

CS307 : System Practicum

vTorrent : BitTorrent Client

Group 22



vTorrent :

Project Description

Development of a BitTorrent based
file sharing system only for IIT Mandi
local area network.

A large blue geometric shape, resembling a stylized 'C' or a corner, occupies the left side of the slide.

Components for this system.

- BitTorrent Client
- .torrent file server
- Tracker

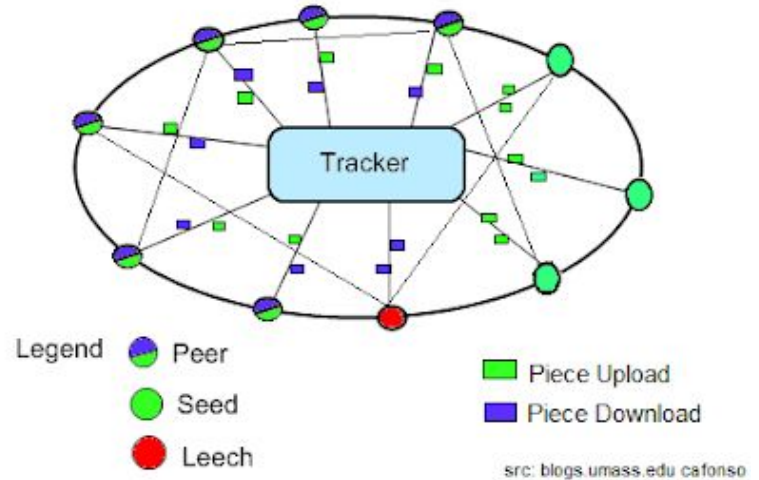
Components of System : Technical Description

- To achieve this system configuration, 2 VM's were used with linux operating system with network interface set to bridged adapter. This resulted in **both VM's to receive ip from Home router with ip address 192.168.1.0/24.**
- So now system includes 4 components

UserName	Work	IP
vaibhav-X510UNR	vTorrent Client	192.168.1.12
client2	FTP File Server	192.168.1.4:20
client2	Tracker	192.168.1.4:8080
client1u	qbitTorrent Client	192.168.1.2

Tracker

- Tracker is the heart of BitTorrent swarm.
- Every peer sharing one given file is connected by tracker i.e, tracker has status of file at each peer.
- It helps peers to find suitable peers to share files.
- To reduce one point failure, more than one trackers are used for each file.



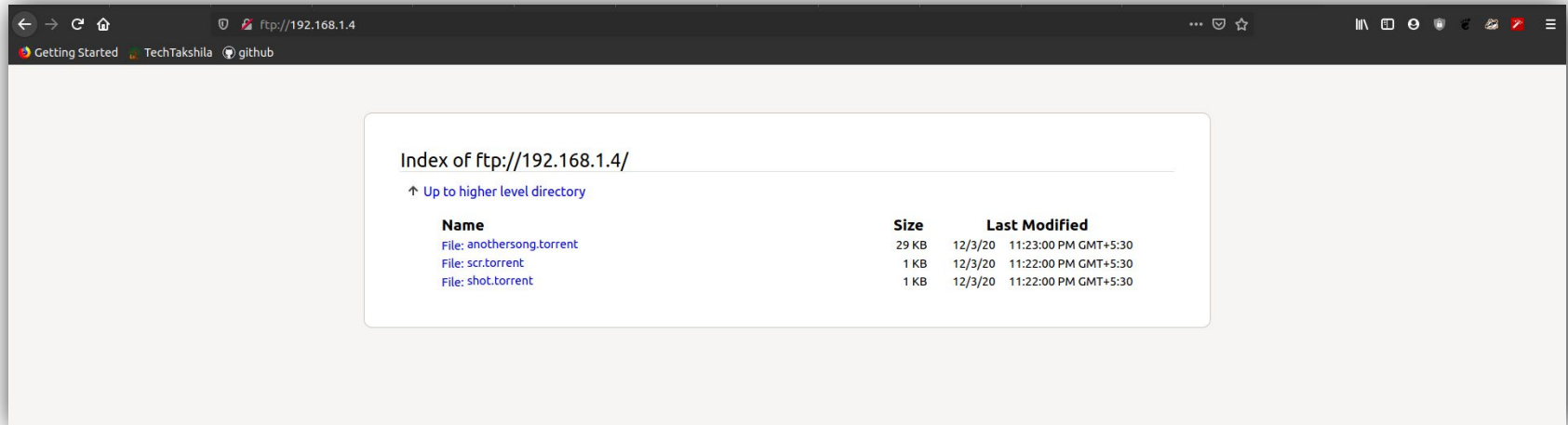
Tracker

- To achieve this system we used open source bitTorrent tracker ***opentracker***.



