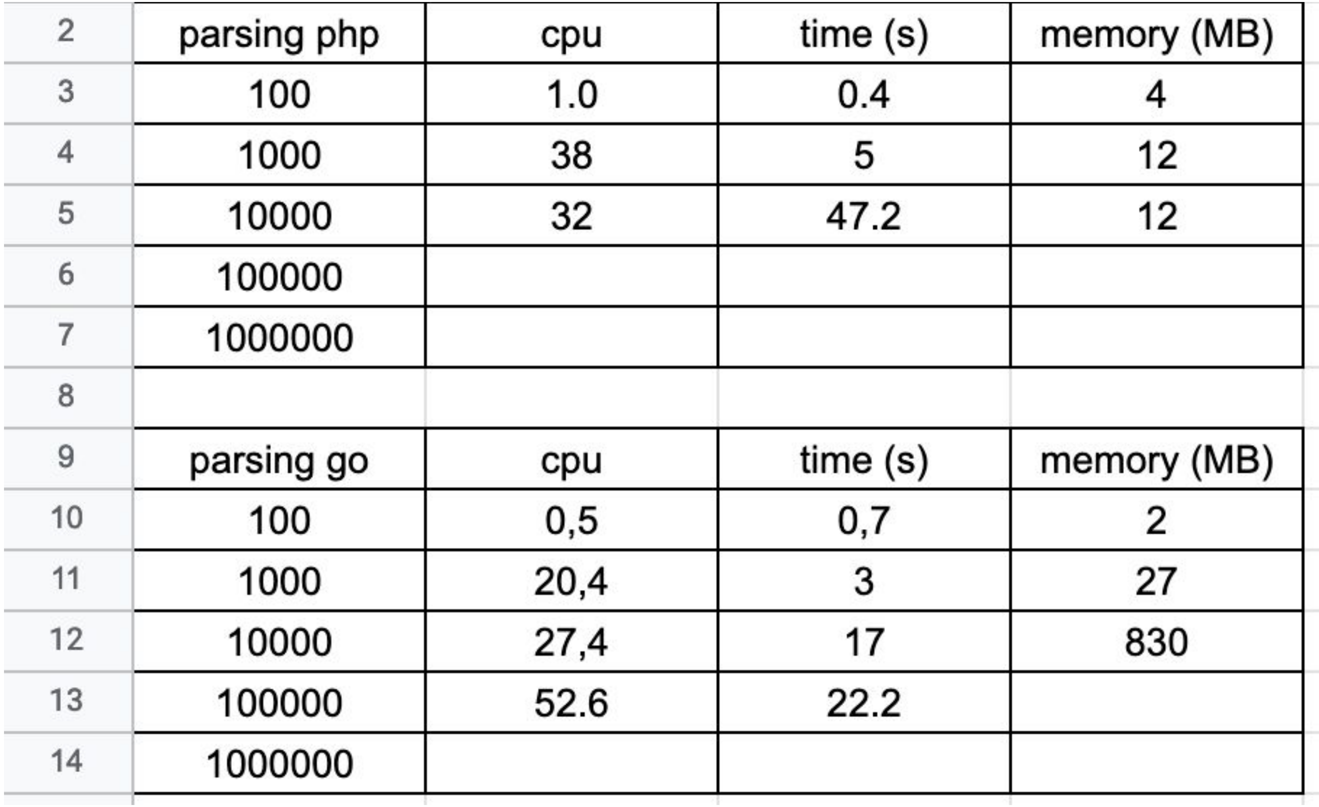
Бенчмарки, переход с PHP на Go

Автор: Денис Лимарев

GO
PHP

ПАРСИНГ + БД



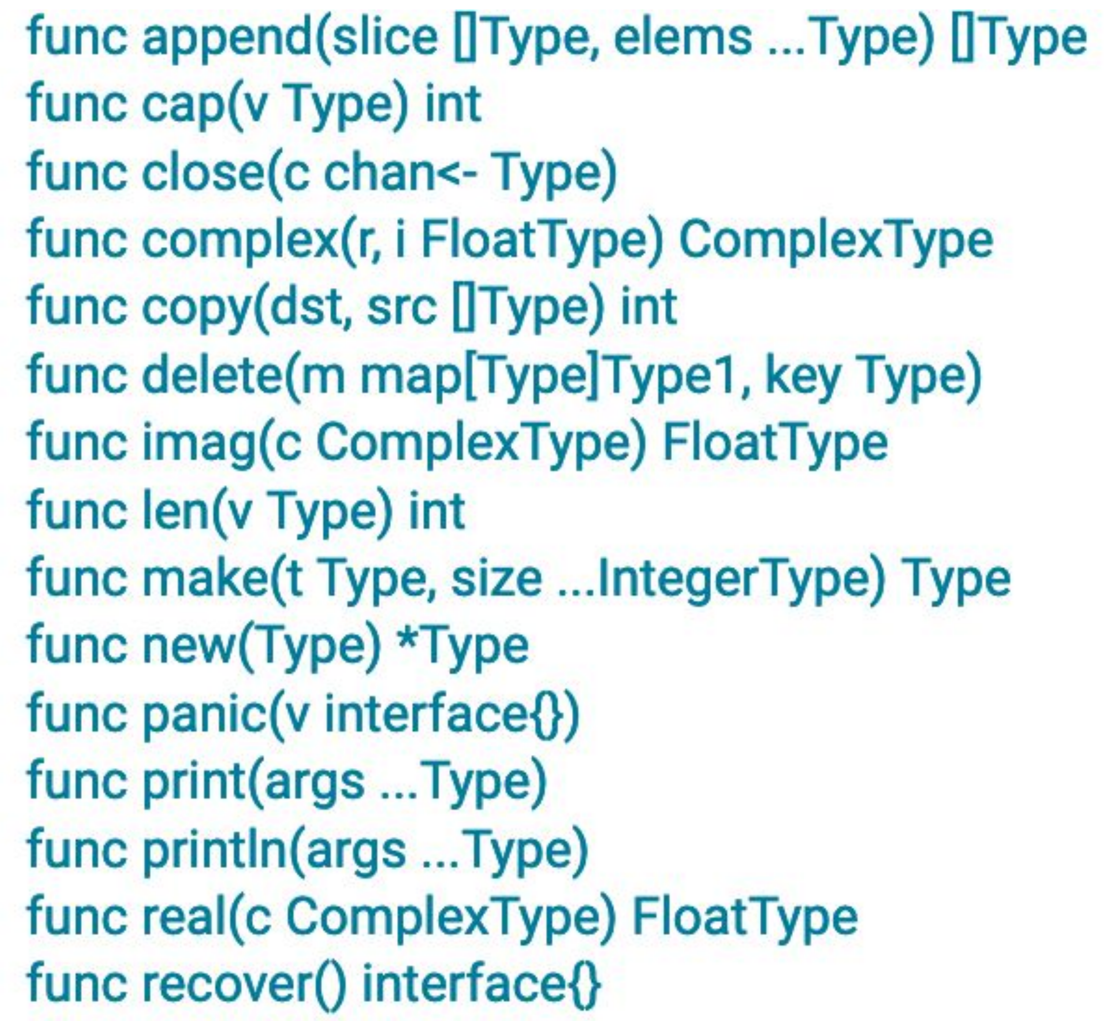
2	parsing php	cpu	time (s)	memory (MB)
3	100	1.0	0.4	4
4	1000	38	5	12
5	10000	32	47.2	12
6	100000			
7	1000000			
8				
9	parsing go	cpu	time (s)	memory (MB)
10	100	0,5	0,7	2
11	1000	20,4	3	27
12	10000	27,4	17	830
13	100000	52.6	22.2	
14	1000000			

