

AND FINALLY,
THE DECENTRALIZATION OF
TORRENTS

USING
FLO BLOCKCHAIN

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

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.

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** file directly
in 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 Internet to search for Torrents to download.

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

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Most of **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
you can use **economic incentives**
to solve technical problems.

We can use Blockchain based torrent systems
to experiment create **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 "**high seas**" of technology.

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In absence of clear legal framework governing Blockchains, the **closest applicable legal framework** is 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 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 providing 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.

Copyrights based regimes will **not survive**
Blockchain age.

However, 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, who 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, just not in increased exposure but also with a **new business model** for their talents and skills

Evolution of that business model will be seeded only interrupted **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 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 figure a way to split the torrent in 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 **till all segments** are put in blockchain.

The transaction ID of the **last segment** is the entry point to full data stream, and is published as 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, we have **all segments** of the torrent downloaded from the blockchain.


Now all the browser has to do is to reassemble them in 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.

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

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 <p>FLO Torrents</p> <p>Created by Ranchi Mall FLO 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 / Drama / 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 / Thriller</p>	<p>Django Unchained</p> <p>[Movie]</p> <p>-by- FT9qkvuWxWBDRHd42tDr5nMYFSx7bL3v7</p> <p>Tags: Action / Drama / 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 & 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 from** FLO Blockchain.

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

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

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Blockchain is designed in such a way that every message has to be **digitally signed** otherwise it will be rejected.

So a torrent upload at address FDG64XNjdsA4rAgfm4ABEs2RcTgqn8Jecv can **only be done by owner** of 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 its followers are not subjected to low quality torrents or viruses.

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Thus a blockchain based torrent solution
has **inbuilt quality control** in it.

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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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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

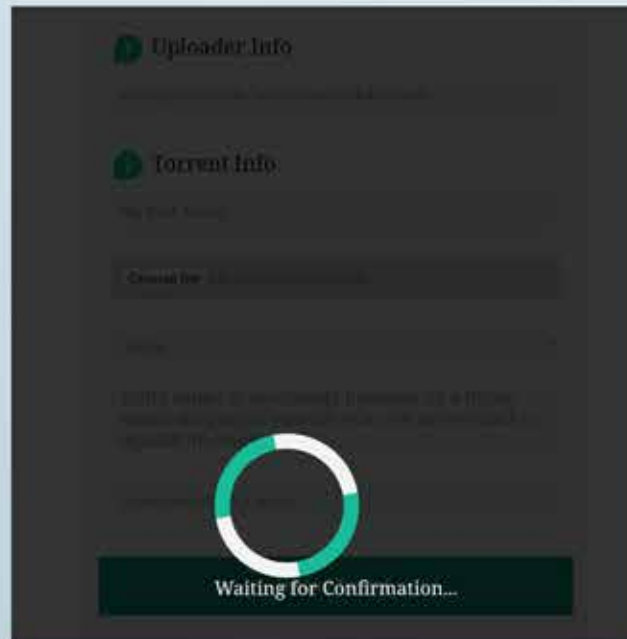
Enter FLO private key (WIF) :

X2qPxsFLENBikKD85NrQZg3HFMnAg

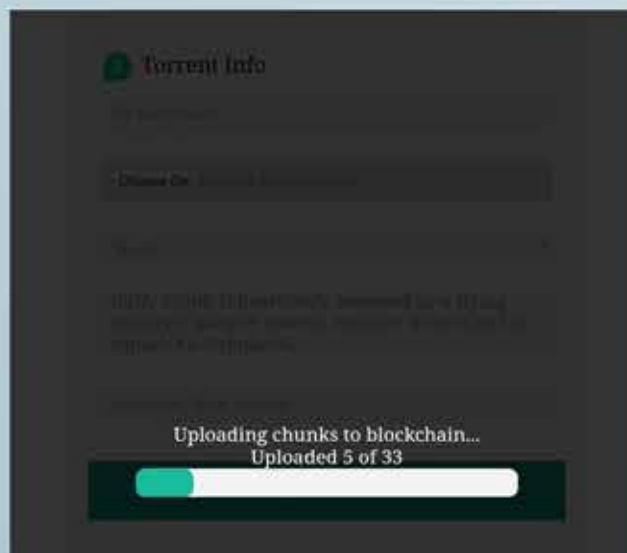
Cancel

OK

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Torrent Upload 3.



This page says

File upload Successful!
Reference Txid : 85a7d7bb2f45301c3c18e9d48b
9f327a372848e726f50e74a0ea1a57e2731e24

