IT大咖说
知识分享平台

TutorMeet+

Use Golang to build a high quality interactive cloud classroom

tutorabc

2017/07/01

About Me

1999-深圳	999、Chinese Medicine Intelligent Robot
2005-上海	EF、.NET Efekta
2011-上海	hujiang、.NET、C++、Golang
2015-南京、上海	tuniu、Java
2016-上海	tutorabc（原vipabc）、Golang TutorMeet+

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Agenda

1. Development of Live Classroom in Online Education；
2. WebRTC Overview；
3. Why Go ?
4. What is TutorMeet+ ?
5. Q&A；

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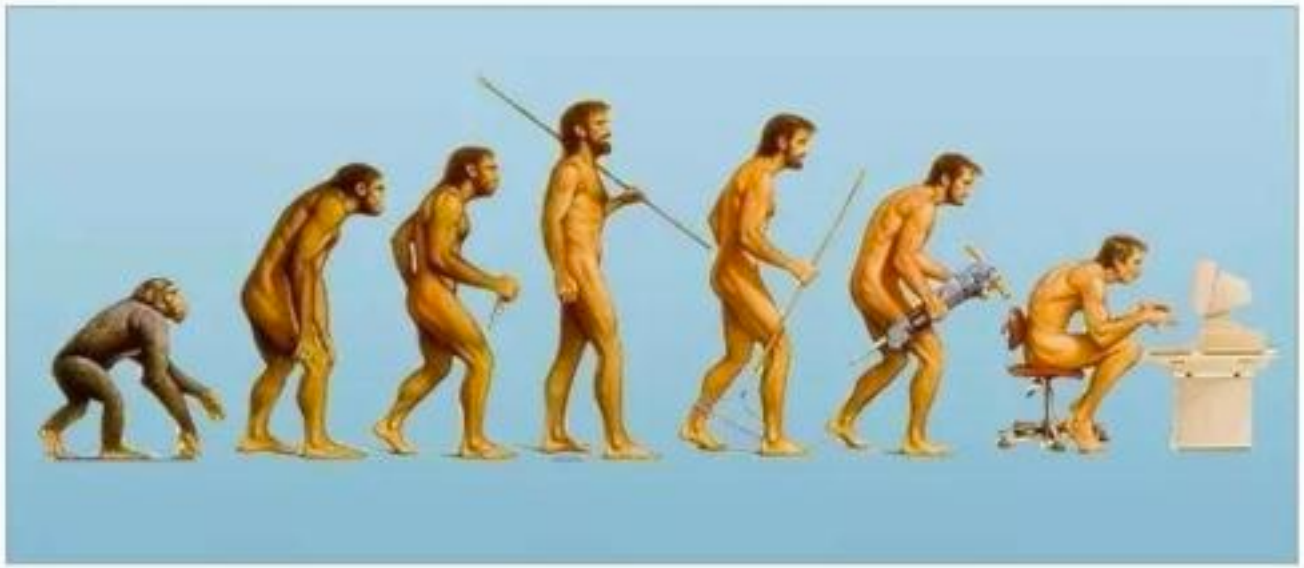
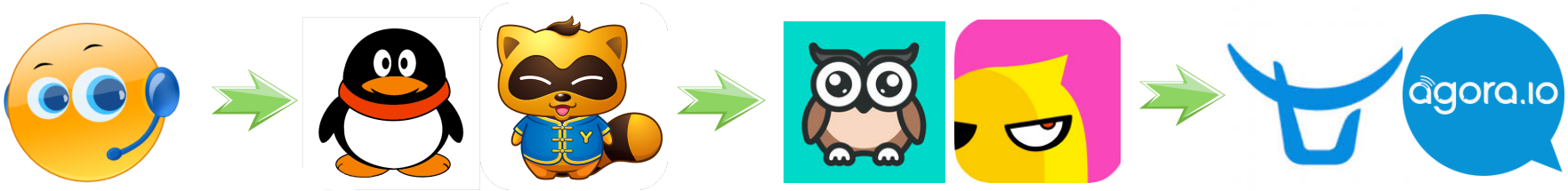
1. Development of Live Classroom in Online Education

History

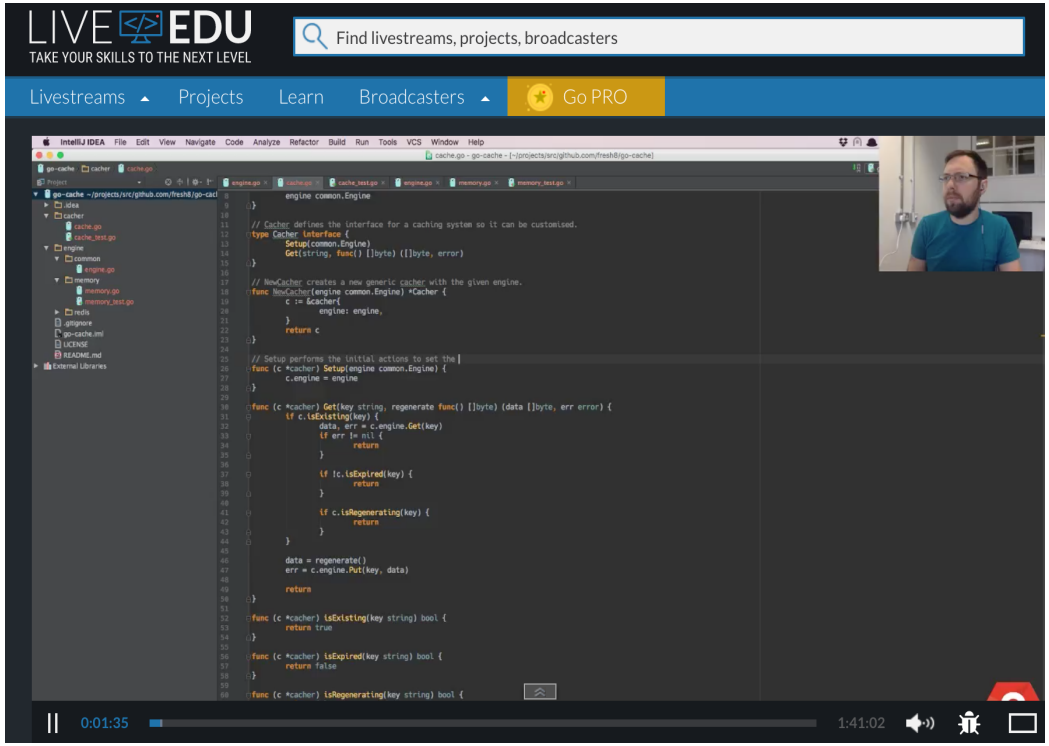
1. FMS ;
2. QQ & YY ;
3. Mobile ;
4. Cloud ;





Pain Points

1. Online & Interactive
2. Quality & Cost
3. Big & Small size Classroom ?
4. Multiple scenes & Personalized needs ?
5. Technical complexity & high quality service ?

