K6 Performance Testing Setup for EverShop

Prerequisites

1. Install K6

```bash
# Ubuntu/Debian
sudo gpg -k
sudo gpg --no-default-keyring --keyring /usr/share/keyrings/k6-archive-keyring.gpg --keyserver hkp://keyserver.ubuntu
echo "deb [signed-by=/usr/share/keyrings/k6-archive-keyring.gpg] https://dl.k6.io/deb stable main" | sudo tee /etc/apt
sudo apt-get update
sudo apt-get install k6
```

2. Configure Prometheus for K6

Add the K6 job to your Prometheus configuration (`/etc/prometheus/prometheus.yml`):

```yaml
scrape_configs:
 - job_name: 'k6'
   scrape_interval: 5s
   static_configs:
    - targets: ['localhost:6565']
```

3. Install Prometheus Remote Write Adapter (if needed)

```bash
# Download and install prometheus remote write adapter
wget https://github.com/prometheus/prometheus/releases/download/v2.40.0/prometheus-2.40.0.linux-amd64.tar.g
tar xvfz prometheus-2.40.0.linux-amd64.tar.gz
sudo cp prometheus-2.40.0.linux-amd64/prometheus /usr/local/bin/
```

Setup Instructions

1. Create Test Files

Save the K6 test script as `k6-evershop-test.js` in your working directory.

2. Make Runner Script Executable

```bash
chmod +x k6-run-tests.sh
```

3. Start Required Services

```bash
# Start Prometheus
sudo systemctl start prometheus

# Start Grafana
sudo systemctl start grafana-server

# Verify EverShop is running
curl http://localhost:9090
```

4. Configure Grafana Dashboard

1. **Access Grafana**: http://localhost:3000 (admin/admin)
2. **Add Prometheus Data Source**:
   - Go to Configuration → Data Sources
   - Add Prometheus
   - URL: `http://localhost:9090`
   - Save & Test
3. **Import K6 Dashboard**:
   - Go to Dashboards → Import
   - Use the provided dashboard JSON or import from Grafana.com
   - Dashboard ID: `2587` (K6 Load Testing Results)

5. Run Performance Tests

Quick Test

```bash
# Simple load test
k6 run --vus 10 --duration 30s k6-evershop-test.js
```

With Prometheus Integration

```bash
# Run with Prometheus output
k6 run \
  --out prometheus-remote-write \
  --tag testtype="load" \
  --tag environment="local" \
  k6-evershop-test.js
```

Using the Runner Script

```bash
# Interactive test runner
./k6-run-tests.sh
```

Test Scenarios Included

1. Smoke Test

- **Duration**: 30 seconds
- **VUs**: 1
- **Purpose**: Basic functionality validation

2. Load Test

- **Duration**: 14 minutes
- **VUs**: 10-20 (ramping)
- **Purpose**: Normal traffic simulation

3. Stress Test

- **Duration**: 23 minutes
- **VUs**: 20-60 (ramping)
- **Purpose**: High load testing

4. Spike Test

- **Duration**: 1 minute 40 seconds
- **VUs**: 5-50 (spike)
- **Purpose**: Sudden traffic spike testing

5. E-commerce User Journey

- **Complete shopping flow**: Homepage → Products → Cart → Checkout
- **API testing**: Product search, cart operations
- **Real user behavior simulation**

Key Metrics Monitored

Performance Metrics

- **Response Time**: p50, p90, p95, p99 percentiles
- **Throughput**: Requests per second
- **Error Rate**: Failed requests percentage
- **Virtual Users**: Concurrent user load

Custom Metrics

- **Page Load Time**: Full page rendering time
- **API Response Time**: Backend API performance
- **Checkout Errors**: E-commerce specific errors
- **Error Rate**: Custom error tracking

Thresholds Configured

javascript

```
thresholds: {
  http_req_duration: ['p(95)<2000'],   // 95% requests < 2s
  http_req_failed: ['rate<0.05'],      // Error rate < 5%
  page_load_time: ['p(95)<3000'],      // Page loads < 3s
```