

Network Services 1

2019-2020





Licenciatura em Engenharia Informática

Ramo de Redes e Administração de Sistemas

Proxy

School Year 2019-2020

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Proxy - meaning

- Proxy is an English term that means "*doing something for someone*" [LEXICO PUBLISHING GROUP, 1998].
- In computing, the term proxy is used to define an intermediate program that acts between the server that stores a certain content and a client machine that makes requests to this server [THE INTERNET SOCIETY – RFC 2616, 1999].
- A proxy server is thus an intermediate machine between a client that wants a resource and a server that provides it.

Proxy

- In a local network we should try to prevent that a client has directly accessing the Internet, thus trying to have a more secure and efficient infrastructure.
- All internal accesses must / should be triggered by a single or set of machines that we define as **proxy servers**.
- With this implementation, a better level of security is achieved because the internal network does not have direct connections to the Internet, so it is more difficult for an external attacker to access and control a local network machine.

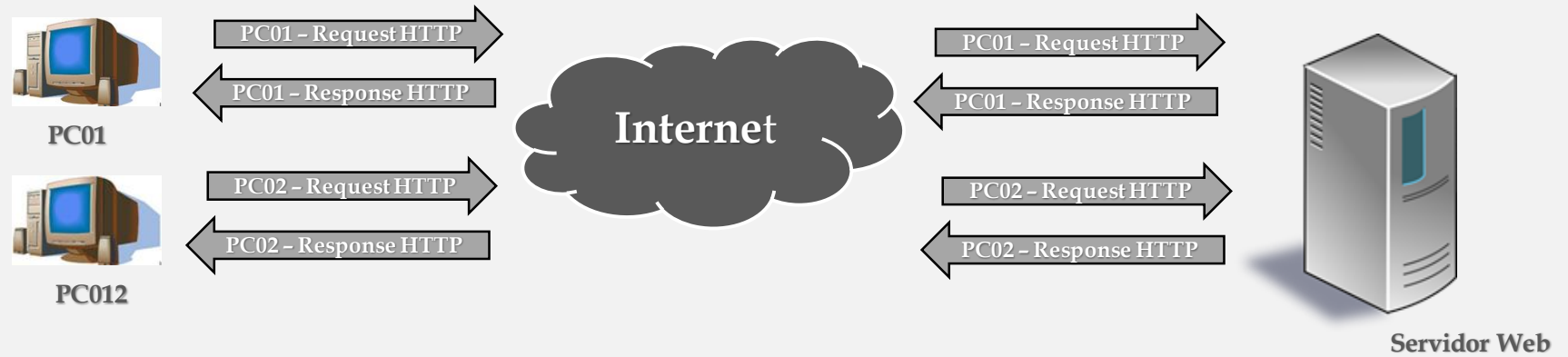
Proxy

- The request instead of being carried out by the client directly to the destination server is redirected through the proxy server.
- This machine is responsible for making the request and return the response to the customer.
- If you have this feature cached you may even directly respond to the client.

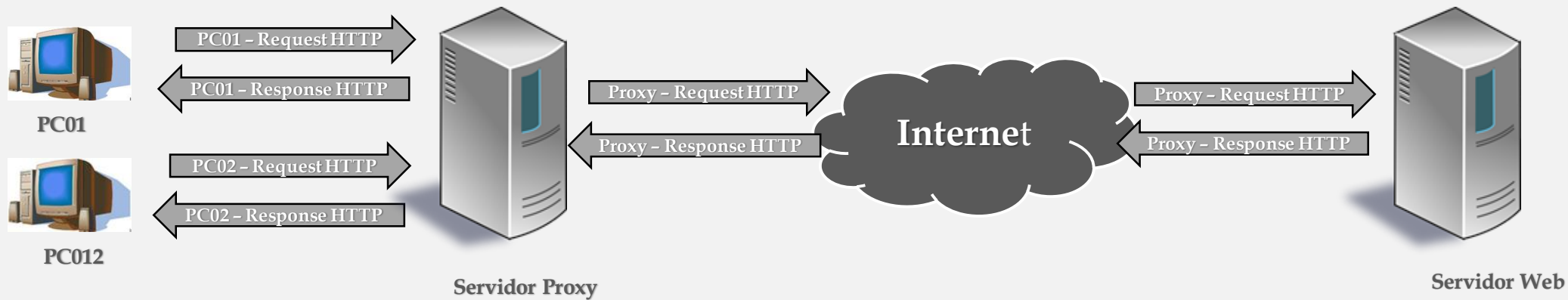


Proxy

Without



With



Objectives

- The Proxy server has the following basic objectives:
 - Keep customers anonymous.
 - Increase the speed of Internet access.
 - Define internal rules in accessing the Internet.
 - Increase security and usage control.
 - Provide a resource caching service.
- **A proxy is neither a replacement for a firewall.**

Benefits

- **Routing and Bandwidth Management**

- Allows access to the internet from machines with private IPs
 - Eliminates the need to activate routing services and / or address translation (NAT)
 - It allows to circumvent geographical limitations.
- Single point of access
 - Facilitates control and generation and analysis of logs
- Minimizes traffic in case the content cache is activated

- **Usage reports**

- With a Proxy you can define a set of reports that allow us to analyze in detail the type of access our organization makes to Internet access (top of sites, distribution by time and by user, etc.)
- These reports serve for a more rational management of existing resources.



