

# MICRO TRANSPORT PROTOCOL(uTP)

## -----WEB TRANSPORT-----

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### ABSTRACT:

In this paper we will discuss about web transport or micro transport protocol (uTP) is a UDP – based protocol designed by Bit Torrent to reduce network congestion by using the (LEDBAT) means Low Extra Delay Back ground Transport. Congestion control algorithm it enables back ground data transfer to utilize available band width efficient without interrupting higher – priority traffic .. making its highly ISP(internet service provider) – friendly . it widely used in torrent client like miu(uTP). Web transport is modern secure and low latency web API that enable bidirectional client-server communication . primarily utilize HTTP/3 protocol . it support both reliable stream and unreliable data gram out-of-order data allowing for flexible data transfer suitable for real0time application like live streaming and gaming . primarily built HTTP/3(via QUIC)-Quick UDP Internet Connection-. through it can operate over HTTP/2 web transport is designed to address the limitation of web socket by offering a more efficient , multi stream approach that avoid head-of- line blocking issues found in web socket provide a common set of API is to interact with different underlying protocol (primarily HTTP/3 over QUIC). Allow for unreliable , out-of-order data delivery which is ideal for time- sensitive data. It is browser –friendly designed for web application allowing for server multi-flexed stream because web transport is consider a GAME-CHANGER for its ability to provide raw UDP-like functionality with in the browser serving as a successor to web socket for high-performs.

KEYWORDS:UDP,HTTP,TLS,TCP,IP,QUIC

### INTRODUCTION:

The web transport is modern web API and protocol framework that provides a low-latency ,Bidirectional and multiplexed communication channel between web client (Browser) and a

server over HTTP/3 .it is designed to address the limitation of older technology like web socket and well –suited for high-performance , real-time application such as on-line gaming , live streaming and collaborative tools. Web transport operate primarily on the top of HTTP/3 which is turn uses the QUIC(Quick UDP Internet Connection) transport protocol QUIC runs over UDP and offer served performance benefit over TCP. such as faster communication setup times and improved congestion control . it support multiple independent data stream over a single connection , which prevent “Head-Of- Line Blocking”. This means a lost packet in one stream does not delay others unrelated stream a significant advantage over web socket web transport unlocks new priority for interactive web experience.

#### ON LINE GAMNG:

It uses low latency data transfer for responsive multiplayer action and action closed gaming services.

#### MEDIA STREAMING:

Efficient secure and low latency audio and video delivery n changing sever-push capabilities.

#### IoT(Internet Of Thinks):

Light weight and efficient transfer of small regular data packet from connected devices.

#### REAL TIME COLLABRATION:

Seamless performance for application like live documents editing and video conferencing .

While the technology’s still in a draft stages with the IETF(Interact Engineering Task Force ) and W3C .(world wide web consortium ) it is supported in most modern chromium-based Browser and it is adoption is growing.

The core capability of the protocol framework provides three primary communication mechanism.

#### Datagram:

Unreliable out-of-order data transfer similar to UDP .ideal for latency sensitive application like gaming where vocational packet loss is accepted .

#### Unidirectional stream:

Reliable ordered one-way byte stream.

Bidirectional stream:

Reliable ordered two-way byte stream .allowing both client- server to initiate data transfer.

Advantageous:

The web transport address served limitation in address technologies. Eliminate the head-of-line blocking unlike web socket , which uses single order stream on a single connection almost packet in one stream does not delay data in others.

Unified session context:

Application can multiplex may stream and datagram with in a single web transport session reducing the over head of multiple hand shakes.

Client-server focus:

While web RTC is optimized for (peer-to-peer)or p2p communication web transport is specifically tailored for high-performance client-server interaction.

Modern web integration:

It is compatible with the web security models (requiring TLS(transport layer security))and support advance feature like web workers.

Current status:

Web transport is currently an avoiding internet-draft managed by the IETF(Internet Engineering Task Force) and the W3C (World Wide Web Consortium)while it has gained experiments or partial support in major browser like chrome and firebox it is not yet a fully finalized industries standard.