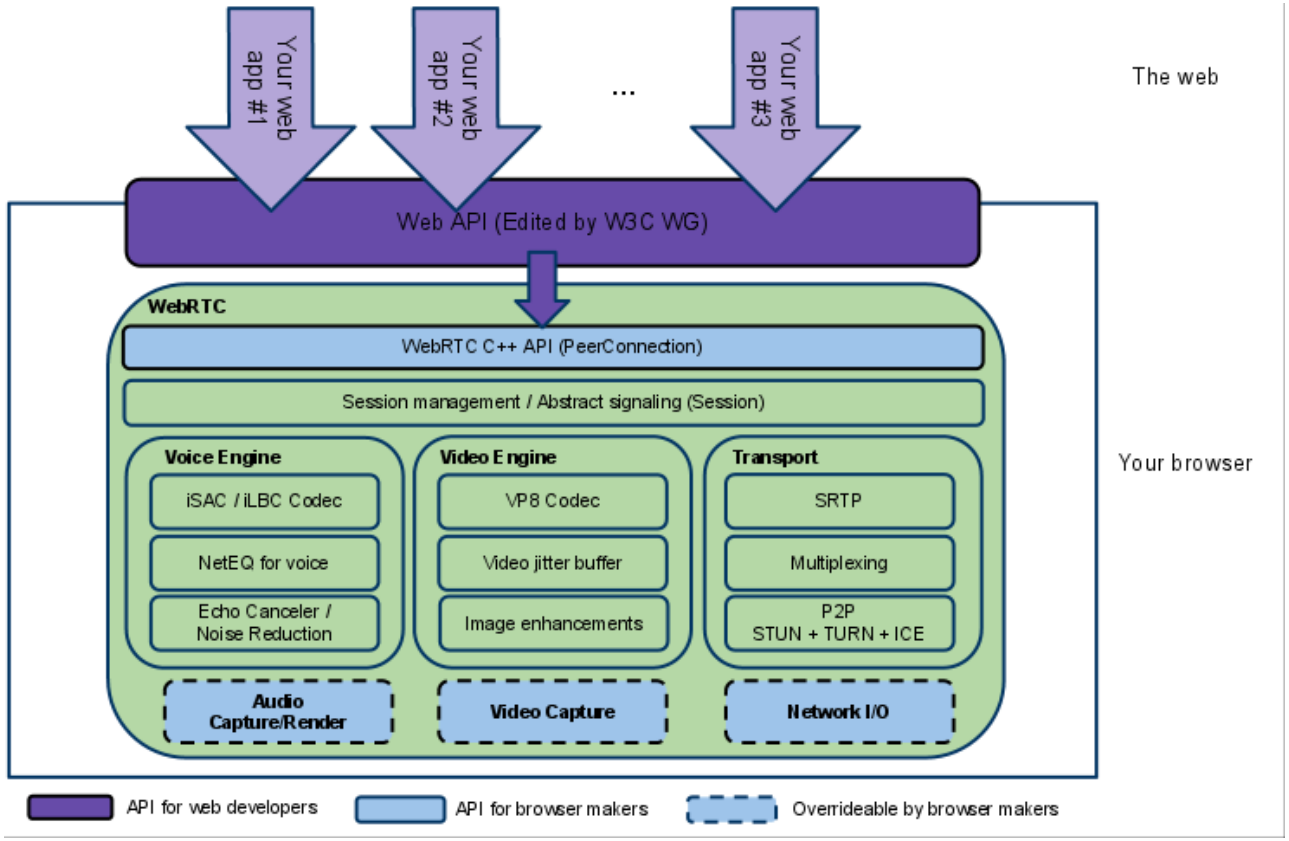


2、Web RTC Overview

WebRTC Overview

WebRTC Pros :

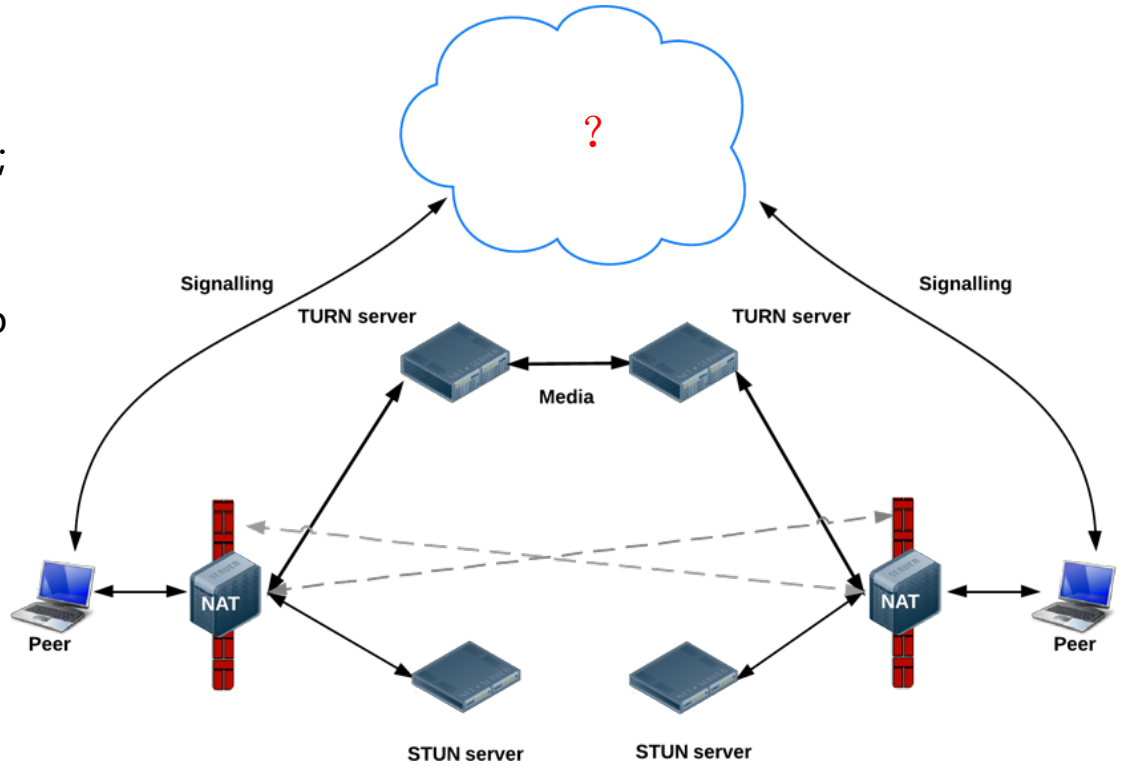
- 1、Convenient & Fast ;
- 2、Free & Open Source ;
- 3、From Google ;



WebRTC Overview

WebRTC Cons：

- Browser ?
- Have to build server by yourself；
- Under a complicated network transmission quality is difficult to guarantee ；
- WebRTC is more suitable for 1to1, but 1toMany and Many - toMany are no good；
- Native&App developed more difficult；



