BITTORRENT PROTOCOL

Assignment:

- Tracker – peer

- Peer – Peer

- Who has the data?
- Tracker knows

- Expected request from peer to tracker in assignemet

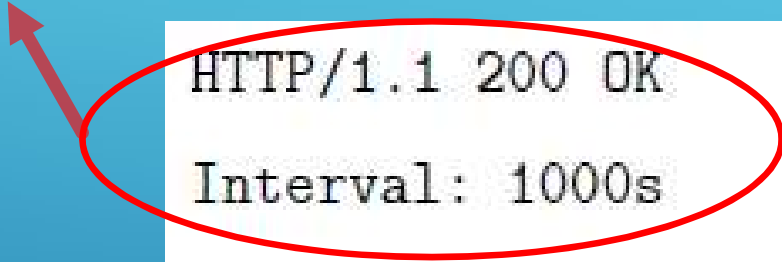GET /announce?info_hash=4de0&peer_id=salam&port=57847 HTTP/1.1

Host: 201.32.32.2

Field   value

Common tracker
url for request
purpose

- Constant lines, not importnat

```
HTTP/1.1 200 OK

Interval: 1000s

info hash: 01ca

hello 176.2.2.1 20311

salam 176.2.10.1 39881
```

An expected response to port 80 of peer

Whole Data

Segmented to parts which called
pieces

One piece

Each piece have a hash code to
recognize unwanted changes

CRC

11010011101100 000 <--- input right padded by 3 bits

1011   <--- divisor

01100011101100 000 <--- result (note the first four bits are the XOR with the divisor beneath, the rest of the bits are unchanged)

 1011   <--- divisor …

00111011101100 000

  1011

00010111101100 000

   1011

00000001101100 000 <--- note that the divisor moves over to align with the next 1 in the dividend (since quotient for that step was zero)

   1011   (in other words, it doesn't necessarily move one bit per iteration)

00000000110100 000

    1011

00000000011000 000

     1011

00000000001110 000

      1011

00000000000101 000

      101 1

_____

00000000000000 100 <--- remainder (3 bits). Division algorithm stops here as dividend is equal to zero.

SAMPLE TORRENT BASE INFORMATION IN ASSIGNMENT

- Info hash: 4de0
- File size: 512
- Piece size: 32
- CRC divisor: 10011
- hash: a2ec54ff02c98421
- data: 9a4a892beef081e0658c3532719002d3fc26b73709606b326c…

▶ HandShake

\<pstrlen\>	\<pstr\>	\<reserved\>	\<info_hash\>\<peer_id\>
19(1byte)	"BitTorrent Protocol"	8X(0x00)	each 20 bytes(few bytes filled in ASCII)

~~TCP/IP Checksum~~ done in PA1

Other BitTorrent Packets

<LENGTH PREFIX><MESSAGE ID><PAYLOAD>
  4 BYTE   1 BYTE

Request: `<len=00 00 00 0d><id=06><index><begin><length>`

برای در خواست قطعه از همتای دیگر. index شماره قطعه، begin شماره بایتی از قطعه که از آنجا درخواست دریافت داریم و length تعداد بایتی که بعد از آن بایت می‌خواهیم. برای مثال فرض کنید کل قطعه اول، که طولش ۱۰۲۴ بایت است را می خواهیم. مقادیر را اینگونه تنظیم می‌کنیم:

index: 0

begin: 0

length: 1024

Piece: `<len=00 00 00 09 + X><id=07><index><begin><block>`

ارسال داده‌ی قطعه به همتا. که index شماره قطعه، begin بایت شروع در قطعه و block، داده است.

Peer #1

```
get peers of 2
new peer vuze4.0-@fi(d added to torrent 2
connect to vuze4.0-@fi(d of 2
Bittorrent handshake packet sent to vuze4.0-@fi(d
Bittorrent handshake packet received from vuze4.0-@fi(d=
unchoke to vuze4.0-@fi(d of 2
vuze4.0-@fi(d= is interested
We do not have the requested piece.
check all of 2
we have 16 piece(s)
```

Tracker

```
new peer vuze4.0-@fi(d added to torrent 3
new peer utorrent3.2-Oxp#2 added to torrent 3
```

Peer #2

```
get peers of 2
the peer_id is utorrent3.2-Oxp#2
Bittorrent handshake packet received from utorrent3.2-Oxp#2
new peer utorrent3.2-Oxp#2 added to torrent 2
Bittorrent handshake packet received from utorrent3.2-Oxp#2
Bittorrent handshake packet sent to utorrent3.2-Oxp#2
utorrent3.2-Oxp#2 unchoked
get interested to utorrent3.2-Oxp#2 of 2
check all of 2
we have 0 piece(s)
download piece 0 from utorrent3.2-Oxp#2 of 2
the piece requested
download piece 0 from utorrent3.2-Oxp#2 of 2
the piece requested
the piece 0 received from utorrent3.2-Oxp#2 and the CRC matched.
check all of 2
we have 1 piece(s)
```