GO
PHP
vk/ld440

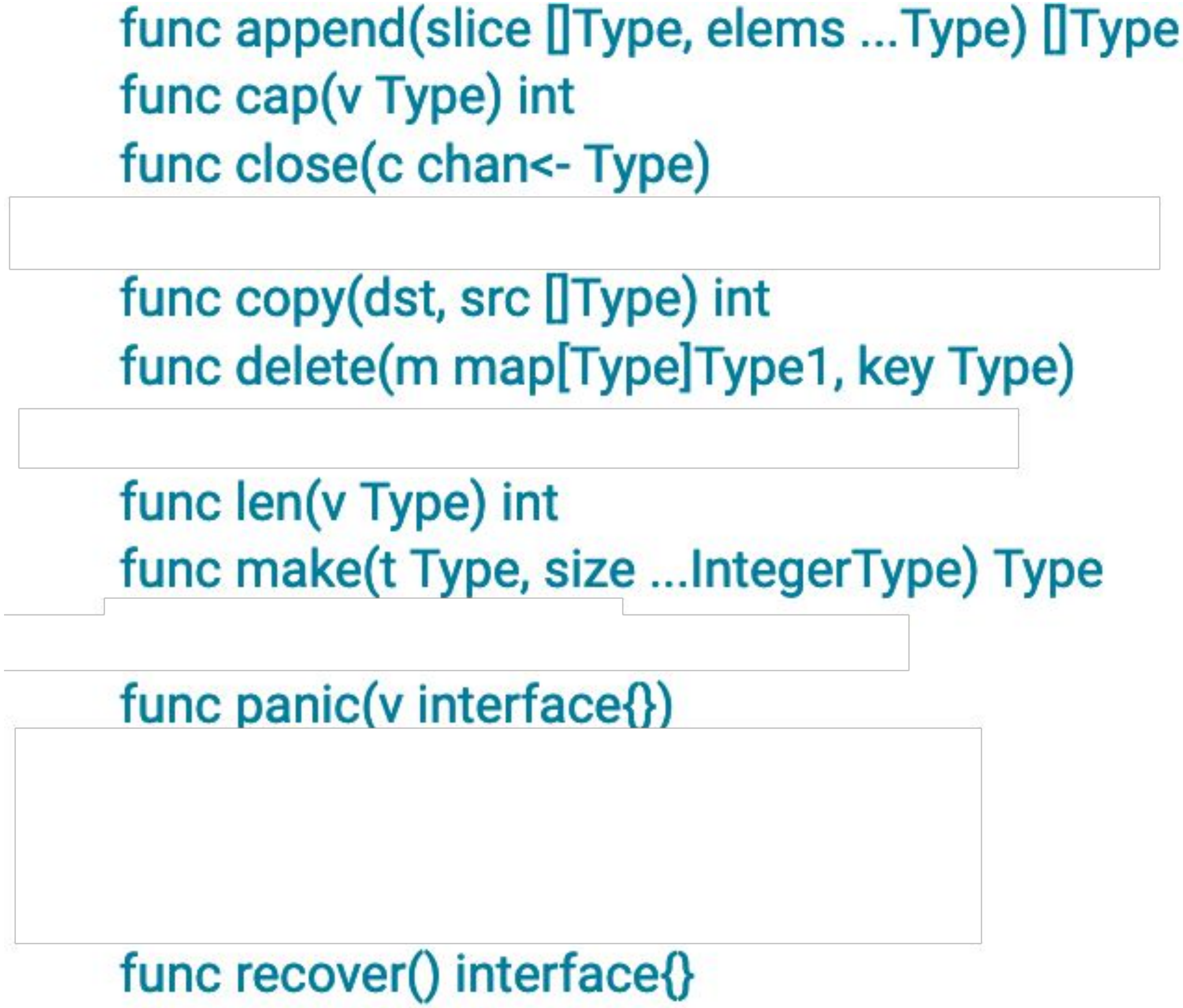
ПЕРЕХОД С PHP НА GO (ВВЕДЕНИЕ)

Основные трудности:

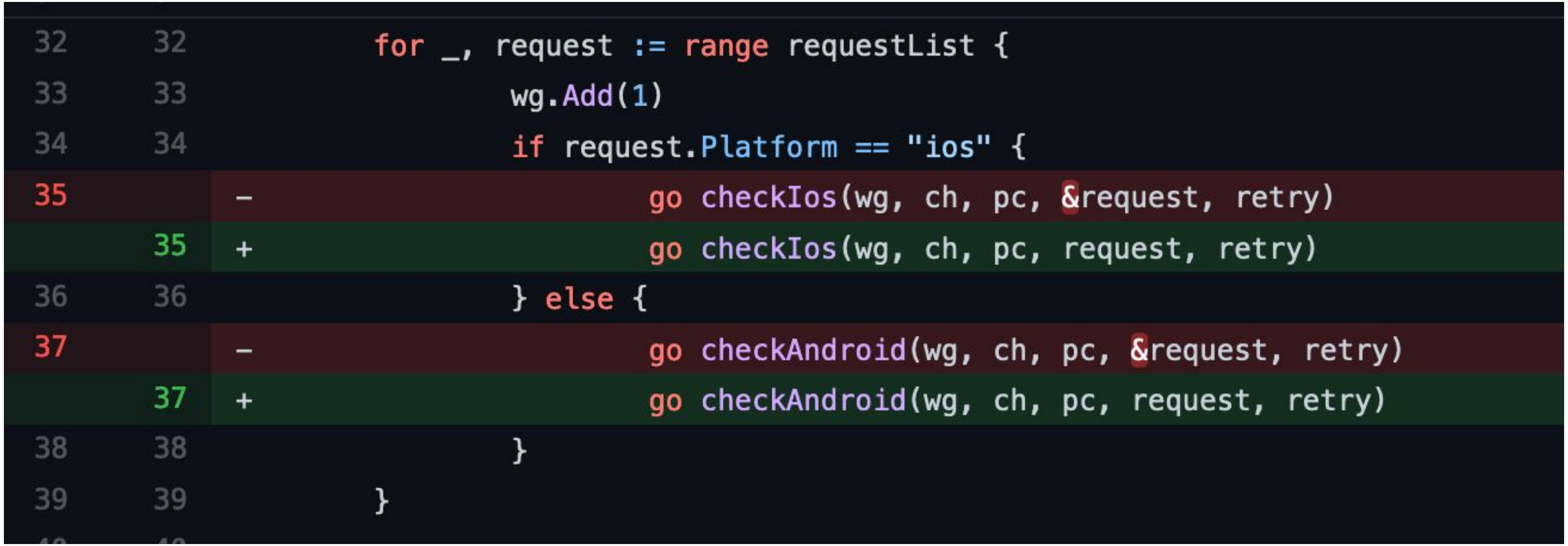
1. Строгая типизация
2. Отсутствие большого количества встроенных функций
3. Многопоточность
4. Возможность использования указателей
5. Низкоуровневая работа с памятью
6. Контексты переменных



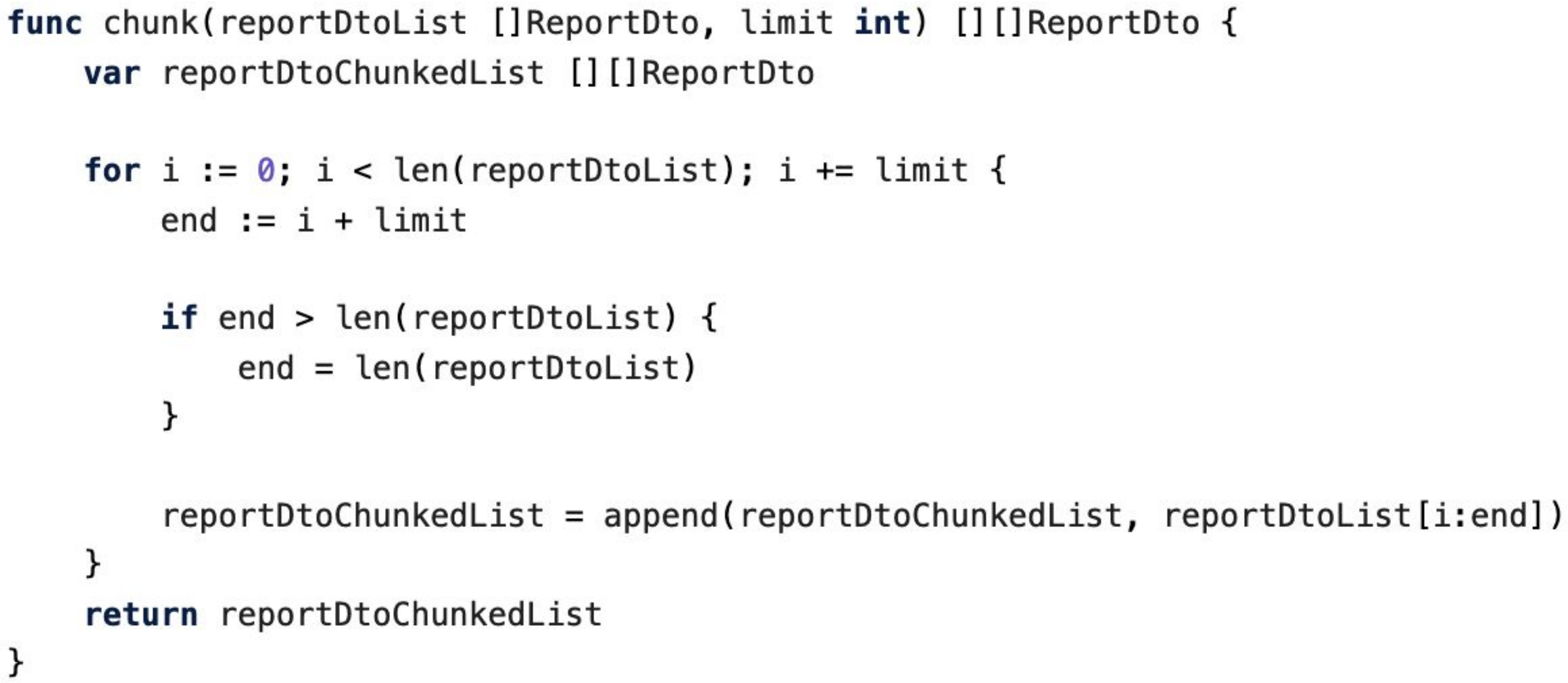
```
func append(slice []Type, elems ...Type) []Type
func cap(v Type) int
func close(c chan<- Type)
func complex(r, i FloatType) ComplexType
func copy(dst, src []Type) int
func delete(m map[Type]Type1, key Type)
func imag(c ComplexType) FloatType
func len(v Type) int
func make(t Type, size ...IntegerType) Type
func new(Type) *Type
func panic(v interface{})
func print(args ...Type)
func println(args ...Type)
func real(c ComplexType) FloatType
func recover() interface{}
```