OK

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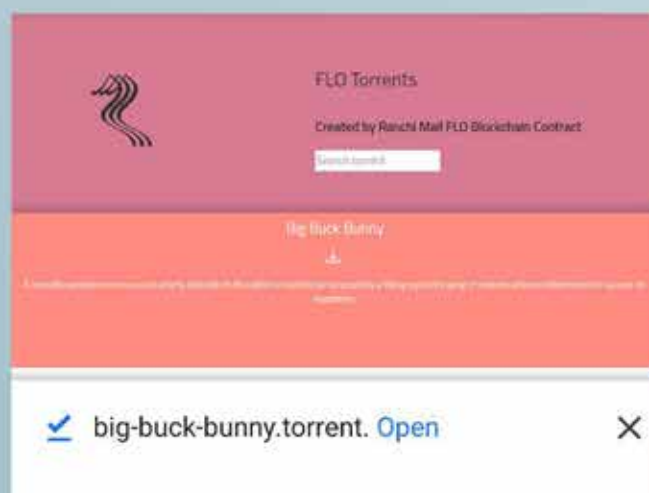
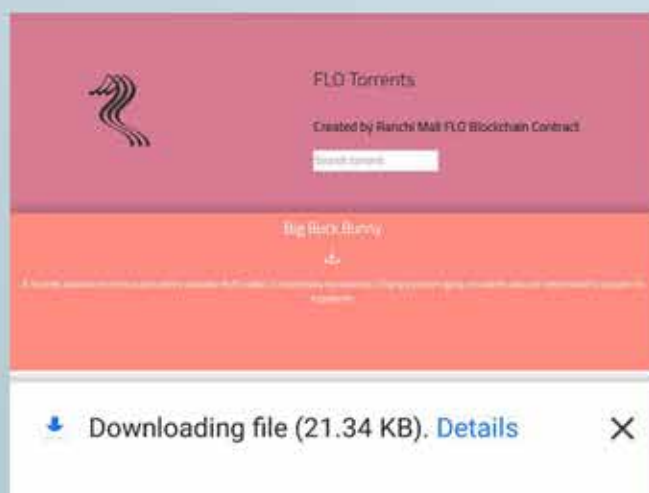
Torrent Download 1.



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Torrent Download 2.



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This is how
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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HOW TORRENT LOOKS IN BLOCKCHAIN

Chunks of 900 characters each plus
Blockchain entry point for 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  
WXXI0SwPjnzLfGIGRllpEhRb89qSf5U1yTZVox5aDx5h5alsUBjJh  
OIM+Ram9+07vstlEvhykxZGwRCD9vAnsQ/iDrb0/4PLlbMAvgcAk  
ZytMTIdEg8G8WupHM+9AAhbDfye9+tijNQkomcVyvDVn0VZgW  
GNuVFo8wWoH6ata3sDVLcGlgSZ8Ff1BR1aE7A/m20xoWXr+T  
x","next":"15431439440eed93b0de205245b6c465f0e46a74a8c5  
40397d4cb65e4bfa4a70"}
```

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

```
floData: {"data":"zNmQVrbOnU5qu30YJNss3zhryVNYElg2+d+0  
DrqEiB0TL7RbRvYf9dgoigzSX8s+gx234otufbeBA8KHuHTqLLtn  
0/sNEnOkI2GeTmd2IVIMh3Tw2QCWNUnalFK0ZytpxeeTos8QhLv  
vB/HF/MezMewVmwpOxV/5d9DapJyw40qxG5ITlCVxd6nfn+Pru  
sOE7I/G9uJiNyPBiorveaFrs8EcUK33rL9tJSXaVfK8OVsBzRC6Um  
ykhNNZwhGUICLGszb4X4bTlSxWq4Sn+JGHt1lODp1cmwtbGlzd  
GwzMTpodHRwczovL3dlYnRvcnJlbnQuaW8vdG9ycmVudHMvZ  
WU=","next":false}
```

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An **entry** will be made in admin ID acting as 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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A typical torrent file is **25** Kilobytes.

It will need about **28** FLO transactions as we can push only **900** data characters in one transaction.

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Every blockchain **transaction** needs 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 that we can pay for 28 data entries and one admin entry into blockchain.

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

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

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Satoshi Nakamoto, the designer of Bitcoins introduced some radical **ideas** in Computer Science and economics.

The **first** is artificial scarcity can create wealth.

Second is 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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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 **token system gains value**.

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Blockchain offers us some **value transfer** functions.

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

More is the consumption of torrents in form of downloads, more is the underlying **potential value**.

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

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

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

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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 as a result of increased consumption of torrents.

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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: then 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 investors valuation will agree with **benchmark guidance valuation**.

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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 **valuation of enterprise** is a certain multiple of enterprise profits.

And **stock market valuation** reflects that consensus.

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Now assuming majority of investors agreed on **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 principle** will be agreed.

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

Investors have to **feel confident**, no matter what torrent system will always continue.

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

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

Suppose consumption of torrents increase in a **certain proportion**.

And a certain ratio of those increased consumers buy the **new tokens**.

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

And this will create the hypothetical buyer of last resort, and we will **clearly establish** the link between more consumption and higher valuation.

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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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Suppose the technology underpinning the system represented by 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 will be suitors for such a technology, which can act as **additional value** for hypothetical buyer of last resort.

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Similarly if the underlying system is **valuable** to some competitor of an existing large technology player, again the hypothetical buyer of last resort **will pay higher for it.**

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

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In open source world there is **additional valuation** if good coders come together, and the owner of system gets the privilege of setting the **technology direction**, and version change acceptance rights.

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

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Sometimes access to distribution channels represented by consumption token system can be **extremely valuable** just by itself, and would represent additional valuation.

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If the consumption user base is large, **buying the attention** to it has valuation potential. Usually it is realized by **advertisement** conventionally, but less intrusive and elegant methods can be designed as well.

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One **big source of value** in a consumption led system is the desire of some of consumers to have themselves **being 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 real world, that buyer of last resort may never be needed.

But just proving the existence of it is sufficient to **convince an investing group** of valuation just on the basis of 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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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 long term**.

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

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

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Now we are ready to get into specifics of
economics of torrent token system.

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