Performance Testing using k6

Test Configuration:

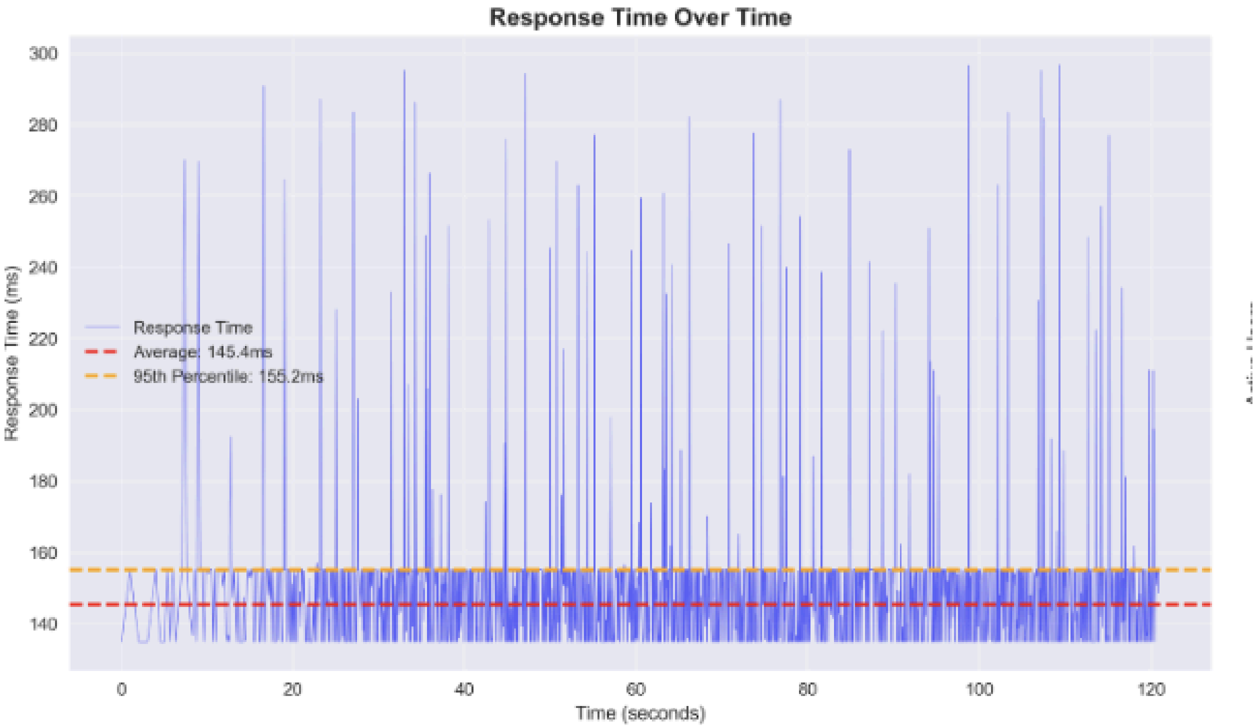
- Target: https://jsonplaceholder.typicode.com/posts
- Duration: 2 minutes
- Max Users: 25
- Ramp-up: 30 seconds
- Executor: ramping-vus with graceful ramp down

Key Metrics:

- Total Requests: 2280
- Success Rate: 100.00%
- Avg Response Time: 145.4ms
- 95th Percentile: 155.2ms
- Throughput: 18.8 req/s