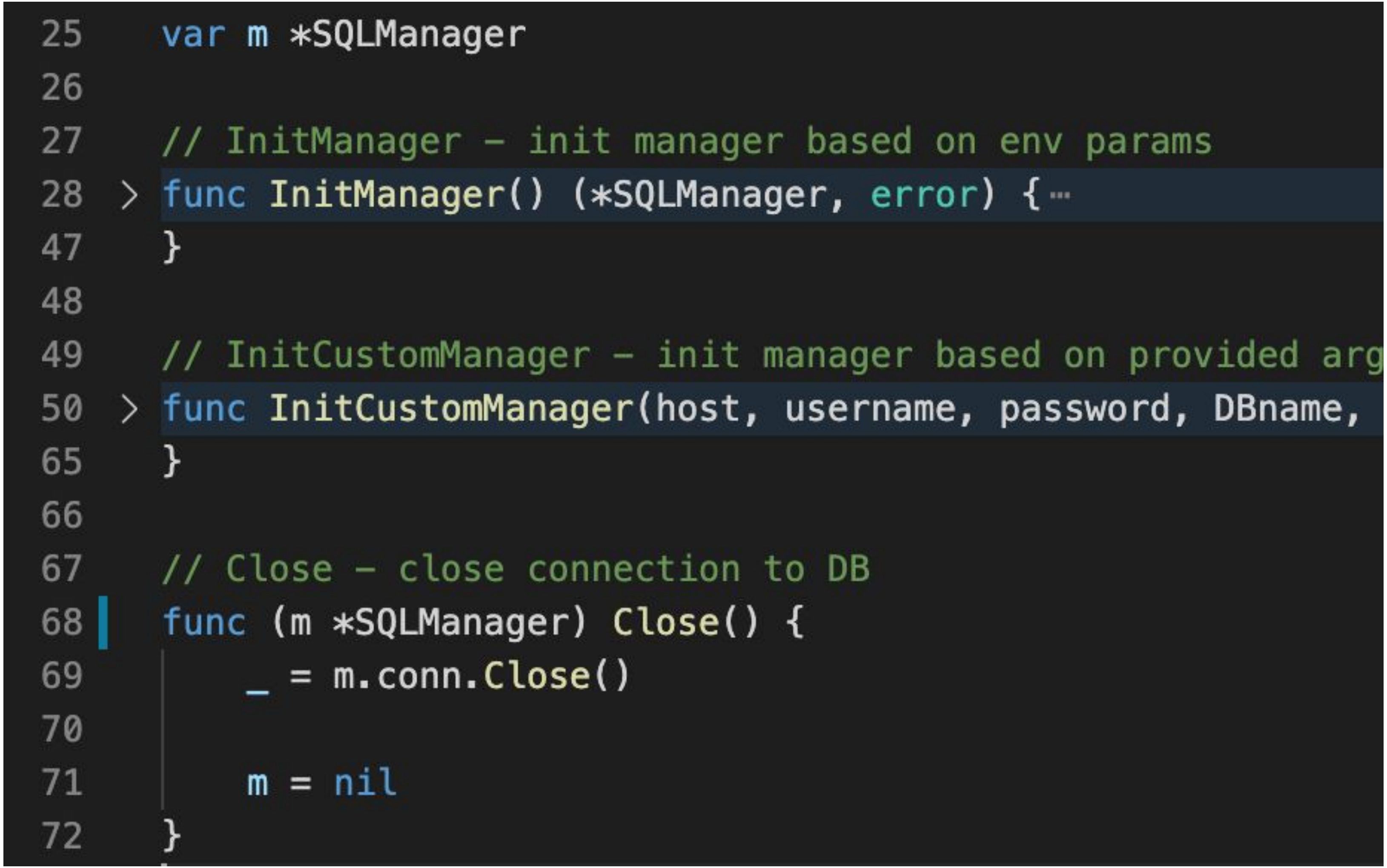
```
func append(slice []Type, elems ...Type) []Type
func cap(v Type) int
func close(c chan<- Type)

func copy(dst, src []Type) int
func delete(m map[Type]Type1, key Type)

func len(v Type) int
func make(t Type, size ...IntegerType) Type

func panic(v interface{})

func recover() interface{}
```



```diff
        for _, request := range requestList {
                wg.Add(1)
                if request.Platform == "ios" {
-                       go checkIos(wg, ch, pc, &request, retry)
+                       go checkIos(wg, ch, pc, request, retry)
                } else {
-                       go checkAndroid(wg, ch, pc, &request, retry)
+                       go checkAndroid(wg, ch, pc, request, retry)
                }
        }
```



```go
func chunk(reportDtoList []ReportDto, limit int) [][]ReportDto {
    var reportDtoChunkedList [][]ReportDto

    for i := 0; i < len(reportDtoList); i += limit {
        end := i + limit

        if end > len(reportDtoList) {
            end = len(reportDtoList)
        }

        reportDtoChunkedList = append(reportDtoChunkedList, reportDtoList[i:end])
    }
    return reportDtoChunkedList
}
```

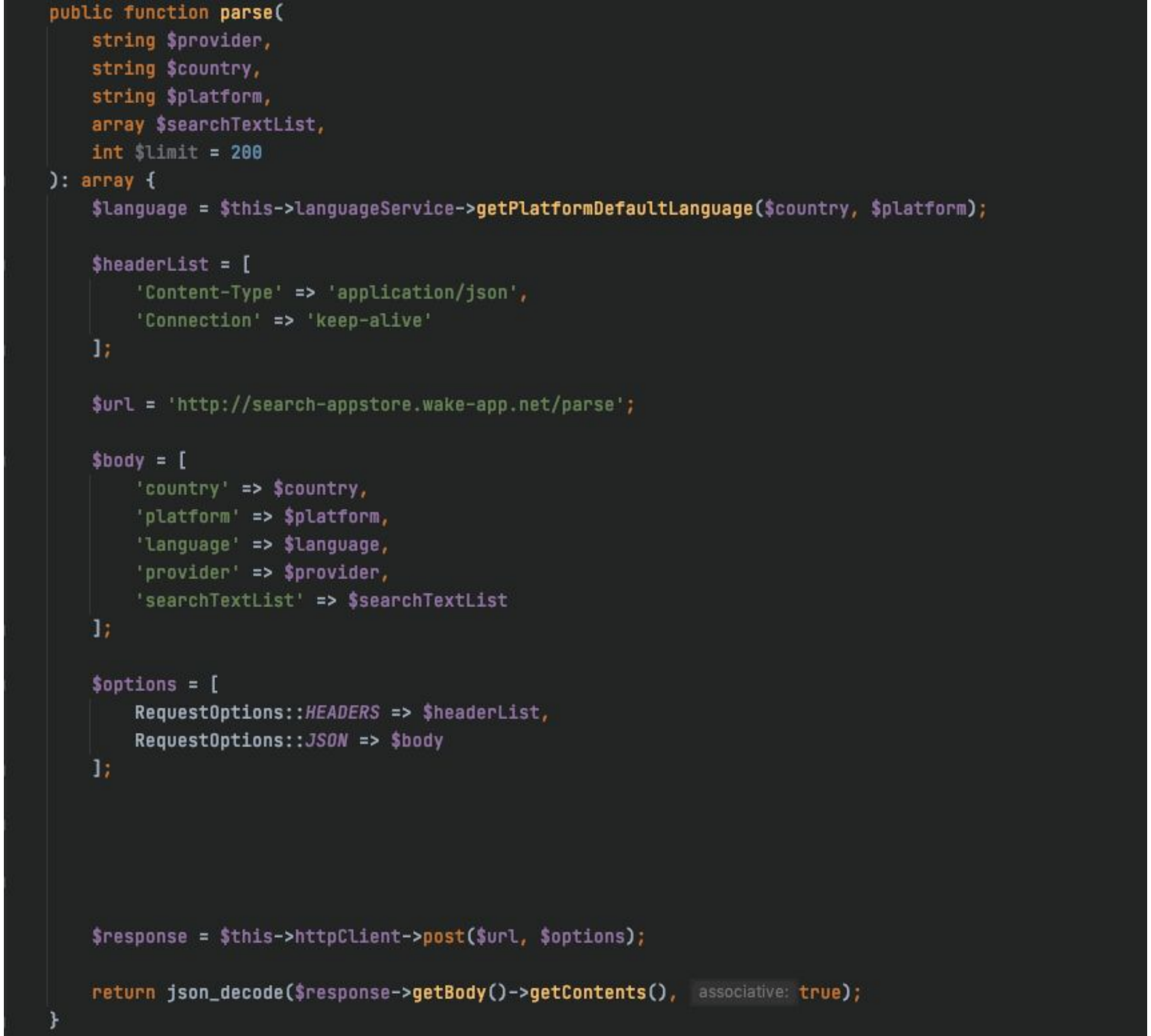


```go
var m *SQLManager

// InitManager - init manager based on env params
func InitManager() (*SQLManager, error) {⋯
}

// InitCustomManager - init manager based on provided arg
func InitCustomManager(host, username, password, DBname,
}

// Close - close connection to DB
func (m *SQLManager) Close() {
    _ = m.conn.Close()

    m = nil
}
```

