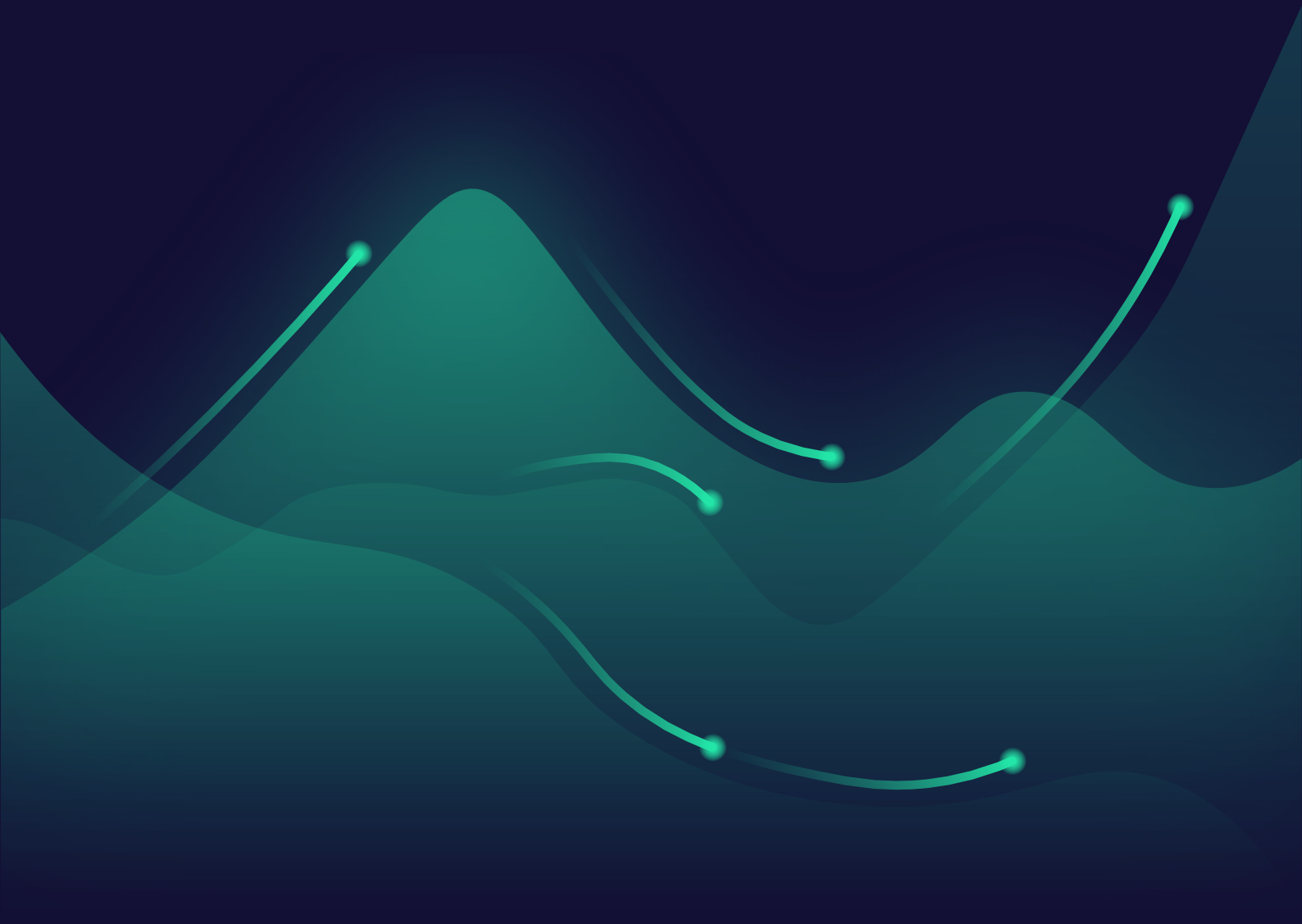