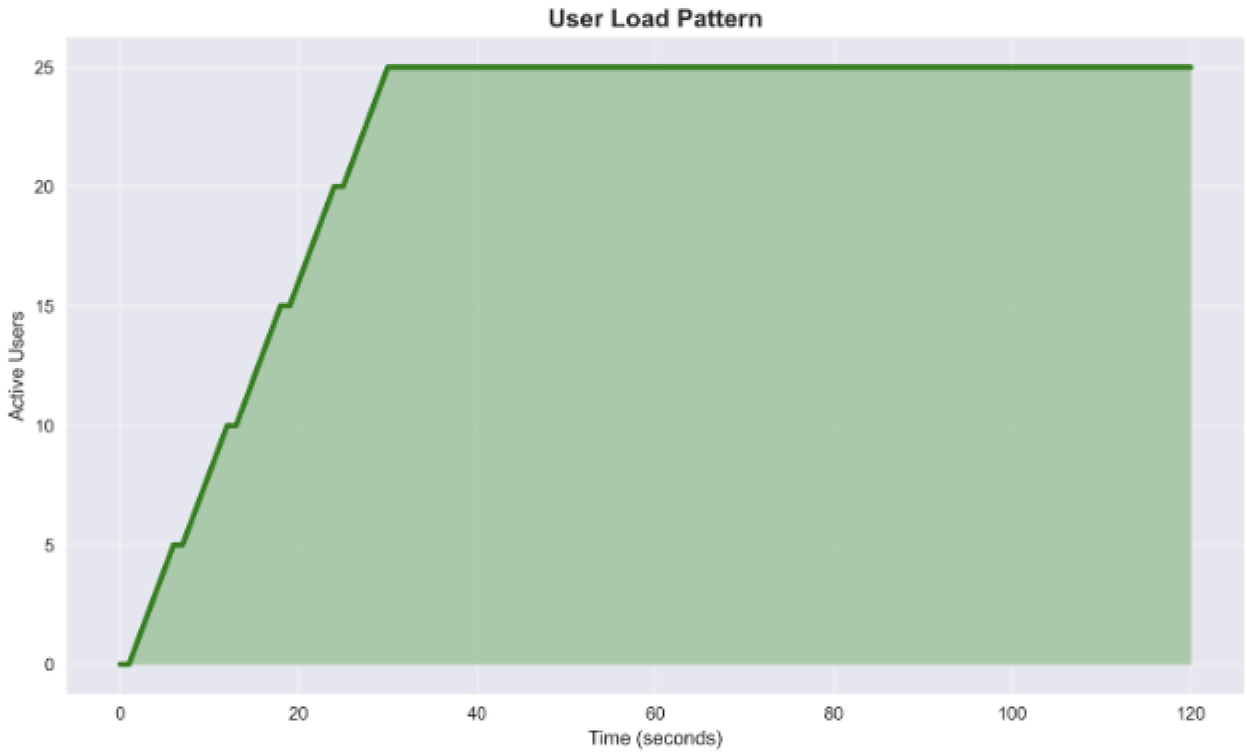
GRAPH ANALYSIS

Chart 1: Response Time Over Time



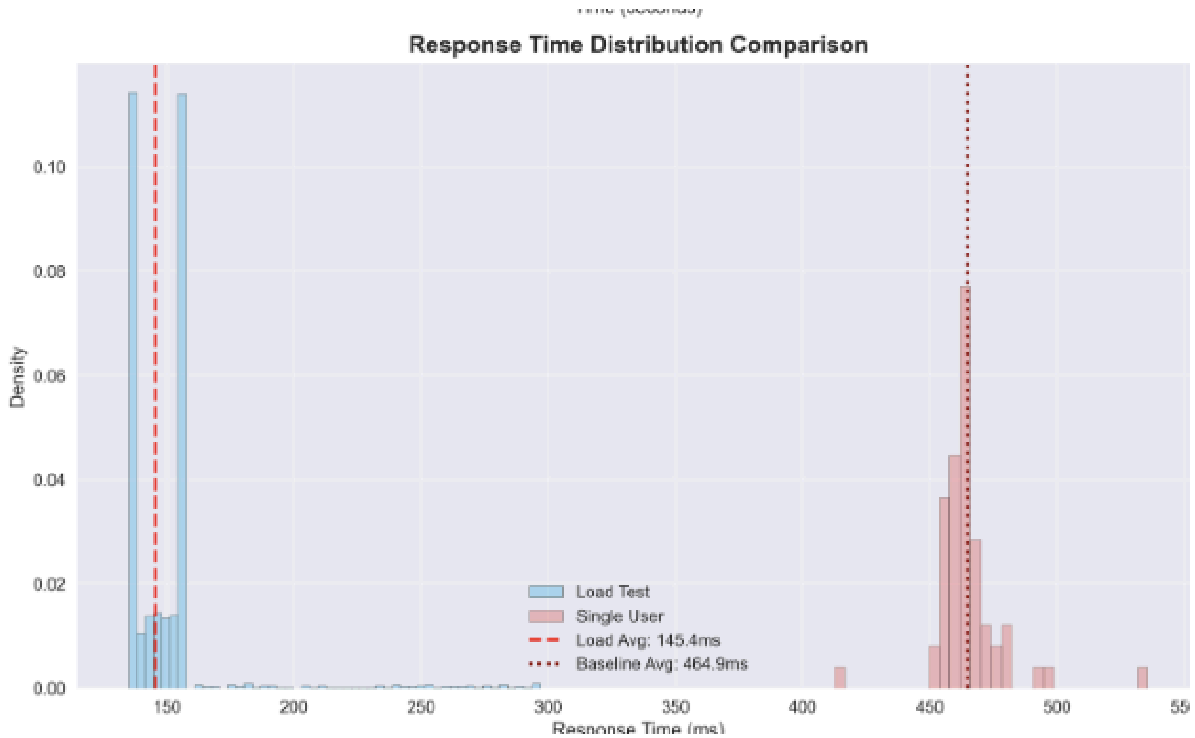
- **Blue spikes**: Individual request response times
- **Red line**: 145.4ms average - quite consistent and fast (below 200 ms) value showing predictable performance over time
- **Orange Line:** 155.2 ms average for the 95th percentile