Benefits

- **Security**
 - Clients can be "hidden" behind the proxy.
 - Does not reveal customer identification.
 - Allows you to block access to certain locations (sites). You can define list of servers that do not allow access (black-list).
 - Allows you to filter dangerous content.
 - It controls who can access the Web through authentication, or who can access and at what time.



Disadvantages

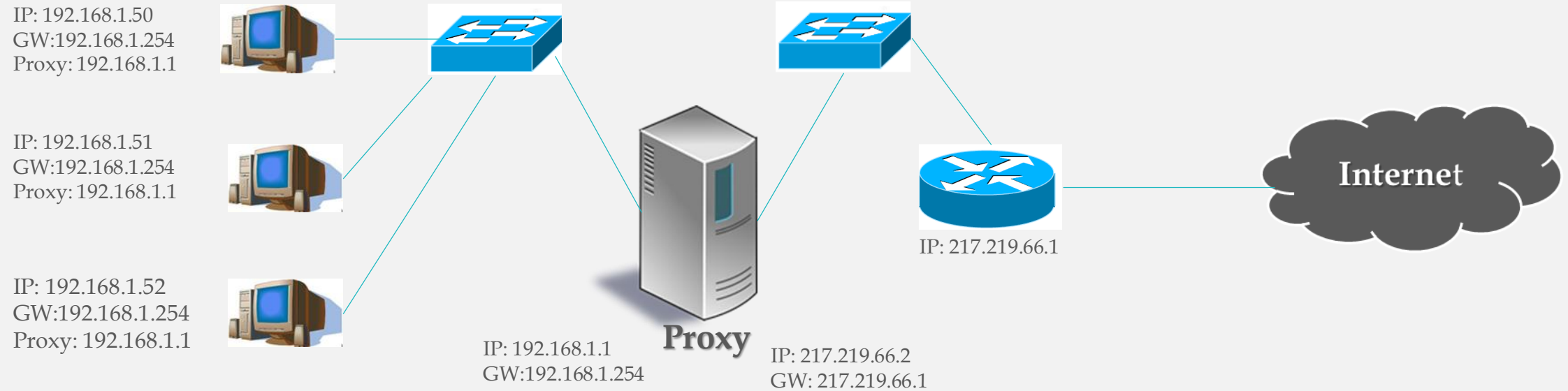
- **Single point of failure**
 - If the proxy does not work, all the clients on your network do not access the Internet.
- **Creates a possible point of service bottleneck**
 - All clients access this service / server to access which may pose performance issues.
- **Increased costs**
 - Proxy services may require modifications to applications and clients.
 - Need to buy, license and maintain more equipment.



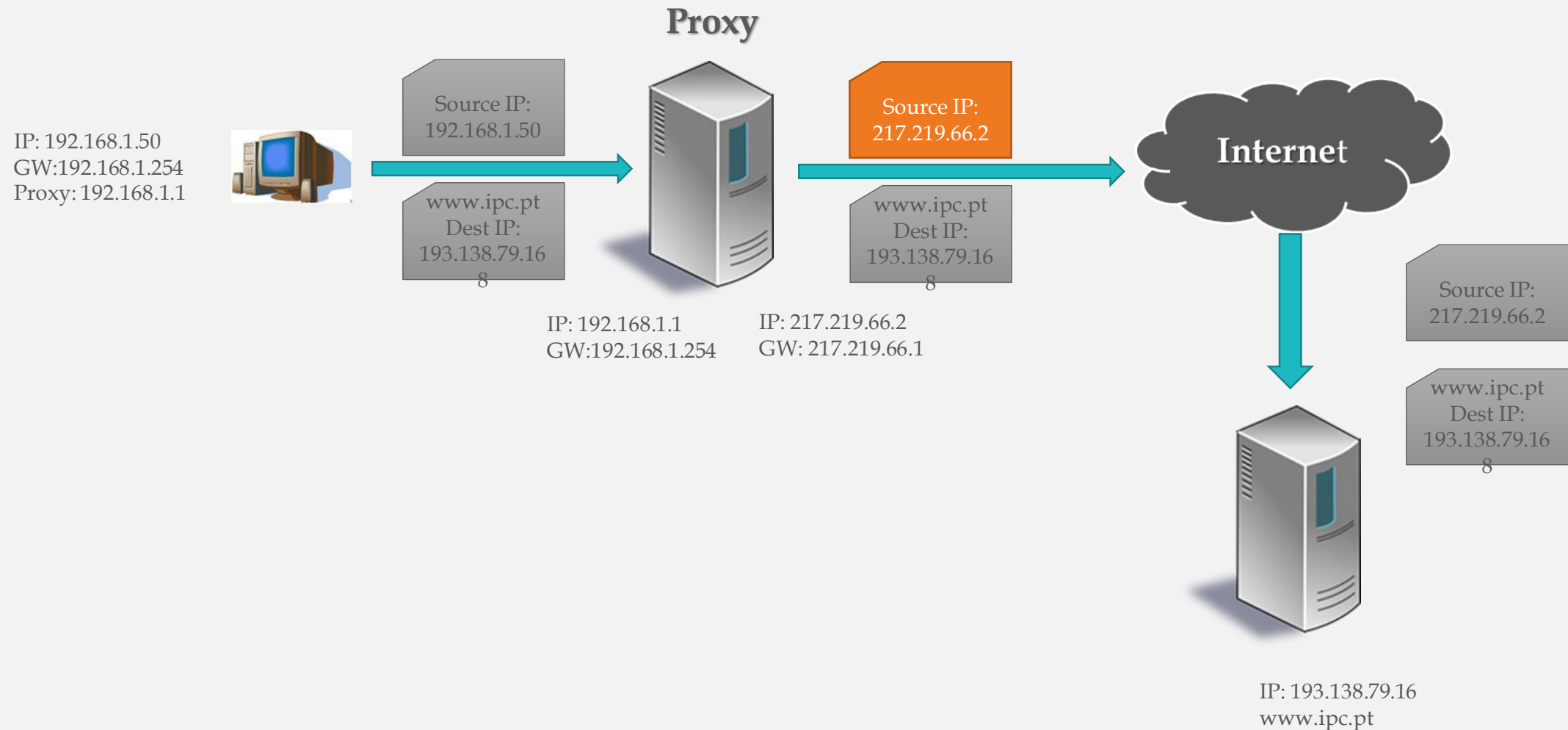
What do you need?

