**CLEVELAND STATE UNIVERSITY**

**CIS 620 – ADVANCED OPERATING SYSTEMS**

# FINAL PROJECT - SQUID PROXY/ CACHING SERVERS

Submitted To

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## ABSTRACT

Linux is the synonym of networking and it is used in home and office environments as e-mail server, application server and most increasingly it also used as the proxy server. A proxy server is the one that provides access to internet for different users at the same time by using a single shared connection. The proxy server is considered to be good when it caches the requests and in turn access the data from local server rather than web, by reducing the time and bandwidth. Squid is a software that supports caching of SFTP, HTTP, FTP etc. It also handles access controls, SSL, DNS and caching of full log requests.

# INTRODUCTION

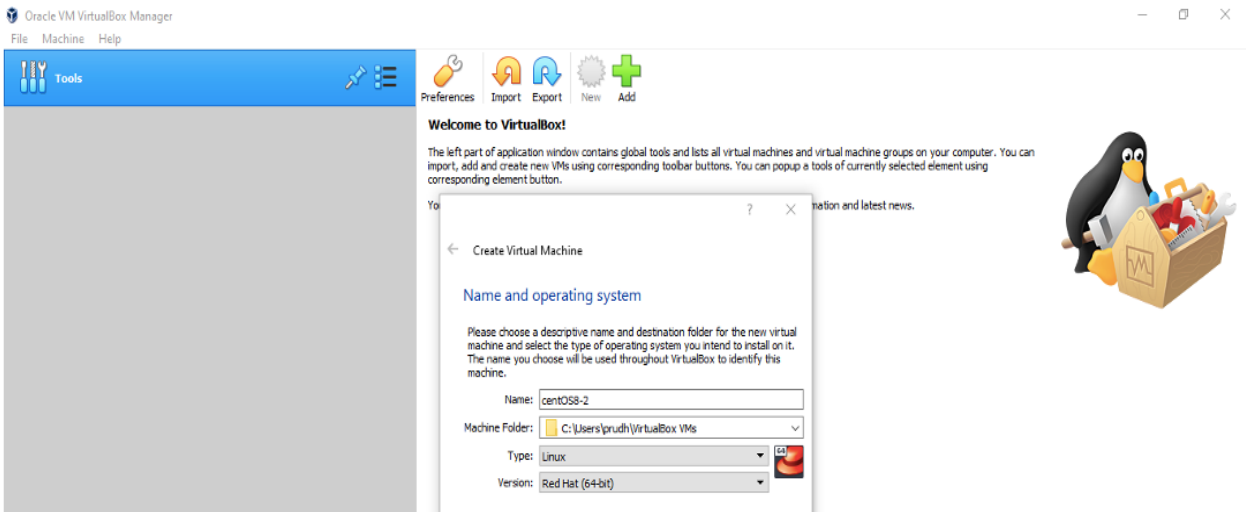
## Proxy Server

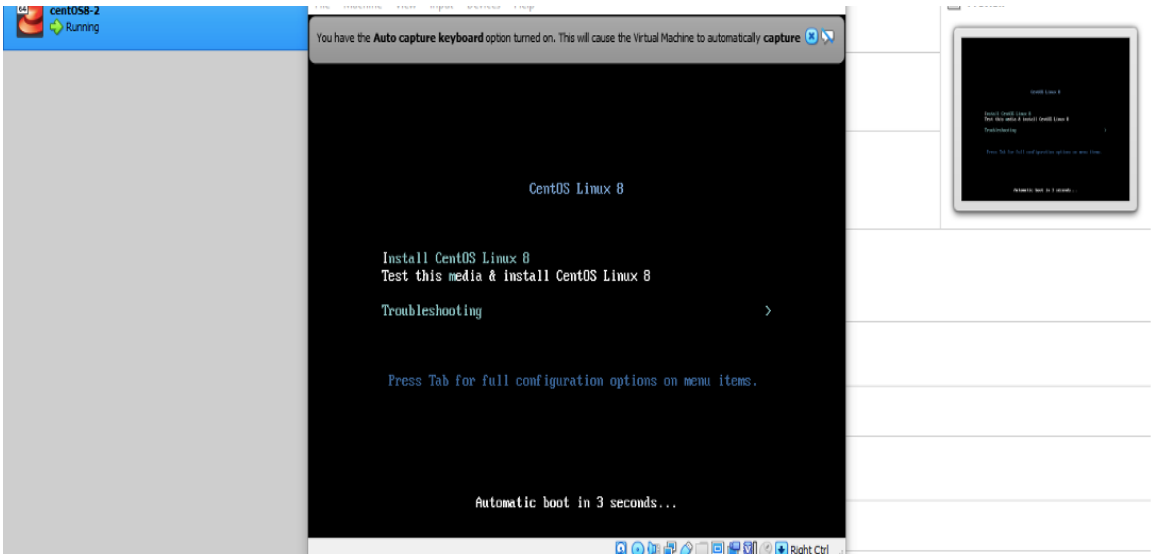
A proxy server can be defined as the computer that sits in between the two end point devices and will act as an intermediate device. Whenever there is a request from the client computer for a resource, it will be sent to the proxy server and then request is forwarded to the destination server to obtain the resource. Once the resource is retrieved by the proxy server, it sent back to the client's machine. Proxy server has the capability of caching a resource. For Example, if a website is visited frequently then the web contents of the site will be cached and then webpage will be served directly to the server.

