CLOUD COMPUTING

Reverse proxies

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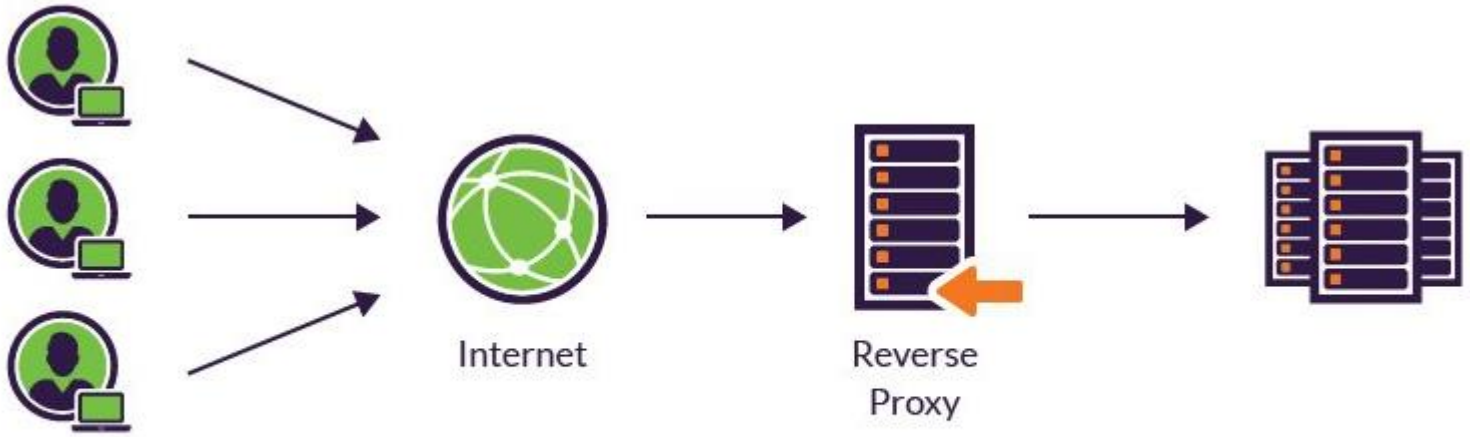
What is a reverse proxy?

- A reverse proxy is a server that sits in front of web servers and forwards client (e.g. web browser) requests to those web servers.
- Reverse proxy helps to increase
  1. Security
  2. Performance
  3. Reliability
- Reverse proxies are typically owned or managed by the web service, and they are accessed by clients from the public internet.
- Reverse proxy servers are implemented in popular open-source web servers such as Apache, Nginx and Caddy
- This software can inspect HTTP headers, which, for example, allows it on a single IP address to relay requests to different internal servers based on the domain name of the HTTP request.

https://en.wikipedia.org/wiki/Reverse_proxy

Reverse proxy



A reverse proxy operates by:

- Receiving a user connection request
- Completing a TCP three-way handshake, terminating the initial connection
- Connecting with the origin server and forwarding the original request

https://www.imperva.com/learn/performance/reverse-proxy/

What is a forward proxy

- A forward proxy, often called a proxy, proxy server, or web proxy.

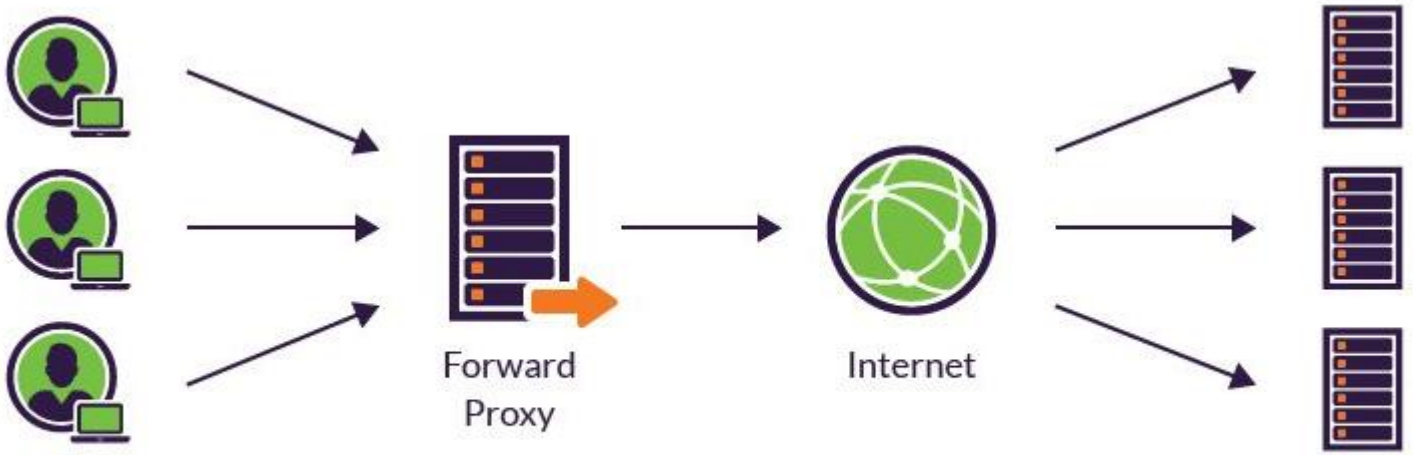
- Forward proxy is a server that sits in front of a group of client machines. When those computers make requests to sites and services on the Internet, the proxy server intercepts those requests and then communicates with web servers on behalf of those clients, like a middleman.

