Gobench Load Testing Tool

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Grokking Checkpoint, 17/10/2020

Features

1. Expressive: Complex scenario, not just a simple HTTP endpoint
2. Protocol diversification: MQTT, NATS, and more
3. Intuitive: Realtime graph
4. Scalable: One million concurrent connection (TBA)

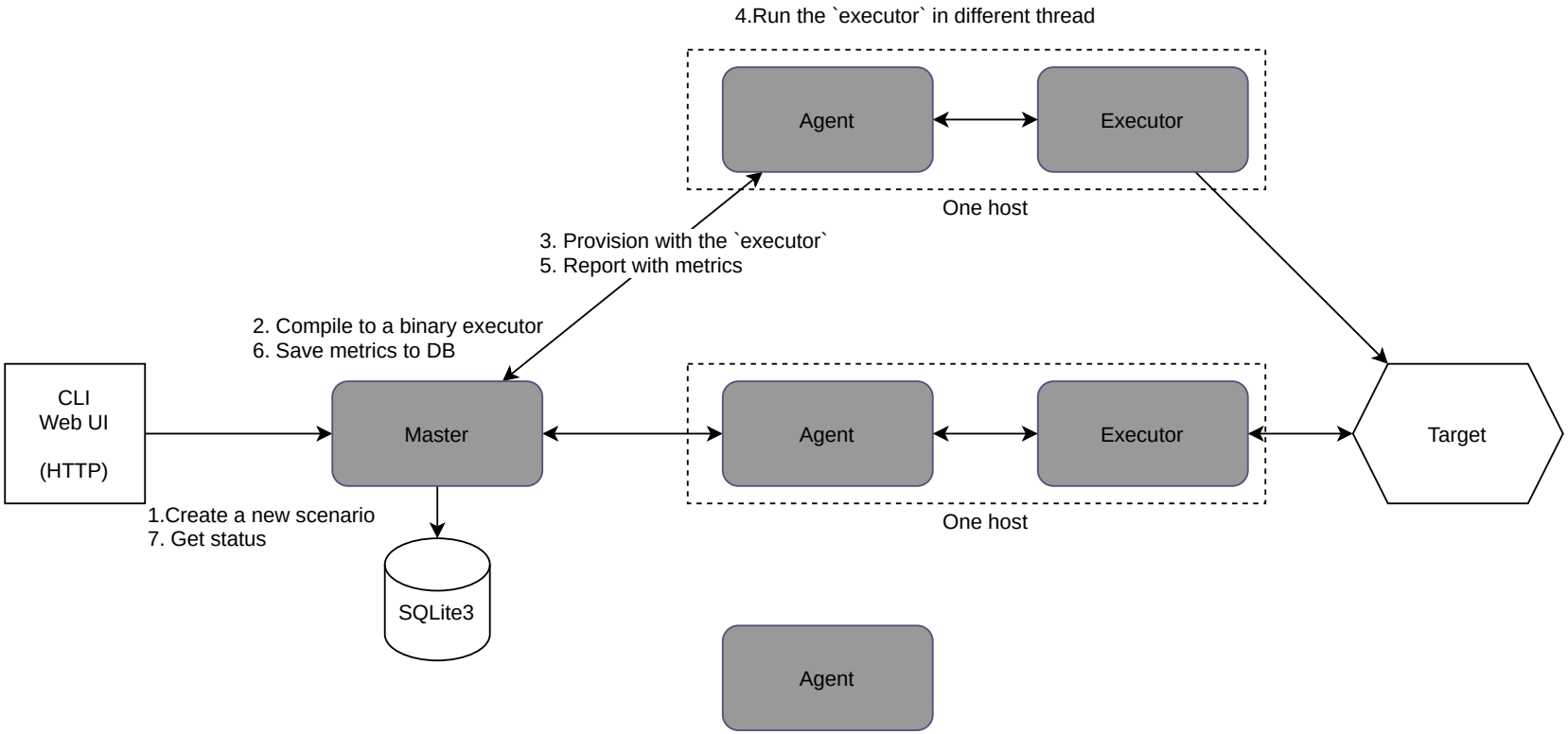
https://github.com/gobench-io/gobench

Expressive: No DSL, only Go yo!

```
package main

import "github.com/gobench-io/gobench/scenario"

func export() scenario.Vus { // required
    return scenario.Vus{
        scenario.Vu{     // a virtual user class
            Nu:   1000,  // number of virtual users
            Rate: 200,   // startup rate (Poisson dist)
            Fu:   f1,    // user ref function
        },
        scenario.Vu{
            Nu:   3000,
            Rate: 200,
            Fu:   f2,
        },
    }
}
```

```go
func f1(ctx context.Context, vui int) {
    for {
        log.Println("tic")
        time.Sleep(1 * time.Second)
    }
}

func f2(ctx context.Context, vui int) {
    // ...
}
```

How does Gobench work, then?