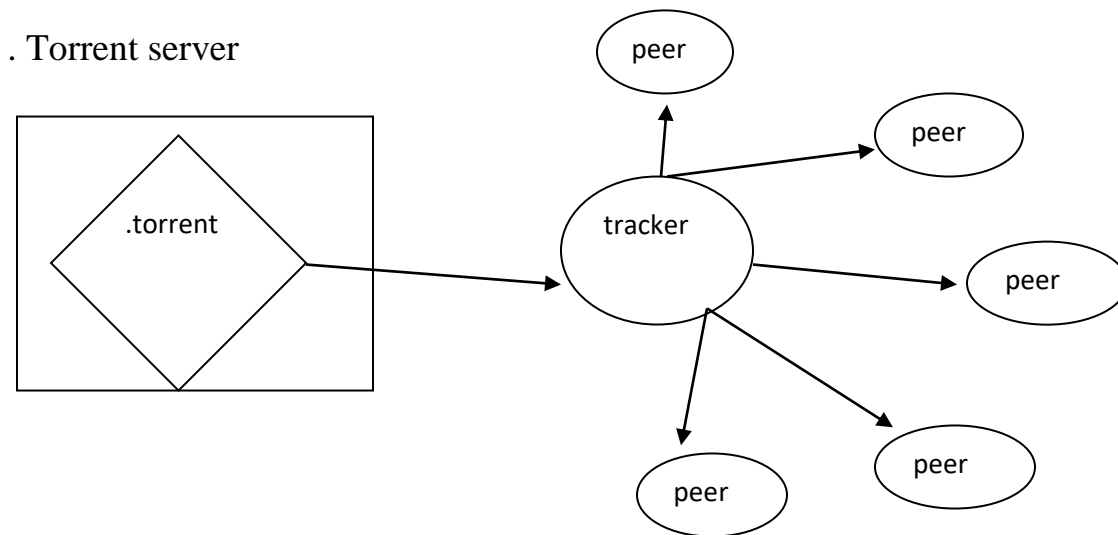
TRANSPORT PROTOCOL IS BitTorrent:

Bit Torrent is a decentralized peer0to-peer (p2p) file sharing protocol . that primary used TCP for data transfer . it often utilize uTP –micro transfer protocol a UDP –based variant designed to reduce latency and manage network congestion better then TCP . it split file in to small pieces , allowing efficient , simultaneously down load in from multiple peers,

Bit Torrent protocol:

While traditionally TCP \_ based modern Bit Torrent relies heavily on uTP(micro transport protocol)UDP to avoid over loading internet connection . it operate by breaking files in to small piece , allowing uses to down load from multiple sources simultaneously . which is faster than traditional client-server method (HTTP/FTP)

It uses tracker to find the peers utilizes a “rarest-first” approaches to ensure the high file availability employees a “tit-for-tat” strategy to encourage sharing. where faster uploaded receive better download speed. it is high efficient for distributing large file and is a legitimate method for file sharing.



**TIT-FOR-TAT strategies:**

This method is a game theory strategy where and agent cooperate and the first move , the mimic the opponent, previous action in subsequent interaction. It encourage mutual co operation allowing for network stability and reciprocity but can lead to cycle of relation if diction occurs . it is strategy of “ equitant relation” or “reciprocal action” an agent start by co operating them in each following steps it replicate the operands last move it is highly effectiveness in it rated long-term interaction such as network transport on line receivers or economic changes.

This power full reciprocal strategy used to manage relation ship and interaction in network , often loading to mutual co operation but requiring careful management to avoid the negative feed back loop.

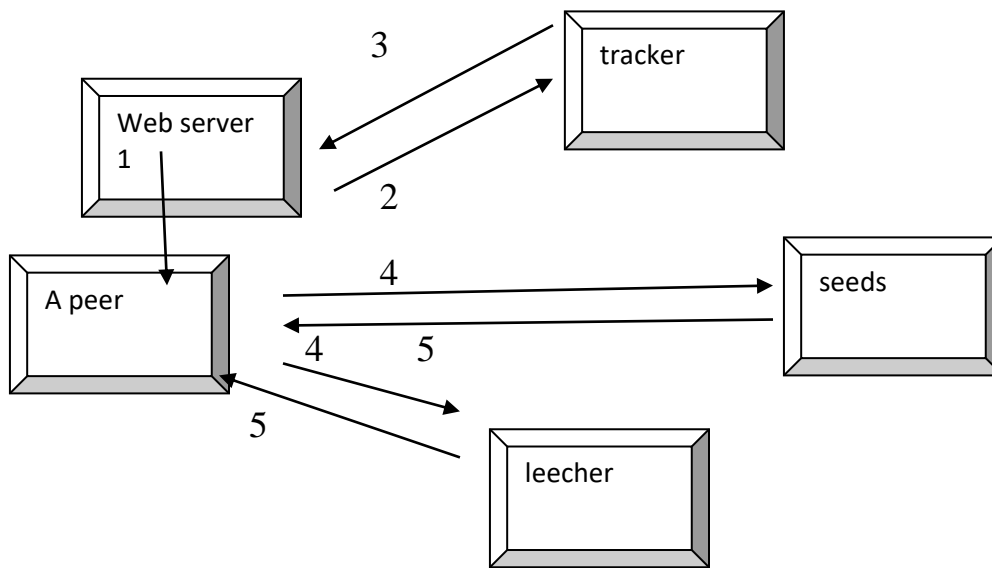
**MICRO Torrent Means:**

It is almost always refer to (uTorrent) a very popular , light weight software application used for file sharing via Bit Torrent .(peer-to-peer) protocol a torrent client software allow you to down load and upload the files(like malicious ,software or large dataset using Bit Torrent protocol the torrent which reference the prefix. Micro .it was named this because the

program was design to be incredibly small size use minimal computer resources (memory, CPU) and run efficiently , unlike large bloated clients .