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WebRTC Overview

Safari

Overview Tools Features Extensions Preview Resources Download

Release 34

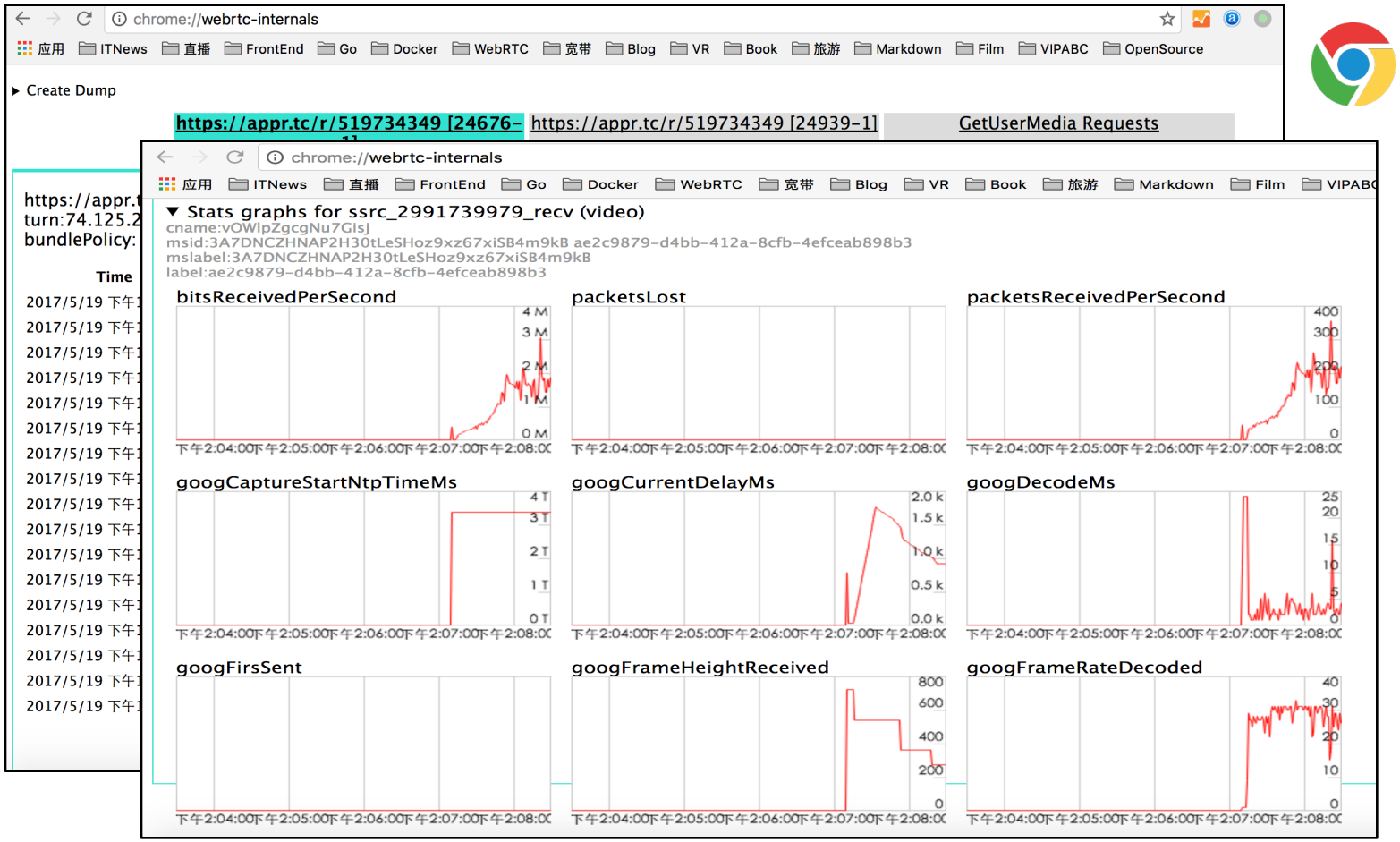
WebRTC

- Added WebRTC options to the Developer menu
- Disabled Legacy WebRTC API in the Experimental Features menu by default
- Changed behavior to close NetworkProcess WebRTC sockets as soon as the Web Process no longer needs them
- Added support for receive-only SDP offers through `addTransceiver`
- Changed handling capture status based on MediaStreamTrack
- Changed RTCPeerConnection to return RTCSessionDescriptionInit instead of RTCSessionDescription
- Fixed a cloned MediaStreamTrack to not mute the other tracks using the same source
- Fixed RTCPeerConnection `getReceivers()` to return transceivers that have an active receiver but no active sender
- Fixed the screen going into sleep mode during WebRTC video

Media

- Fixed high CPU usage when entering fullscreen or seeking during MSE video playback
- Fixed seeking during MSE video playback where audio would begin playing long before rendering the video

WebRTC Overview

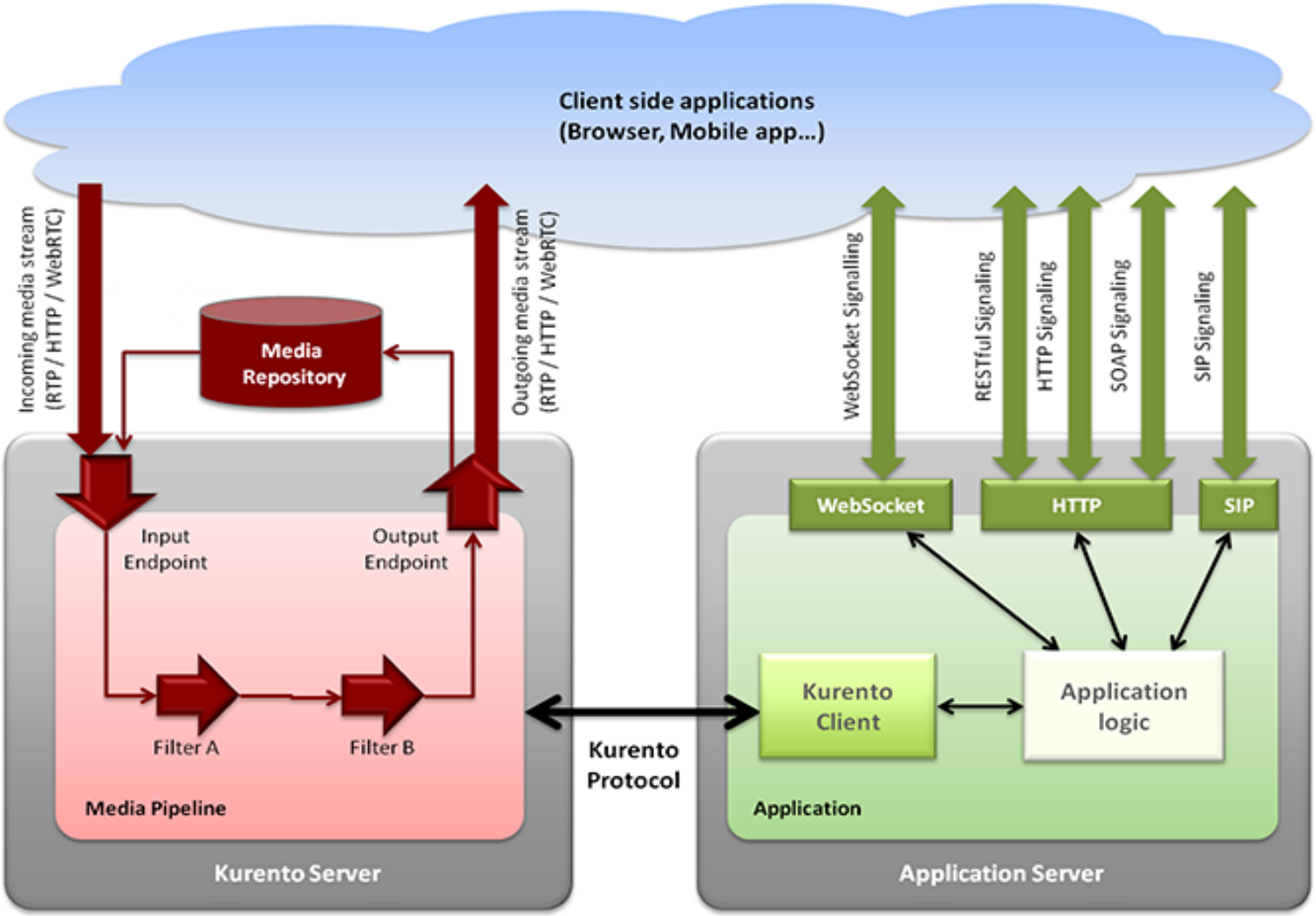


WebRTC Open Source Server

OpenSource of WebRTC Media Server :

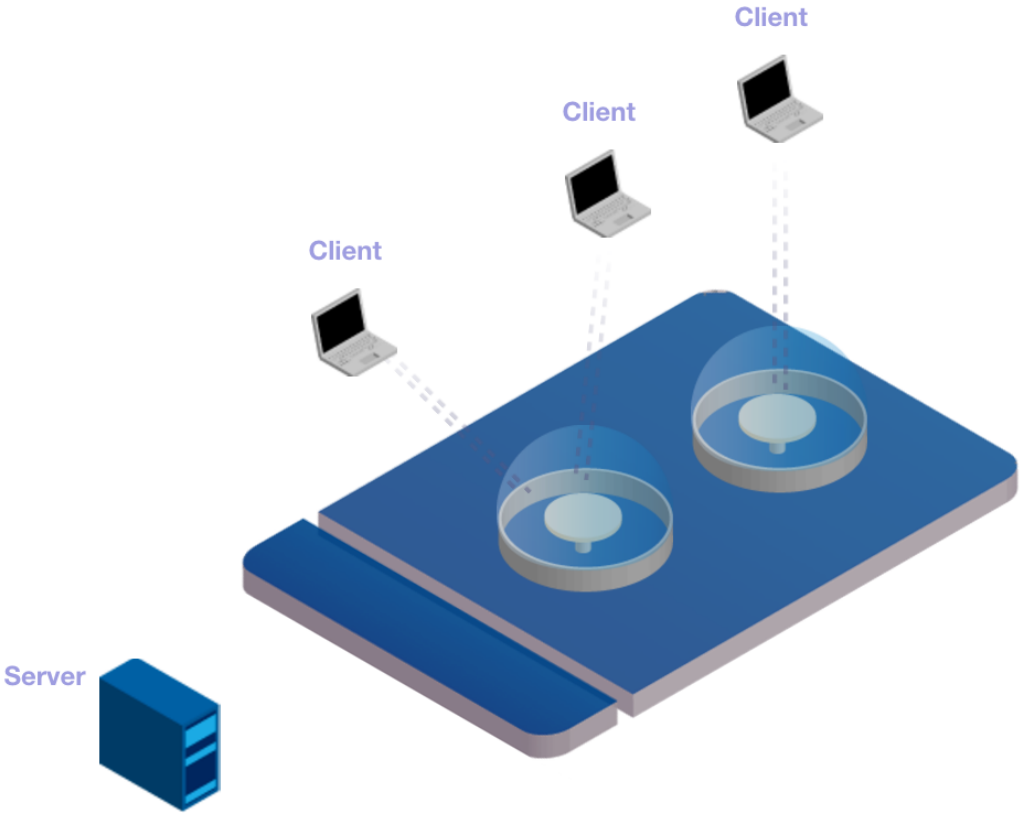
- **lynckia/licode :** github.com/lynckia/licode/
- **meetecho (janus) :** github.com/meetecho/janus-gateway
- **jitsi (meetme) :** github.com/jitsi/jitsi
- **Kurento :** github.com/Kurento/kurento-media-server