- A specific hardware or software "box" and server with two network cards
- One internal and one external address
- Internet access

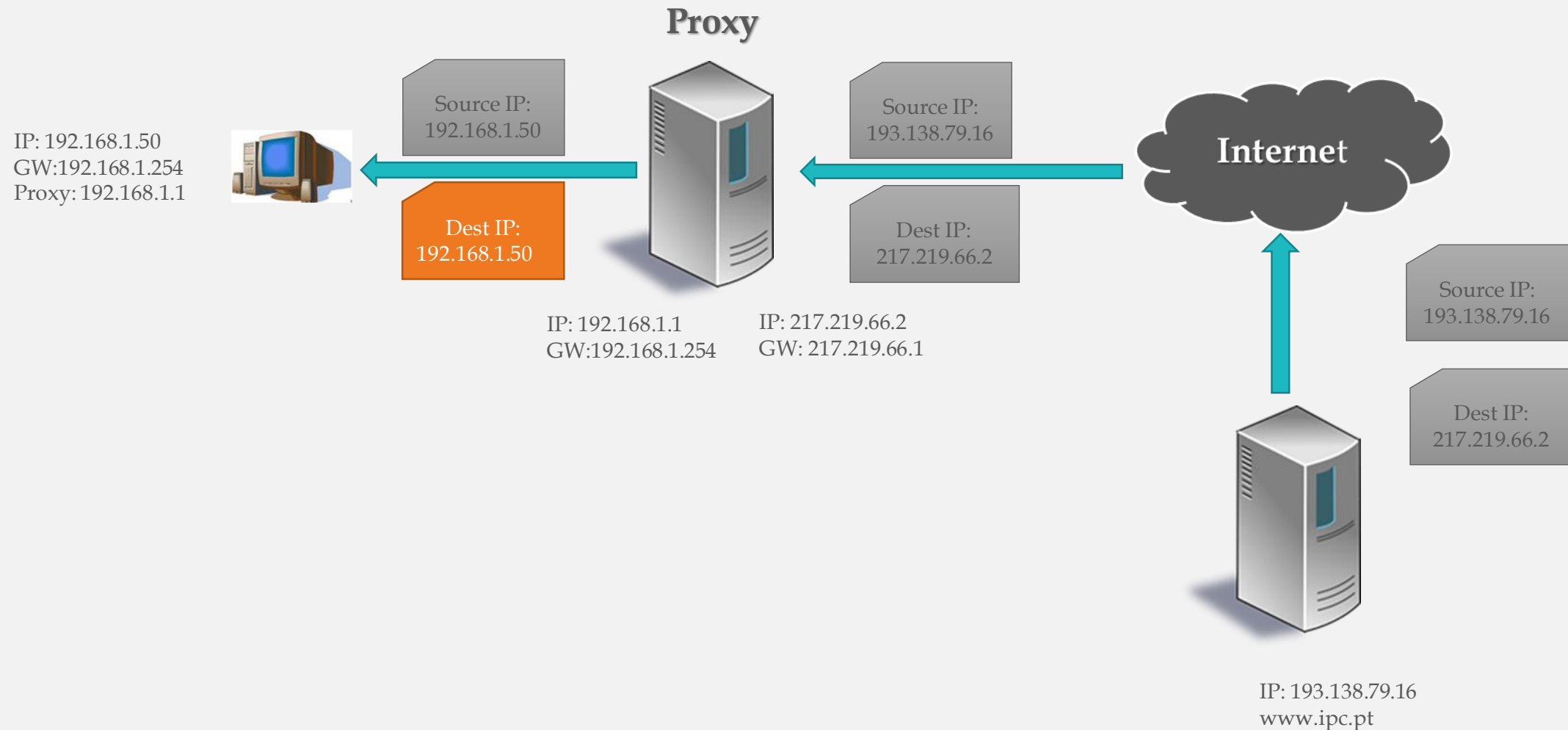
How it works



How it works



How it works



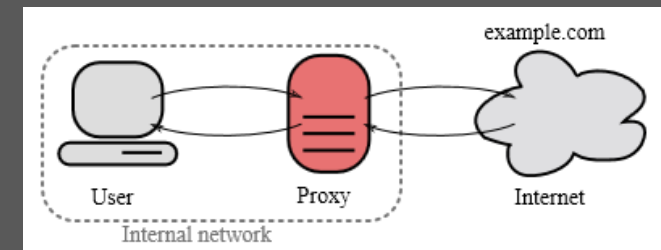
Commercial proposals

Software Proxy	Hardware Proxy
Squid	Cisco Pix
Kerio Winroute	Blue Coat
CCproxy	Cyberroam
CProxy	
Wingate	
Nginx	