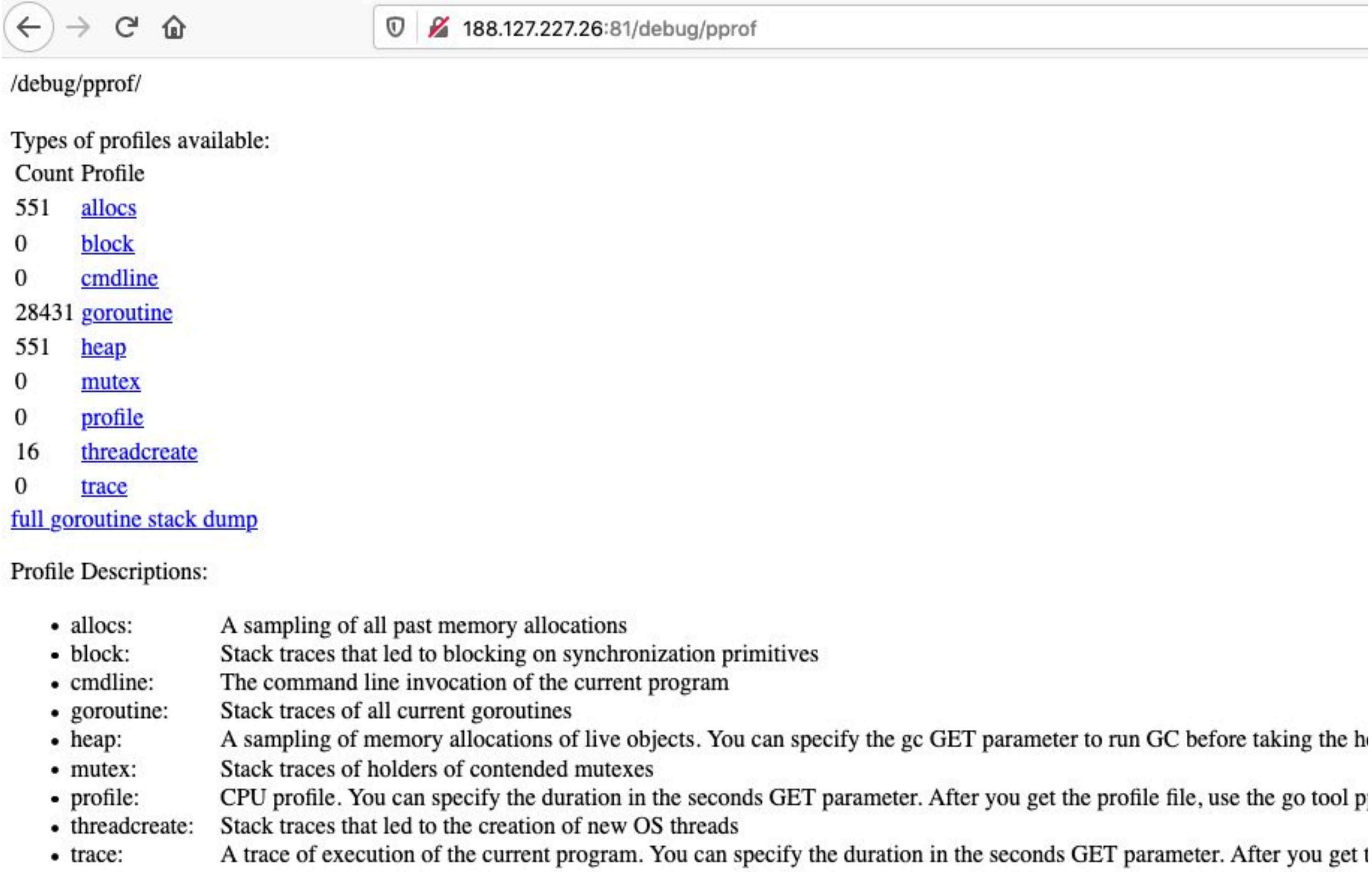
Спасибо за внимание

Мы с пацанами после митапа

Ошибки недели



```php
public function parse(
    string $provider,
    string $country,
    string $platform,
    array $searchTextList,
    int $limit = 200
): array {
    $language = $this->languageService->getPlatformDefaultLanguage($country, $platform);

    $headerList = [
        'Content-Type' => 'application/json',
        'Connection' => 'keep-alive'
    ];

    $url = 'http://search-appstore.wake-app.net/parse';

    $body = [
        'country' => $country,
        'platform' => $platform,
        'language' => $language,
        'provider' => $provider,
        'searchTextList' => $searchTextList
    ];

    $options = [
        RequestOptions::HEADERS => $headerList,
        RequestOptions::JSON => $body
    ];





    $response = $this->httpClient->post($url, $options);

    return json_decode($response->getBody()->getContents(), associative: true);
}
```



/debug/pprof/

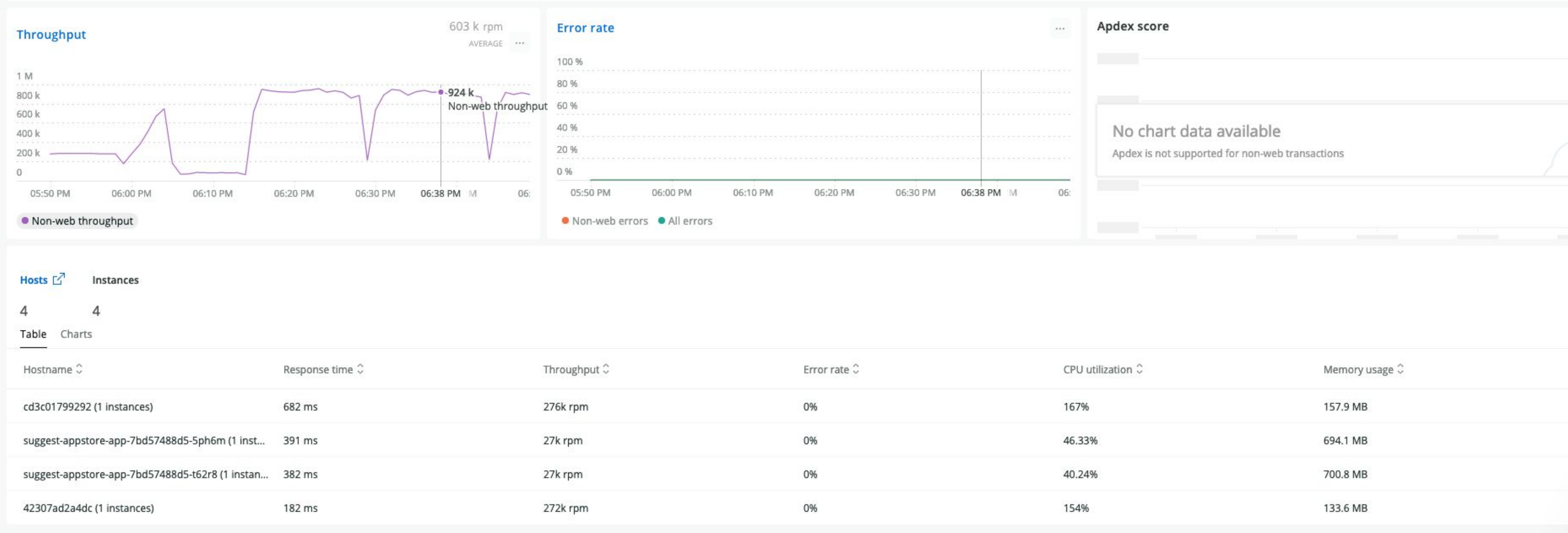
Types of profiles available:

Count	Profile
551	allocs
0	block
0	cmdline
28431	goroutine
551	heap
0	mutex
0	profile
16	threadcreate
0	trace

full goroutine stack dump

Profile Descriptions:

- allocs: A sampling of all past memory allocations
- block: Stack traces that led to blocking on synchronization primitives
- cmdline: The command line invocation of the current program
- goroutine: Stack traces of all current goroutines
- heap: A sampling of memory allocations of live objects. You can specify the gc GET parameter to run GC before taking the h
- mutex: Stack traces of holders of contended mutexes
- profile: CPU profile. You can specify the duration in the seconds GET parameter. After you get the profile file, use the go tool p
- threadcreate: Stack traces that led to the creation of new OS threads
- trace: A trace of execution of the current program. You can specify the duration in the seconds GET parameter. After you get t