WebRTC Overview

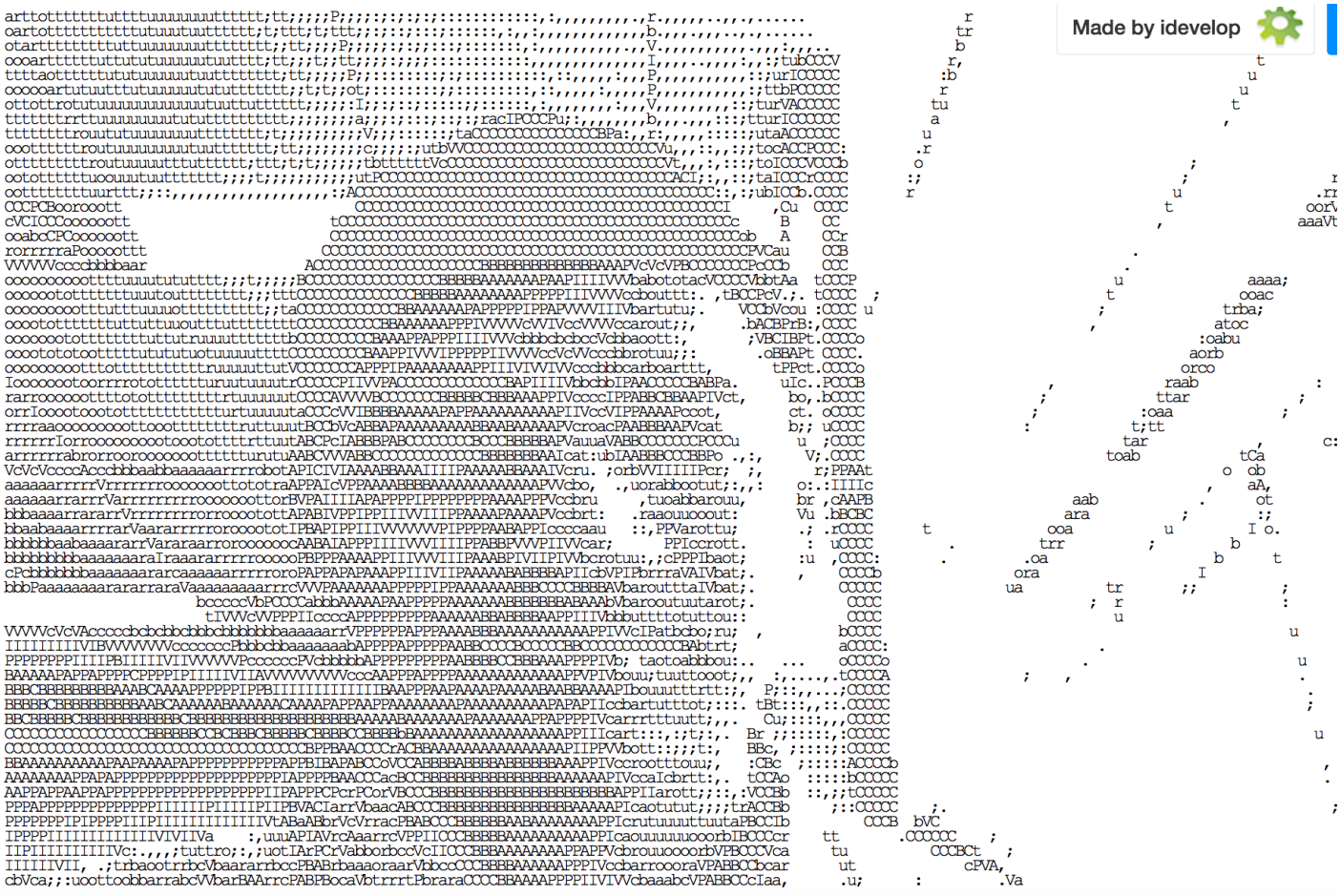


WebRTC Overview

Architecture overview



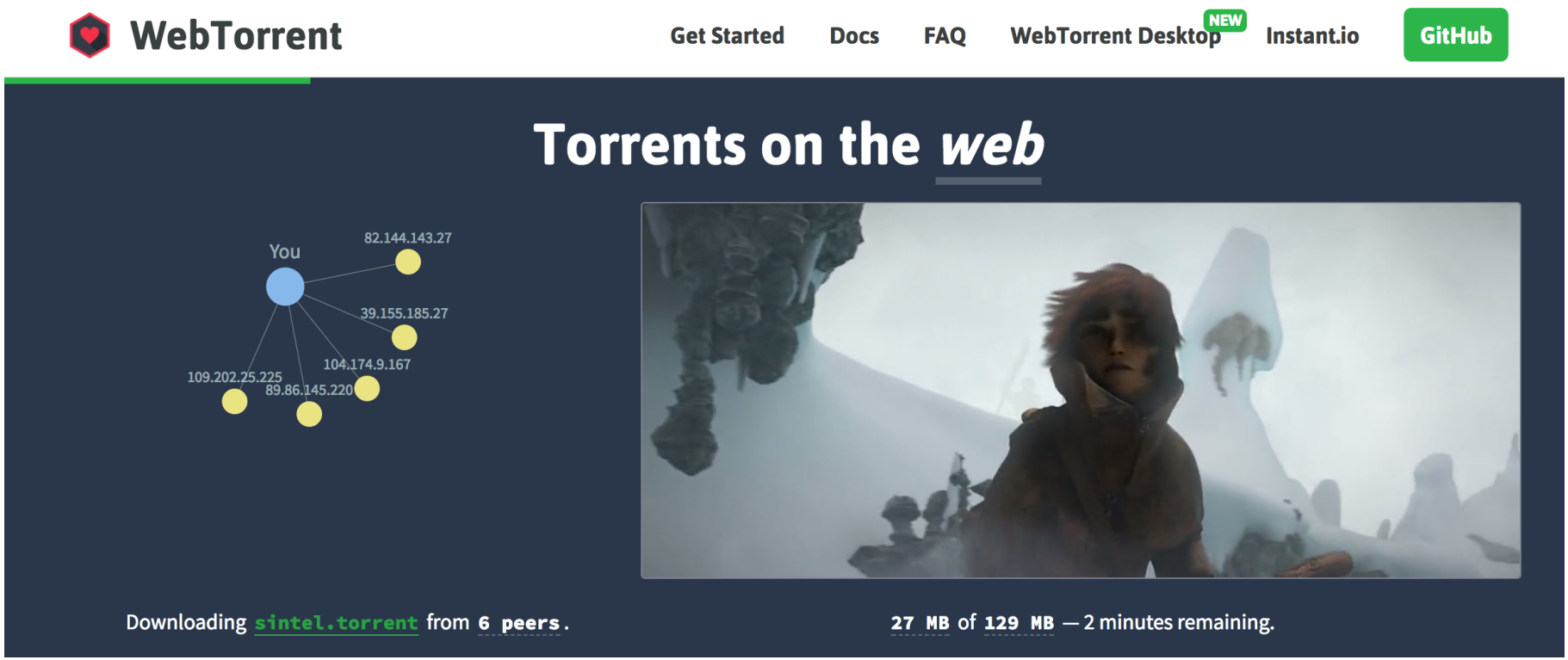
WebRTC Overview



https://idevelop.ro/ascii-camera/

https://idevelop.ro/predator-vision/

WebRTC Overview



https://webtorrent.io/

https://github.com/webtorrent/webtorrent

http://mg8.org/processing/bt.html

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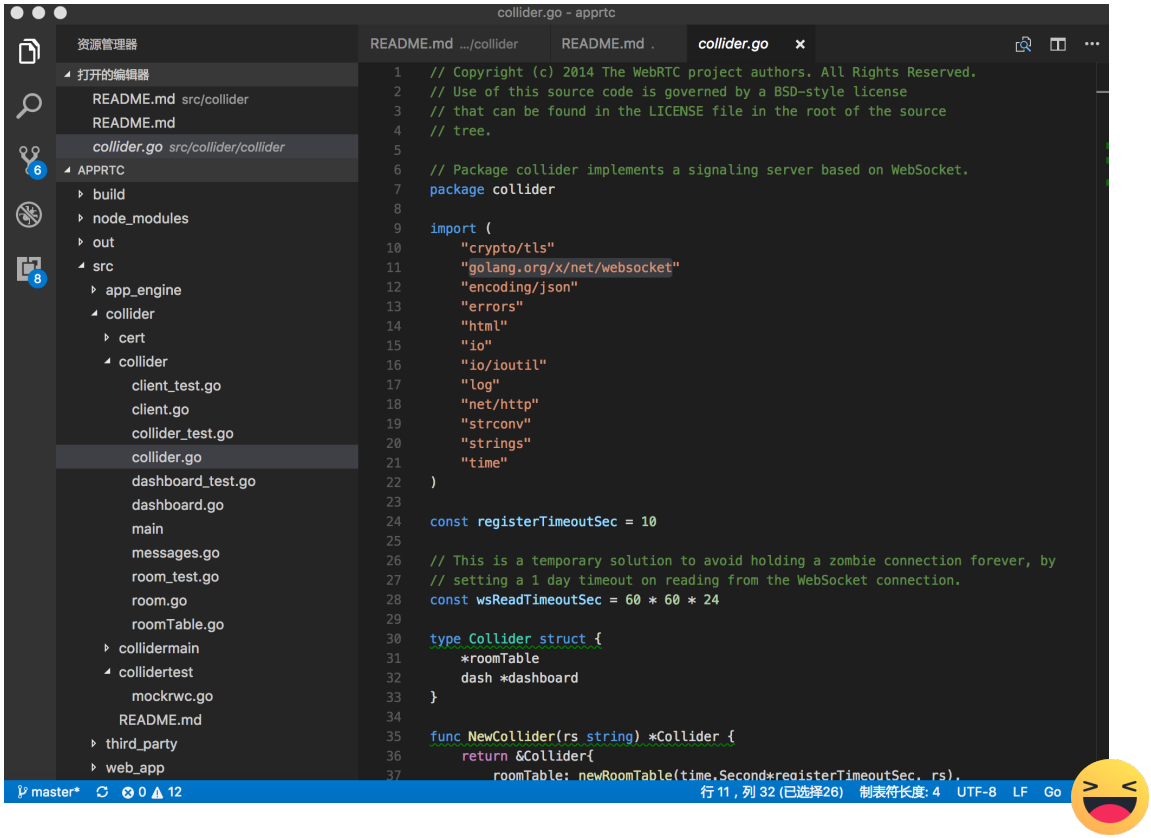
3、Why Go ?

Apprtc - Collider (Golang)



Collider & WebSocket

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```go
package collider

import (
    "crypto/tls"
    "golang.org/x/net/websocket"
    "encoding/json"
    ……
)

type Collider struct {
