

AND FINALLY,  
THE DECENTRALIZATION OF  
**TORRENTS**

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USING  
FLO BLOCKCHAIN

**150 million** active users use BitTorrent,  
a distributed file sharing system.

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About **15 million to 27 million** concurrent  
users are on the network at any time.

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In all, **more than a billion** users  
have tried BitTorrent.

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BitTorrent is **the largest** decentralized  
network in the world.

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BitTorrent Architecture has  
**3** main components:

- Data Storage component
  - Detecting who is online component
  - Locating File component
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Today

COMPONENT	STATUS
Data Storage	Totally Decentralized
Detecting who is online	Decentralized
Locating File	Centralized

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Locating File component is called a **Torrent**.

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## NOW ANNOUNCING:

Decentralization of Torrent by  
storing **Torrent** files directly  
on the FLO Blockchain.

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This will make the BitTorrent network  
**100%** decentralized.

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Users will **no longer depend on** torrent listing sites on the internet to search for torrents to download.

Users **can directly fetch** the torrents from FLO Blockchain using a simple HTML page.

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Most **current** torrent sites are  
adware funded. This leads to users  
being **exposed** to viruses and malware.

Using **Blockchain based**  
torrent search systems, this **risk**  
can be **eliminated**.

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Satoshi Nakamoto taught us  
we can use **economic incentives**  
to solve technical problems.

We can use Blockchain based torrent systems  
to experiment with creating **new funding models**  
for artists using tokenization.

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A pure blockchain like Bitcoin is cross geography.  
There is **no geographical jurisdiction**.

It's like the "**high seas**" of technology.

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In the absence of a clear legal framework governing Blockchains, the **closest applicable legal framework** is the United Nations Convention on the law of the sea.

This project is released under Article 87 1(f) governing "Freedom of High Seas" **guaranteeing freedom of scientific research.**

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Due to the open nature of Blockchain and difficulties enforcing copyrights in a free information exchange system, we propose to create a blockchain based token system to **compensate artists and creators of content.**

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We hope that torrent based blockchain systems will **reward the content creators** much more handsomely than current copyright based royalty regimes.

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However, emergence of an acceptable blockchain-torrent based payment system for content creators will go through a **market-based competitive selection** process.

We are only proposing provide ONE step forward for such a system; one step at a time.

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Capitalism is a creative destruction process.  
Blockchain based economies are extreme  
capitalism in action.

Copyright-based regimes will **not survive the  
blockchain age.**

The **emerging alternatives will be  
much better** for content creators than present  
reward systems if remunerations of successful  
blockchain based systems for its owners are  
any indication.

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For example, YouTube was initially criticized by content creators as a venue for violation of their intellectual property, but later the same platform enabled artists like Justin Bieber and Psy, benefitted from increased access to a wider non-paying audience on YouTube.

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We hope **our torrent** innovation will enable future artists in a similar way, not just with increased exposure but also with a **new business model** for their talents and skills

Evolution of that business model will be seeded only when uninterrupted **access to their creativity** is available.

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Free markets are **creatively destructive**.  
Often destructive elements are faster  
than creative elements

But creativity will catch up.  
And in due time, **clear benefits**  
will be there for all to see.

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## TECHNICAL DETAILS

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The product has 2 independent components:

- Torrent downloader
  - Torrent uploader
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Maximum number of free characters that can be stored in a FLO blockchain transaction is 1040.

But torrents are typically 20000 characters each.

So, we need to first design a way to split the torrent into smaller segments and find a way to link them inside the blockchain.

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Splitting can easily be achieved by reading only 900 characters from the torrent file one at a time, and using the remaining characters for linking purposes.

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We put the **first segment** in the FLO Blockchain, and get its unique transaction ID.

Then we put the **second segment** in the blockchain, and link it with previous transaction ID.

This process continues **until all segments** are put on the blockchain.

The transaction ID of the **last segment** is the entry point to the full data stream, and is published as a torrent ID.

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Transactions from a **global FLO Address** will list all Torrent IDs, and other details like name of torrent, description etc.

This global FLO Address will be a **trusted** address, and will list only trusted and **good quality** torrents.

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The **torrent downloader** will first read the global FLO Address, **find all** the **torrent details** and list it.

