1. Encoding the videos:
   1. Install ffmpeg:
      1. Linux:

***sudo apt update***

***sudo apt install ffmpeg***

* + 1. Windows:
* Download: <https://www.gyan.dev/ffmpeg/builds/ffmpeg-git-full.7z>
* Unzip the file and rename it as ffmpeg and move the folder ffmpeg to C root, C:\
* Add the path: C:\ffmpeg to environment variables, fro doing this you need to press Windows key → input “variables” → click “Edit the system environment variables” → click “Environment Variables” → in “User variables for xxxxx“ double click “Path” → click “New” → input “C:\ffmpeg\bin”, then do the same for “System Variables”.
* Restart your PC to enable the ffmpeg.
  + 1. FreeBSD:

**sudo pkg update**

**sudo pkg install ffmpeg**

* 1. Encoding the Videos with below commands:
* ffmpeg -i big\_buck\_bunny.mp4 -s 480X270 -c:v libx264 -b:v 2000k -g 60 -an input\_video\_480X270\_2000k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -s 640X360 -c:v libx264 -b:v 3000k -g 60 -an input\_video\_640X360\_3000k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -s 960X540 -c:v libx264 -b:v 5000k -g 60 -an input\_video\_960X540\_5000k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -s 1280X720 -c:v libx264 -b:v 10000k -g 60 -an input\_video\_1280X720\_10000k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -s 1920X1080 -c:v libx264 -b:v 17200k -g 60 -an input\_video\_1920X1080\_17200k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -s 3840X2160 -c:v libx264 -b:v 40000k -g 60 -an input\_video\_3840X2160\_40000k.mp4
* ffmpeg -i big\_buck\_bunny.mp4 -c:a aac -b:a 128k -vn input\_audio\_128k.mp4
* MP4Box -dash 5000 -rap -profile dashavc264:onDemand -mpd-title BBB -out manifest.mpd -frag 2000 input\_audio\_128k.mp4 input\_video\_480X270\_2000k.mp4 input\_video\_640X360\_3000k.mp4 input\_video\_960X540\_5000k.mp4 input\_video\_1280X720\_10000k.mp4 input\_video\_1920X1080\_17200k.mp4 input\_video\_3840X2160\_40000k.mp4

**For -i option, replace the filename with your own video, for -an option, you can replace the filename with any name you want. You can decide how many segments you want.**

1. Configure the server:

**For Windows**

* 1. Setting Up the Web Server
     1. Open up Programs and Features (either through the control panel or Cortana)
     2. Click Turn Windows features on or off
     3. Find Internet Information Services
     4. Tick the box
     5. Click OK and it will install
     6. Test it by opening Chrome and navigating to your local internet address, "127.0.0.1"
     7. You should see the default IIS page
  2. Enabling CORS:
     1. Open up the web server (WindowsKey+S then type "iis")
     2. Under Connections open up your server
     3. Then open up Sites Click on "Default Web Site" since that is where we put our files
     4. Double Click on HTTP Response Headers
     5. Under Actions click Add…
     6. For name, type in "Access-Control-Allow-Origin"
     7. For value, type "\*"
     8. Click OK to add the header
     9. Click add once more
     10. For name, type in "Access-Control-Allow-Headers"
     11. For value, type in "Range"
     12. Click OK to add the header
  3. Adding the DASH MIME Type
     1. Under connections click your server
     2. Double Click MIME Types
     3. Click Add...
     4. For File name extension type ".mpd"
     5. For MIME type type "application/dash+xml"
     6. Click OK

**For Linux**

1. Install Apache2:

sudo apt update

sudo apt install apache2

1. Enable the CORS:

## Enable headers module

sudo a2enmod headers

## Modify the Apache configuration file:

sudo nano /etc/apache2/apache2.conf

Then add the commands in the tag:

<Directory /var/www/html>

...

Header set Access-Control-Allow-Origin "\*"

Header set Access-Control-Allow-Methods "POST, GET, OPTIONS, DELETE, PUT"

Header set Access-Control-Max-Age "1000"

Header set Access-Control-Expose-Headers: "Server,range,Content-Length,Content-Range"

Header set Access-Control-Allow-Headers "range,x-requested-with, Content-Type, origin, authorization, accept, client-security-token"

...

</Directory>

1. Restart the Apache server:

sudo systemctl restart apache2

**For Freebsd**

1. Install Apache2 (httpd):

sudo pkg update

sudo pkg install apache24

1. Enable and start Apache:

sudo sysrc apache24\_enable=YES

sudo service apache24 start

1. Enable headers module (for CORS):

sudo nano /usr/local/etc/apache24/httpd.conf

Ensure this line is present (and **not commented**):

LoadModule headers\_module libexec/apache24/mod\_headers.so

1. Enable CORS for Apache document root:

Still in httpd.conf, find or add this block:

<Directory "/usr/local/www/apache24/data">

Options Indexes FollowSymLinks

AllowOverride None

Require all granted

Header set Access-Control-Allow-Origin "\*"

Header set Access-Control-Allow-Methods "POST, GET, OPTIONS, DELETE, PUT"

Header set Access-Control-Max-Age "1000"

Header set Access-Control-Expose-Headers "Server,range,Content-Length,Content-Range"

Header set Access-Control-Allow-Headers "range,x-requested-with, Content-Type, origin, authorization, accept, client-security-token"

</Directory>

1. Restart Apache:

sudo service apache24 restart

1. Put the MPD file and the dash segments into the apache htdocs folder:

For Windows: C:\inetpub\wwwroot\

For Linux: /var/www/html

For FreeBSD: /usr/local/www/apache24/data

1. Download the HTML and javascript files at: <https://drive.google.com/drive/folders/1PwFtp0dLxpu-a0GaL0ciRWla2pM5NYa6?usp=sharing>

Get the ip address of your server, replace the ip address in the .js file with your server ip address. Check details in script.js. Use Firefox (recommended) or Chrome to open the HTML file to play the streaming.