No chart data available

Apdex is not supported for non-web transactions

Hosts

4

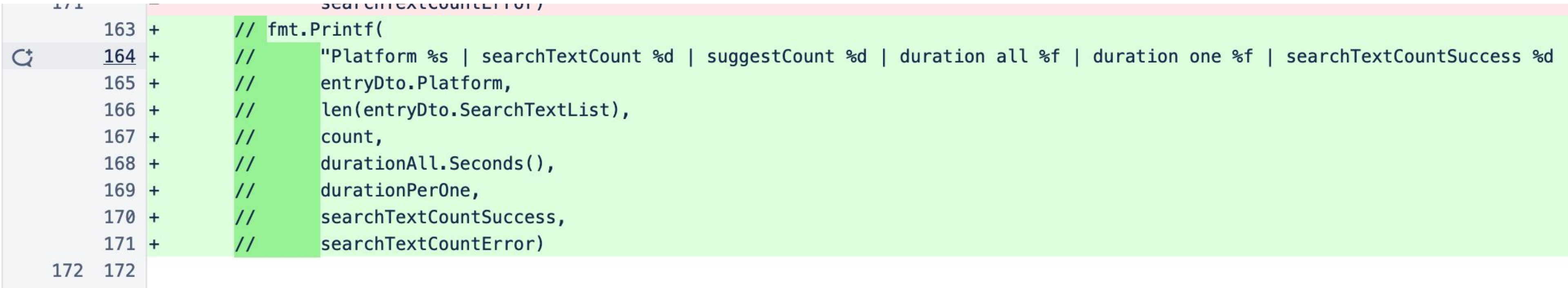
Instances

4

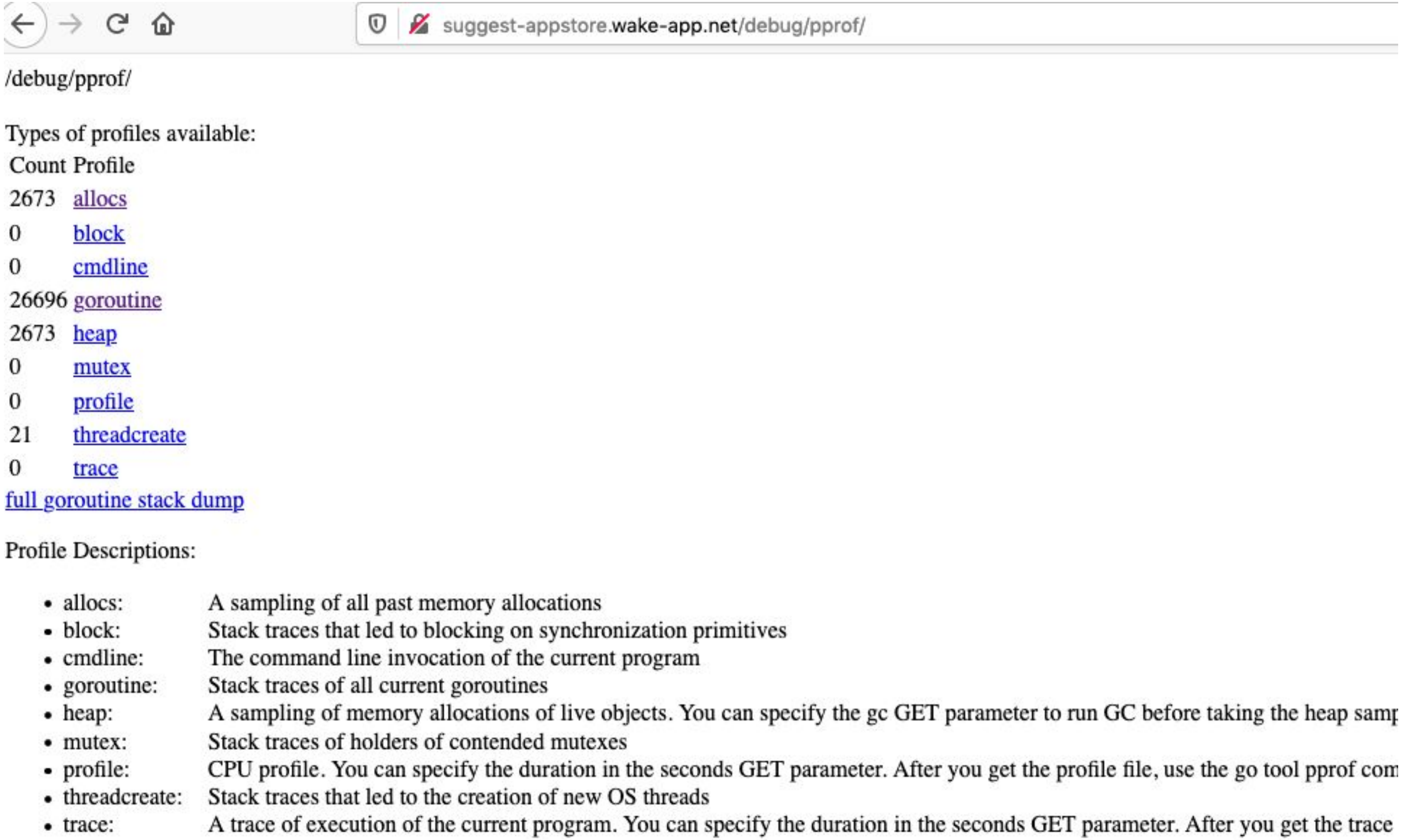
Table

Charts

Hostname	Response time	Throughput	Error rate	CPU utilization	Memory usage
cd3c01799292 (1 instances)	682 ms	276k rpm	0%	167%	157.9 MB
suggest-appstore-app-7bd57488d5-5ph6m (1 inst...	391 ms	27k rpm	0%	46.33%	694.1 MB
suggest-appstore-app-7bd57488d5-t62r8 (1 instan...	382 ms	27k rpm	0%	40.24%	700.8 MB
42307ad2a4dc (1 instances)	182 ms	272k rpm	0%	154%	133.6 MB



```
-                 searchTextCountError)
+       // fmt.Printf(
+       //      "Platform %s | searchTextCount %d | suggestCount %d | duration all %f | duration one %f | searchTextCountSuccess %d
+       //      entryDto.Platform,
+       //      len(entryDto.SearchTextList),
+       //      count,
+       //      durationAll.Seconds(),
+       //      durationPerOne,
+       //      searchTextCountSuccess,
+       //      searchTextCountError)

```



suggest-appstore.wake-app.net/debug/pprof/

/debug/pprof/

Types of profiles available:

Count	Profile
2673	allocs
0	block
0	cmdline
26696	goroutine
2673	heap
0	mutex
0	profile
21	threadcreate
0	trace

full goroutine stack dump

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- profile: CPU profile. You can specify the duration in the seconds GET parameter. After you get the profile file, use the go tool pprof com
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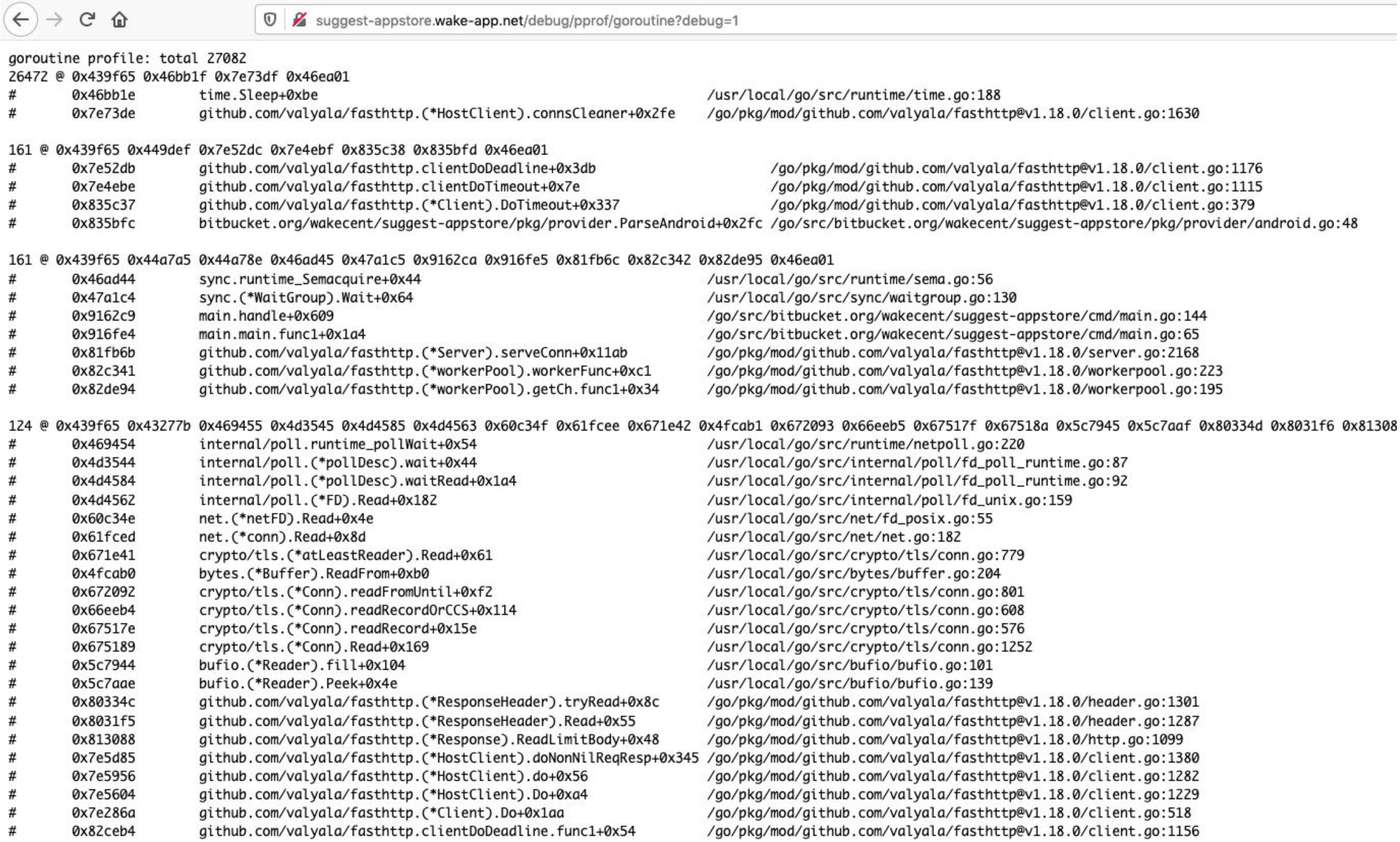