Chart 2: User Load Pattern



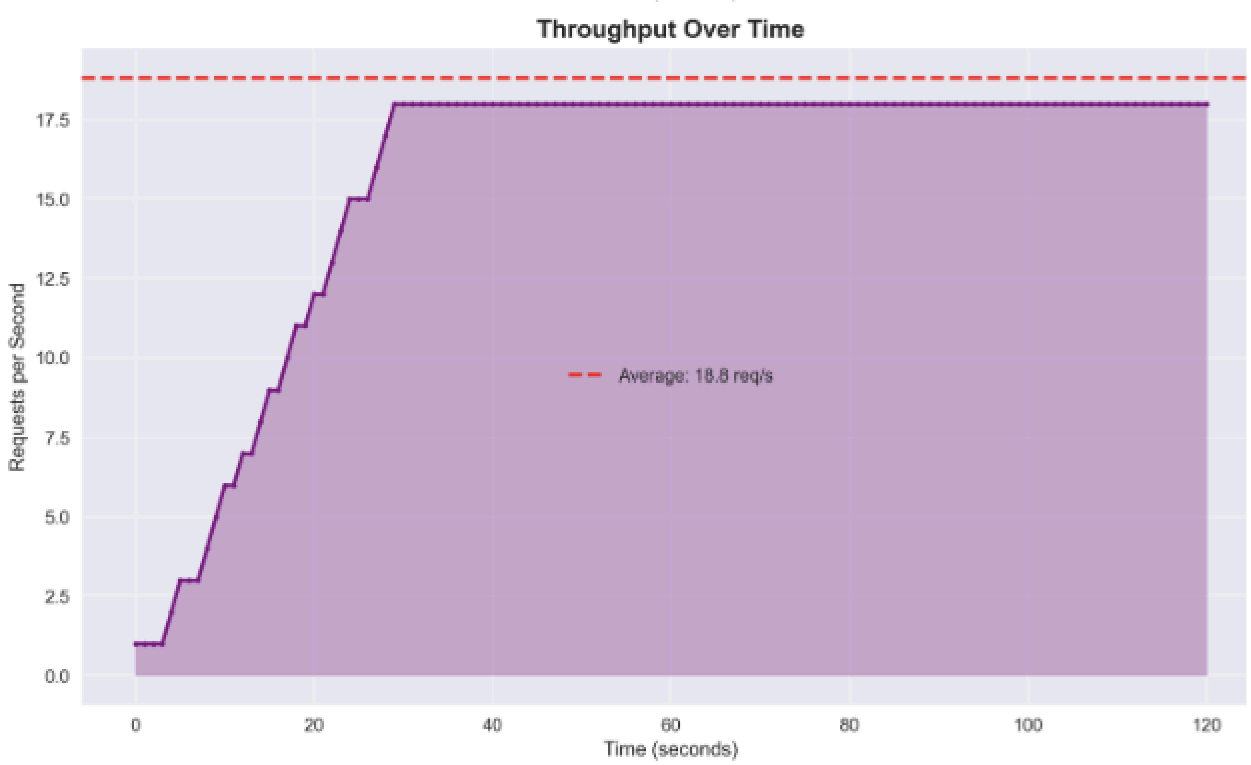
- **Green ramp**: Smooth 0→25 user increase over 30 seconds
- **Flat plateau**: It sustained 25 users for 90+ seconds
- This API can handle real-world traffic growth patterns