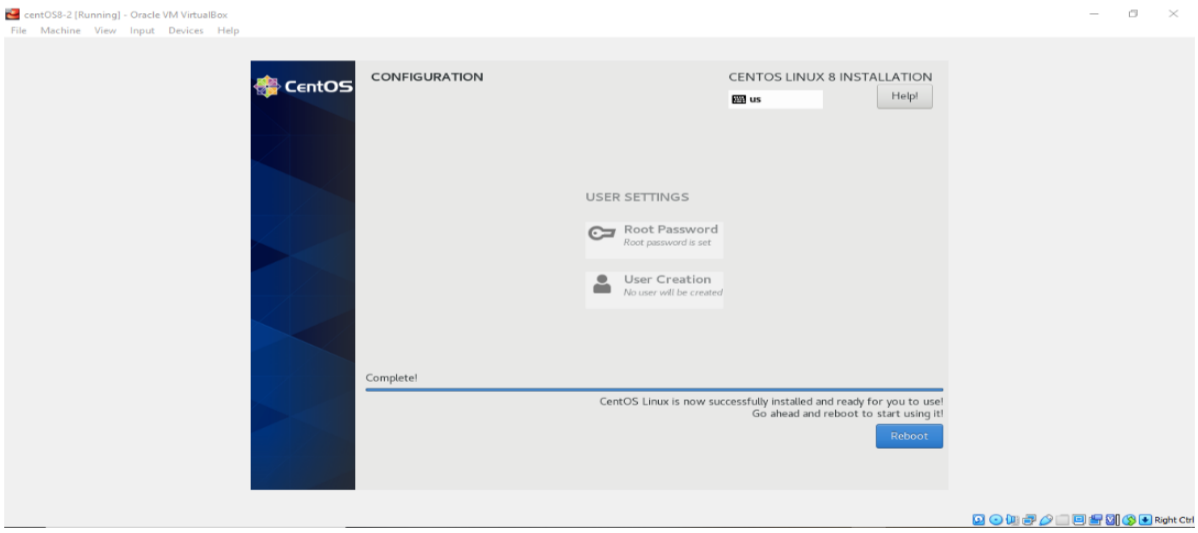
## CentOS

CentOS is a kind of free Open-Source Linux Distribution. A Linux Distribution is defined as the software collection with Linux Kernel. CentOS is a Linux appropriation (got from Red Hat Enterprise Linux) that is popular mainstream with framework administrators, DevOps specialists, and home. It's additionally utilized by numerous associations for advancement and creation of servers.

