# Performance Analysis of Web Applications

This report analyzes the performance metrics of three web applications: Moodle, Home, and Notice, using 50 and 100 samples in Apache JMeter with a ramp-up time of 100 seconds. The performance metrics include shortest, longest, and average execution times, as well as average throughput, data reception, and data transmission rates.

Duration assertions were set as follows: Moodle (130 ms), Home (300 ms), and Notice (100 ms).

## Comparison Table-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **URL** | **Sample Size** | **Shortest Time (ms)** | **Longest Time (ms)** | **Average Time (ms)** |
| https://cse.buet.ac.bd/moodle | 50 | 47 | 1437 | 180.53 |
| 100 | 17 | 3503 | 134.21 |
| https://cse.buet.ac.bd/home | 50 | 139 | 754 | 295.28 |
| 100 | 60 | 457 | 278.43 |
| https://cse.buet.ac.bd/home/notice | 50 | 27 | 1196 | 291.34 |
| 100 | 23 | 2268 | 304.35 |

## Comparison Table-2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **URL** | **Sample Size** | **Average Throughput (req/sec)** | **Avg Data Reception (KB/sec)** | **Avg Data Transmission (KB/sec)** |
| https://cse.buet.ac.bd/moodle | 50 | 7.99 | 46.39 | 5.73 |
| 100 | 15.96 | 92.66 | 11.45 |
| https://cse.buet.ac.bd/home | 50 | 5.91 | 7.96 | 14.37 |
| 100 | 11.74 | 15.84 | 28.55 |
| https://cse.buet.ac.bd/home/notice | 50 | 3.01 | 322.58 | 1.33 |
| 100 | 5.95 | 636.85 | 2.62 |

### Key Observations:

### 1. Moodle:

### ◦ For 50 samples, Moodle exhibits an average response time of 180.53 ms. The shortest response time is 47 ms, and the longest is 1437 ms.

### ◦ For 100 samples, the average response time decreases to 134.21 ms, with a shortest response time of 17 ms and a longest of 3503 ms.

### ◦ Throughput for Moodle increases from 7.99 req/sec (50 samples) to 15.96 req/sec (100 samples).

### ◦ Data reception and transmission approximately double, reaching 92.66 KB/sec and 11.45 KB/sec for 100 samples.

### 2. Home:

### ◦ For 50 samples, Home exhibits an average response time of 295.28 ms, with a shortest response time of 139 ms and a longest of 754 ms.

### ◦ For 100 samples, the average response time slightly decreases to 278.43 ms, with a shortest response time of 60 ms and a longest of 457 ms.

### ◦ Throughput increases from 5.91 req/sec (50 samples) to 11.74 req/sec (100 samples).

### ◦ Data reception and transmission also improve, reaching 15.84 KB/sec and 28.55 KB/sec for 100 samples.

### 3. Notice:

### ◦ For 50 samples, Notice has an average response time of 291.34 ms, with a shortest response time of 27 ms and a longest of 1196 ms.

### ◦ For 100 samples, the average response time increases slightly to 304.35 ms, with a shortest response time of 23 ms and a longest of 2268 ms.

### ◦ Throughput improves from 3.01 req/sec (50 samples) to 5.95 req/sec (100 samples).

### ◦ Notice exhibits significantly higher data reception rates at 322.58 KB/sec (50 samples) and 636.85 KB/sec (100 samples).

### Conclusion:

### 1. Moodle:

### ◦ Moodle demonstrates improved throughput and scalability under load, with a consistent reduction in average response time. However, occasional spikes in response times (up to 3503 ms) indicate areas for optimization.

### 2. Home:

### ◦ Home performs reliably with the lowest response times among the URLs. Throughput and data rates show consistent growth, but further optimization could address minor response time fluctuations.

### 3. Notice:

### ◦ Notice exhibits the highest data reception rates but struggles with maintaining response times under load. While throughput improves, the system shows limited scalability compared to Moodle and Home.