Zenoh's Object Buffer Pool Benchmark (2021-10-07)

Jerry Lin (林祥瑞), jerry73204@gmail.com

Settings

In this benchmark, each task takes a buffer from the pool, fills it with random numbers and gives it back to the pool. We measure the total elapsed time to consume all tasks.

The following sites are measured.

- `pool` : Zenoh's ObjectBufferPool
- `arena` : Jerry's implementation of lock-free concurrent buffer pool.
- `std` : Use standard library's default allocator

This is our settings.

- async-std runtime 1.10.0
- 32 concurrent workers (on 32-core system)
- Pool initialization time is separatedly measured

Zenoh's object buffer pool vs. std

10^6 tasks, 65536 bytes per buffer

```
init pool:      177.147µs
pool:   15.313429361s
std:    7.894207918s
```

10^6 tasks, 4096 bytes per buffer

```
init pool:      69.993µs
pool:   16.305793979s
std:    546.341926ms
```

10^6 tasks, 64 bytes per buffer

```
init pool:      5.731µs
pool:   16.200823987s
std:    325.788024ms
```

Lock-free arena vs. std

10^6 tasks, 65536 bytes per buffer

```
init arena:     8.598253ms
arena:   2.229351425s
std:    7.919572742s
```

10^6 tasks, 4096 bytes per buffer

```
init arena:     431.249µs
arena:   567.226069ms
std:    532.8542ms
```

10^6 tasks, 64 bytes per buffer

```
init arena:     12.324µs
arena:   719.787164ms
std:    336.515863ms
```