UDP BitTorrent tracker performance comparison

This is a performance comparison of several WebTorrent tracker implementations, using *aquatic_udp_load_test*.

Setup

Tested tracker implementations

Tracker	URL	Commit
aquatic_udp	https://github.com/greatest-ape/aquatic	b0c9c93
opentracker	http://erdgeist.org/arts/software/opentracker/	110868e
chihaya	https://github.com/chihaya/chihaya	acf2a5a

Hardware

Hetzner CCX62: 48 dedicated vCPUs (AMD Milan Epyc 7003)

General software information

Software	Version
Debian	Bullseye
Linux	6.0.0
rustc	1.66.1
GCC	10.2.1
Go	1.19.5

Before building opentracker, run:

```
sed -i "s/^OPTS_production=-O3/OPTS_production=-O3 -march=native -mtune=native/g"
Makefile
sed -i "s/if \(numwant > 200\) numwant = 200/if (numwant > 50) numwant = 50/g" ot_udp.c
```

Load test config:

```
duration = 60
weight_connect = 100
weight_announce = 100
weight_scrape = 1
```

Measurements

Results are ordered ascendingly by 1) allotted cores and 2) number of responses per second. Best results within a core number tier are marked in bold.

aquatic_udp

Cores	taskset	Socket workers	Swarm workers	Load test workers	Responses per second
1	**0,24**	**1**	**1**	**1**	**295k**
2	**0-1,24-25**	**1**	**1**	**1**	**392k**
4	**0-3,24-27**	**3**	**1**	**4**	**846k**
6	0-5,24-29	4	2	8	1054k
6	**0-5,24-29**	**5**	**1**	**8**	**1330k**
8	0-7,24-31	6	2	8	1315k
8	**0-7,24-31**	**7**	**1**	**8**	**2011k**
10	0-9,24-33	8	2	8	1427k
10	**0-9,24-33**	**9**	**1**	**8**	**1823k**
12	0-11,24-35	11	1	8	1910k
12	0-11,24-35	11	1	12	1885k
12	**0-11,24-35**	**10**	**2**	**8**	**2032k**
16	0-15,24-39	14	2	8	1996k
16	**0-15,24-39**	**15**	**1**	**8**	**2295k**

opentracker

Cores / workers	taskset	Load test workers	Responses per second
1 *	**0,24**	**1**	**210k**
1	0,24	2	255k
1	**0,24**	**1**	**279k**
2	0-1,24-25	2	356k
2	**0-1,24-25**	**4**	**360k**
4	0-3,24-27	8	611k †
4	**0-3,24-27**	**4**	**633k †**

Cores / workers	taskset	Load test workers	Responses per second
6	**0-5,24-29**	**8**	**762k †**
8	0-7,24-31	8	859k †
12	**0-11,24-35**	**8**	**1003k †**
16	0-15,24-39	8	**924k †**

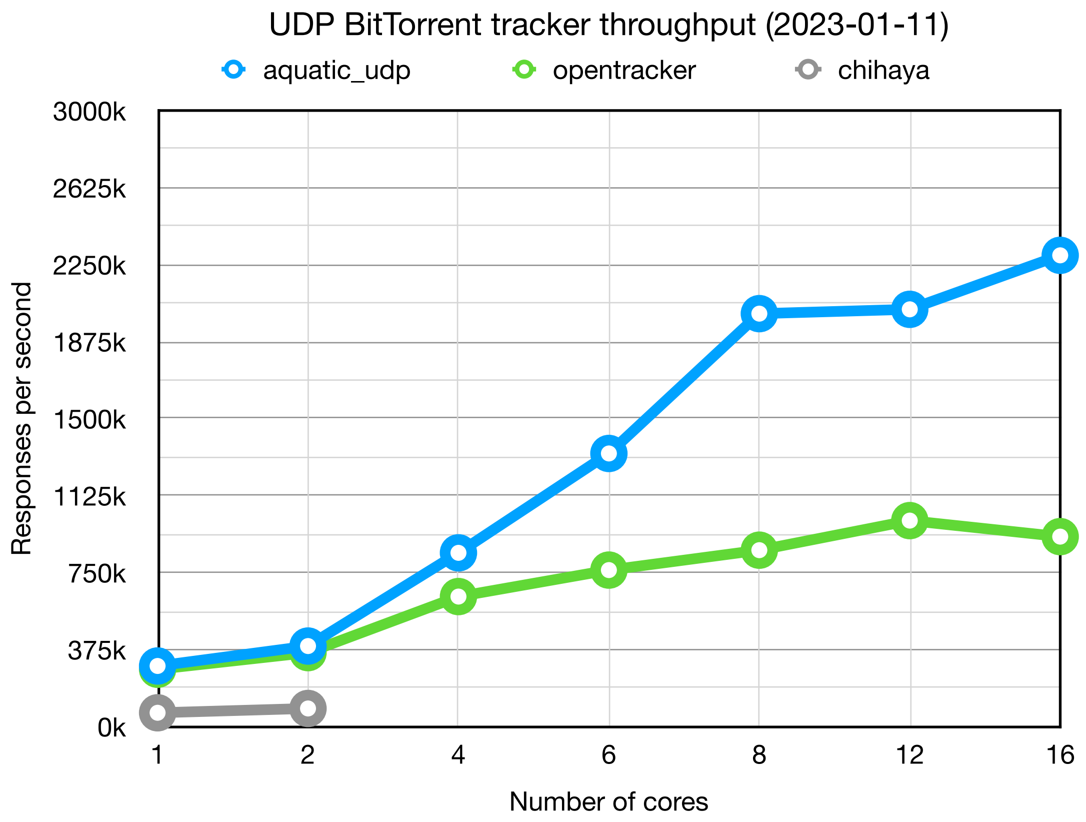
* worker count set to 0 for single-threaded mode
† I ran load test for 120 seconds and wrote down the peak value, since traffic was initially slow and then gained speed after around 30 seconds

Chihaya

Cores	taskset	Load test workers	Responses per second
1 *	**0,24**	**1**	**67k**
2 *	0-1,24-25	4	78k
2 *	0-1,24-25	2	80k
2 *	0-1,24-25	1	84k
2	**0-1,24-25**	**1**	**88k**
4	0-3,24-27	1	(Chihaya panic) †
8	0-7,24-31	1	(Chihaya panic) †
8 *	0-7,24-31	1	(Chihaya panic) †

* GOMAXPROCS set to target core count
† “panic: too many concurrent operations on a single file or socket (max 1048575)”

Results



UDP BitTorrent tracker throughput (2023-01-11)

Cores	aquatic_udp	opentracker	chihaya
1	295k	279k	67k
2	392k	360k	88k
4	846k	633k	— (crashed)
6	1330k	762k	—
8	2011k	859k	—
12	2032k	1003k	—
16	2295k	925k	—