Micro it mans commonly pronounces as “YOU-Torrent”-MEW-Torrent “Or micro Torrent it is small efficient tool for down loading files from decentralized network now commonly Web server

used for streaming and file management



1.Download 2. Request 3.Send 4.connection 5.Exchange file

SWARM in micro Torrent:

A swarm torrent refers to the entire group of peers (computers) that are simultaneously uploading and downloading the same file using the BitTorrent (p2p) protocol.

THE COMPONENT OF SWARM:

H=the swarm consist of seeder (people who have 100% of the file and sharing it) and leecher /peer (people who have downloading the file and sharing the pieces of they leaves ) it works when it start a torrent downloaded your client (like torrent) or qBitTorrent join the swarm you down load pieces of the file from multiple peoples in the swarm at the same time rather than single server. A swarm has many seeder compared to leecher ensuring the file is easy to download and unit “DIE”(because unreliable ) . there is no central server , which means the swarm is resilient if one person goes off line the download continues from the others .

When you join the swarm ,you become apart of this collection network to exchange data pieces with others the swarm is compared two type of participates .

SEEDER: user who have the 100%complete the files and are only uploading it to others.

## LEECHERS/PEERS:

User who are still downloading part of the file while simultaneously uploading the part they already have to others.

## COONNECTIVITIES:

Your client might show to number (“5,20”) this usually means you are already connected to 5 user out of total of 20 available in the swarm.

## TRACKING:

A tracker or DHT(distributed hash table) is used to help these use find each others and from the swarm.

## UNIQUENESS:

Every unique Torrent has it own dedicated swarm . you only share data with people downloading the exact same file as you.. the BitTorrent protocol allows only one swarm to share the file at any given time . you can think of a swarm as being similar to conference call every one in the swarm shares the same conversation and only one conversation can exits ay only given time in this case the conversation is about the particular file being shared.

## Torrent FILES:

A Torrent site is on-line directory or searching engine that host small files (.Torrent files or magnet links) designed for peer-to-peers(p2p) file sharing using the Bit Torrent protocol . they allow user to download large file such as movie, software , games or media in smaller pieces from others user rather than a single control server after resulting faster speed and greater reliability.

Instead of downloading from one sources you download small pieces of fill from a “swarm” of other user. Seeder who already have the file .they are need to facilitate efficient distribution of data while they are often associated with pirated content . they are also used for legal open-source file sharing (LINUX distribution) torrenting itself is not illegal .but downloading copyrighted material without authentication is many site are known to host or private link to un authorized content while using Torrent site can expose user to malware or legal risk if they down loading copyrighted material without authorization is illegal in many comtries.

## qBitTorrent:

it is free open-sources and cross platform (p2p)file sharing application that sever as lightweight alternative to u torrent . it enable fast, ad-free Torrent downloading with feature like an integrated searching engine RSS support privileged and bandwidth scheduling on WINDOW,LINUX and Mac OS...

## NO ADS;

Unlike many other Torrent client it is agree of advertisement . it allow searching across multiple Torrent sites directly with in the client ,unlike many others site popular client it cutting the no –advertisement malware or bundled software.

## VPN(virtual private network) binding:

A highly recommitted security for qBitTorrent is VPN binding which ensure the application only downloaded when your VPN is active to prevent IP Leeds

## LEGAL CONTEXT:

The software itself is legal to use however downloading copyrighting material ( the movies, of software to haven't paid for ) is illegal in many jurisdiction . it is commonly used for legal process . such as downloading LINUX distribution or public domain context.

## COCLUSION:

The micro transport protocol uTP success fully mitigated network congestion because by heavy file sharing traffic by using LEDBAT( low extra delay background transport ) to priorities other application operating efficiently over UDP. While it improve user experience by reducing latency it is susceptible to security risk from malicious –run compliment receiver it provide reliable order delivery similar to TCP .but it is designed to be “network-friendly “ by slowing down prevent rather than react to network congestion it create a BitTorrent INC... as a UDP based solution to replace TCP for the peer-to-peer transfer , aiming to avoid the high latency and poor responsiveness of the standard TCP congestion control ti that context.

The web based transport is a modern low-latency. Bidirectional protocol design to over come web socket limitation/particularly for real-time application like gaming and live streaming utilize HTTP/3 and QUIC .it offer supervisor performance by eliminating head-of-line blocking and enabling unreliable data transfer it provide supervisor low latency performance by supporting multiple simultaneously stream and un reliable data transmission making it ideal for interactive media.

While web socket are constraint by single stream blocking we transport handles unreliable data (UDP-like ) better then web RTC (real-time clock) in client server setup . it has in chrome ,edge and firebox ( approx 79% global coverage ) but lacks of SAFARI support requiring fall back mechanism for productivity use .it is positioned as the future standard for real-time , high – throughput web communication.

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