k6 Load testing

init imports, options → once → **setup()** returns data → data → **default()** loops per VU → data → **teardown()** cleanup

CONCEPTS

Scripts are JavaScript, but k6 runs them in its own Go runtime: no Node.js APIs, no npm install.

Options resolve in this order: defaults, script options, environment variables, then CLI flags (highest).

Failed checks do not change the exit code. Add a threshold on the checks metric to fail the run.

RUNNING

k6 new [*<file>*]
Scaffold a script

k6 run *<script>*
Run a script locally

k6 run -
Read the script from stdin

--vus *<n>* / -u *<n>*
Concurrent virtual users

--duration *<time>* / -d *<time>*
Total run time, e.g. 3m

--iterations *<n>* / -i *<n>*
Total iterations across VUs

RUNNING (cont.)

--stage *<time>*:*<target>*
Ramp VUs, repeatable (-s)

VARIABLES AND TAGS

-e *<NAME>*=*<value>* / --env *<NAME>*=*<value>*
Set a variable in __ENV

--tag *<name>*=*<value>*
Tag every metric of the run

K6_*<OPTION>*
Set most options by env var

OUTPUT AND SUMMARY

--out json=*<file>* / -o json=*<file>*
Write every metric point as JSON

--out csv=*<file>*
Write metric points as CSV

--out *<name>*=*<target>*
Stream to InfluxDB or another output

--summary-export *<file>*
Write the end summary as JSON

--summary-trend-stats *<list>*
Choose trend stats, e.g. avg,p(95),max

OUTPUT AND SUMMARY (cont.)

--quiet / -q
Hide the progress bar

DEBUGGING

--http-debug
Log HTTP requests and responses

--http-debug=full
Include request and response bodies

--no-thresholds
Run without evaluating thresholds

--insecure-skip-tls-verify
Accept any TLS certificate

SCRIPT OPTIONS

options block

```
export const options = {
  vus: 10,
  duration: '30s',
};
```

Stages

```
stages: [
  { duration: '30s', target: 20 },
  { duration: '1m', target: 20 },
  { duration: '10s', target: 0 },
],
```

SCRIPT OPTIONS (cont.)

Thresholds

```
thresholds: {
  http_req_duration: ['p(95)<200'],
  http_req_failed: ['rate<0.01'],
  checks: ['rate>0.99'],
},
```

Scenario

```
scenarios: {
  api: {
    executor: 'constant-arrival-rate',
    rate: 20, timeUnit: '1s',
    duration: '1m',
    preAllocatedVUs: 10,
maxVUs: 50,
  },
},
```

Threshold syntax

Metric type	Aggregations
Counter	count, rate
Gauge	value
Rate	rate
Trend	avg, min, max, med, p(N)

A threshold key can filter by tag: 'http_req_duration{type:API}': ['p(95)<500'].

SCRIPT API

Minimal test

```
import http from 'k6/http';
import { check, sleep } from 'k6';

export default function () {
  const res = http.get('https://test.k6.io/');
  check(res, { 'status is 200': (r) => r.status === 200 });
  sleep(1);
}
```

check(*<val>*, { *<name>*: *<fn>* })
Assert without stopping the test

sleep(*<seconds>*)
Pause the VU between iterations

group('*<name>*', *<fn>*)
Group requests under a name

http.get(*<url>*)
GET request

http.post(*<url>*, *<body>*, *<params>*)
POST request

__ENV.*<NAME>*
Read a variable set with -e

export function setup()
Run once; return shared data