The **user will select a torrent to download.** It's entry transaction ID is retrieved, and the last segment of torrent file is downloaded. The previous transaction ID is also retrieved, and data in that ID is downloaded.

Finally **all segments are downloaded** till we reach the first segment which has no further linkages.

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Thus, **all segments** of the torrent can be downloaded from the blockchain.

Now, all the browser has to do is to reassemble them in the correct order, and **we have our torrent file.**

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Since every torrent needs more than one write operation in the FLO Blockchain, we need to also **split the FLO balance** on the address which is uploading.

Before a torrent is uploaded from an address, the number of segments needed is calculated, and the **FLO balance is split** to cover transaction fees for each of them.

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 <p>FUD Torrents</p> <p>Created by Ranchi Mall FUD Blockchain Contract</p> <input type="text"/>	<p>Undisputed 3: Redemption</p> <p>[Movie]</p> <p>-by- FDcV3Xn4F51K91WozakaKdaVrG8Bf7B5fw</p> <p>Tags: Action / Crime / Drama / Sport</p>	<p>True Grit</p> <p>[Movie]</p> <p>-by- FRZUuwwC2Bo1dKhH3u3Gzw8BfVxV5QA16</p> <p>Tags: Action / Western / Crime / Western</p>
<p>The Hundred-Foot Journey</p> <p>[Movie]</p> <p>-by- FDcV3Xn4F51K91WozakaKdaVrG8Bf7B5fw</p> <p>Tags: Drama / Comedy / Romance</p>	<p>The Green Hornet</p> <p>[Movie]</p> <p>-by- FRZUuwwC2Bo1dKhH3u3Gzw8BfVxV5QA16</p> <p>Tags: Action / Comedy / Crime / Sci-Fi / Thriller</p>	<p>Last Passenger</p> <p>[Movie]</p> <p>-by- FRZUuwwC2Bo1dKhH3u3Gzw8BfVxV5QA16</p> <p>Tags: Action / Mystery / Thriller</p>
<p>Mad Max</p> <p>[Movie]</p> <p>-by- FDcV3Xn4F51K91WozakaKdaVrG8Bf7B5fw</p> <p>Tags: Action / Adventure / Sci-Fi / Thriller</p>	<p>Lights Out</p> <p>[Movie]</p> <p>-by- F6LUuwwRRjFuEW97Y4av31eLqgVMK9FrgE2</p> <p>Tags: Action / Drama / Horror / Mystery / Thriller</p>	<p>The Mummy Returns</p> <p>[Movie]</p> <p>-by- F6LUuwwRRjFuEW97Y4av31eLqgVMK9FrgE2</p> <p>Tags: Action / Adventure / Fantasy / Thriller</p>
<p>Inkheart</p> <p>[Movie]</p> <p>-by- F7dGgerhZWD98j5CZpi8BYPhE8RMBLR</p> <p>Tags: Drama / Adventure / Family / Fantasy</p>	<p>Captive State</p> <p>[Movie]</p> <p>-by- FRZUuwwC2Bo1dKhH3u3Gzw8BfVxV5QA16</p> <p>Tags: Action / Western</p>	<p>Django Unchained</p> <p>[Movie]</p> <p>-by- FT9qkvuWxWBDRHd42tDr5nMYFSx7bL3v7</p> <p>Tags: Action / Comedy / Western</p>
<p>Changeling</p> <p>[Movie]</p> <p>-by- FDcV3Xn4F51K91WozakaKdaVrG8Bf7B5fw</p> <p>Tags: Action / Biography / Crime / Drama / History / Mystery / Thriller</p>	<p>Assassins</p> <p>[Movie]</p> <p>-by- F7dGgerhZWD98j5CZpi8BYPhE8RMBLR</p> <p>Tags: Action / Crime / Thriller</p>	<p>Angels &amp; Demons</p> <p>[Movie]</p> <p>-by- F6LUuwwRRjFuEW97Y4av31eLqgVMK9FrgE2</p> <p>Tags: Action / Mystery / Thriller</p>
<p>Spider-Man 2</p> <p>[Movie]</p> <p>-by- FT9qkvuWxWBDRHd42tDr5nMYFSx7bL3v7</p> <p>Tags: Action / Adventure / Fantasy / Romance / Sci-Fi</p>	<p>G.I. Joe: The Rise of Cobra</p> <p>[Movie]</p> <p>-by- F6LUuwwRRjFuEW97Y4av31eLqgVMK9FrgE2</p> <p>Tags: Action / Adventure / Sci-Fi / Thriller</p>	<p>Tom and Jerry in Shiver Me Whiskers</p> <p>[Movie]</p> <p>-by- FDcV3Xn4F51K91WozakaKdaVrG8Bf7B5fw</p> <p>Tags: Action / Adventure / Animation / Comedy / Family / Fantasy</p>

