

Proxies and CDNs

How I set up the CDN:

First, I setup Amazon Web Services Account.

1. I setup EC2 virtual server in the cloud by creating instance of basic amazon Linux server and launched the instance.
2. Changed Inbound security group setting of EC2 instance to provide port range from 8080-8090 and TCP rule such that it can be accessed from anywhere.
3. Opened S3 storage service and created a bucket to store the files in Europe region and uploaded a file 'file.bin' for size 51MB with accessible permission settings.
4. Then opened CloudFront Content Delivery service to create a distribution to serve files stored in S3 storage service all over the world. It took a while to copy the content all over the amazon data centres, after 15 minutes it's been deployed and ready to use.
5. Then checked if the file is accessible from domain name of CDN and proceeded with further steps.

How I setup wget tool:

I have installed wget tool on windows and used wget command to download the file from servers. Wget command takes first argument as requested URL, if it needs to fetch through proxy then 'http_proxy' argument is used to mention proxy server.

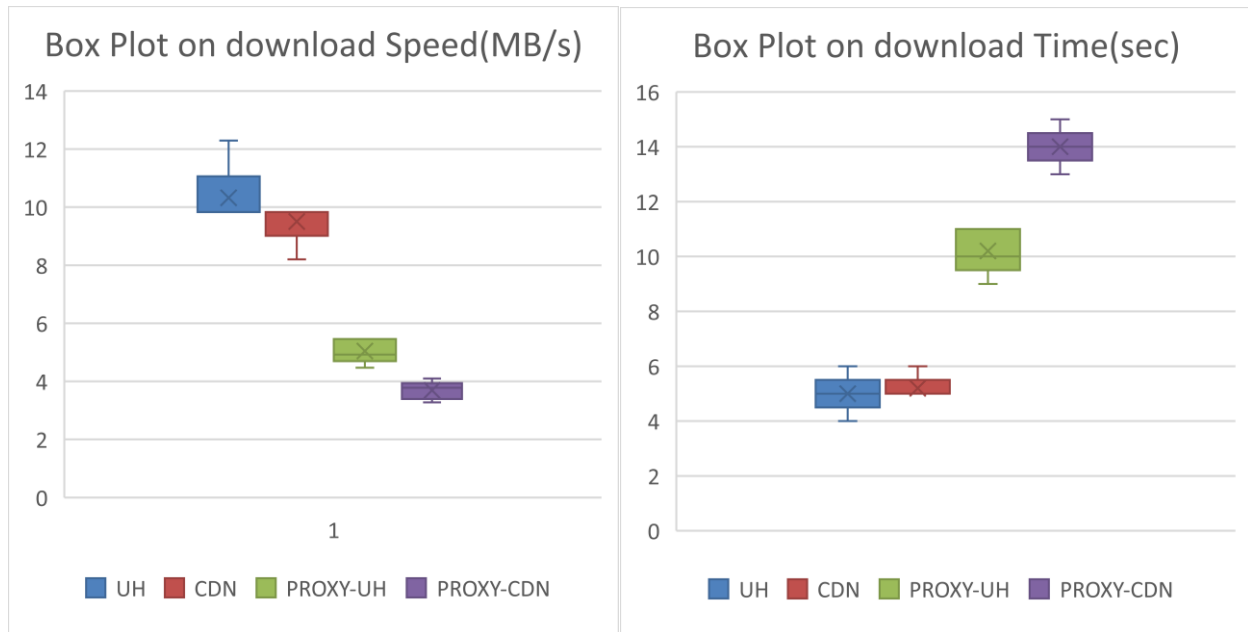
I have uploaded the same file "file.bin" of size 51MB in UH server "*program.uh.cs.edu*" by using SFTP and ran a server to serve that file by using command ***python3 -m http.server 20220***.

I have performed 5 measurements for each request for the content to download from server.

1. **Directly from UH server**
wget http://program.cs.uh.edu:20220/file.bin
2. **Directly from CDN**
wget http://d2onyho88rzbba.cloudfront.net/file.bin
3. **From UH through Proxy**
wget -e http_proxy=http://138.201.72.45:8998 http://program.cs.uh.edu:20220/file.bin
4. **From CDN through Proxy**
wget -e http_proxy=http://138.201.72.45:8998 http://d2onyho88rzbba.cloudfront.net/file.bin

Results:

Measurements	UH		CDN		PROXY-UH		PROXY-CDN	
	speed(MB/s)	time(sec)	speed(MB/s)	time(sec)	speed(MB/s)	time(sec)	speed(MB/s)	time(sec)
1	12.29	4	9.83	5	4.47	11	3.78	14
2	9.83	5	8.2	6	4.92	11	3.78	14
3	9.83	5	9.83	5	4.92	10	4.1	13
4	9.83	6	9.83	5	5.46	10	3.28	15
5	9.83	5	9.83	5	5.46	9	3.51	14

**Observations:**

From the results what I observed is that, requests that directly made to UH server and CDN server have close download time but request to UH server gave the lowest download speed. I believe the reason for this is, UH server location might be little bit closer to client than the nearest CDN. The other two requests took longer download time, which I believe as the proxy server is located in Berlin, the request has to go to Berlin then to UH server or CDN server in respective cases to fetch the file. As I observed from the results, the CDN server is located farther from UH server might be the reason for response from CDN was little bit slower than UH server in both with proxy and without proxy cases. Also, I believe that if I made a direct request from India to UH server and to CDN server, results would have been reverse assuming CDN server would be closer to client than the UH server this time.

Limitations:

I believe that it also depends on the speed of my internet connection. If the speed is fluctuating frequently then results may vary request to request. It happened in my case sometimes, so I measured the results during night time so that speed of my internet connection remains somehow stable.