# **Performance Testing Plan for Magento Demo Site**

## **Objective:**

The objective of this performance test plan is to systematically evaluate and benchmark both the front‑end user experience and the back‑end API layer of the Magento demo site under realistic and peak load conditions. Specifically, this plan aims to:

* **Front‑End Performance:** Measure the responsiveness, stability, and scalability of key user journeys—account registration, user sign‑in, product page interactions, and end‑to‑end order placement—to ensure that page load times, interactive rendering, and end‑user workflows consistently meet defined service‑level targets.
* **Back‑End API Performance:** Validate the throughput, latency, and error resilience of critical REST endpoints (product catalog searches, customer profile retrieval, cart management, and checkout/payment operations) by simulating concurrent read/write loads and mixed‑traffic scenarios.

By combining these front‑end and API‑level tests, we will identify performance bottlenecks, verify infrastructure capacity, and surface actionable insights for tuning application, database, and network components—ultimately ensuring a seamless and reliable shopping experience for end users.

## **Testing Tools:**

| **Tool** | **Purpose** |
| --- | --- |
| Apache JMeter | Open-source load & stress generation for HTTP, Web, and REST APIs |
| Akamai CloudTest | Cloud-based load testing with global geo-distribution and CDN integration |
| Browser DevTools | Network throttling, page load metrics (TTFB, FCP, LCP) |
| Application Monitors | CPU/Memory/DB metrics (e.g., New Relic, Datadog, Grafana) |

## **Test Scenarios: Front-End Application:**

| TC\_ID | Test Scenario | Load % |
| --- | --- | --- |
| TC\_01 | Registration Flow | 20% |
| TC\_02 | Sign In Flow | 50% |
| TC\_03 | Product Details Page | 15% |
| TC\_04 | Place Order | 15% |

**Test Scenarios: Backend APIs:**

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| **TC\_ID** | **Test Scenario** | **Load %** |
| --- | --- | --- |
| TC\_01 | Sign up API | 20% |
| TC\_02 | Sign in API | 50% |
| TC\_03 | Product detail API | 15% |
| TC\_04 | Add to cart, View cart, Checkout, Place order APIs | 15% |

## **TC\_01\_Registration Flow:**

| **Key Points** | **Details** |
| --- | --- |
| Purpose | First touchpoint for new users—any slowness here blocks sign-ups and hurts acquisition. |
| Priority | High |
| Scenario | Steady Load: Ramp 0→100 new regs over 5 min, hold 100 for 15 min • Spike Test: Jump 0→200 regs in 30 s • Soak Test: 50 regs/min for 2 h to detect leaks |
| Virtual Users | Steady: 100 | Spike: 200 | Soak: ~50 users/min |
| Ramp-Up | Steady: 5 min | Spike: 30 s |
| Duration | Steady: 15 min | Spike: 5 min | Soak: 2 h |
| Key Metrics | • Response Time (Avg / P95 / P99) (< 2 s target) • Throughput (req/sec) • Error Rate (< 1%) • Server CPU/Memory/DB Connections |

## **TC\_02\_Sign In Flow:**

| **Key Points** | **Details** |
| --- | --- |
| Purpose | Critical for returning users—must be snappy, especially during promotions. |
| Priority | High |
| Scenario | • Load Test: Ramp 0→500 concurrent logins over 10 min, hold 500 for 30 min • Peak Hour: 1,000 logins in 2 min • Error-Mix: 90% valid / 10% invalid creds under load |
| Virtual Users | Load: 500 | Peak: 1,000 |
| Ramp-Up | Load: 10 min | Peak: 2 min |
| Duration | Load: 30 min | Peak: 5 min |
| Key Metrics | • Login Response Time (< 1 s target) • Success vs. Failure Rate • Auth Service / DB Query Latency • Server Resource Utilization |

## **TC\_03\_Product Details Page:**

| **Key Points** | **Details** |
| --- | --- |
| Purpose | Heaviest page: images, related items, reviews—potential user bottleneck if this drags. |
| Priority | High |
| Scenario | • Concurrency: Ramp 0→300 VUs over 5 min, hold for 20 min across top 10 product IDs • Cache Cold vs. Warm: 50 VUs straight after cache flush vs. immediate re-run • Geo Test: 3 regions |
| Virtual Users | 300 |
| Ramp-Up | 5 min |
| Duration | 20 min |
| Key Metrics | • TTFB (Time to First Byte) • FCP / LCP (First / Largest Contentful Paint) • Requests/sec on images & APIs • Cache Hit/Miss Ratio |

## **TC\_04\_Place Order:**

| **Key Points** | **Details** |
| --- | --- |
| Purpose | Ultimate conversion path—any bottleneck here directly impacts revenue |
| Priority | High |
| Scenario | • End-to-End Checkout: Ramp 0→200 users (add to cart → checkout) over 10 min, hold for 30 min • Payment Spike: Inject 50% payment failures under load to test retries • Abandonment: 400 add-to-cart, 50% complete |
| Virtual Users | Checkout: 200 | Abandon: 400 |
| Ramp-Up | 10 min |
| Duration | 30 min |
| Key Metrics | • Checkout Latency (Add-to-Cart → Confirmation) (< 3 s) • Orders/sec Throughput • Error / Timeout Rate • DB Transaction Times • Payment API Latency |

## **Backend API Performance**

| **Key Points** | **Details** |
| --- | --- |
| Purpose | Core functionality is driven by REST endpoints; ensuring API layer scales avoids frontend slowdowns. |
| Priority | High |
| Scenario | • Product Catalog: /rest/V1/products?searchCriteria • Customer: /rest/V1/customers/{id} • Cart: /rest/V1/carts/mine • Checkout: /rest/V1/carts/mine/payment-information |
| Virtual Users | • Concurrent Reads: 500 users hitting catalog endpoint over 10 min • Concurrent Writes: 200 users creating carts/orders • Mixed Load: 70% reads / 30% writes for 30 min |
| Ramp-Up | 5 min |
| Duration | 30 min |
| Key Metrics | • API Response Time (Avg / P95 / P99) • Throughput (req/sec) • Error Rate • DB Query Latency • HTTP 5xx Rate |

## **General Best Practices:**

| **Tools** | **Notes** |
| --- | --- |
| Network Throttling | Simulate Fast 3G, Slow 4G to mirror real-world user conditions. |
| Monitoring & Profiling | Capture App/DB/CDN metrics via New Relic, Datadog, Grafana. |
| Baseline & Regression | Establish baseline; re-run after each major release to catch degradations. |
| SLA Reporting | Define SLAs (e.g. “95% of reqs < 1 s”); include in every test report. |
| Result Visualization | Use JMeter/Akamai dashboards or Grafana to chart performance metrics. |