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All the data has been **picked up from** the FLO Blockchain.

Data **upload was done by** an anonymous FLO Address on the FLO Blockchain.

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**TORRENTS**



All torrents were **uploaded by** the FLO Address  
FDG64XNjdsA4rAgfm4ABEs2RcTgqn8Jecv

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Blockchain is designed in such a way that only **digitally signed** messages are accepted.

A torrent upload at address  
FDG64XNjdsA4rAgfm4ABEs2RcTgqn8Jecv  
can **only be done by the owner** of the address  
and no one else because digital signatures  
**cannot be faked**.

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This permits anonymous addresses to **develop a reputation** by ensuring their followers are not subjected to low quality torrents or viruses.

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**TORRENTS**

Thus, a blockchain-based torrent solution  
has **inbuilt quality control**.

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**TORRENTS**



## Torrent Upload

1.

**1** Uploader Info

Your FLO ID \*

**2** Torrent Info

Torrent Name

Choose File No file chosen

Torrent Type \*

Torrent Description

Torrent Tags

Upload Torrent

**1** Uploader Info

FESTHp5x11o247bc7bYmNTxDGNShd1mPboV

**2** Torrent Info

Big Buck Bunny

Choose file big-buck-bunny.torrent

Movie \*

fluffy rabbit is heartlessly harassed by a flying squirrel's gang of rodents who are determined to squash his happiness.

Animation, Short, Comedy

Upload Torrent

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**TORRENTS**



### This page says

Your net balance is : 0.1

Total fee for upload : 0.019000000000000003

Confirm to upload into blockchain?

Cancel

OK

## Torrent Upload 2.

### This page says

Enter FLO private key (WIF) :

XXXXXXXXXXXXXXXXXXXX

Cancel

OK

### This page says

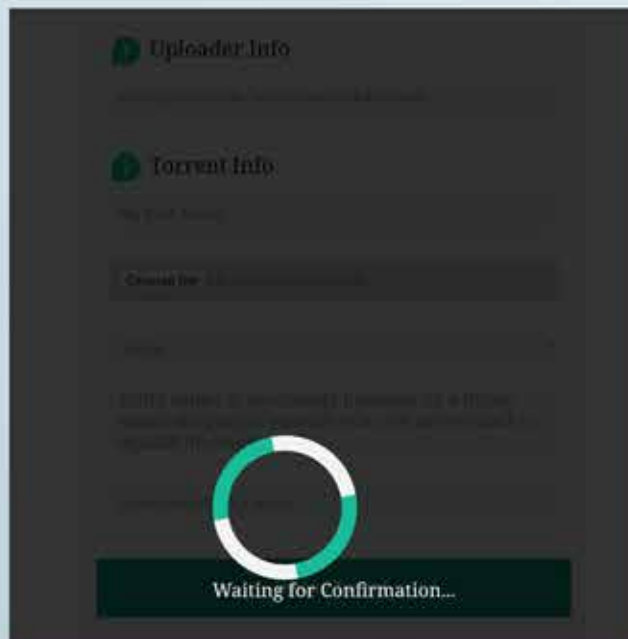
Enter FLO private key (WIF) :