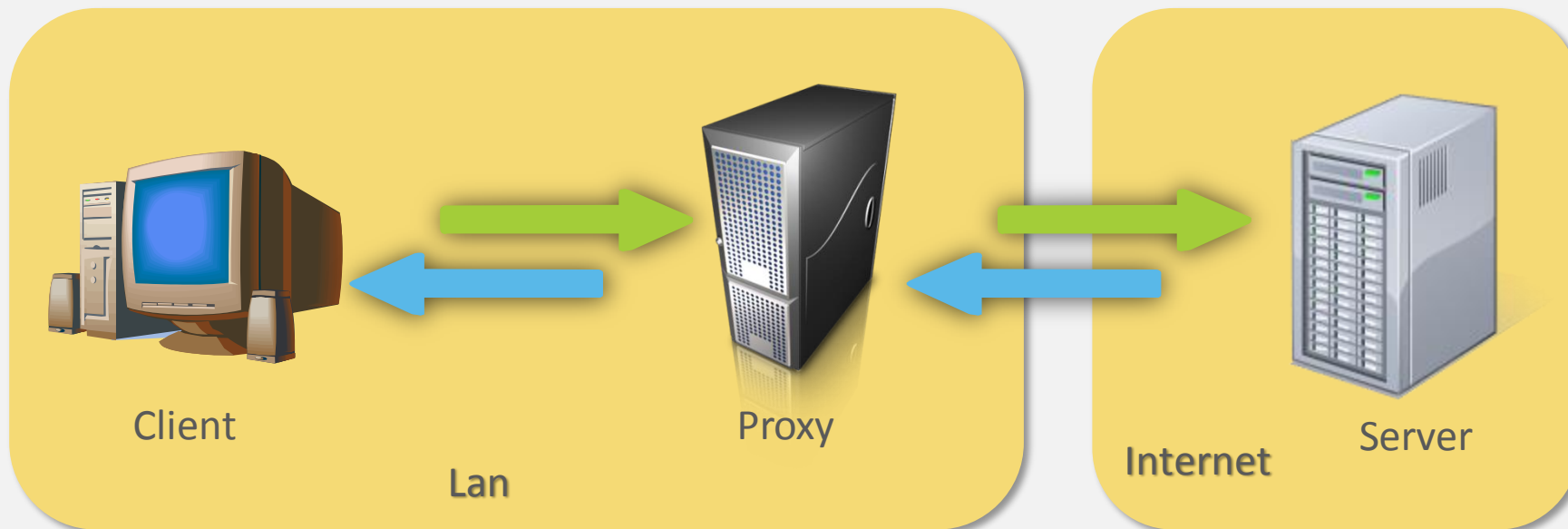
Proxy types

- Some proxy types:
 - *Forward proxy (Normal (Regular/Caching))*
 - *Open proxy*
 - *Transparent proxy*
 - *Reverse proxy*

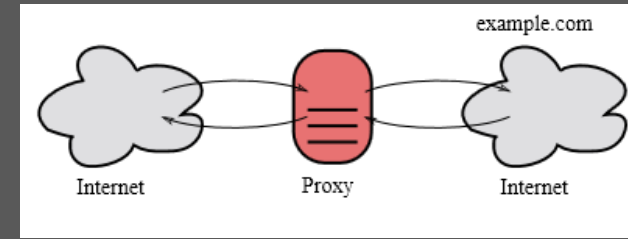
Forward proxy



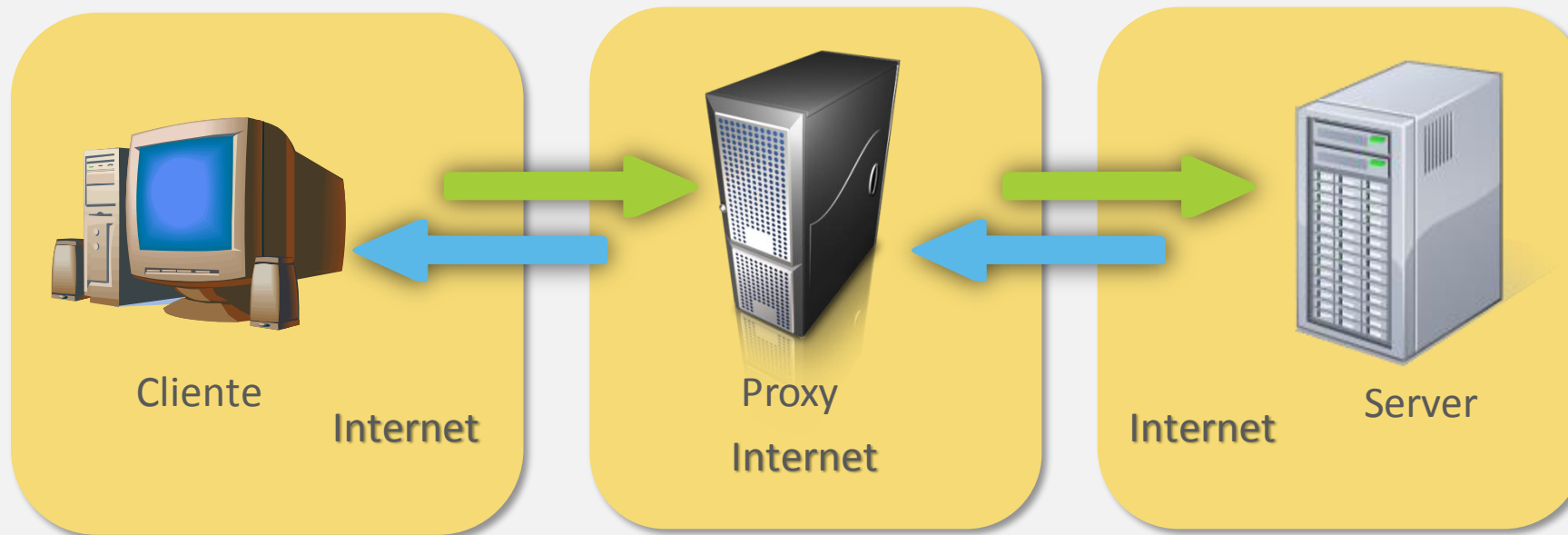
- Most Common Proxy Type
- Allows access to the internet to machines with private IPs or whose access to the outside was limited
- Only allows access to authorized machines