Terminology - Master

Master is one single server

- Coordinate jobs
- Manage the network of Agents
- Collect metrics information from Agents
- Store results, handle web API requests
- SPOF

```
$ gobench --mode master --cluster-port 6890 --port 8080
```

Terminology - Agent

Agents run on any (Unix) machine

- Receive jobs from Master
- Run the job by executing Executor
- Manage data generated by Executor
- Periodically send resource usage updates and job metrics to Master.

```
$ gobench --mode agent --cluster-port 6890 --route master:6890
```

Terminology - Executor

Executor is started by Agent

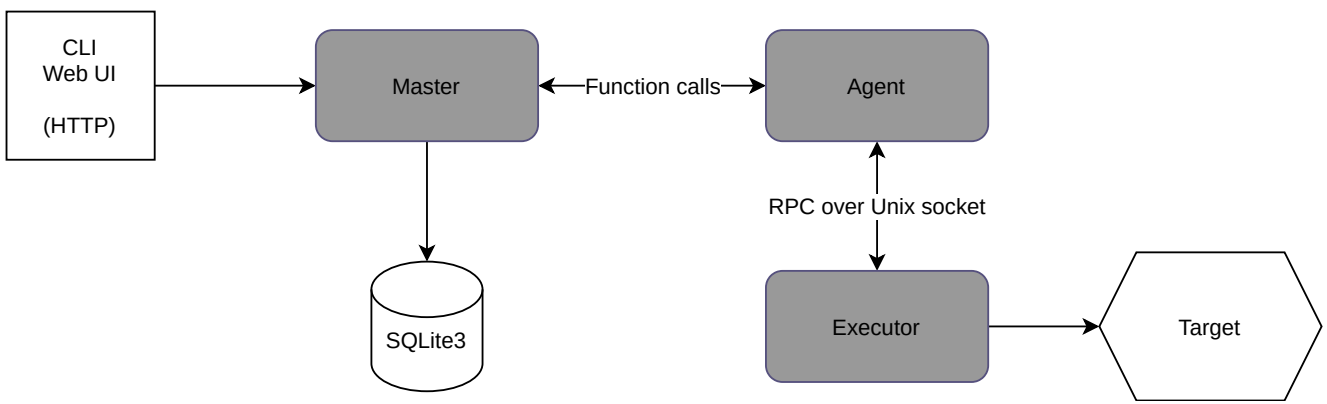
- When running the job, Agent has only one Executor
- Aggregate metrics information (gauge, counter, histogram) before report to Agent

```
$ executor --agent-soc gobench-agentsocket-14259 --executor-soc executorsock-12
```

Local mode

Gobench can run in a (default) local mode which Master has just one local Agent

```
$ curl -X POST -H 'Content-Type: application/json'
--data '{
          "name":"cool bench",
          "scenario":"base64 encode scenario file",
          "gomod":"base64 encode go.mod file",
          "mode": "local"
        }'
http://endpoint/api/applications
```



Distributed mode (Work In Process)

```
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--data '{
            "name":"cool bench",
            "scenario":"base64 encode scenario file",
            "gomod":"base64 encode go.mod file",
            "mode": "cloud",
            "node": 7
        }'
http://endpoint/api/applications
```