X2qPxsFLENBikKD85NrQZg3HFMnAg

Cancel

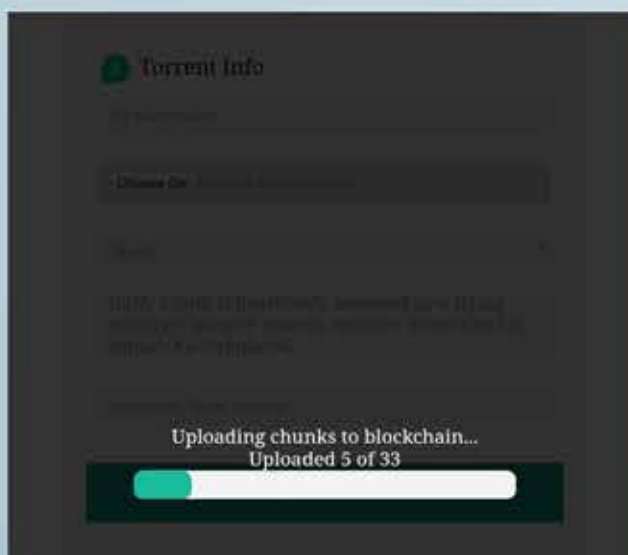
OK

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## Torrent Upload

3.



### This page says

File upload Successful!  
Reference Txid : 85a7d7bb2f45301c3c18e9d48b  
9f327a372848e726f50e74a0ea1a57e2731e24

OK

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**TORRENTS**



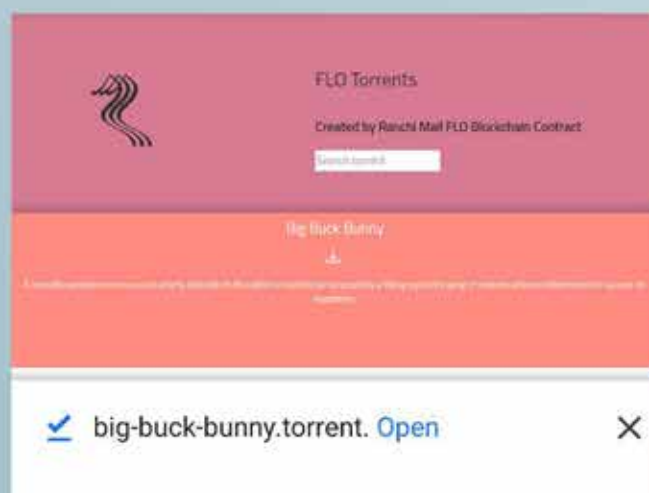
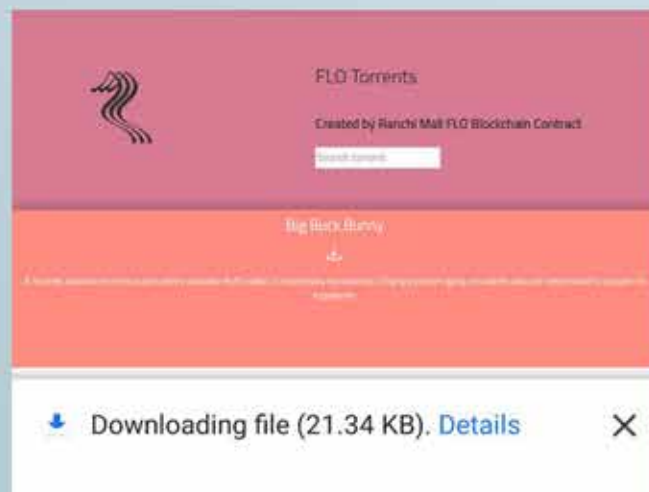
## Torrent Download 1.



