

# Traffic Ops

## Golang Rewrite

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Traffic Ops Golang Incremental Rewrite App #729

<https://github.com/apache/incubator-trafficcontrol/pull/729>

# Overview

- Golang Proxy Sequences
- Feature Parity Progress
- How the code base is being affected
- Testing
- Anatomy of a Handler
  - how to build one (if time)

# Why the Golang Rewrite?

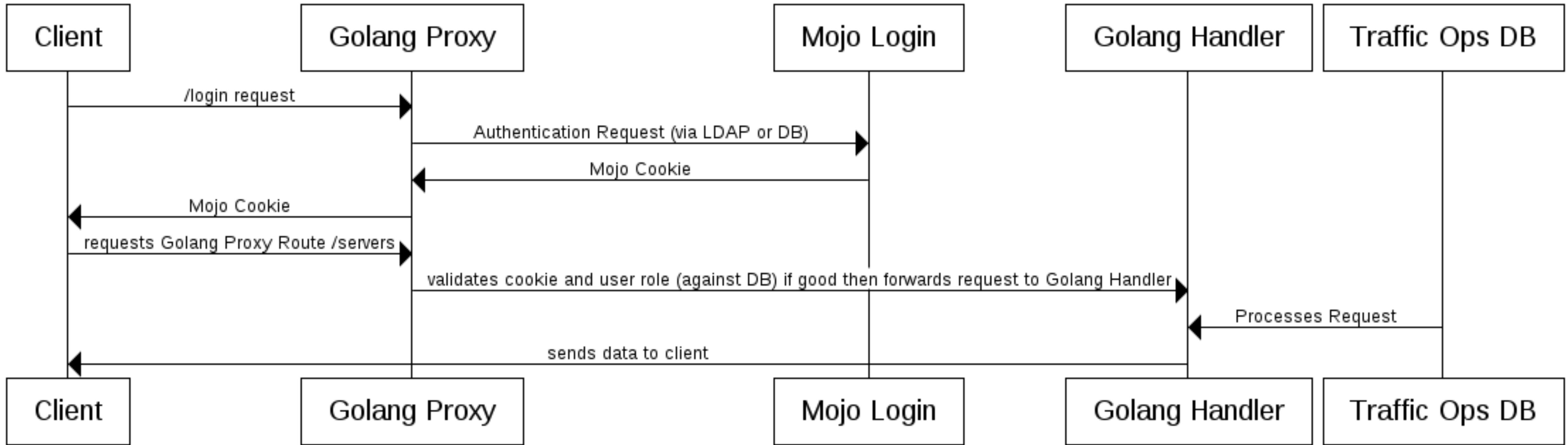
- Prefer Evolution over Big Bang
  - (Strangler Pattern - Martin Fowler)
- Reuse of deployment features
  - (rpms, configs, Puppet, Ansible)
- Performance

# Why the Golang Rewrite?

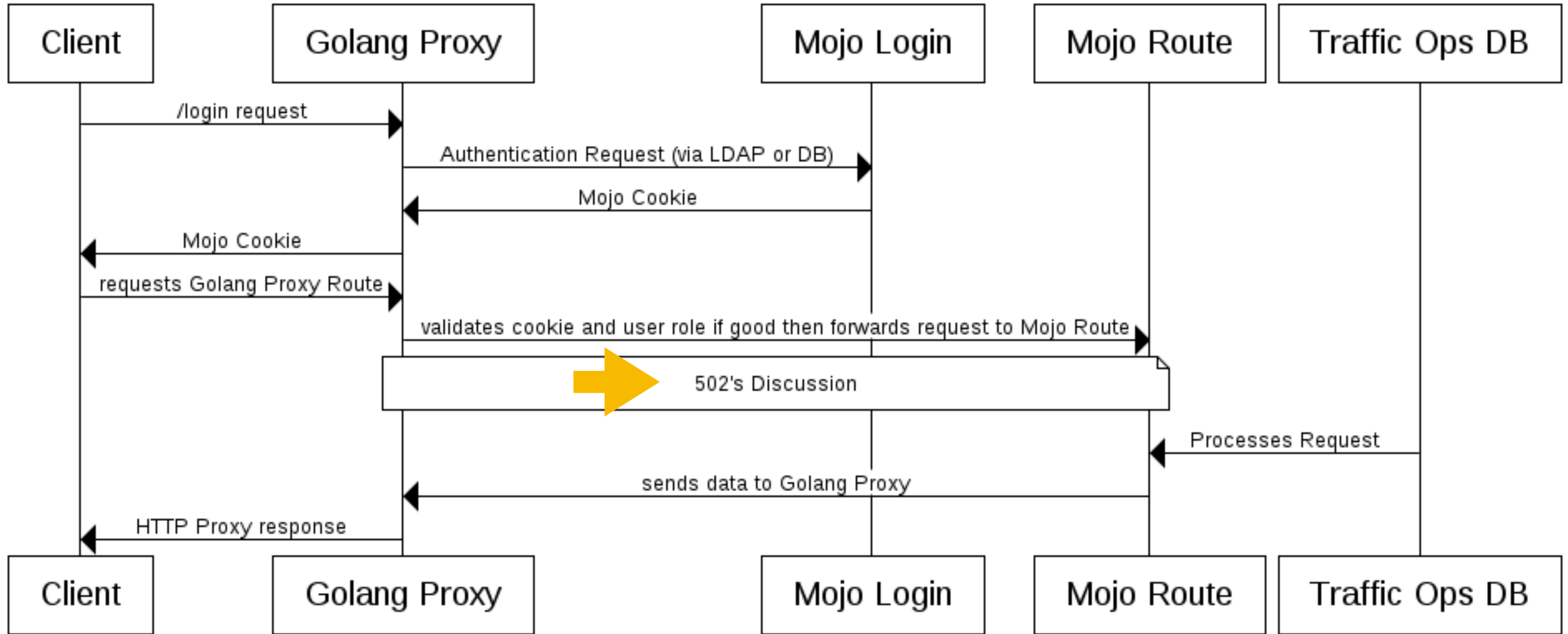
- Tools
  - (Gogland, goconvey, and of course vim-go)
  - Emacs users, you're on your own!
- Innovation