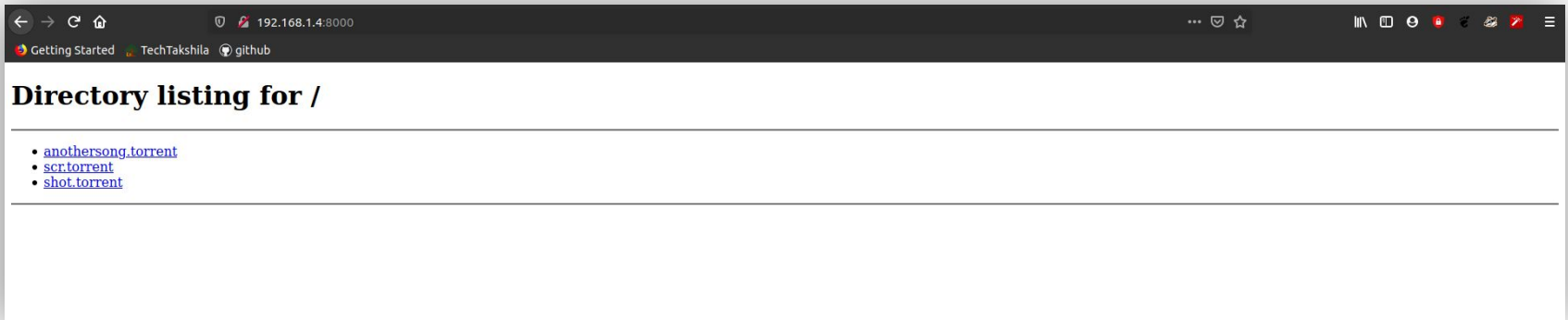
File Server(ftp)

- Hosted a central ftp server on client2 with ip 192.168.1.4
- User have to login with their LDAP user and password.
- Users cannot see each others files.



File Server (http)

- A Central Place to hold all torrent files available for public use for IIT Mandi.
- Cannot upload files without admin privileges.



vTorrent Client

- A BitTorrent specification based python client with asyncio enabled.
- Created a python package for ease of use.

```
vaibhav@vaibhav-X510UNR:~/Downloads$ vtorrent -h
usage: vtorrent [-h] [--path PATH] [-cname CNAME] [--tracker TRACKER] torrent

vtorrent v0.1.1

positional arguments:
  torrent              The metainfo file path (.torrent)

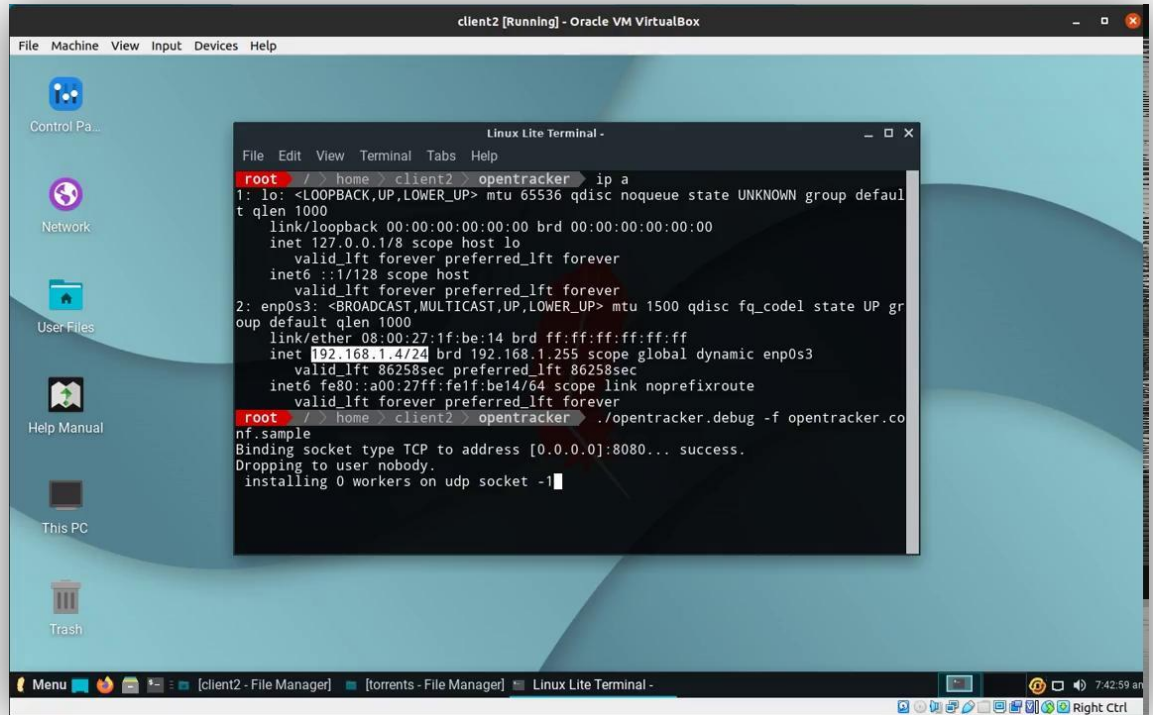
optional arguments:
  -h, --help            show this help message and exit
  --path PATH           The download directory path, defaults to './downloads'
  -cname CNAME          To convert normal file into .torrent file, (input name of
                        the normal file)
  --tracker TRACKER     address of the tracker in format { http://server-
                        ip:server-port/announce }
vaibhav@vaibhav-X510UNR:~/Downloads$
```