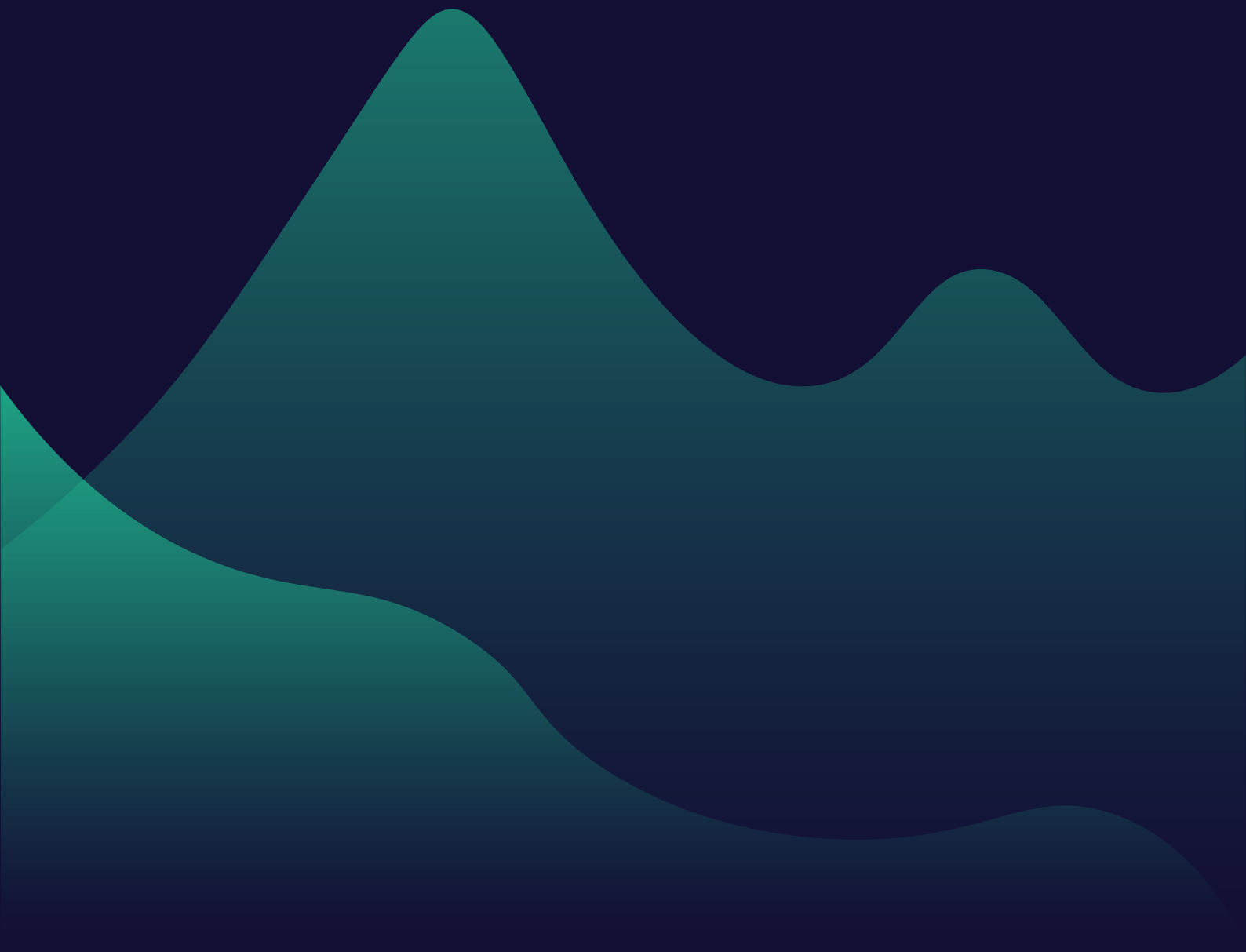
oxylabs®