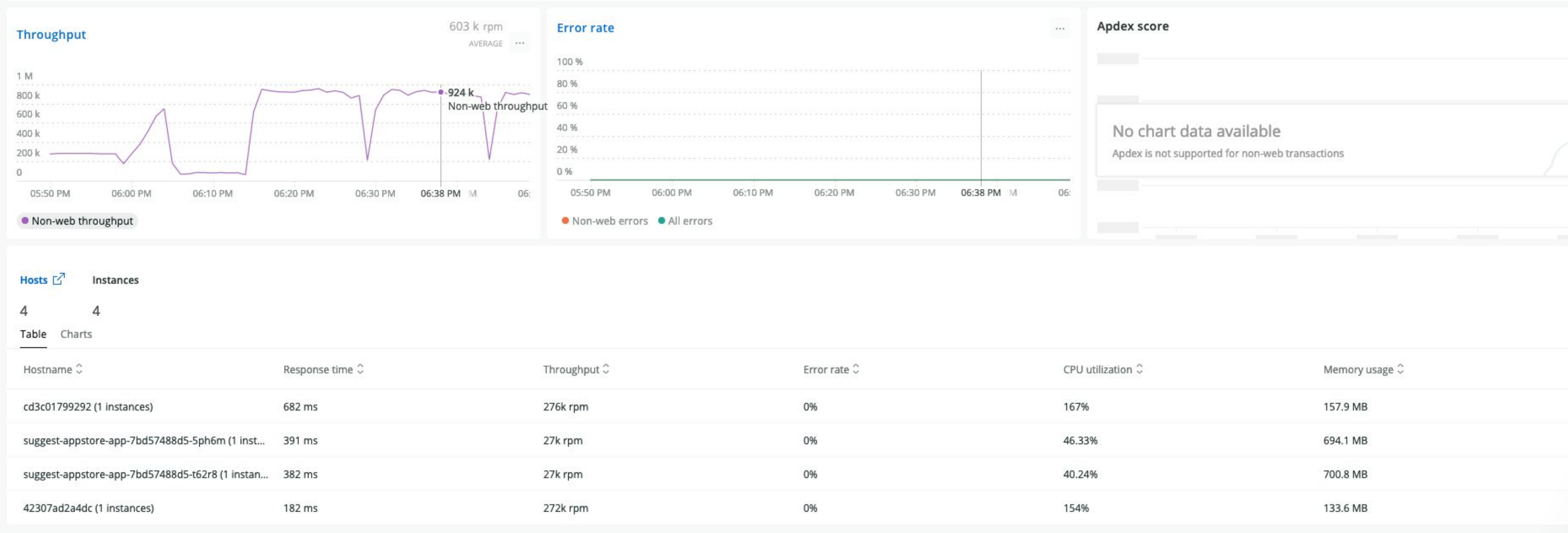
suggest-appstore.wake-app.net/debug/pprof/goroutine?debug=1

```
goroutine profile: total 27082
26472 @ 0x439f65 0x46bb1f 0x7e73df 0x46ea01
#       0x46bb1e        time.Sleep+0xbe                                                 /usr/local/go/src/runtime/time.go:188
#       0x7e73de        github.com/valyala/fasthttp.(*HostClient).connsCleaner+0x2fe    /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1630

161 @ 0x439f65 0x449def 0x7e52dc 0x7e4ebf 0x835c38 0x835bfd 0x46ea01
#       0x7e52db        github.com/valyala/fasthttp.clientDoDeadline+0x3db                       /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1176
#       0x7e4ebe        github.com/valyala/fasthttp.clientDoTimeout+0x7e                         /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1115
#       0x835c37        github.com/valyala/fasthttp.(*Client).DoTimeout+0x337                    /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:379
#       0x835bfc        bitbucket.org/wakecent/suggest-appstore/pkg/provider.ParseAndroid+0x2fc /go/src/bitbucket.org/wakecent/suggest-appstore/pkg/provider/android.go:48

161 @ 0x439f65 0x44a7a5 0x44a78e 0x46ad45 0x47a1c5 0x9162ca 0x916fe5 0x81fb6c 0x82c342 0x82de95 0x46ea01
#       0x46ad44        sync.runtime_Semacquire+0x44                                    /usr/local/go/src/runtime/sema.go:56
#       0x47a1c4        sync.(*WaitGroup).Wait+0x64                                     /usr/local/go/src/sync/waitgroup.go:130
#       0x9162c9        main.handle+0x609                                               /go/src/bitbucket.org/wakecent/suggest-appstore/cmd/main.go:144
#       0x916fe4        main.main.func1+0x1a4                                           /go/src/bitbucket.org/wakecent/suggest-appstore/cmd/main.go:65
#       0x81fb6b        github.com/valyala/fasthttp.(*Server).serveConn+0x11ab          /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/server.go:2168
#       0x82c341        github.com/valyala/fasthttp.(*workerPool).workerFunc+0xc1       /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/workerpool.go:223
#       0x82de94        github.com/valyala/fasthttp.(*workerPool).getCh.func1+0x34      /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/workerpool.go:195

124 @ 0x439f65 0x43277b 0x469455 0x4d3545 0x4d4585 0x4d4563 0x60c34f 0x61fcee 0x671e42 0x4fcab1 0x672093 0x66eeb5 0x67517f 0x67518a 0x5c7945 0x5c7aaf 0x80334d 0x8031f6 0x81308
#       0x469454        internal/poll.runtime_pollWait+0x54                             /usr/local/go/src/runtime/netpoll.go:220
#       0x4d3544        internal/poll.(*pollDesc).wait+0x44                             /usr/local/go/src/internal/poll/fd_poll_runtime.go:87
#       0x4d4584        internal/poll.(*pollDesc).waitRead+0x1a4                        /usr/local/go/src/internal/poll/fd_poll_runtime.go:92
#       0x4d4562        internal/poll.(*FD).Read+0x182                                  /usr/local/go/src/internal/poll/fd_unix.go:159
#       0x60c34e        net.(*netFD).Read+0x4e                                          /usr/local/go/src/net/fd_posix.go:55
#       0x61fced        net.(*conn).Read+0x8d                                           /usr/local/go/src/net/net.go:182
#       0x671e41        crypto/tls.(*atLeastReader).Read+0x61                           /usr/local/go/src/crypto/tls/conn.go:779
#       0x4fcab0        bytes.(*Buffer).ReadFrom+0xb0                                   /usr/local/go/src/bytes/buffer.go:204
#       0x672092        crypto/tls.(*Conn).readFromUntil+0xf2                           /usr/local/go/src/crypto/tls/conn.go:801
#       0x66eeb4        crypto/tls.(*Conn).readRecordOrCCS+0x114                        /usr/local/go/src/crypto/tls/conn.go:608
#       0x67517e        crypto/tls.(*Conn).readRecord+0x15e                             /usr/local/go/src/crypto/tls/conn.go:576
#       0x675189        crypto/tls.(*Conn).Read+0x169                                   /usr/local/go/src/crypto/tls/conn.go:1252
#       0x5c7944        bufio.(*Reader).fill+0x104                                      /usr/local/go/src/bufio/bufio.go:101
#       0x5c7aae        bufio.(*Reader).Peek+0x4e                                       /usr/local/go/src/bufio/bufio.go:139
#       0x80334c        github.com/valyala/fasthttp.(*ResponseHeader).tryRead+0x8c      /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/header.go:1301
#       0x8031f5        github.com/valyala/fasthttp.(*ResponseHeader).Read+0x55         /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/header.go:1287
#       0x813088        github.com/valyala/fasthttp.(*Response).ReadLimitBody+0x48      /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/http.go:1099
#       0x7e5d85        github.com/valyala/fasthttp.(*HostClient).doNonNilReqResp+0x345 /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1380
#       0x7e5956        github.com/valyala/fasthttp.(*HostClient).do+0x56               /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1282
#       0x7e5604        github.com/valyala/fasthttp.(*HostClient).Do+0xa4               /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1229
#       0x7e286a        github.com/valyala/fasthttp.(*Client).Do+0x1aa                 /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:518
#       0x82ceb4        github.com/valyala/fasthttp.clientDoDeadline.func1+0x54         /go/pkg/mod/github.com/valyala/fasthttp@v1.18.0/client.go:1156
```