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**TORRENTS**



## Torrent Download 2.



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TORRENTS

This is what a  
**raw torrent file**  
looks like

```
{
  "announce": "udp://tracker.leechers-paradise.org:6969",
  "announce-list": [
    [
      "udp://tracker.leechers-paradise.org:6969"
    ],
    [
      "udp://tracker.coppersurfer.tk:6969"
    ],
    [
      "udp://tracker.opentrackr.org:1337"
    ],
    [
      "udp://explodie.org:6969"
    ],
    [
      "udp://tracker.empire-js.us:1337"
    ],
    [
      "wss://tracker.btorrent.xyz"
    ],
    [
      "wss://tracker.openwebtorrent.com"
    ],
    [
      "wss://tracker.fastcast.nz"
    ]
  ],
  "comment": "WebTorrent <https://webtorrent.io>",
  "created by": "WebTorrent <https://webtorrent.io>",
  "creation date": 1490916601,
  "encoding": "UTF-8",
  "info": {
    "files": [
      {
        "length": 140,
        "path": [
          "Big Buck Bunny.en.srt"
        ]
      },
      {
        "length": 276134947,
        "path": [
          "Big Buck Bunny.mp4"
        ]
      },
      {
        "length": 310380,
        "path": [
          "poster.jpg"
        ]
      }
    ]
  },
  "name": "Big Buck Bunny",
  "piece length": 262144,
  3E 96 70 sA C7 89 42 CE 9B C4 94 61 DC 9F AE AD 0F
  Co DF 93 F9 9A F9 B6 A0 9C 40 B1 B1 B3 B7 Co FB 4F
  DD 0A C1 E9 E9 6F 09 C7 FA A5 0C 13 3A C4 D9 07 76
  0F 58 23 66 7D B5 BF 22 EA 6A DB E6 41 06 5F 8E 1F
  55 02 4C 58 B3 C4 26 E4 E9 D1 10 3E 8B 9D 8D 86 6D
  58 EF DC 06 75 FB DE EF 07 77 0B 9A 50 C8 D2 2A 2E
  82 74 71 A5 14 E9 E6 B2 11 56 38 26 18 98 33 42 A2 59
  CE A2 A8 0A D7 23 9F D5 0B B7 4E 60 3A A8 FF 31 FC
  C1 9A 2E AF 01 74 45 96 C6 20 A9 6B 59 6C 9F 69 88
  F1 8F 8A D7 7B 58 DB 8F 8A CF 10 0D 37 7C 00 31 84
  43 AC FD 6E DB E2 2A E4 39 Fo 20 FC AD 43 B9 A2 00
  6D 4D 24 A1 6F DC E8 FD 73 05 03 9D 7C FD 49 27 81
  DC 84 00 1D 6B C5 CF BB B5 BA E9 54 0C A2 A6 DF 17
  95 5E DF F3 01 06 DB 1C 4C 68 C1 26 D4 81 2F 33 DF 8C
  06 13 9B 4F 5C 58 F8 Fo 66 43 4A 60 71 A6 88 D3 9E 30
  C5 50 D0 35 9C 4A 76 04 3E CB 0B FB 27 20 51 6F FE A3
  76 30 26 F7 77 54 58 .....
```

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THE DECENTRALIZATION OF  
**TORRENTS**



## HOW TORRENT LOOKS ON THE BLOCKCHAIN

**Chunks** of 900 characters each plus a blockchain entry point for the next chunk.

```
floData: {"data":"BTi4k0/h6qCLVLaED2ISLy0gy0C5ds/qkFiLxqar  
pMXV+IDPwaK9jx4I/ta+o6Z0o+lmRFv+TR8AzDPciZi9mih4hu2H  
QOiC0S7bRMqmkp08np+4GSrRslwFThxgcXgufXb/z38v26Nf92d  
SnHOL6rkSJkPyEvkG8TCaxLUXBL+PVDNF86YuHZYhC2CZkciAoD  
cG/UO+zts6VUqW9RGJ/0PLnL6aGRvls1WxxzfKWuls/QwpeQtsn  
KkOTMErgWb3AtNI0WM6GX0xc5pnbKpn0w9vAkSSDabsitdfQh  
m2CGQtFb9uKYOh2ncfY8XL6rPKXJl+K3b3xiiBU608SBbKBiR319  
b+E4zlyMZciVNNHEbhPv4WG7nOcZ71xgb63E3dvD4c0Upr61vW  
thQNc9WoX1BqGUpQwJisyvuS3X4egeMius0UjKWfuyFuSLsAsv  
QCwPoyqmSt9q1VvYjp5YauEgLvvpvBR4vjQ6Hb0hwwMwbMCJI  
YX8Sa5MuHTaKsqmQF5iHD/3q/A69QGNbPw5OtvT/HqOuzoPNv  
mBzw0vkpbnaRKPTlkEXgByj288jl9EM5LHz625Z4gSz2PiqQ3qAc  
3gnaG9sC3UYpo0O84ogxtZeX9gD8UjkZCDJGNnEKmK9Cmgc/Y  
e/DEGj26Y4aOvpGND/k/qjhKpKZaO8b7L+qd1ol0vUAoeTwlCqss  
WXKI0SwPjnzLfGIGRllpEhRb89qSf5U1yTZVox5aDx5h5alsUBjJh  
OIM+Ram9+07vstlEvhykxZGwRCD9vAnsQ/iDrb0/4PLlbMAvgcAk  
ZytMTIdEg8G8WupHM+9AAhbDfye9+tijNQkomcVyvDVn0VZgW  
GNuVFo8wWoH6ata3sDVLcGlgSZ8Ff1BR1aE7A/m20xoWXr+T  
x","next":"15431439440eed93b0de205245b6c465f0e46a74a8c5  
40397d4cb65e4bfa4a70"}
```