Load Testing With Residential Proxies

Guide for Cybersecurity Companies



1. Introduction to Load Testing



Load testing* is key to any good system performance. Even the most advanced systems may break under certain loads, and testing is the only way to find out what problems may arise during the busiest time.

While load testing has been performed for decades and has advanced a lot, it still has flaws. With Artificial Intelligence and machine learning fast infiltrating into technologies and challenging more and more tasks to become automated, new load testing approaches need to be employed.

At Oxylabs, by working with many cybersecurity companies, we have identified the main problems companies come across while testing system load.

> **The aim of this white paper is to offer cybersecurity companies Residential Proxies as a solution to generate realistic traffic for load testing.****

*In this white paper, load testing is referred to as part of performance testing and a synonym to stress testing.

**This offer is intended for cybersecurity companies only. Oxylabs closely monitors Residential Proxy network activity in order to avoid any misuse.

What is load testing?

In the simplest form, load testing simulates multiple users accessing an application at the same time, in order to test its performance and quality of service. Load tests may target specific parts of the application, for example, a website shopping cart's load capacity.

Load testing allows identifying potential weak points of the system, including:

- Breakpoints of the platform
- Service speeds under various load
- Bottlenecks
- A maximum number of concurrent and simultaneous users

One of the main requirements for load testing is sustaining a heavy traffic load over the whole testing time.

Statistics:

103% A **two-second delay** in retail web page load time increases bounce rates by 103%

24% 24% of e-commerce sites did not have a plan if their website went down during Black Friday

91% 91% of users will leave a website if it loads too slowly

Development of load testing tools

1990s

Load testing has been performed since the 90's. However, back in the day, it did not reflect realistic load. The most popular load testing software equated one virtual user (VU) with one Transmission Control Protocol (TCP) connection, meaning that one virtual user had access to one TCP connection to send requests to the target server.

Based on these load tests, companies that had undergone the testing thought that if a number of VU were able to access the site, it meant that the same number of real users would be able to use the service simultaneously. However, in reality, up until this day, browsers use multiple concurrent TCP connections and perform multiple downloads in parallel to the server, thus putting significantly more load on the system than one VU would during the test.

2000s

Fast-forward a decade, mobile websites and single-page applications brought new challenges to load testing. Load testing services were slow to catch up with API-driven and asynchronous traffic, and still required a lot of manual effort.

2010s

Some say that load testing tools had to be more developer-focused. Output results needed to be suitable to be parsed by software rather than manually and work well in an automated testing environment. Around 2010, more developer-focused tools started to appear, however their command-line UX, among other things, still had flaws.

2020

In 2020, load testing software is much more advanced. Current load testing softwares are able to test many different application, server, and protocol types.

Load testing vs DDoS

Contrary to load testing, distributed denial of service (DDoS) is an unplanned and malicious attack on a web server. DDoS attacks disrupt normal traffic to a website and often render the server inoperable. DDoS attacks aim to break operation of a service, while load tests are carried out to identify the server's potential flaws and are planned in advance.

The future of load testing

Load testing is fast developing towards more automation and performance optimization. Companies invest in Artificial Intelligence and machine learning in order to create systems that are able to automatically optimize performance. This investment is needed, because the technical stack is constantly growing, infrastructures are becoming more complex, and performing tasks manually is simply no longer efficient.

> **In order to test automated performance optimization systems, load tests need to reflect what happens to systems when they are loaded with real users.**

The importance of load testing:

$86M Amazon's downtime during Prime Day cost the company an estimate of around $86 million

$1.2M **60 minutes** of Netflix downtime causes $1.2 million revenue loss

$52M Amazon received 52.44 million website visits during Cyber Monday in 2018

2. Residential Proxies for Load Testing

Load testing chain

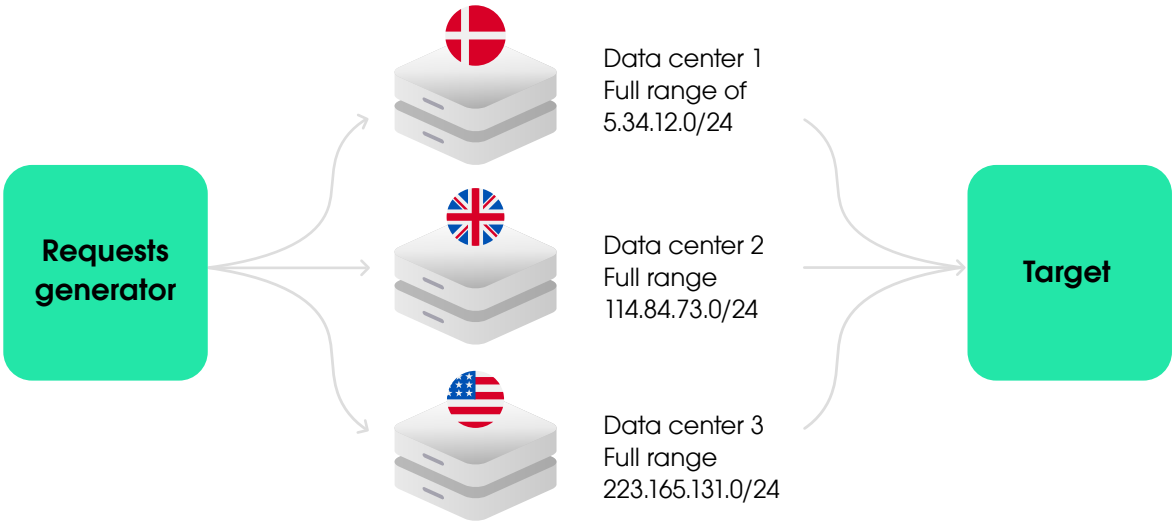
Load generator is used to generate load on the server to test its scalability and performance. To perform load testing, a load generator needs to send requests to the target. The target returns a response. Measuring the response time provides valuable information that companies use to make conclusions about their website's performance under a certain load. Proxies work like a tunnel between the client and the website after the connection is made.