No chart data available

Apdex is not supported for non-web transactions

Hosts 4

Instances 4

Table Charts

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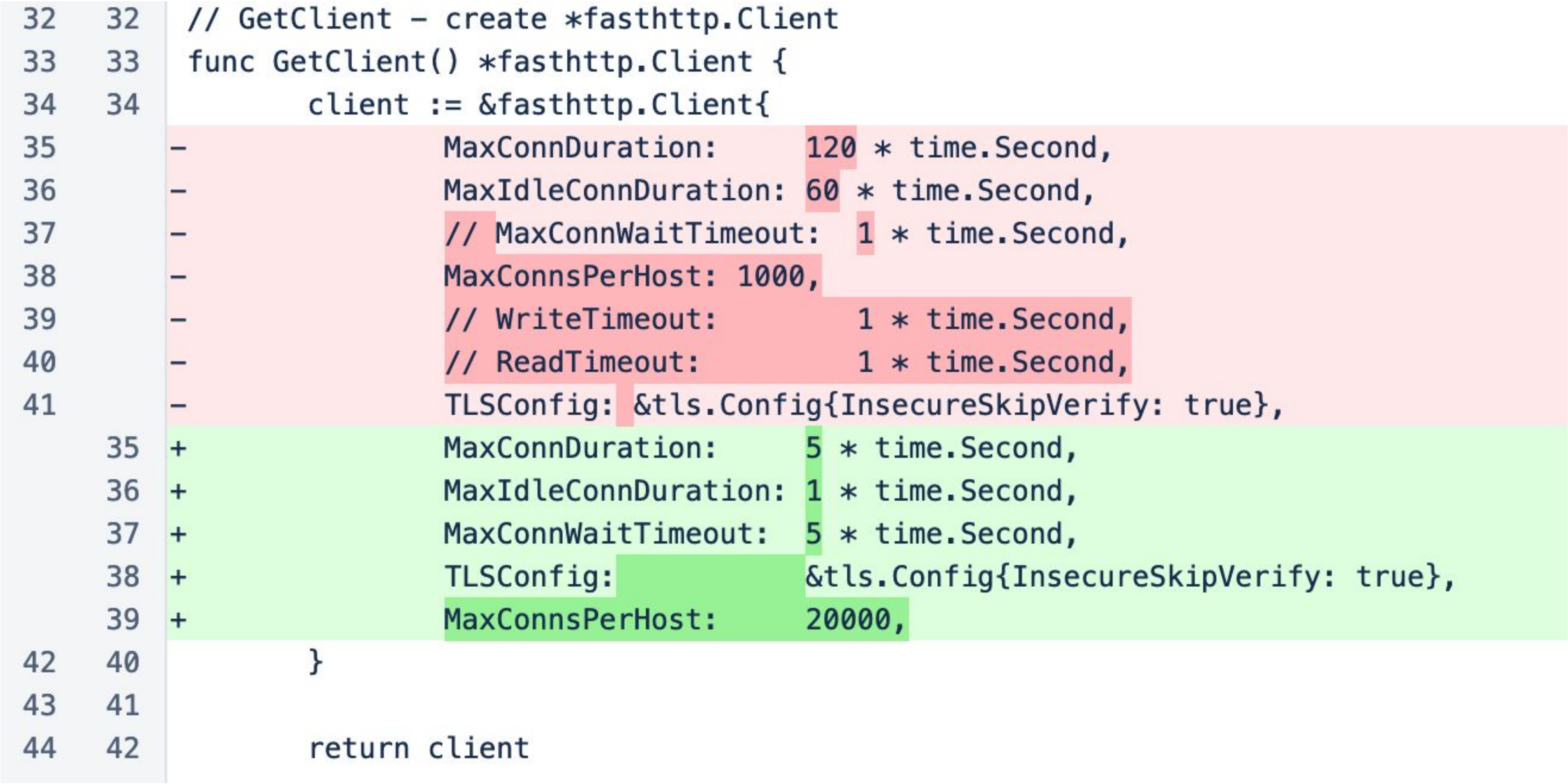
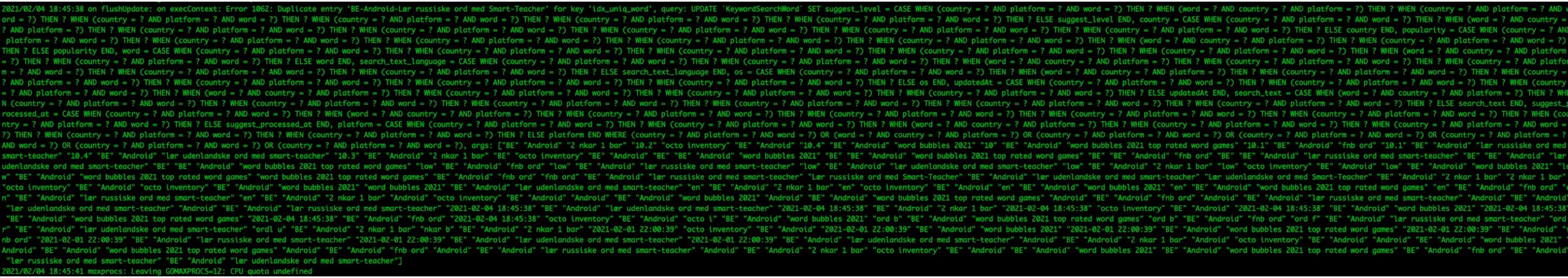


```
 // GetClient - create *fasthttp.Client
 func GetClient() *fasthttp.Client {
         client := &fasthttp.Client{
-                MaxConnDuration:     120 * time.Second,
-                MaxIdleConnDuration: 60 * time.Second,
-                // MaxConnWaitTimeout:  1 * time.Second,
-                MaxConnsPerHost: 1000,
-                // WriteTimeout:        1 * time.Second,
-                // ReadTimeout:         1 * time.Second,
-                TLSConfig: &tls.Config{InsecureSkipVerify: true},
+                MaxConnDuration:     5 * time.Second,
+                MaxIdleConnDuration: 1 * time.Second,
+                MaxConnWaitTimeout:  5 * time.Second,
+                TLSConfig:           &tls.Config{InsecureSkipVerify: true},
+                MaxConnsPerHost:     20000,
         }

         return client
```



```
2021/02/04 18:45:38 on flushUpdate: on execContext: Error 1062: Duplicate entry 'BE-Android-Lær russiske ord med Smart-Teacher' for key 'idx_uniq_word', query: UPDATE `KeywordSearchWord` SET suggest_level = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND w
ord = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE suggest_level END, country = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country =
? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE country END, popularity = CASE WHEN (country = ? AND
 platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?)
THEN ? ELSE popularity END, word = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform
= ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE word END, search_text_language = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platfo
m = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE search_text_language END, os = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country =
? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE os END, updatedAt = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country
= ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE updatedAt END, search_text = CASE WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHE
N (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE search_text END, suggest_p
rocessed_at = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (cou
ntry = ? AND platform = ? AND word = ?) THEN ? ELSE suggest_processed_at END, platform = CASE WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (word = ? AND country = ? AND platform = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word =
?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? WHEN (country = ? AND platform = ? AND word = ?) THEN ? ELSE platform END WHERE (country = ? AND platform = ? AND word = ?) OR (word = ? AND country = ? AND platform = ?) OR (country = ? AND platform = ? AND word = ?) OR (country = ? AND platform = ? AND word = ?) OR (country = ? AND platform = ?