Open proxy

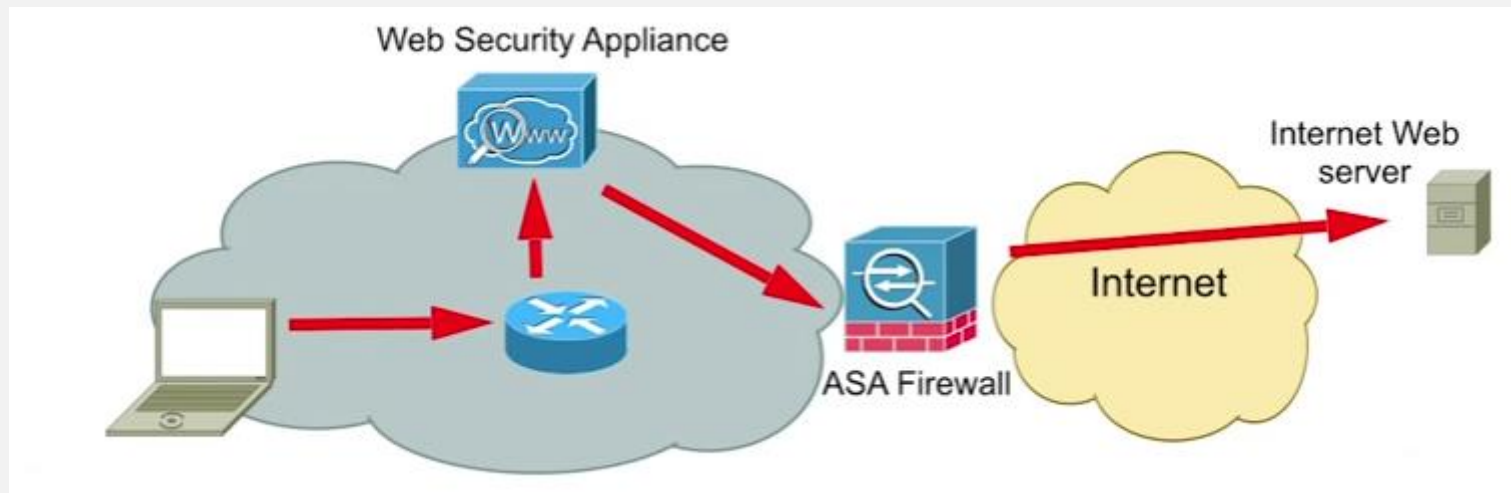


- Special type of forward proxy that allows access to any client
- The use of one or more open proxies allows to hide the identity of the clients
- There are so-called free proxy servers on the internet that do this function.
- You can for example go to <http://aliveproxy.com/proxy-list/proxies.aspx/Portugal-pt> to consult this list.

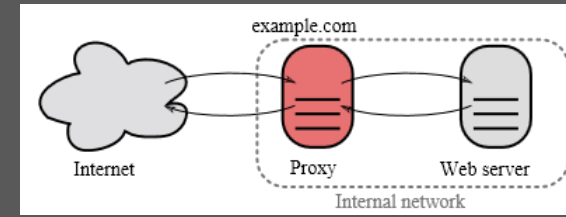


Proxy Transparente

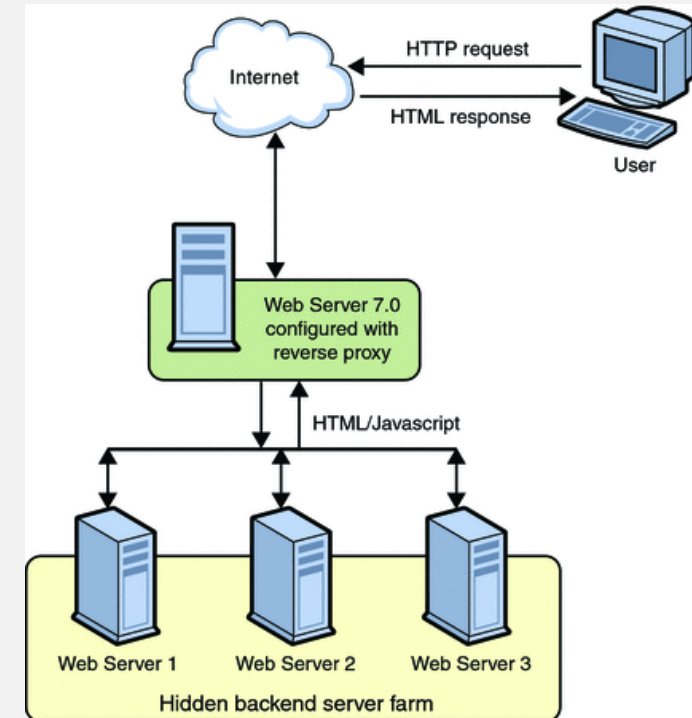
- Identical to forward but does not require any client-side configuration.
- It is an architecture that allows the client not to know the existence of the proxy
- Used in large companies where customer configuration is critical.