    *roomTable
    dash *dashboard
}

func NewCollider(rs string) *Collider {
    return &Collider{
        roomTable: newRoomTable(time.Second*registerTimeoutSec, rs),
        dash: newDashboard(),
    }
}

// Run starts the collider server and blocks the thread until the program exits.
func (c *Collider) Run(p int, useTls bool) {
    http.Handle("/ws", websocket.Handler(c.wsHandler))
    http.HandleFunc("/status", c.httpStatusHandler)
    http.HandleFunc("/", c.httpHandler)

    var e error

    ……
}
```

WebSocket Demo

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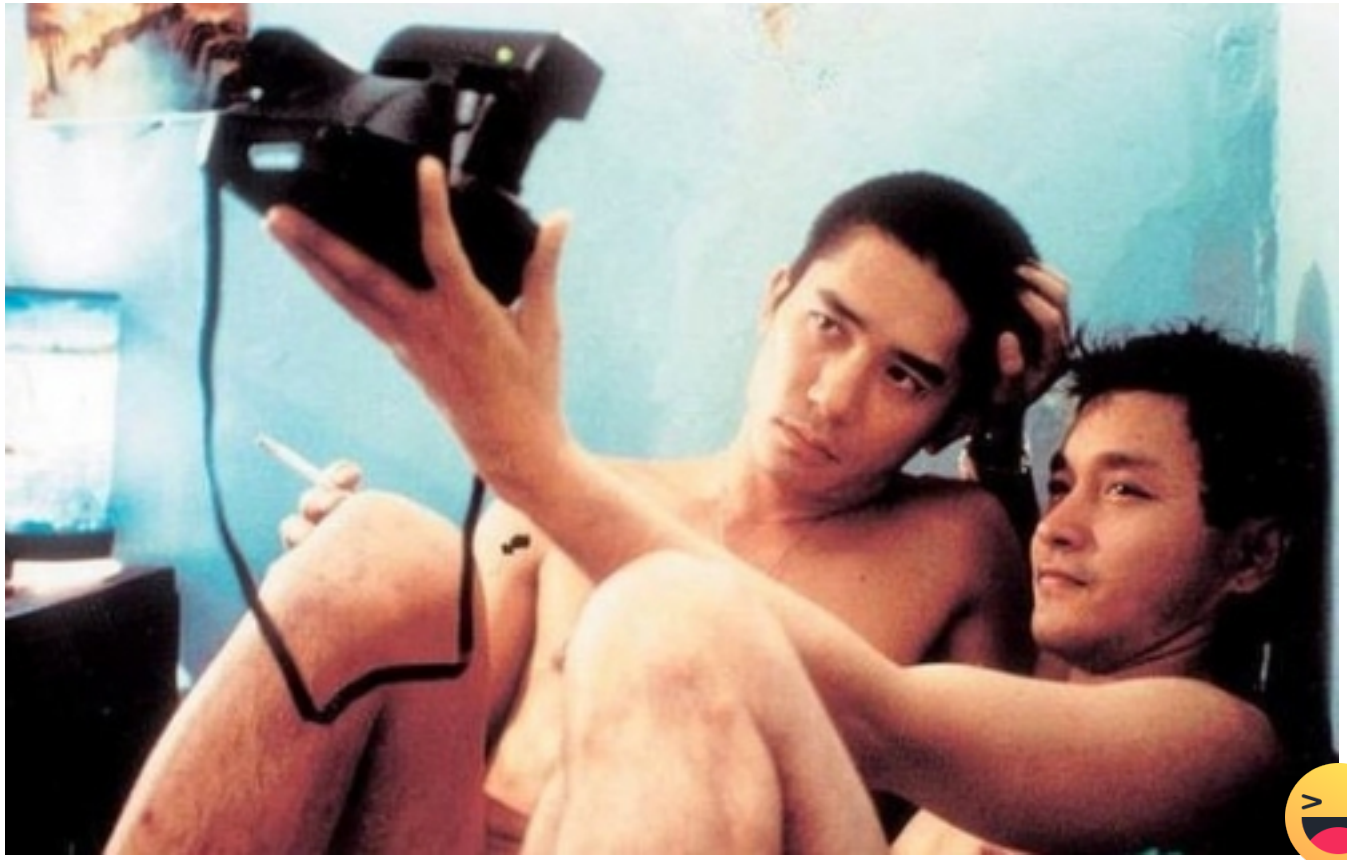
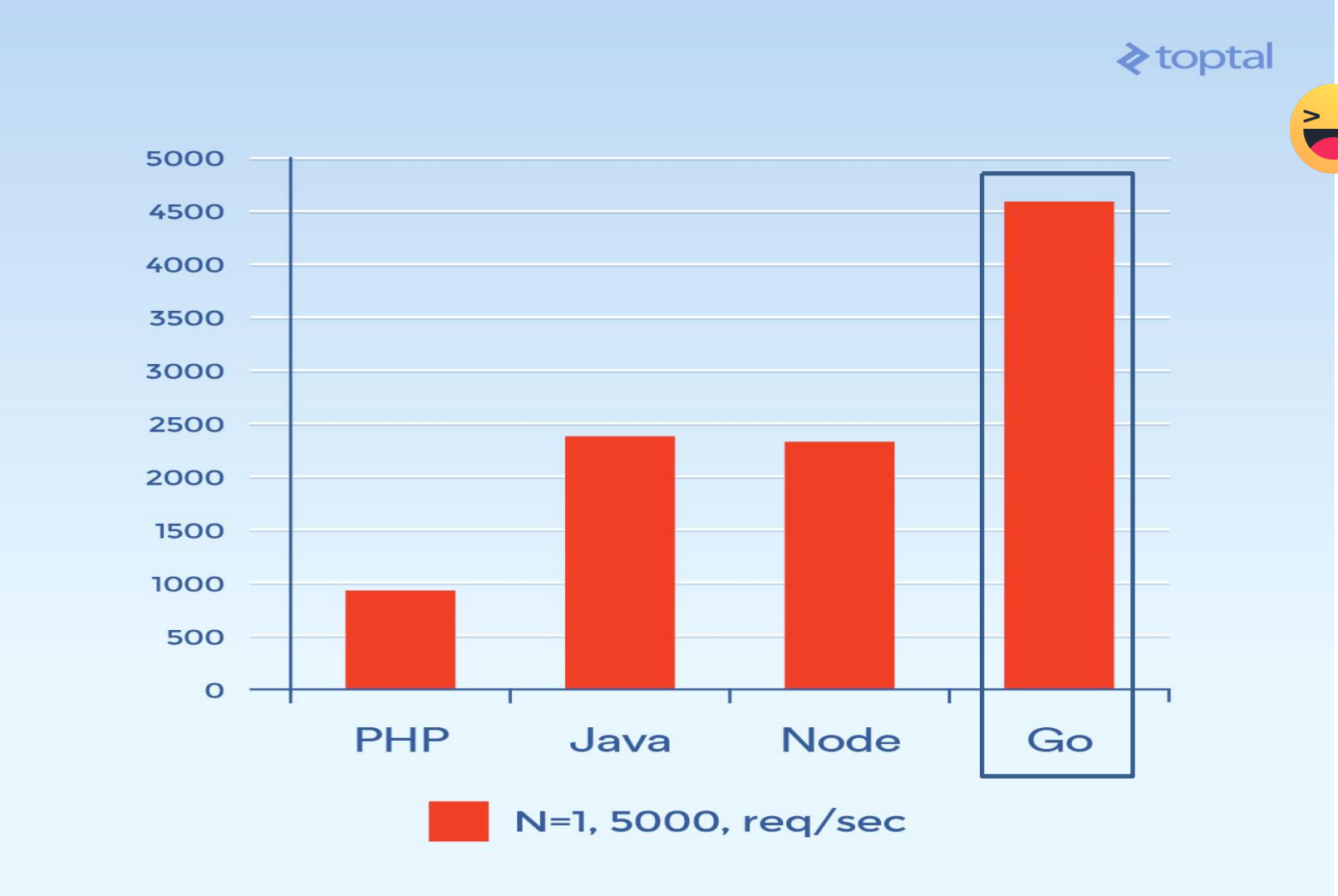
```go
package main