Working of Components

Working of tracker

This video is working of
the tracker listening on
port 8080/tcp at ip
192.168.1.4



The screenshot shows a Linux Lite desktop environment with a terminal window open. The terminal displays the output of the 'ip a' command, showing network interfaces 'lo' and 'enp0s3'. The 'lo' interface has an IP of 127.0.0.1, and the 'enp0s3' interface has an IP of 192.168.1.4. Below the network information, the terminal shows the command to start the opentracker daemon in debug mode, listening on port 8080. The output indicates that the socket binding was successful and that 0 workers were installed on the UDP socket.

```
client2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

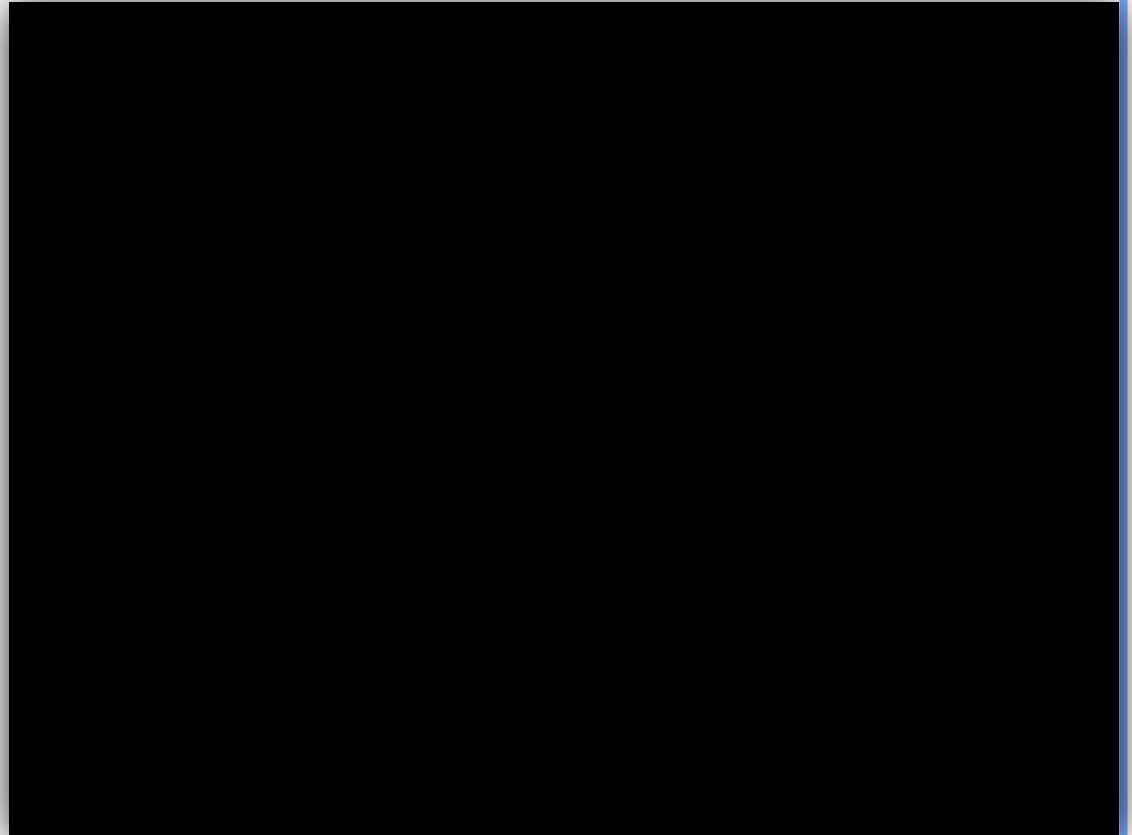
Control Pa...
Network
User Files
Help Manual
This PC
Trash

Linux Lite Terminal -
File Edit View Terminal Tabs Help

root / > home > client2 > opentracker ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP gr
    link/ether 08:00:27:1f:be:14 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.4/24 brd 192.168.1.255 scope global dynamic enp0s3
        valid_lft 86258sec preferred_lft 86258sec
    inet6 fe80::a00:27ff:fe1f:be14/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root / > home > client2 > opentracker ./opentracker.debug -f opentracker.co
nf.sample
Binding socket type TCP to address [0.0.0.0]:8080... success.
Dropping to user nobody.
installing 0 workers on udp socket -1
```