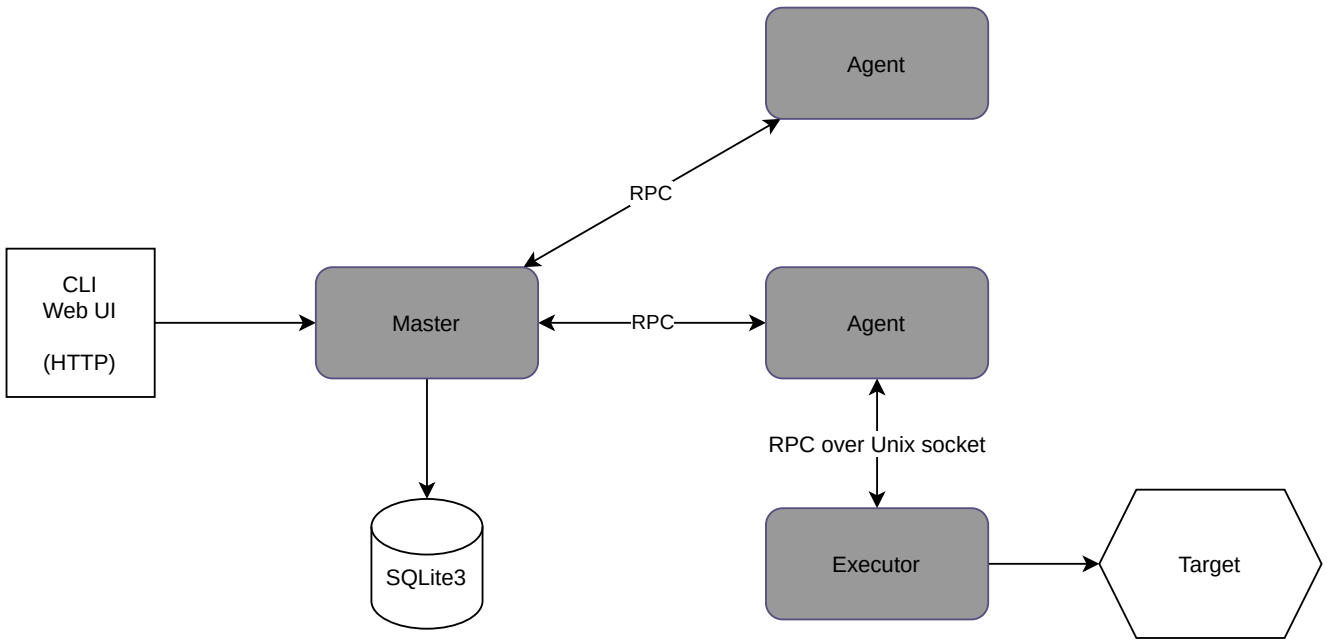

Create new client

Example: https://github.com/gobench-io/gobench/tree/master/clients

Call 2 APIs

```
import (
    "github.com/gobench-io/gobench/executor"
)

executor.Setup(groups)
executor.Notify(metric-id, value)
```

Metric collection

1. Aggregate metrics at Executor. Send the result over the Master (via Master)
2. Send the raw metrics to master or centralize DB

(1) is simple; but lost the ability to merge histogram metrics.

(2) is expensive.

Gobench is using (1)

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WIP

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- More client types (RPC, WS, graphQL)
- Benchmark the benchmark https://k6.io/blog/comparing-best-open-source-load-testing-tools#max-traffic-generation-capability
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May never

- Different DB driver layer to save raw metrics

Gobench is my first serious Golang project.
Some learned lessons

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First attempt for scenario is Go plugin

```
go build -buildmode=plugin -o scenario.so scenario.go
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Error when build with different version or build from different path

```
panic: plugin.Open("plugin"): plugin was built with a different version of package
```

Still an opened issue https://github.com/golang/go/issues/27751

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Can we reliability force to kill a child goroutine?

No. Phantom routines.

```
func f1(ctx context.Context, vui int) {
    go foo()

    for {
        select {
        case <-ctx.Done():
            return
        }
    }
}
```

Lesson 3: User program must be run at different kernel process

Can we recover from a panic?

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Can we recover from a panic?

Not always.

```
func f1(ctx context.Context, vui int) {
    defer func() {
        if r := recover(); r != nil {
            // ...
        }
    }()

    go func() {
        panic("Panicking")
    }

    for {
        select {
        case <-ctx.Done():
            return
        }
    }
}
```

Move from Go plugin

User scenario + go template => Executor binary

```
out, err := exec.
        Command(
            "sh", "-c",
            fmt.Sprintf("cd %s; go build -o %s", dir, binaryPath),
        ).
        CombinedOutput()
```

Agent and Executor

Communicate via grpc over unix socket

```
cmd := exec.CommandContext(ctx, executorPath,
        "--agent-sock", agentSock,
        "--executor-sock", executorSock)
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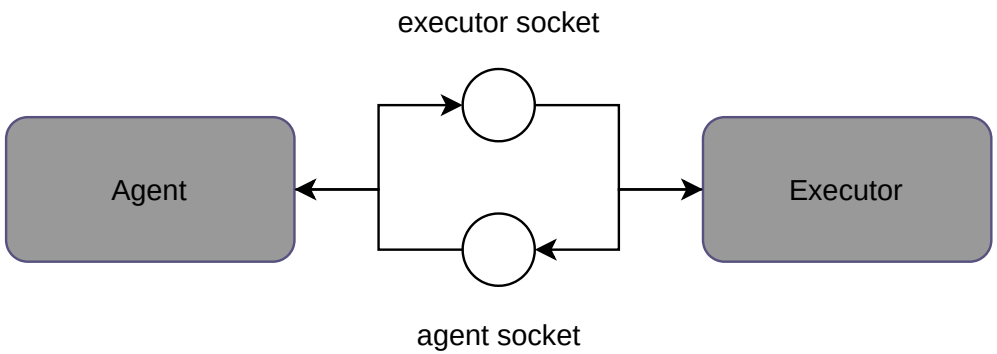

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- no 3rd party lib

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But

- this package is frozen
- cannot get remote address https://github.com/golang/go/issues/4584

github.com/gobench-io/gobench