76.48 ms`
    - **Max Request Duration**: `333.13 ms`
2. **Request Throughput**: `221.2 requests/second`
3. **HTTP Failures**: **17.25%** (11,656 requests failed out of 67,560)
    - The failure rate is significant and suggests that the API struggled with the load at certain times.
4. **Data Transferred**:
    - **Data Sent**: 7.7 MB
    - **Data Received**: 25 MB
5. **TCP and Connection Metrics**:
    - **Connection Time**: `1.03 ms` (avg)
    - **TLS Handshake Time**: `561.83 µs` (avg)
    - **Waiting Time**: `63.86 ms` (avg)

Observations

1. **High Success Rate**:
    - Overall, **99.62%** of checks passed, indicating that the API handled most requests correctly.
2. **Significant Failure Rate**:
    - Despite the high success rate, **17.25%** of requests failed. This is a notable issue and suggests possible server overload or timeouts under high load.
3. **Search and Delete Failures**:
    - The **Search User** and **Delete User** operations had a **2%** failure rate, which could indicate performance bottlenecks in these endpoints.
4. **Response Time**:
    - Response times were generally good, with an average of **64.11 ms** and **95%** of requests completing in under **76.48 ms**.

Recommendations

1. **Investigate Failure Rate**:
    - The **17.25% failure rate** needs to be investigated, focusing on potential server-side issues such as timeouts, resource exhaustion, or overload.
2. **Optimize Search and Delete Endpoints**:

- The **Search** and **Delete** operations showed slightly higher failure rates. Consider optimizing these endpoints, perhaps by improving database indexing or reviewing resource limits.

3. **Scale Server Resources**:
   - If expecting sustained high traffic, consider scaling up server resources (CPU, memory) to reduce failure rates and maintain performance under load.

Conclusion

The API demonstrated good performance overall, with low response times and high throughput. However, the **17.25% failure rate** under heavy load is a concern and should be addressed through further investigation and optimization of the API's infrastructure and endpoints.