## CentOS Installation






## Prerequisites for Squid Installation

- CentOS operating system
- Access for the Terminal Window
- Root user privileges
- Yum package installer
- Access to the text editor, vim

## Steps for Squid Proxy Installation on CentOS

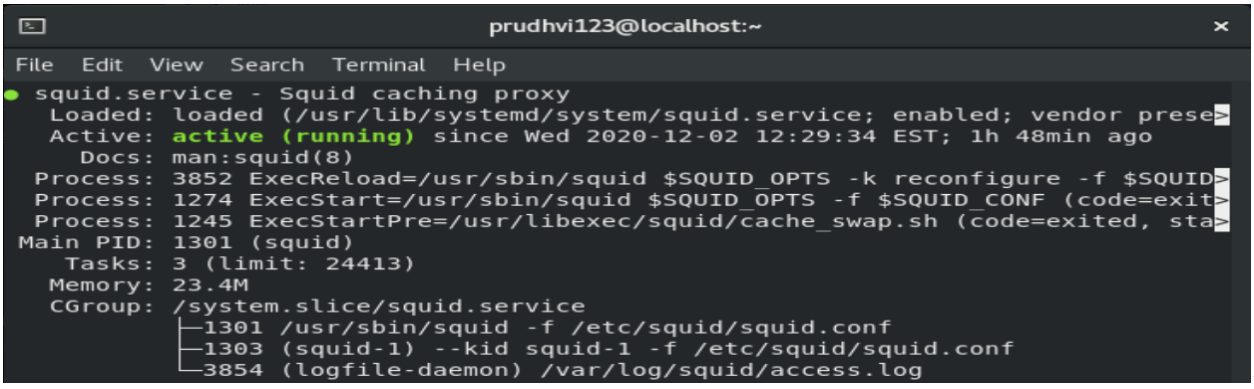
**Step 1:**

Refresh the repositories of CentOS

```
sudo yum -y update
```

**Step 2:**

- Installing the package of CentOS
  - yum -y install squid
- Start squid by using the following command
  - systemctl start squid
- Setup an automatic start at the boot
  - systemctl enable squid
- Check the status of service
  - systemctl status squid



## Configuration of the Squid Web Proxy

The Squid configuration file is found within the location /etc/squid/squid.conf

- Open the Squid configuration file using the text editor
  - sudo vi /etc/squid/squid.conf
- Add the following option
  - dns_v4_first on
- Restart the squid service
  - systemctl restart squid

```
acl localnet src 10.0.0.0/8     # RFC1918 possible internal network
acl localnet src 172.16.0.0/12  # RFC1918 possible internal network
acl localnet src 192.168.0.0/16 # RFC1918 possible internal network
acl localnet src fc00::/7       # RFC 4193 local private network range
acl localnet src fe80::/10      # RFC 4291 link-local (directly plugged) machinesacl SSL_ports port 443
acl Safe_ports port 80          # http
acl Safe_ports port 21          # ftp
acl Safe_ports port 443         # https
acl Safe_ports port 70          # gopher
acl Safe_ports port 210         # wais
acl Safe_ports port 1025-65535  # unregistered ports
acl Safe_ports port 280         # http-mgmt
acl Safe_ports port 488         # gss-http
acl Safe_ports port 591         # filemaker
acl Safe_ports port 777         # multiling http
acl CONNECT method CONNECT#
```

```
http_access allow localnet
http_access allow localhost# And finally deny all other access to this proxy
http_access deny all# Squid normally listens to port 3128
http_port 3128# Uncomment and adjust the following to add a disk cache directory.
#cache_dir ufs /var/spool/squid 100 16 256# Leave coredumps in the first cache dir
coredump_dir /var/spool/squid
```

**Creation of Access Control Lists and Allow IP addresses**

- In order to allow a wide range of IP addresses through proxy server, a ACL entry can be added.

```
acl localnet src 10.0.0.0/8     # RFC1918 possible internal network
acl localnet src 172.16.0.0/12  # RFC1918 possible internal network
acl localnet src 192.168.0.0/16 # RFC1918 possible internal network
acl localnet src fc00::/7       # RFC 4193 local private network range
acl localnet src fe80::/10      # RFC 4291 link-local (directly plugged) machines
acl localnet src 110.220.330.0/24 #Your newly added ACL
```

- Restart the squid service

  systemctl restart squid

- Configure the port numbers in the configuration file.

  acl Safe_ports port 3128

- Default ports configured within the squid proxy server

```
acl Safe_ports port 80          # http
acl Safe_ports port 21          # ftp
acl Safe_ports port 443         # https
acl Safe_ports port 70          # gopher
acl Safe_ports port 210         # wais
acl Safe_ports port 1025-65535  # unregistered ports
acl Safe_ports port 280         # http-mgmt
acl Safe_ports port 488         # gss-http
acl Safe_ports port 591         # filemaker
acl Safe_ports port 777         # multiling http
```