import (
    "fmt"
    "net/http"
    "time"
    "github.com/gorilla/websocket"
)

var upgrader = websocket.Upgrader{}

func main() {
    http.HandleFunc("/", func(w http.ResponseWriter, r *http.Request) {
        http.ServeFile(w, r, "index.html")
    })
    http.HandleFunc("/v1/ws", func(w http.ResponseWriter, r *http.Request) {
        var conn, _ = upgrader.Upgrade(w, r, nil)
        go func(conn *websocket.Conn) {
            for {
                mType, msg, _ := conn.ReadMessage()
                outputStr := "Server:" + string(msg)
                conn.WriteMessage(mType, []byte(outputStr))
            }
        }(conn)
    })

    http.HandleFunc("/v2/ws", func(w http.ResponseWriter, r *http.Request) {
        var conn, _ = upgrader.Upgrade(w, r, nil)
        go func(conn *websocket.Conn) {
            for {
                _, msg, _ := conn.ReadMessage()
                outputStr := fmt.Sprintf("Server-{%s}:value=%v", time.Now(), string(msg))
                //conn.WriteMessage(mType, []byte(outputStr))
                println(outputStr)
            }
        }(conn)
    })

    fmt.Println("Websocket Demo Server starting ...")
    http.ListenAndServe(":3000", nil)