- There are a few reasons one might want to use a forward proxy:
  1. To avoid state or institutional browsing restrictions
  2. To block access to certain content
  3. To protect their identity online

Reverse Proxy vs Forward Proxy

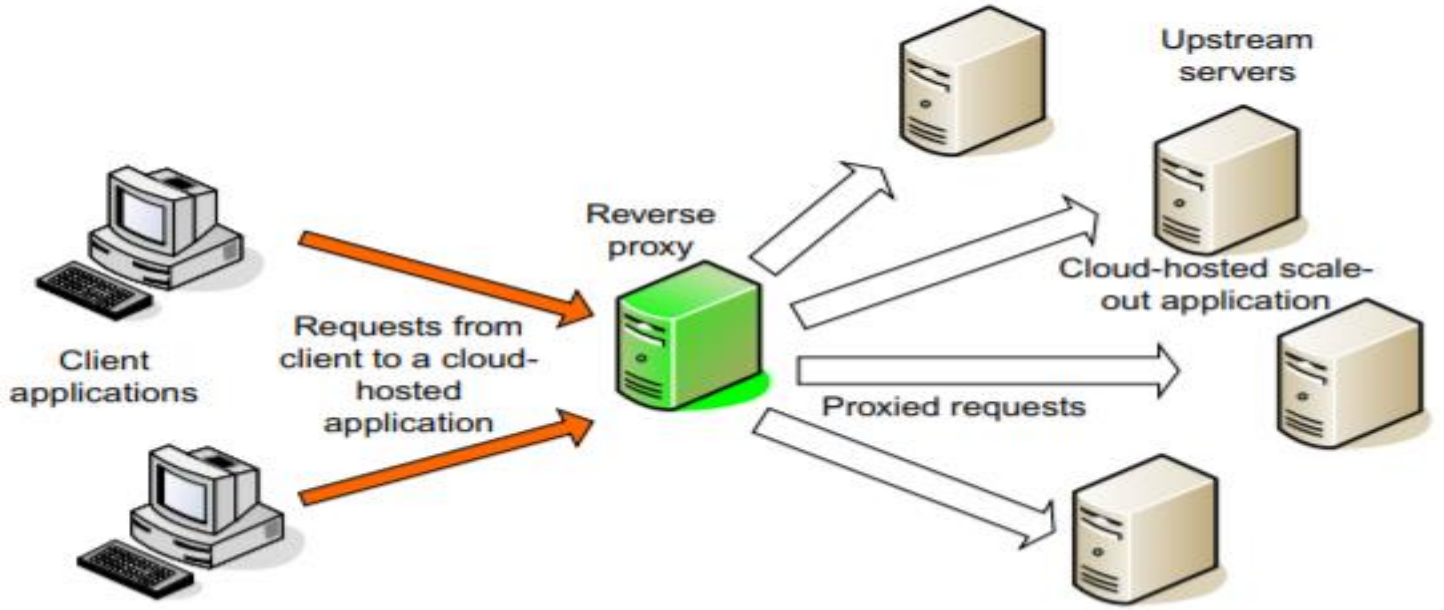
- A forward proxy server is also positioned at network's edge, but regulates outbound traffic according to preset policies in shared networks.
- Additionally, it disguises a client's IP address and blocks malicious incoming traffic.
- Forward proxies are typically used internally by large organizations, such as universities and enterprises, to:
  - Block employees from visiting certain websites
  - Monitor employee online activity
  - Block malicious traffic from reaching an origin server
  - Improve the user experience by caching external site content

Reverse Proxy vs Forward Proxy



https://www.imperva.com/learn/performance/reverse-proxy/

Configuration of reverse proxy



Benefits of a reverse proxy

- Load Balancing
- Protection from attacks
- Global Server Load Balancing
- Caching
- SSL encryption

https://www.cloudflare.com/learning/cdn/glossary/reverse-proxy/

Nginix

- Nginx is one such reverse proxy which claims to be hosting more than 20 million web sites.
- Nginx uses a simple round robin scheduler to forward client requests.
- There is also an option to use a hash-based scheduling to choose an upstream server based on hashing a configurable variable – that can be the request URL, incoming HTTP request headers or some combination of those

Nginix(Continued)

```
upstream sample_loadbalancer {
        server 10.1.1.3:80 ;
        server 10.1.1.4:80 ;
        server 10.1.1.5:80 ;
         server 10.1.1.6:80 ;
} }
```

upstream lists the different virtual web servers that are configured at the backend.

All one needs to do to scale the system is to add more servers and add those IP addresses in the upstream section.

THANK YOU

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