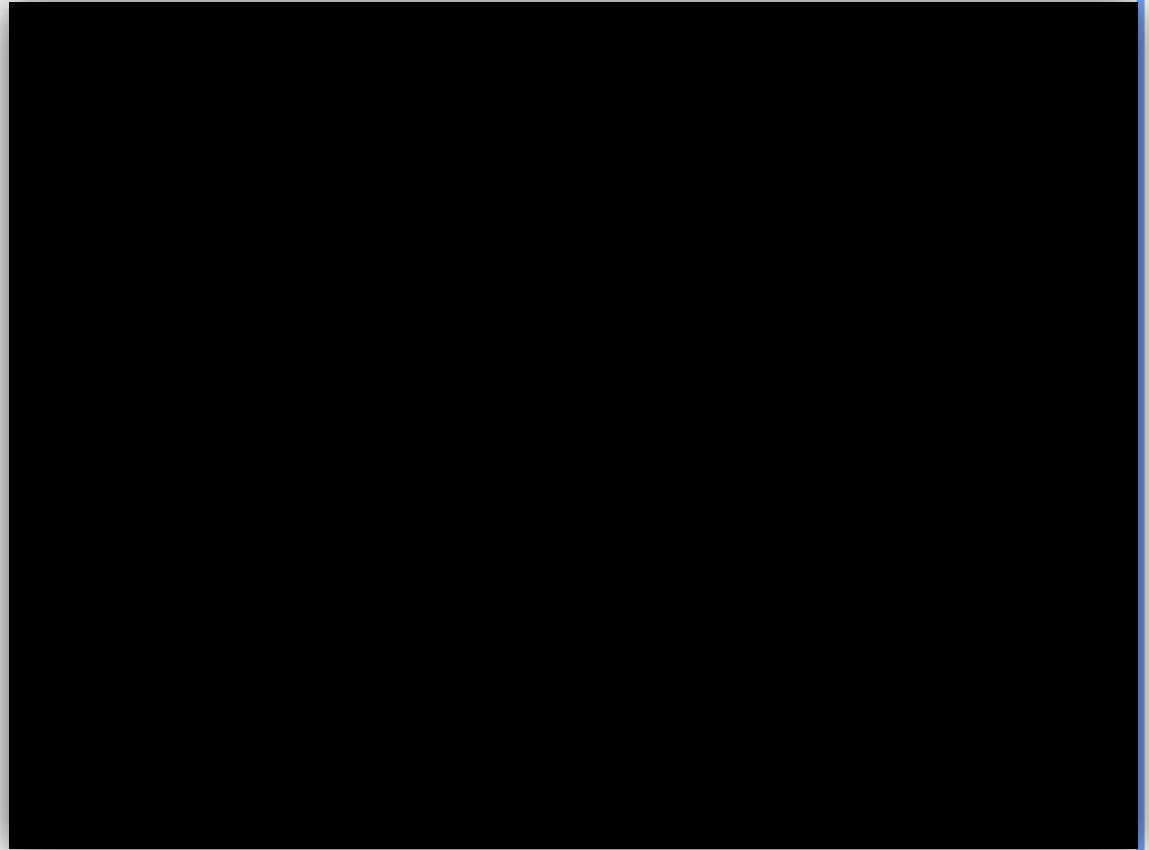
Working of file server

This video is working of the ftp server present at 192.168.1.4, it is accessed from laptop 192.168.1.12 with LDAP id and passwd.