}
```

C++ & Go

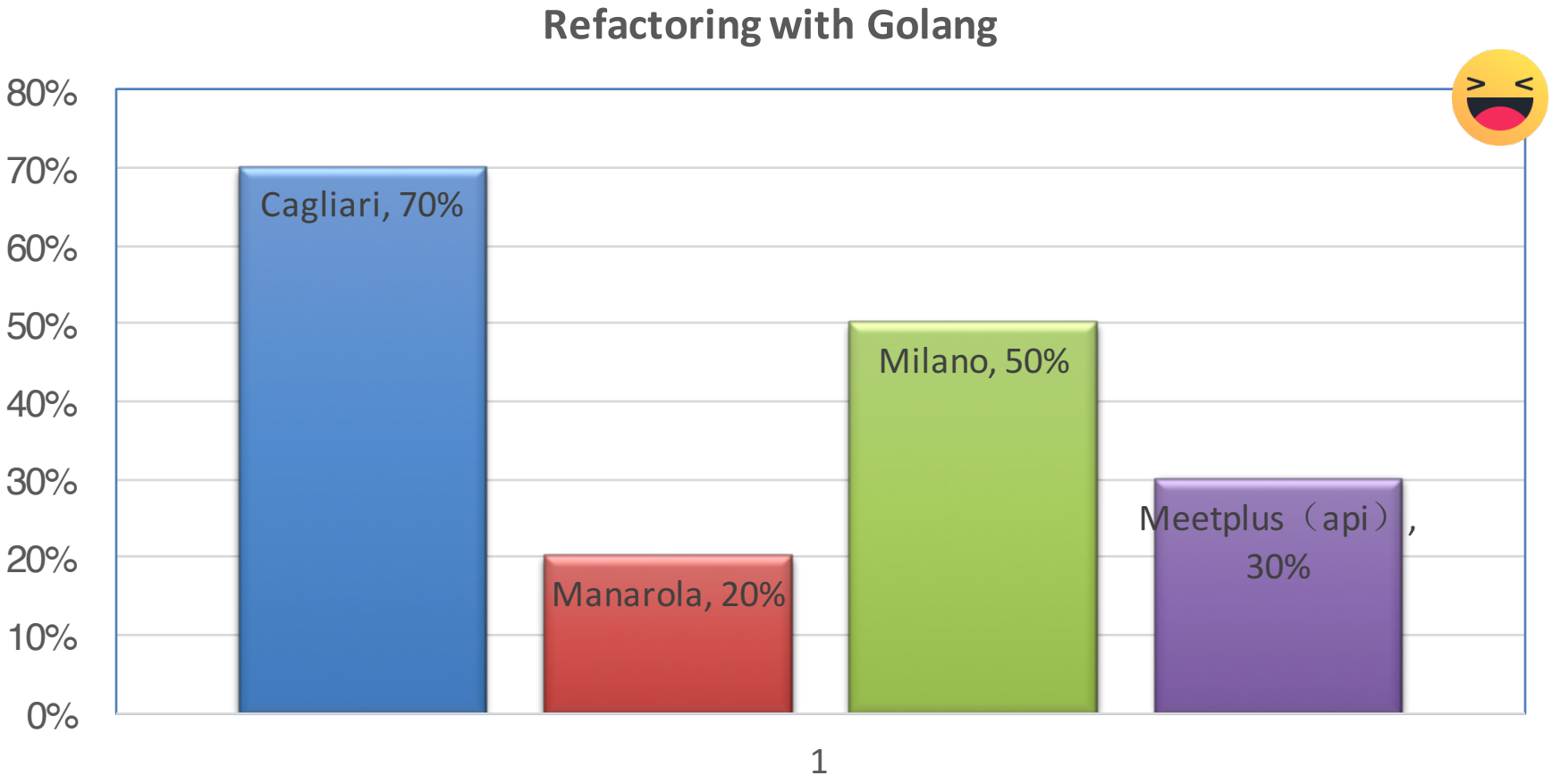


Performance



http://www.itran.cc/2017/05/17/server-side-io-performance-node-php-java-go/

Less Code



Ecology of Golang

etcd

docker

Ginkgo

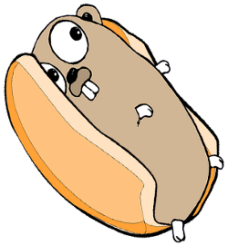
A Golang BDD Testing Framework

Prometheus

An open-source service monitoring system and time series database.

Gomega

Ginkgo's Preferred Matcher Library



BEEGO

Gorilla

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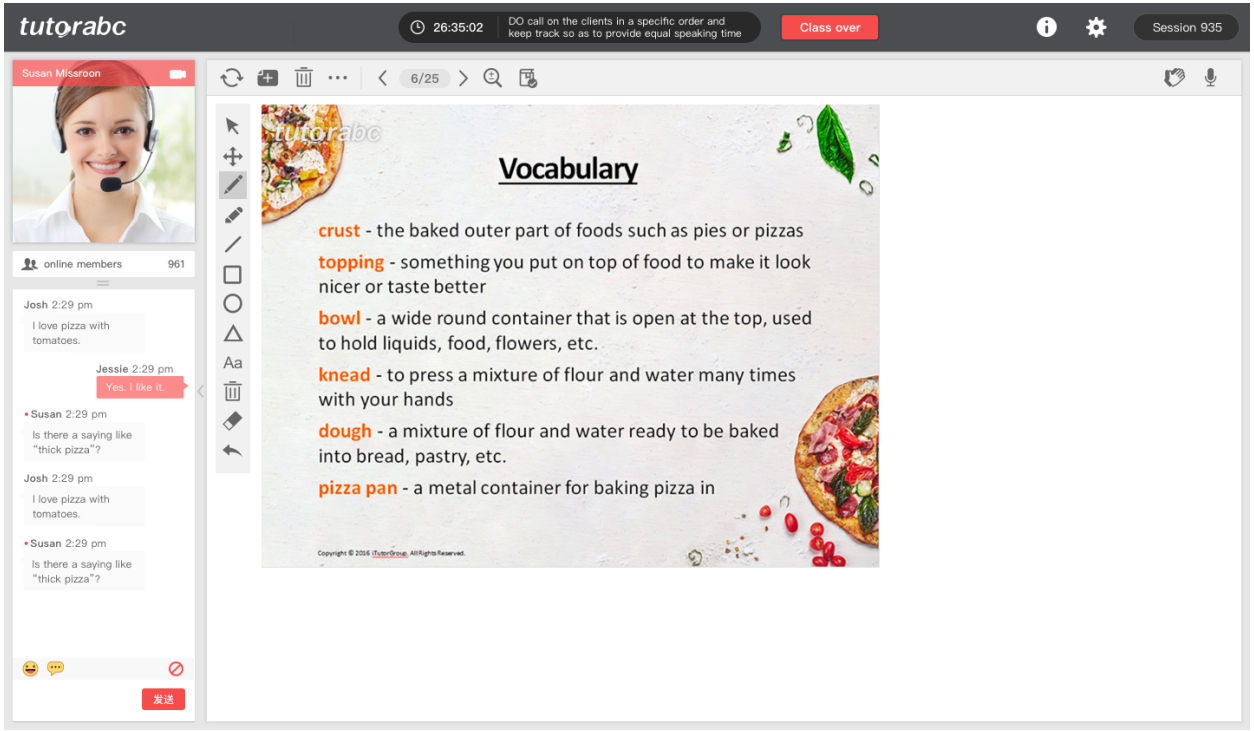
4、What is TutorMeet+ ?

TutorMeet+ v1.0 Overview

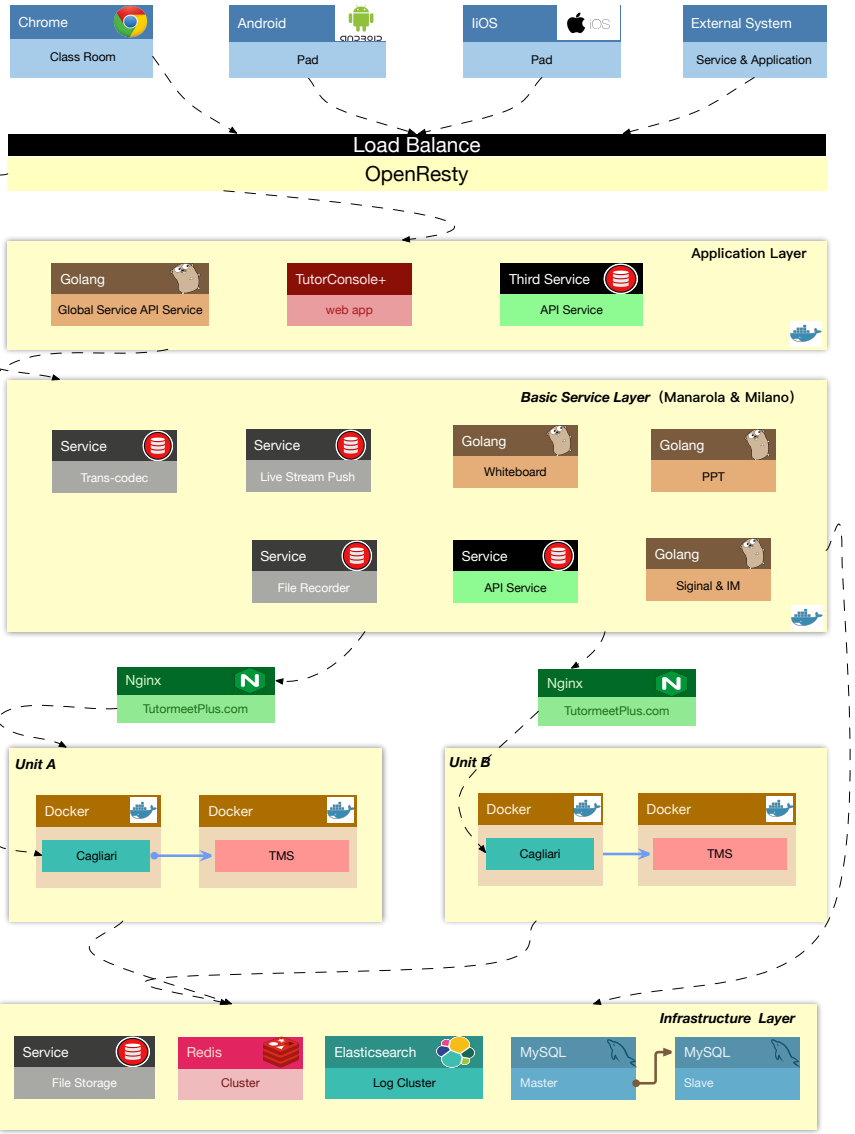
- Docker
- UDP
- P2P
- HD Desktop Share



TutorMeet+ v1.0 Overview

Support 10000 people on one online classroom

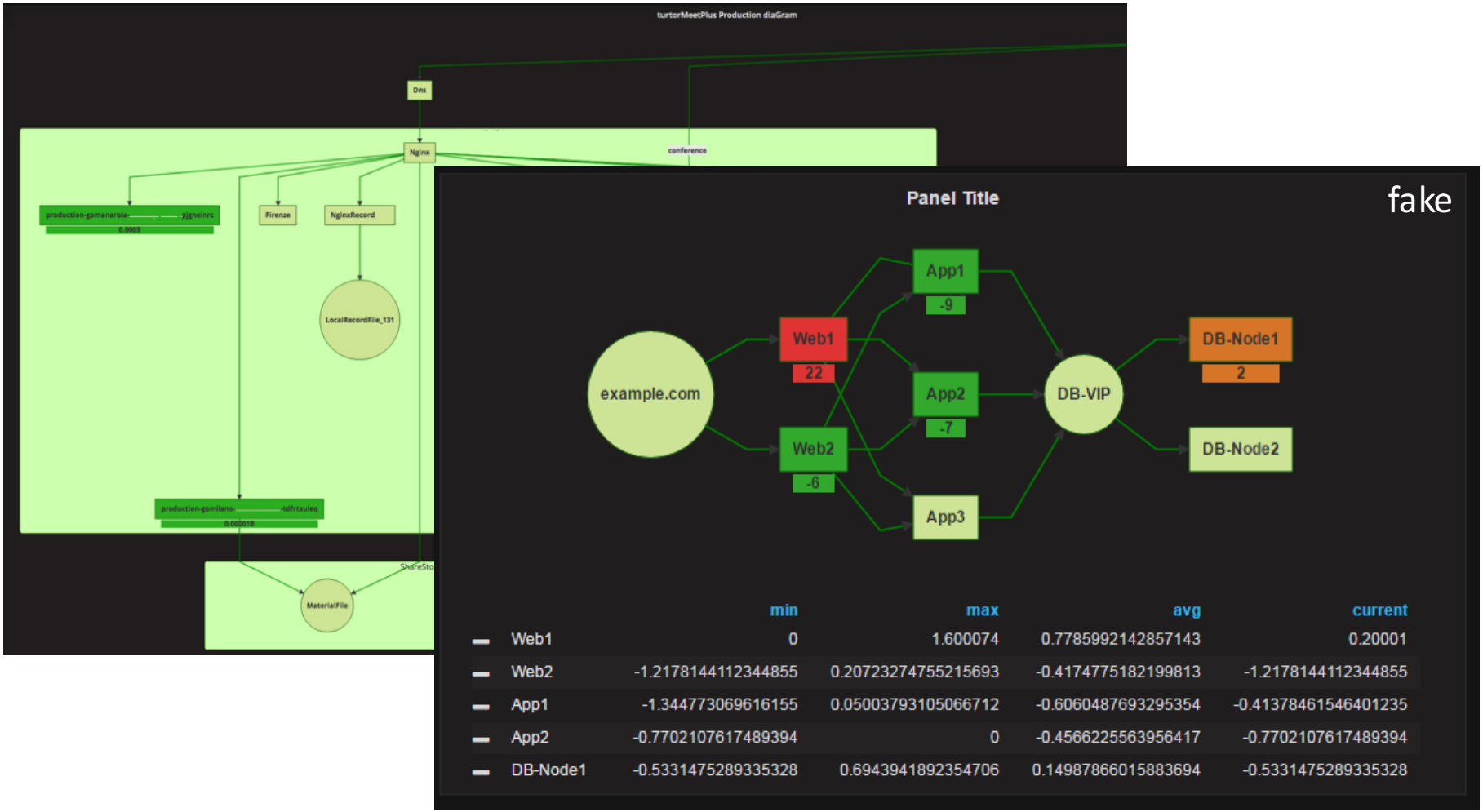
TutorMeet+ v1.0 Architectu



TutorMeet+ v1.0 Monitor Syste...