Chart 3: Response Time Distribution



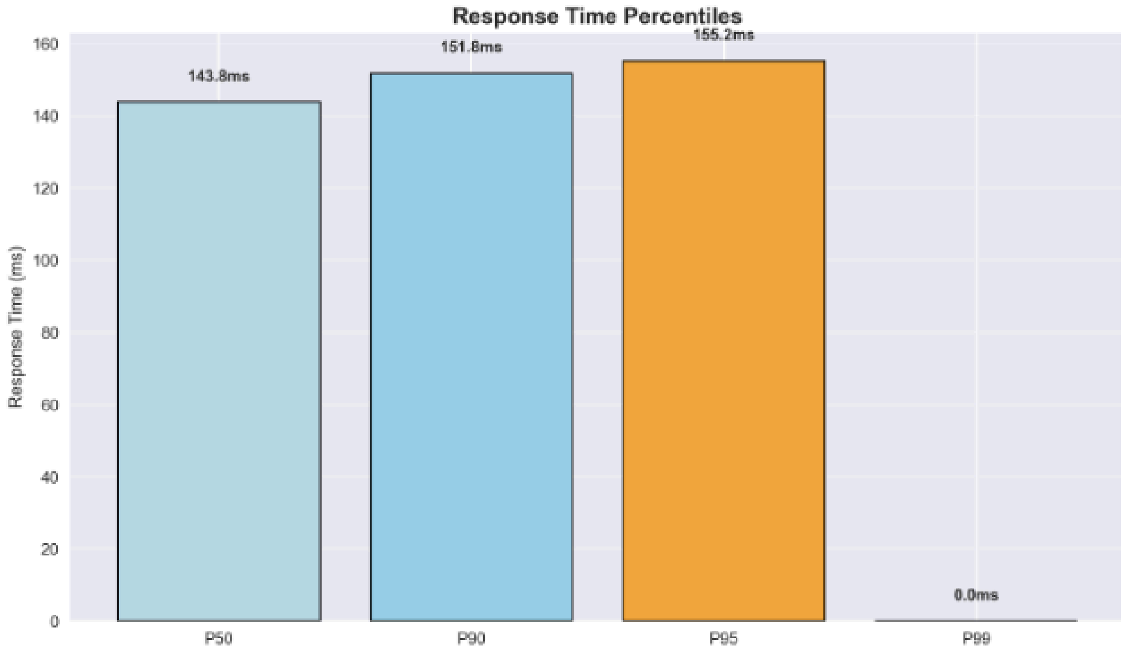
- **Blue bars**: Concurrent user response distribution
- **Red bars**: Single user response
- **Key insight**: **Tight clustering** around 140-160ms with minimal outliers thus most users get similar response times

Chart 4: Throughput Over Time



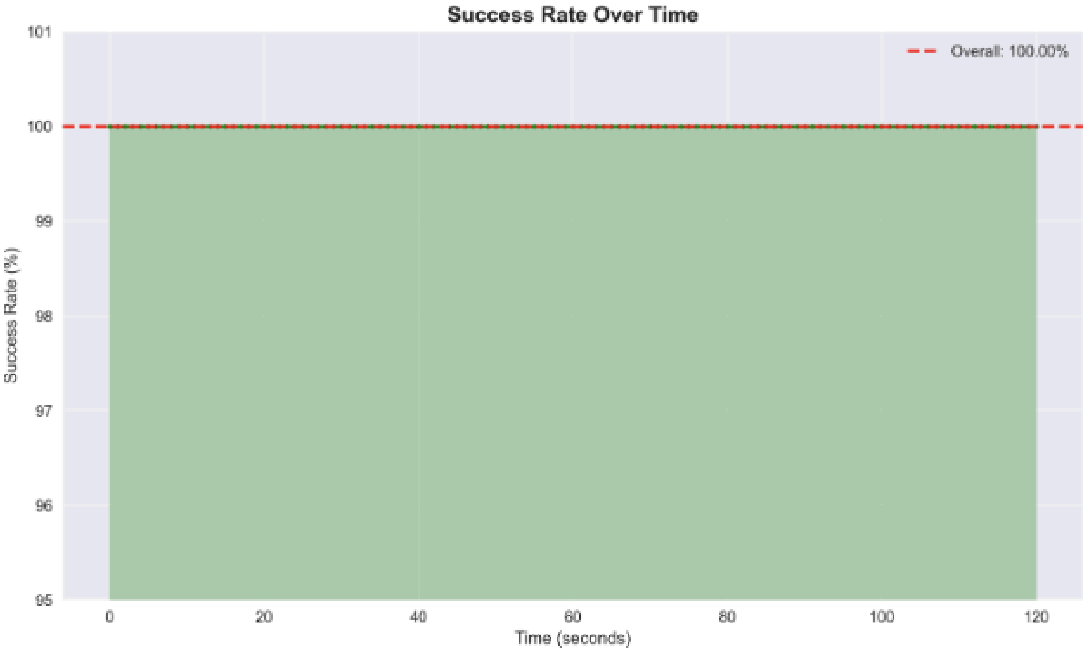
- **Purple area**: Requests/second scaling with user load
- **18.8 req/s sustained**: Good capacity maintenance, thus showcasing predictable user capacity. It can easily serve up to 19 requests per second