To visualize, load testing chain looks like this:

In order to perform a realistic load test, traffic load generated towards the target website needs to appear as human-like as possible. This is where residential proxies step in.

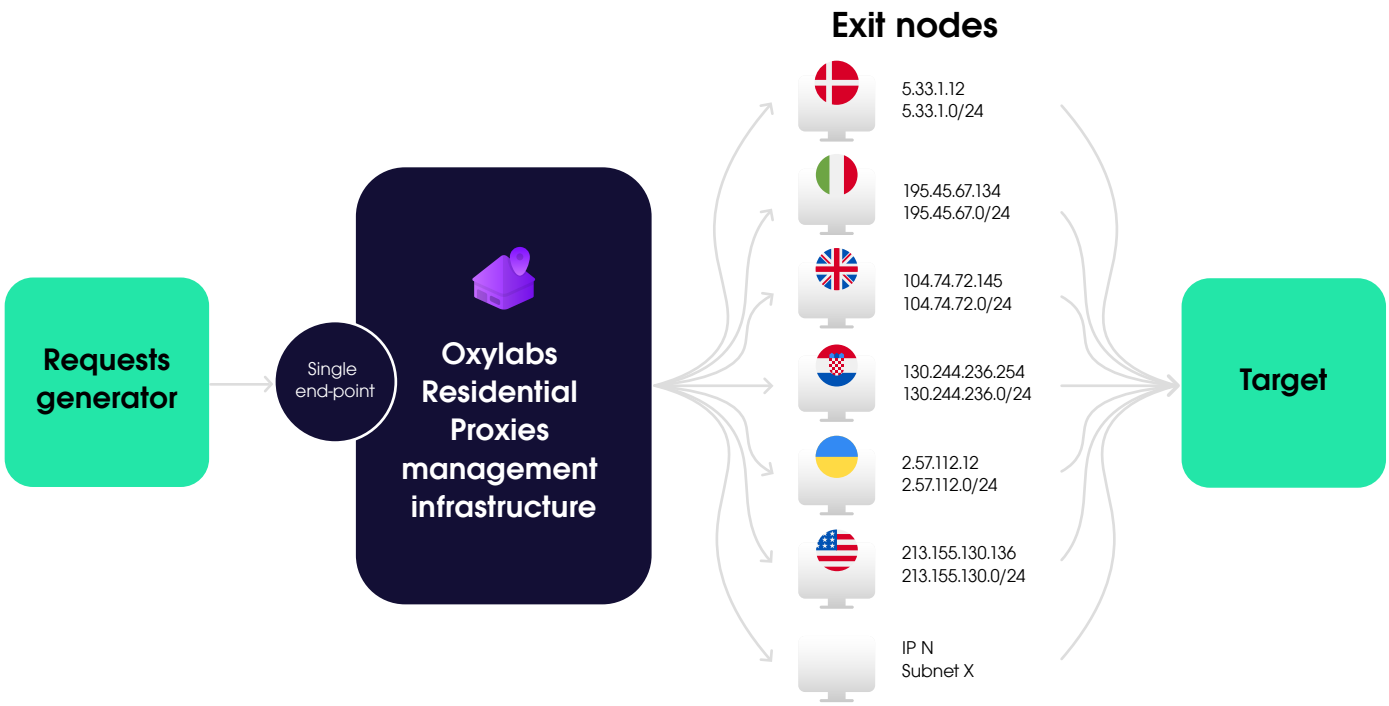
Datacenter vs Residential Proxies for load testing