Reverse proxy

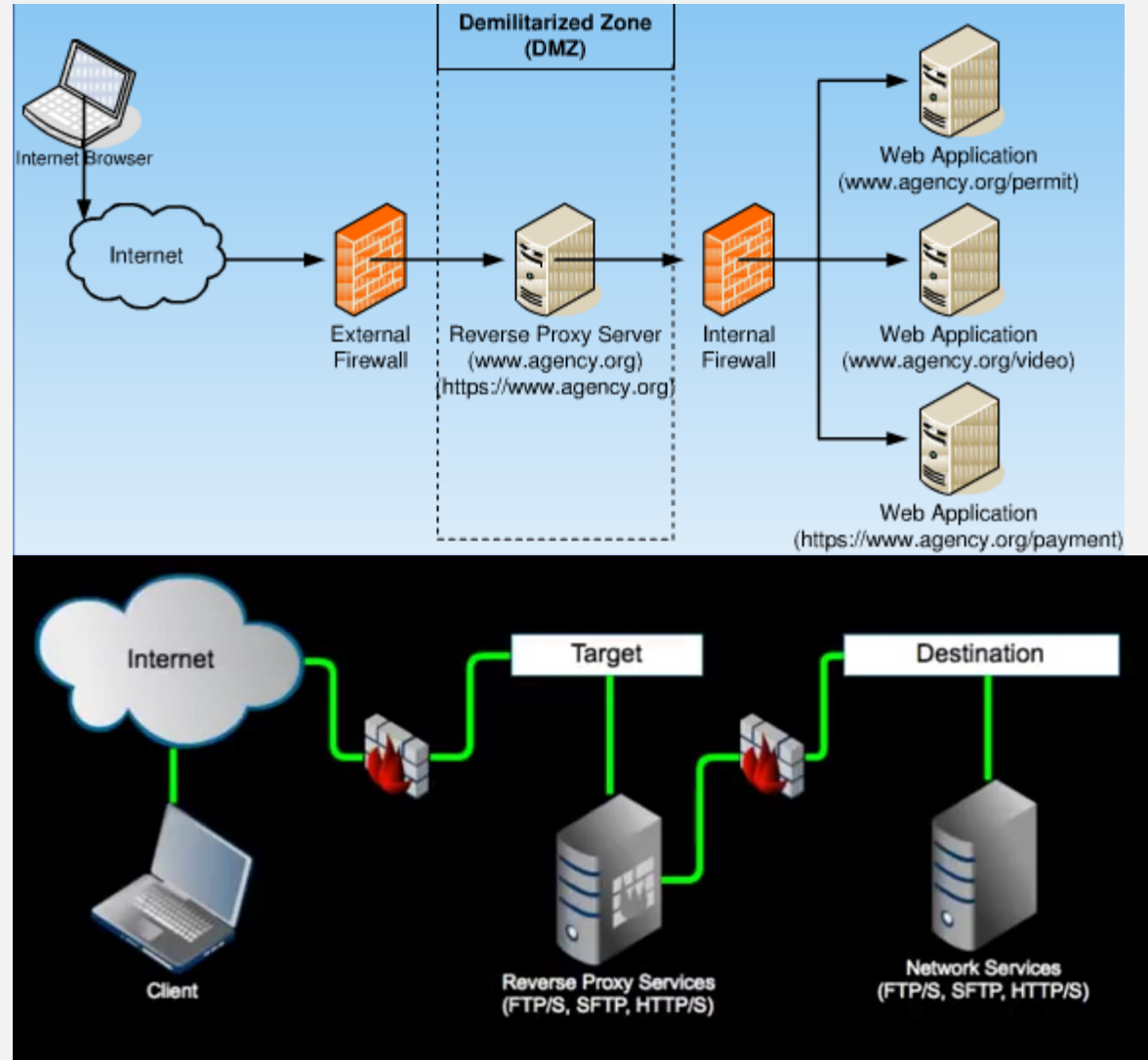


- It is called reverse-proxy to a hidden-proxy-hidden "proxy server", that is, a proxy server that allows users not to access the Internet but Internet users indirectly access certain internal servers . For example, it allows you to access internal servers or distribute orders between several identical servers (load balancing).