Chart 5: Response Time Percentiles



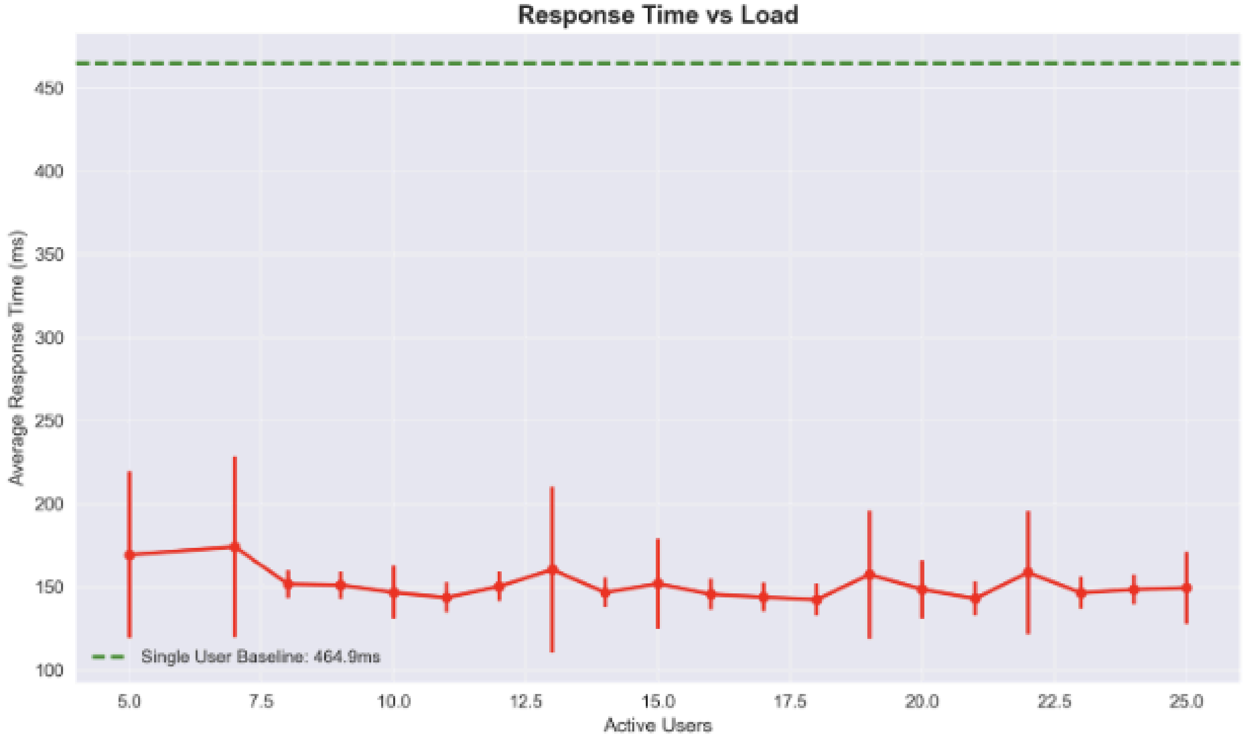
- **P95: 155.2ms**: 95% of users get sub-155ms responses which is well under 200 ms industry standard