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THE DECENTRALIZATION OF  
**TORRENTS**



The **last chunk** will have a blockchain entry point set as false.

```
floData: {"data":"zNmQVrbOnU5qu30YJNss3zhryVNYElg2+d+0  
DrqEiB0TL7RbRvYf9dquoigzSX8s+gx234otufbeBA8KHuHTqLLtn  
0/sNEnOkI2GeTmd2IVIMh3Tw2QCWNUnalFK0ZytpxeeTos8QhLv  
vB/HF/MezMewVmwpOxV/5d9DapJyw40qxG5ITlCVxd6nfn+Pru  
sOE7I/G9uJiNyPBiorveaFrs8EcUK33rL9tJSXaVfK8OVsBzRC6Um  
ykhNNZwhGUICLGszb4X4bTlSxWq4Sn+JGHt1lODp1cmwtbGlzd  
GwzMTpodHRwczovL3dlYnRvcnJlbnQuaW8vdG9ycmVudHMvZ  
WU=","next":false}
```

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THE DECENTRALIZATION OF  
**TORRENTS**

An **entry** will be made by an admin ID acting as a directory for all torrents.

**Admin ID** is the FLO address  
FJFfNaSSNSHsnCXBNSnncWpgB3N9ebzhSM  
in this case.

```
floData: {"FLO_Torrent":{"name":"Big Buck Bunny","filename":"big-buck-bunny.torrent","type":"Movie","size":21857,"description":"A recently awoken enormous and utterly adorable fluffy rabbit is heartlessly harassed by a flying squirrel's gang of rodents who are determined to squash his happiness.","tags":"Animation, Short, Comedy","chunks":33,"startTx":"43bc3872071e930a6427aa717a230e15a5b93bb6bbcf90e6b8962084a27ab6db"}}
```

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THE DECENTRALIZATION OF  
**TORRENTS**

A typical torrent file is 25 Kilobytes.

It will need about 28 FLO transactions as each transaction is limited to 900 data characters.

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THE DECENTRALIZATION OF  
**TORRENTS**

Every blockchain **transaction** has to be **paid for**.

In this case FLO tokens are used to pay for FLO transactions.

So we split a single payment input to 29 payment inputs so we can pay for 28 data entries and one admin entry onto the blockchain.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

The **torrent uploader** performs the payment input **splitting** before the torrent can be stored on the FLO Blockchain.

Since blockchains are slow, **it takes some time** to do the splitting, and entering the data chunks onto the FLO Blockchain.

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THE DECENTRALIZATION OF  
**TORRENTS**



**Satoshi Nakamoto**, the designer of Bitcoin introduced some radical **ideas** in computer science and economics.

1. Artificial scarcity can create wealth.

2. Economic incentives can solve computer science problems.

**We will use these** principles to create some economics out of FLO Torrent solution.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**



To create artificial scarcity, we will initialize a **token system**.

And to incentivize torrent uploaders, we will use **economic incentives** using that token system.

We also need to incentivize **content creators**, but that's possible at some scale only when the **token system gains value**.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

Blockchain offers some **value transfer** functions.

We will use consumption of torrents to **feed value** into token system.

As more torrents are consumed in the form of downloads, underlying **potential value increases**.

---

AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

But **actual value** is created by investors.

A **benchmark value** guidance system based on consumption metrics need to be established.

The target is to get **median valuation** of all investors close to the benchmark valuation.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

This can be obtained by having some investors of last resort who will have some seniority in **investor privileges**.

If that cannot be achieved, then some form of **income stream** has to be established through increasing torrent consumption.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**



If the **cost of continuous operations** can be made so low that even if **token valuation** is close to zero, the system will continue to operate and investors will accept **consumption** to token value relationship.