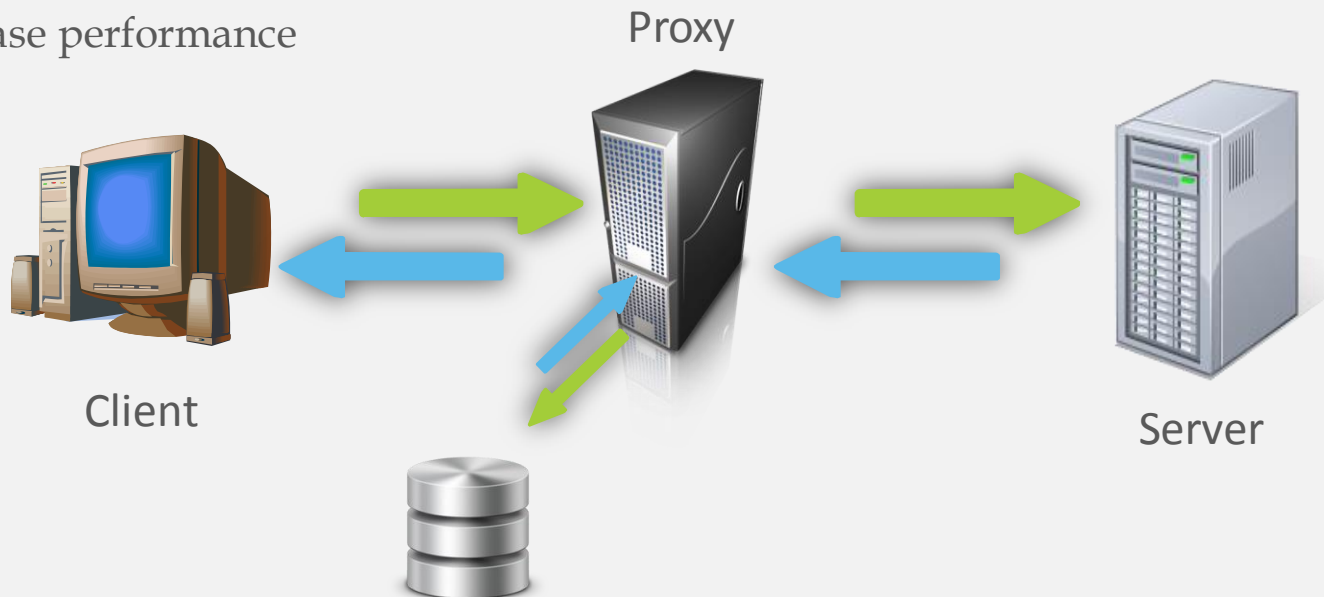
Reverse Proxy - Functions

- SSL encryption / acceleration
- Load balancing
- Compression
- Serve / cache static content
- Safety
- Single Sign On

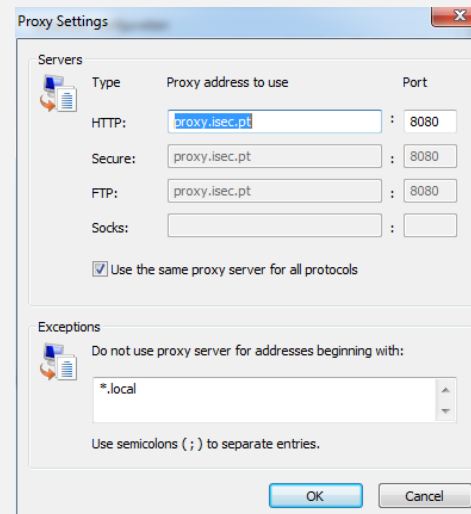
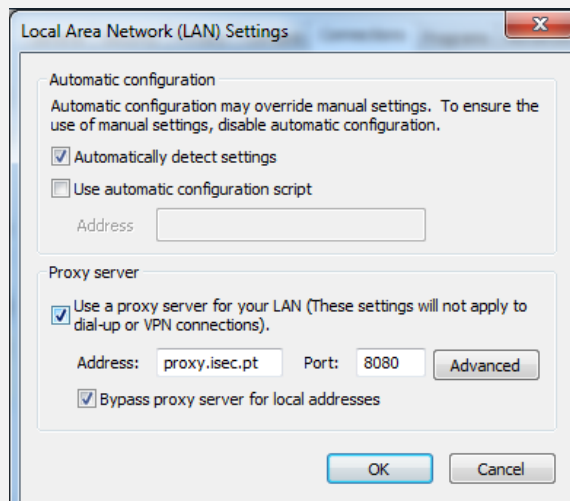
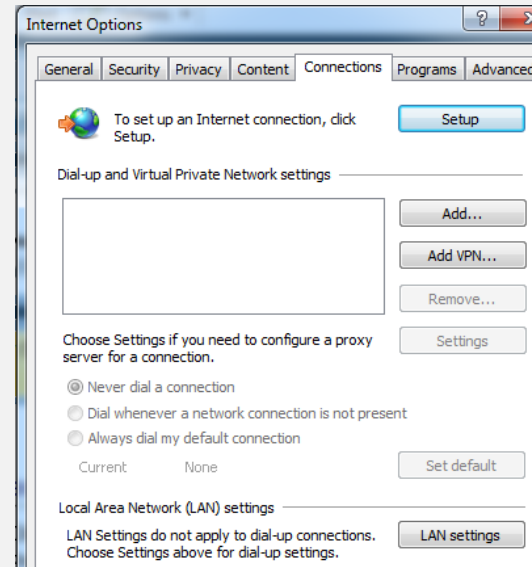
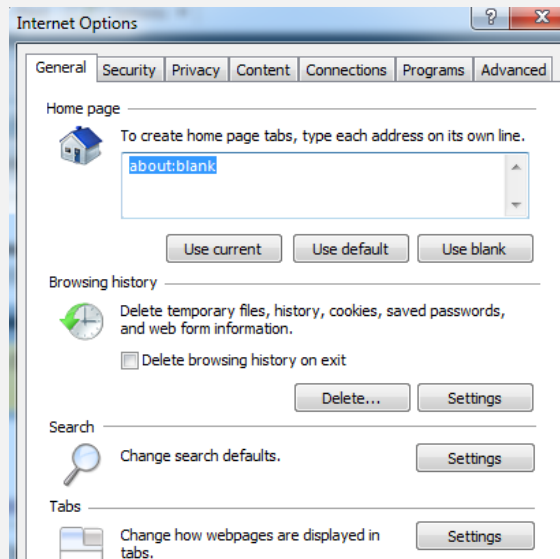