- In order to save the changes, restart the squid:

  systemctl restart squid

## Basic Authentication

- In order to authenticate the user, we need to install the httpd-tools using the command:

  yum -y install httpd-tools

- Creation of a new file

  touch /etc/squid/passwd && chown squid /etc/squid/passwd

- Creation of the password

  htpasswd /etc/squid/passwd newuser

- Edit the squid.conf file and add the following commands:

  auth_param basic program /usr/lib64/squid/basic_ncsa_auth /etc/squid/passwd

  auth_param basic children 5

  auth_param basic realm Squid Basic Authentication

  auth_param basic credentialsttl 2 hours

  acl auth_users proxy_auth REQUIRED

  http_access allow auth_users

Once the above configuration is done any user who try to login into proxy server a prompt will be entered for username and password. None of the unauthenticated users will be stopped. Different authentication methods available on Squid are:

- LDAP: Uses Linux Lightweight Directory Access Protocol
- NCSA: Uses NCSA style username and password file
- SMB: Uses SMB server like SAMBA or Windows NT
- MSNT: Uses Windows NT authentication domain
- PAM: Uses Linux Pluggable Authentication Modules
- getpwam: Uses Linux password file.

## Blocking the Websites using Squid Proxy

- Create a new text file /etc/squid/blocked.acl by using the command below:

  sudo vi /etc/squid/blocked.acl

- Websites to be blocked are added within the file as follows:

  .flipkart.com

  .amazon.in

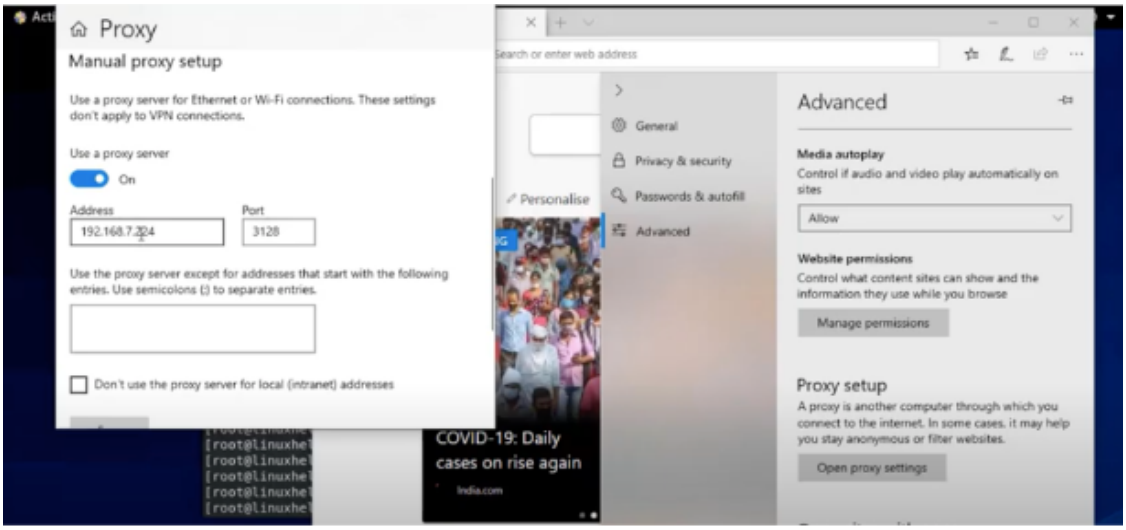
- Open the squid.conf file and the commands:

  acl blocked_websites dstdomain "/etc/squid/blocked.acl"