Working of client

- This video is working of the client with torrent file of ubuntu 20.10.iso taken from official ubuntu website.
- This shows that client is able to connect to tracker and download from peers.



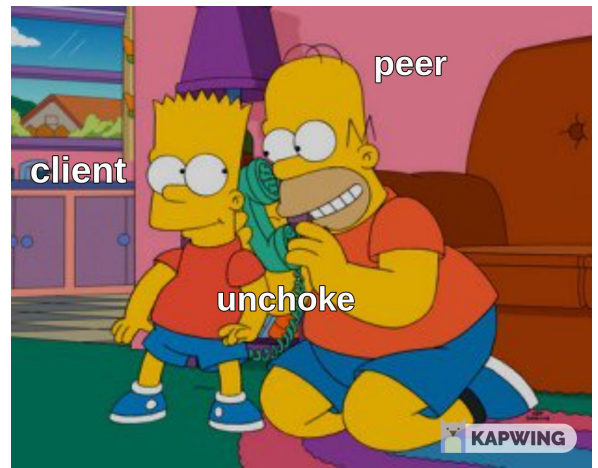
PWP (Peer wire protocol)

- According to BTP/1.0 PWP facilitates the exchange of pieces of the file. The Bittorrent Client maintains the **state information** for each connection that it has with a remote peer.

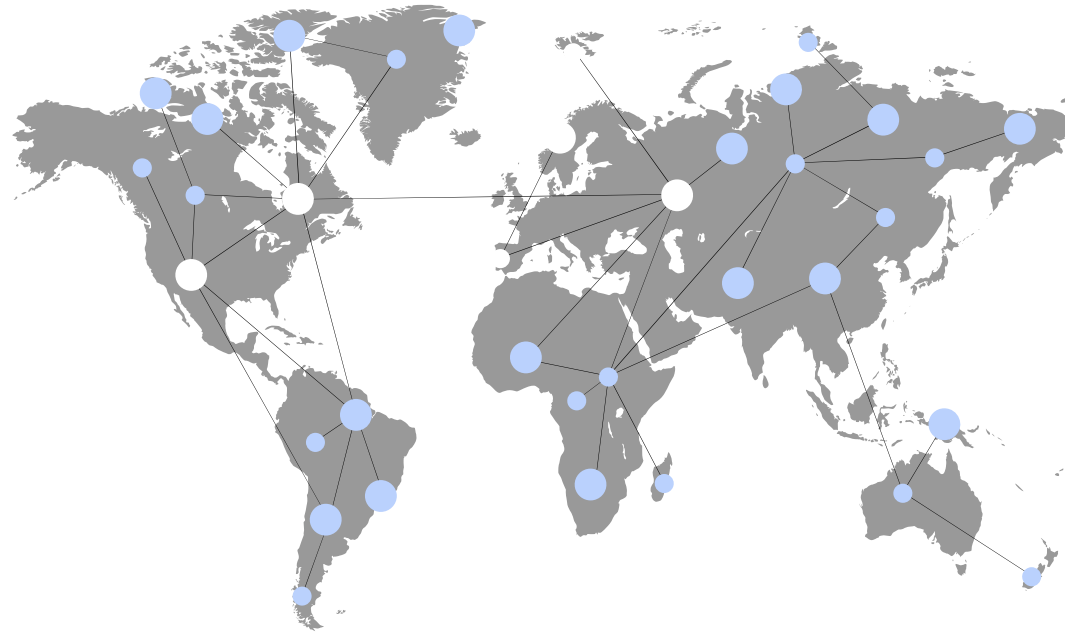
State	Significance
<i>am choking</i>	client is choking the peer
<i>peer choking</i>	peer is choking the client
<i>am interested</i>	client is interested in peer
<i>peer interested</i>	peer is interested in client

Client is getting choked

- Without peer uploading, the client is getting choked by other peers.
- Solution : code the uploading of requests.



Peer To Peer



Client Services



Security

vTorrent offers security by using only private trackers and file serving system.



Create torrent

vTorrent can create .torrent metafiles for you.

Group 22



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Thanks!

Does anyone have any questions?