AND word = ?) OR (country = ? AND platform = ? AND word = ?) OR (country = ? AND platform = ? AND word = ?), args: ["BE" "Android" "2 nkar 1 bar" "10.2" "octo inventory" "BE" "Android" "10.4" "BE" "Android" "word bubbles 2021" "10" "BE" "Android" "word bubbles 2021 top rated word games" "10.1" "BE" "Android" "fnb ord" "10.1" "BE" "Android" "lær russiske ord med
smart-teacher" "10.4" "BE" "Android" "lær udenlandske ord med smart-teacher" "10.3" "BE" "Android" "2 nkar 1 bar" "BE" "octo inventory" "BE" "Android" "BE" "BE" "Android" "word bubbles 2021" "BE" "BE" "Android" "word bubbles 2021 top rated word games" "BE" "BE" "Android" "fnb ord" "BE" "BE" "Android" "lær russiske ord med smart-teacher" "BE" "BE" "Android" "lær
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 "lær russiske ord med smart-teacher" "BE" "Android" "lær udenlandske ord med smart-teacher"]
2021/02/04 18:45:41 maxprocs: Leaving GOMAXPROCS=12: CPU quota undefined
```
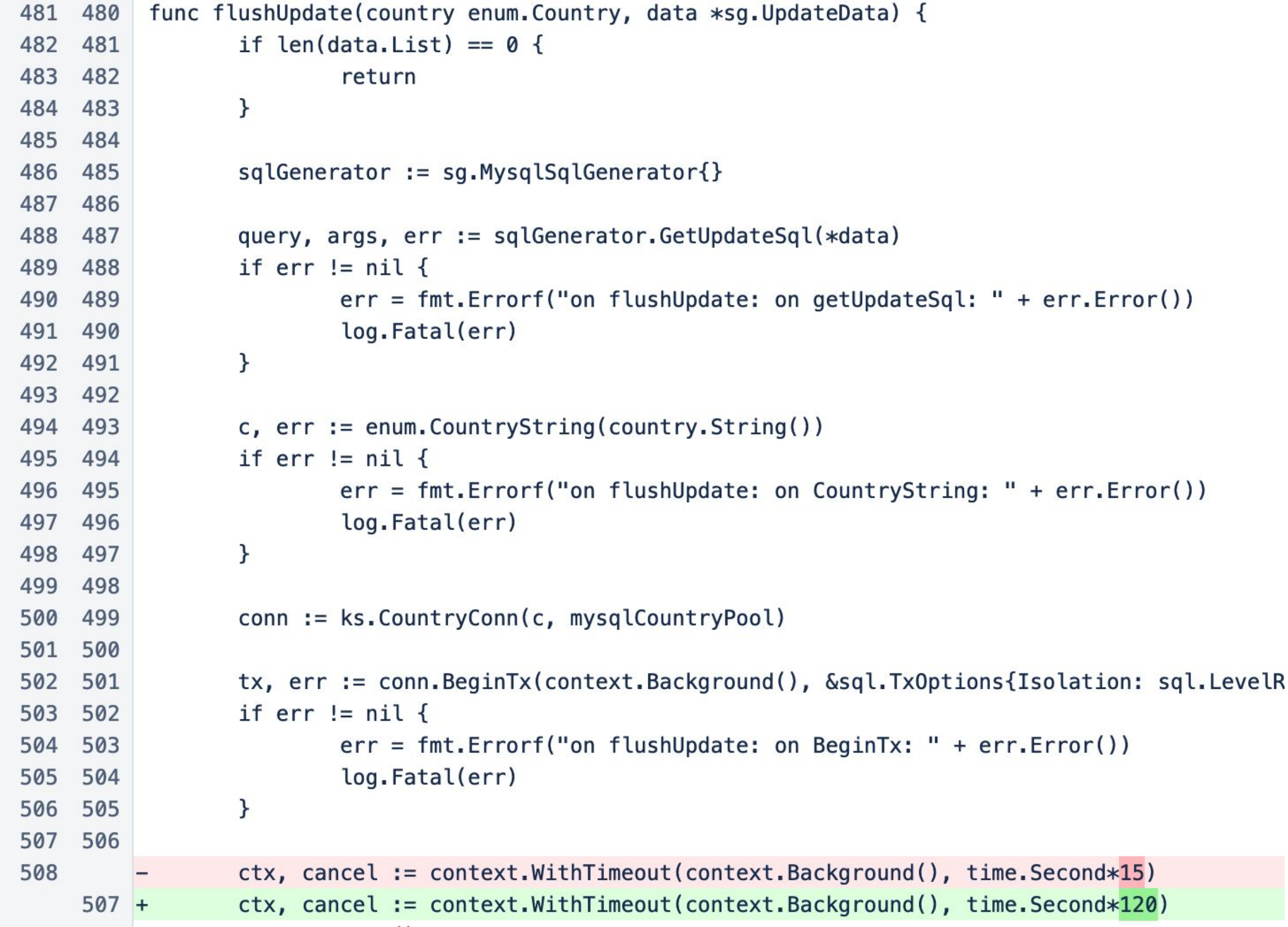
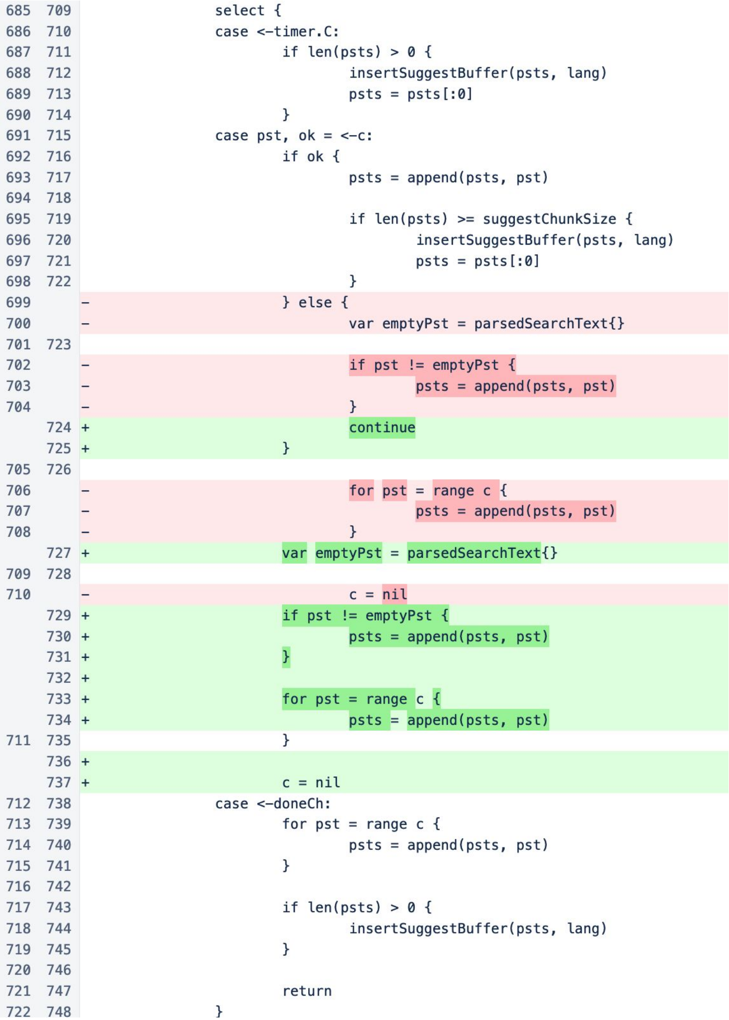



```
 func flushUpdate(country enum.Country, data *sg.UpdateData) {
        if len(data.List) == 0 {
                return
        }

        sqlGenerator := sg.MysqlSqlGenerator{}

        query, args, err := sqlGenerator.GetUpdateSql(*data)
        if err != nil {
                err = fmt.Errorf("on flushUpdate: on getUpdateSql: " + err.Error())
                log.Fatal(err)
        }

        c, err := enum.CountryString(country.String())
        if err != nil {
                err = fmt.Errorf("on flushUpdate: on CountryString: " + err.Error())
                log.Fatal(err)
        }

        conn := ks.CountryConn(c, mysqlCountryPool)

        tx, err := conn.BeginTx(context.Background(), &sql.TxOptions{Isolation: sql.LevelR
        if err != nil {
                err = fmt.Errorf("on flushUpdate: on BeginTx: " + err.Error())
                log.Fatal(err)
        }

-       ctx, cancel := context.WithTimeout(context.Background(), time.Second*15)
+       ctx, cancel := context.WithTimeout(context.Background(), time.Second*120)
```



```
  select {
  case <-timer.C:
      if len(psts) > 0 {
          insertSuggestBuffer(psts, lang)
          psts = psts[:0]
      }
  case pst, ok = <-c:
      if ok {
          psts = append(psts, pst)

          if len(psts) >= suggestChunkSize {
              insertSuggestBuffer(psts, lang)
              psts = psts[:0]
          }
-     } else {
-         var emptyPst = parsedSearchText{}

-         if pst != emptyPst {
-             psts = append(psts, pst)
-         }
+         continue
+     }

-         for pst = range c {
-             psts = append(psts, pst)
-         }
+     var emptyPst = parsedSearchText{}

-         c = nil
+     if pst != emptyPst {
+         psts = append(psts, pst)
+     }
+
+     for pst = range c {
+         psts = append(psts, pst)
      }
+
+     c = nil
  case <-doneCh:
      for pst = range c {
          psts = append(psts, pst)
      }

      if len(psts) > 0 {
          insertSuggestBuffer(psts, lang)
      }

      return
  }
```