  http_access deny blocked_websites

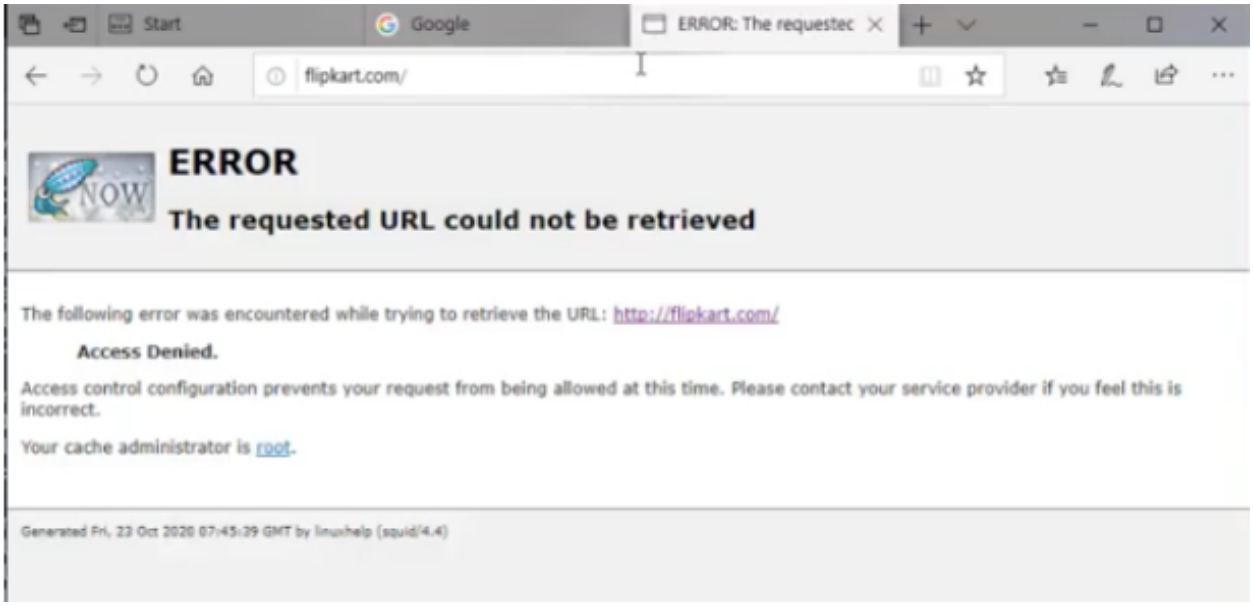
## Configuration of Client Browser

- Start the browser and the proxy in settings i.e., Internet Explorer → Internet Options → Connections → LAN Settings and fill in the details of IP address and Port number.

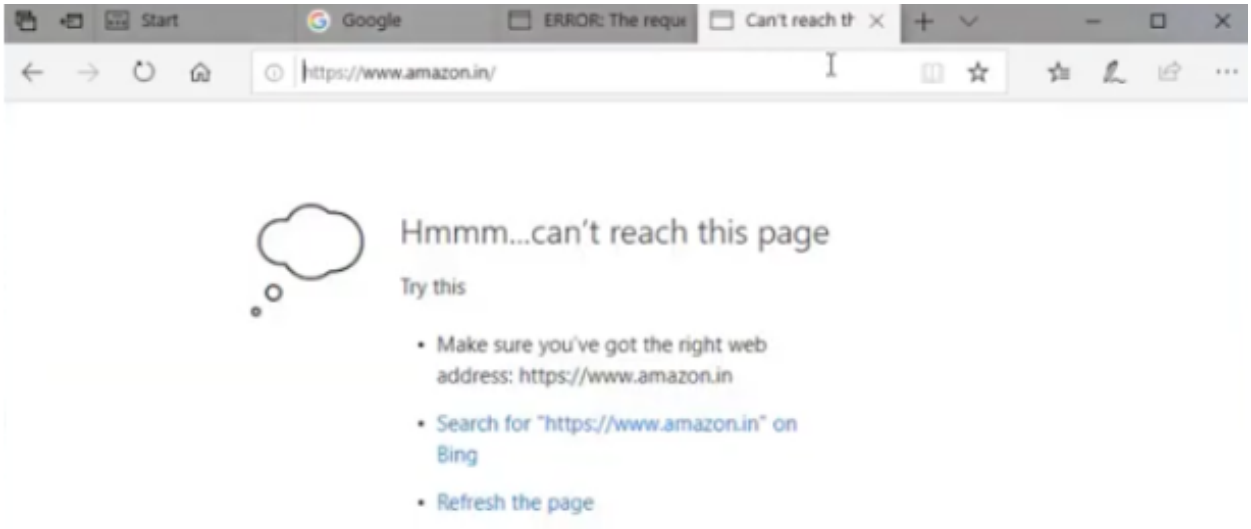


Squid Screenshots while accessing the Blocked Websites:

- **Flipkart.com**




- **Amazon.in**



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