Caching

- You can configure caching functionality on your proxies servers.
- When the same content is requested by two clients, the second client is provided with the copy of the cached information at the first request, making a new request unnecessary to the original server.
- Main objectives:
 - Minimize traffic
 - Increase performance



Client Configuration (internet explorer)

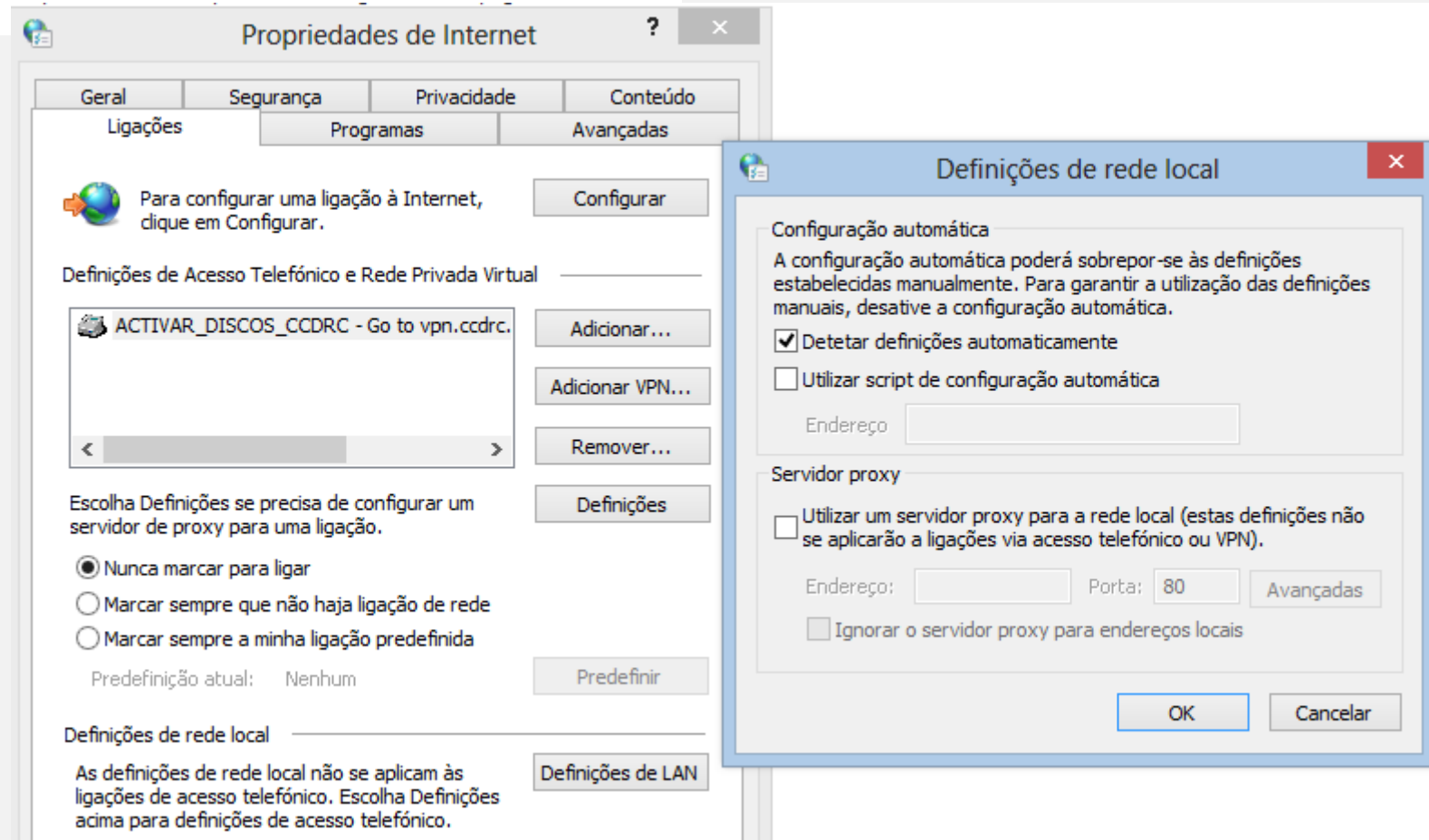


Client Configuration(chrome)

Rede

O Google Chrome está usando as configurações de proxy do sistema do seu computador para se conectar à rede.

Alterar configurações de proxy...



Software Proxy

- Squid
 - It is one of the most used proxies.
 - Developed from ARPA's Harvest project, his project's mentor was Duane Wessels.
 - <http://www.squid-cache.org/>



Advantages

- It is supported on various operating systems;
- Decreased bandwidth use;
- Fast loading of pages stored in the cache;
- Filter content using SquidGuard;
- Possibility to verify the use of the network through the generators of reports;

Disadvantages

- Consume resources;
- It takes time to load pages that are not cached;
- Difficult optimization;

Questions



References

- <http://www.authorstream.com/Presentation/aSGuest31285-271167-web-proxy-server-entertainment-ppt-powerpoint/> - Acedido em maio de 2020
- <http://pt.kioskea.net/contents/lan/proxy.php3> - Acedido em maio de 2020
- www.slideshare.net/poustchi/proxy-servers-firewalls-178732?src=related_normal&rel=2467014 - - Acedido em maio de 2020
- www.cisco.com
- www.microsoft.com
- <http://pt.wikipedia.org/wiki/Proxy> - Acedido em maio de 2020.