In order to perform a realistic load test, the software needs to generate a load that is as close to real-user traffic as possible. Currently, load testing service providers often choose datacenter VM instances to generate traffic. Datacenter servers are using the same subnets and a single ASN, therefore are easily detectable and blockable by anti-DDoS solutions.



Meanwhile, residential proxies come from many different users with unique IP addresses from various geographic locations and relay a realistic traffic load.

Example
on the next page



Benefits of Residential Proxies in load testing

Residential proxies allow load testers to spread out traffic across a large number of source IPs from different networks and send requests from certain geo-locations.

Another benefit of residential proxies is testing different routes that reach the target server. If requests are sent through one route, the performance only affects users on that particular route, which does not reflect a realistic scenario. Residential proxies allow testing all the routes that reach the target server and measure their performance.

Oxylabs Residential Proxies currently support HTTP and HTTPS, and SOCKS5 protocols. This allows users to generate different types of load testing traffic from many different sources.

Our Residential Proxy network is based on various device platforms, from IOT and Mobile devices, to Desktops and servers.

Ragnar Lönn, founder of **Load Impact**, the world's most widely used online load testing service, says:

> **Oxylabs proxy network looks really useful as a way of spreading out traffic generation for a load test so the target system can't detect that the traffic is actually artificial.**

Residential Proxies have many benefits for load testing:

- **Wide location coverage**
  Our Residential Proxies cover every country in the world, allowing users to send requests from anywhere around the globe

- **Proxy pool size**
  Oxylabs Residential Proxy network contains over 100M+ residential IPs which means that systems can be tested with as many real users as required

- **Unlimited concurrent requests**
  No limits and restrictions, keep a virtually unlimited amount of concurrent connections

- **Hardly detectable and unblockable**
  By their nature, residential proxies can tunnel real users' traffic and avoid IP blocks

- **Secure load testing**
  Oxylabs Residential IPs come from trusted partners, who ensure that all network participants have expressed consent, are fully informed, and fairly rewarded for their contribution

Transparent residential proxy acquisition

Having in mind that the residential proxy network is generally based on physical devices owned by real people (end-users), it requires responsibility, on behalf of the provider, to operate ethically and transparently.

The sensitive nature of residential proxies calls for an additional level of industry standards to ensure that each person participating in the network has been onboarded willingly.

The ethical residential proxy acquisition process falls under tier A+ and tier A models, which are defined by the collaborative approach to the network participants. These models ensure that each end-user has been fully informed and has expressed consent to join the network. The highest tier model is distinguished by offering fair financial reward in exchange for participation.

3. Summary

- Load testing is an important part of **testing system capabilities** and **identifying potential breaking points**.

- Load tests have significantly advanced in the past few decades, but **they still do not always generate a realistic load.**

- Residential proxies are the **key component to performing realistic load tests**.

- Oxylabs Residential Proxies spread out traffic across many source IPs and allow sending requests from many geographical locations. This is essential in order to **generate realistic traffic to the target system**.

- Oxylabs Residential Proxies **cover every city in the world**, which allows picking any location to generate traffic for a realistic load testing.

- Oxylabs provides a **legitimate Residential Proxy infrastructure**. We demand from all of our proxy resource providers to ensure that all the residential network participants have expressed consent, are fully informed, and fairly rewarded for their contribution.

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Want to Know More?

If you would like to know more about any of the topics mentioned in this white paper or learn about our products, please get in touch! Our team is ready to answer any of your questions and offer you the best solution for your business needs.

Get in touch with Oxylabs

Our Mission

Our mission is to share all the know-how that we collected over the years in the industry in order to create the future where big data is accessible to all businesses. We seek to create a healthy environment for everyone to grow and thrive in.

Our Values

As a leading company in the proxy and web scraping industry, we ensure that the highest standards of business ethics lead all our operations. Our core values guide us toward achieving our mission. Learn more