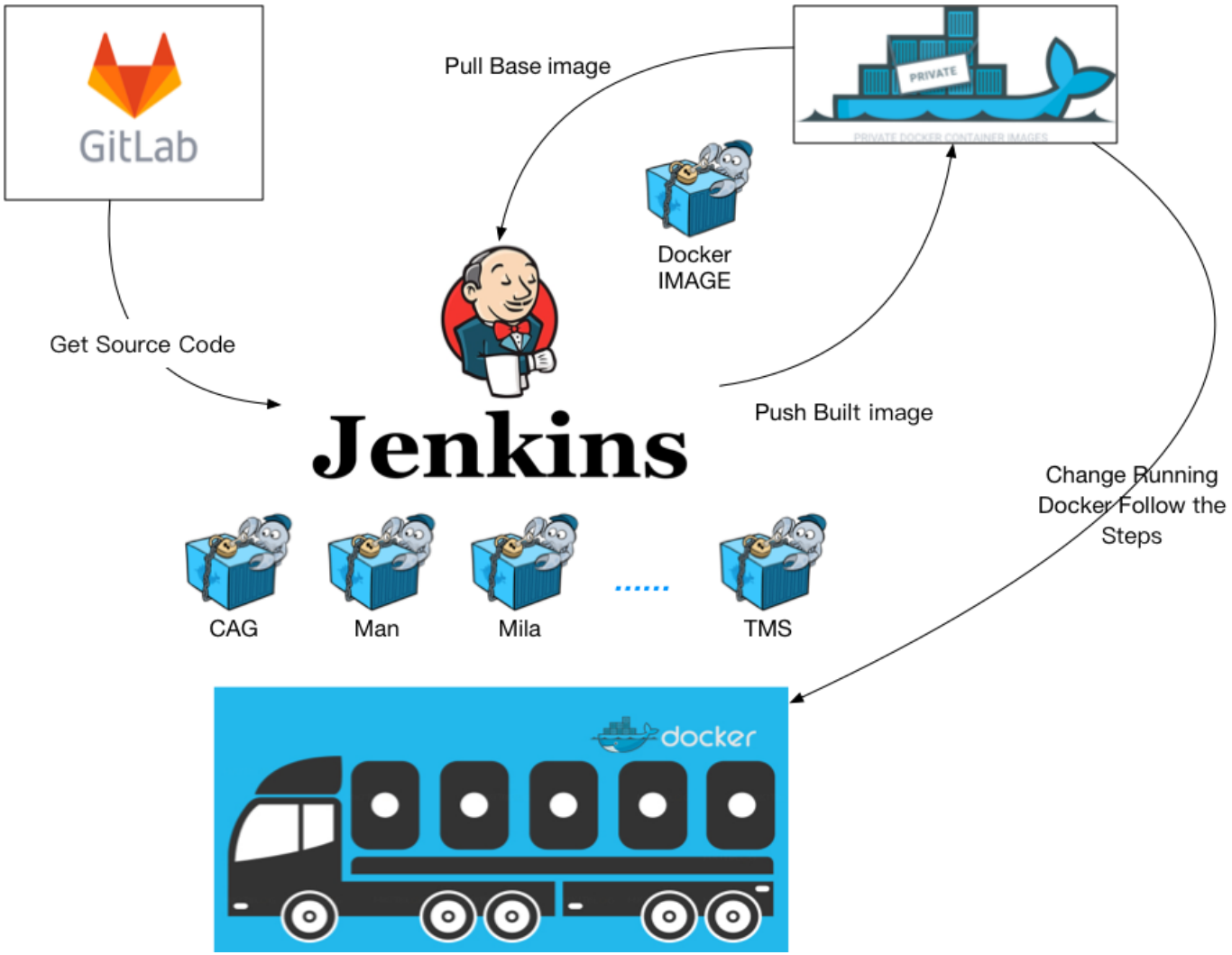
TutorMeet+ v1.0 Monitor System II

TutorMeet+ v1.0 Monitor System III



	min	max	avg	current
Web1	0	1.600074	0.7785992142857143	0.20001
Web2	-1.2178144112344855	0.20723274755215693	-0.4174775182199813	-1.2178144112344855
App1	-1.344773069616155	0.05003793105066712	-0.6060487693295354	-0.41378461546401235
App2	-0.7702107617489394	0	-0.4566225563956417	-0.7702107617489394
DB-Node1	-0.5331475289335328	0.6943941892354706	0.14987866015883694	-0.5331475289335328

TutorMeet+ Auto Deployme



5、TutorMeet+ v1.0 Upgrade

TutorMeet+ Upgrade

- Container Orchestration ;
- Light Native Client ;
- Development Upgrade ;
- For WeChat ;
- Front-End Refactoring ;

Q&A

We are recruiting excellent gopher！

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Thanks !