In other words, if the consumption numbers are publicly established and accepted and, continuity of operations are assured even at zero token value, then the investor valuation will agree with the **benchmark guidance valuation**.

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THE DECENTRALIZATION OF  
**TORRENTS**



For instance in stock markets, investors in high technology companies **never see profits**. Profits are mostly retained by companies themselves.

But investors have a consensus that the **valuation of an enterprise** a function of enterprise profits.

**Stock market valuation** reflects that consensus.

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THE DECENTRALIZATION OF  
**TORRENTS**

Now assuming the majority of investors agrees on **the general valuation** of a token system based on some consumption numbers,, and **backed** that valuation **with real money**, then the remaining investors will have to agree.

Over time such consumption-linked **token valuation principles** will be agreed upon.

Of course, for this to apply, **continuity of operations** is a necessary condition.

Investors have to **feel confident**, that no matter what torrent system is being used, it will always continue.

A **pure blockchain system** makes it easy to create that confidence.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

Valuation of last resort:

This idea becomes even stronger if some kind of **hypothetical purchaser** of last resort is available.

If that hypothetical buyer of **last resort system** can be created, then this system will become iron clad.

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THE DECENTRALIZATION OF  
**TORRENTS**



So now we will try to find out that **hypothetical buyer** of last resort.

Suppose consumption of torrents increases by a **certain proportion**, and, a certain ratio of the new consumers buy the **new tokens**.

Then, if we can statistically establish an increase in new token buyers as a result of **more consumption**, we will have a direct linkage between increased consumption and **higher valuation**.

This will create the hypothetical buyer of last resort. We will **clearly establish** the link between more consumption and higher valuation.

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AND FINALLY  
THE DECENTRALIZATION OF  
**TORRENTS**

However, consumption user pool to investor conversion only provides a **minimum level** of valuation.

There are more reasons why a buyer of last resort will buy **consumption based** tokens.

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THE DECENTRALIZATION OF  
**TORRENTS**



Suppose the technology underpinning the system represented by the consumption token system fills a **vital technology gap** for an existing large technology player, then **valuation for hypothetical investor** of last resort is higher.

This can be attained if, for instance, the torrent system creates a Netflix-like **interface in blockchain mode**. Then users of such a technology, create **additional value** for the hypothetical buyer of last resort.

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AND FINALLY  
THE DECENTRALIZATION OF  
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Similarly, if the underlying system is **valuable** to a competitor of an existing large technology player, the hypothetical buyer of last resort **will pay more for it.**

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Assuming the underlying system has a **very passionate community**, then access to that community has **valuation potential** for the hypothetical buyer of last resort.

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In an open source world **valuation increases** when good coders come together, and, the owner of a system gets the privilege of setting the **technology direction**, and version change acceptance rights.

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Some kinds of consumption can be **geographically concentrated**, and can have **strategic value** to the buyer of last resort.

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THE DECENTRALIZATION OF  
**TORRENTS**



Sometimes access to distribution channels represented by a consumption token system can be **extremely valuable** just by themselves, and would increase valuation.

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If the consumption user base is large, **buying the attention** to it has valuation potential. Usually it is achieved through conventional **advertising** but, less intrusive and elegant methods can be designed.

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One **big source of value** in a consumption-led system is the desire of some consumers to **be given priority** over other consumers.

For instance, if we consider Twitter as a consumption system for tweets, then some users would pay to have sponsored tweets.

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In the real world, the buyer of last resort may never be needed.

But just proving his existence is sufficient to **convince an investing group** of valuation, just on the basis of guaranteed consumption.

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Once a valuation basis is established, then a subsequent investing group can assume the **consumption token rights** of previous investing group.

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THE DECENTRALIZATION OF  
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If sufficient scarcity is maintained, and accruing valuation to the scarce token pool is increasing over time, the **prices of tokens** will secularly **increase in the long term**.

Of course, **normal speculative activity** will occur along with the tokens own boom and bust cycles.

But over the long term, if the consumption is **verifiably increasing**, then a secularly price appreciating system can be designed.

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AND FINALLY  
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Now we are ready to get into the specifics of the **economics of torrent token system**.

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AND FINALLY  
THE DECENTRALIZATION OF  
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