Chart 6: Success Rate Over Time



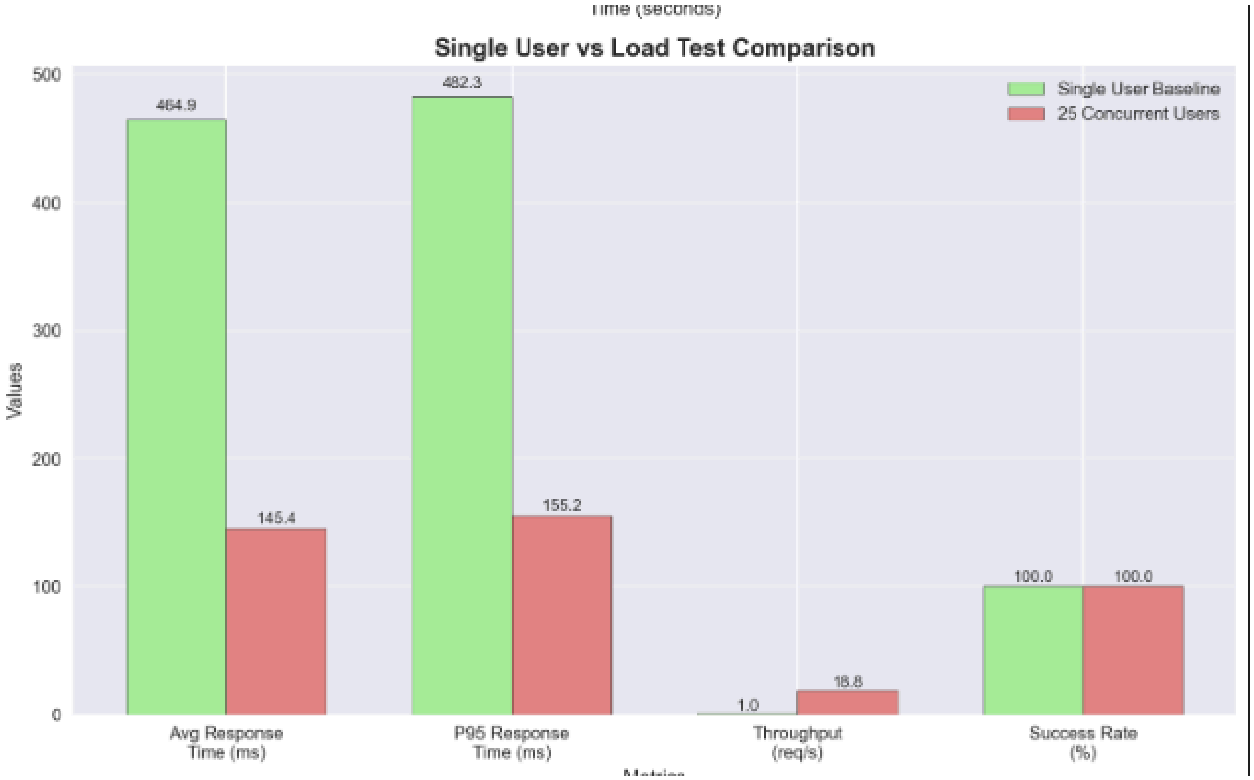
- **Flat green line at 100%**: Perfect reliability throughout

Chart 7: Response Time vs Load



- **Red line**: Consistent response time across all user levels

Chart 8: Single vs Concurrent Users Comparison



- Concurrent performance **looks better** than a single user
- **464.9ms → 145.4ms**: 70% improvement in response time
- **1 → 18.8 req/s**: 18x throughput improvement
- The application **performs better** under realistic conditions for concurrent users and is poor for a single user

Metric	Single User	25 Users
Average	464.9ms	145.4ms
P95	482.3ms	155.2ms
Throughput	1 req/sec	18.8 req/s
Success Rate	100%	100%

ANOMALY AND RECOMMENDATION

A three times increase in response time for a single user against 25 concurrent users is something to be investigated. We would recommend **checking Database Connection Pooling**

CONCLUSION

- The application's API performance across all key metrics is good for concurrent users
- The application performs well for concurrent users only
- Need to investigate for single-user performance issue before considering production release