# Sequence Diagrams

## Golang Proxy with Golang Route



## Golang Proxy with Mojo Route





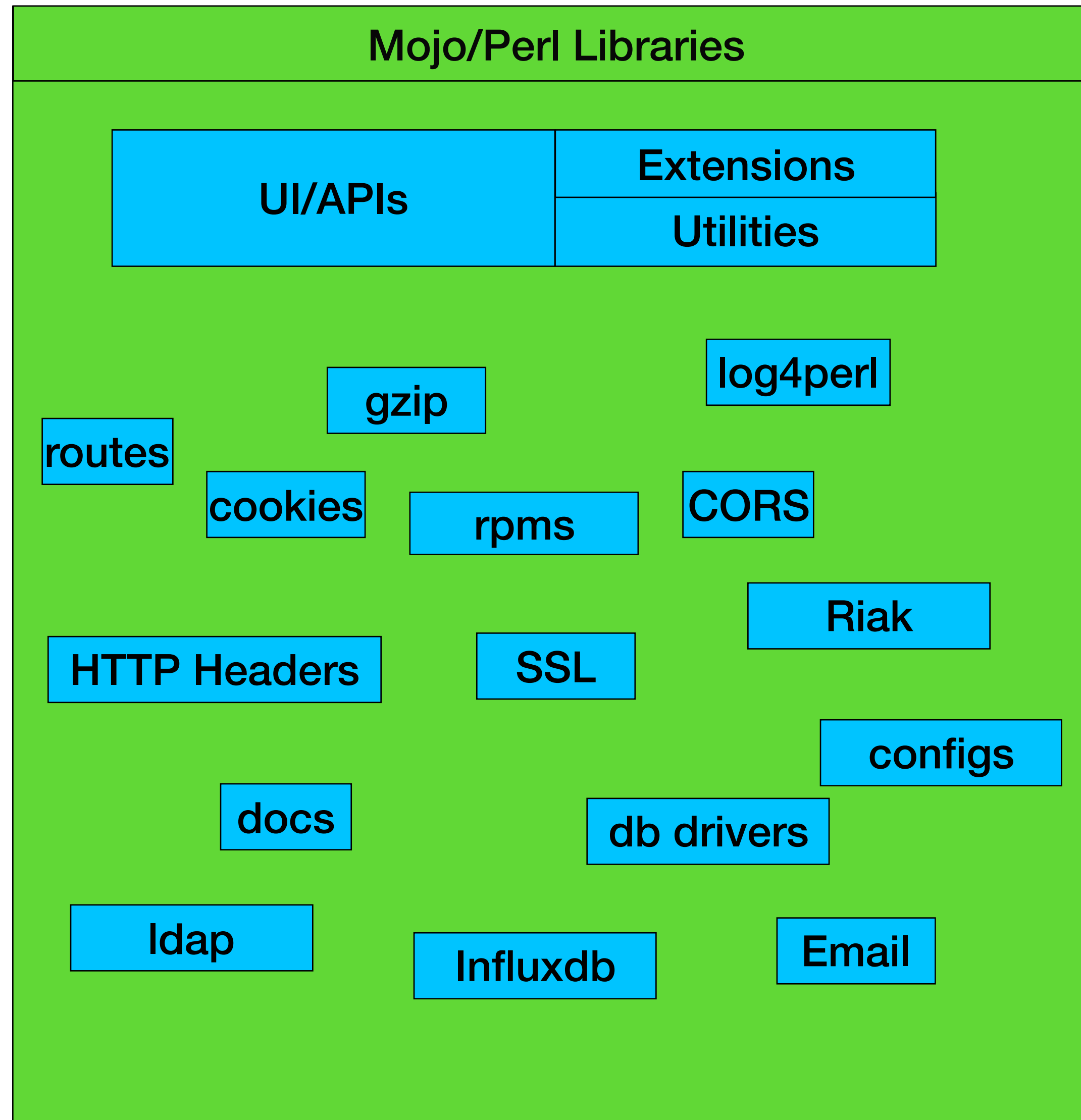
## **502 Bad Gateway**

The server was acting as a **gateway** or proxy and received an invalid response from the upstream server.

# Feature Parity Progress

- 11 of ~300 endpoints (handlers)
- Github Project
  - <https://github.com/apache/incubator-trafficcontrol/projects/2>

# Traffic Ops v2.1 Features

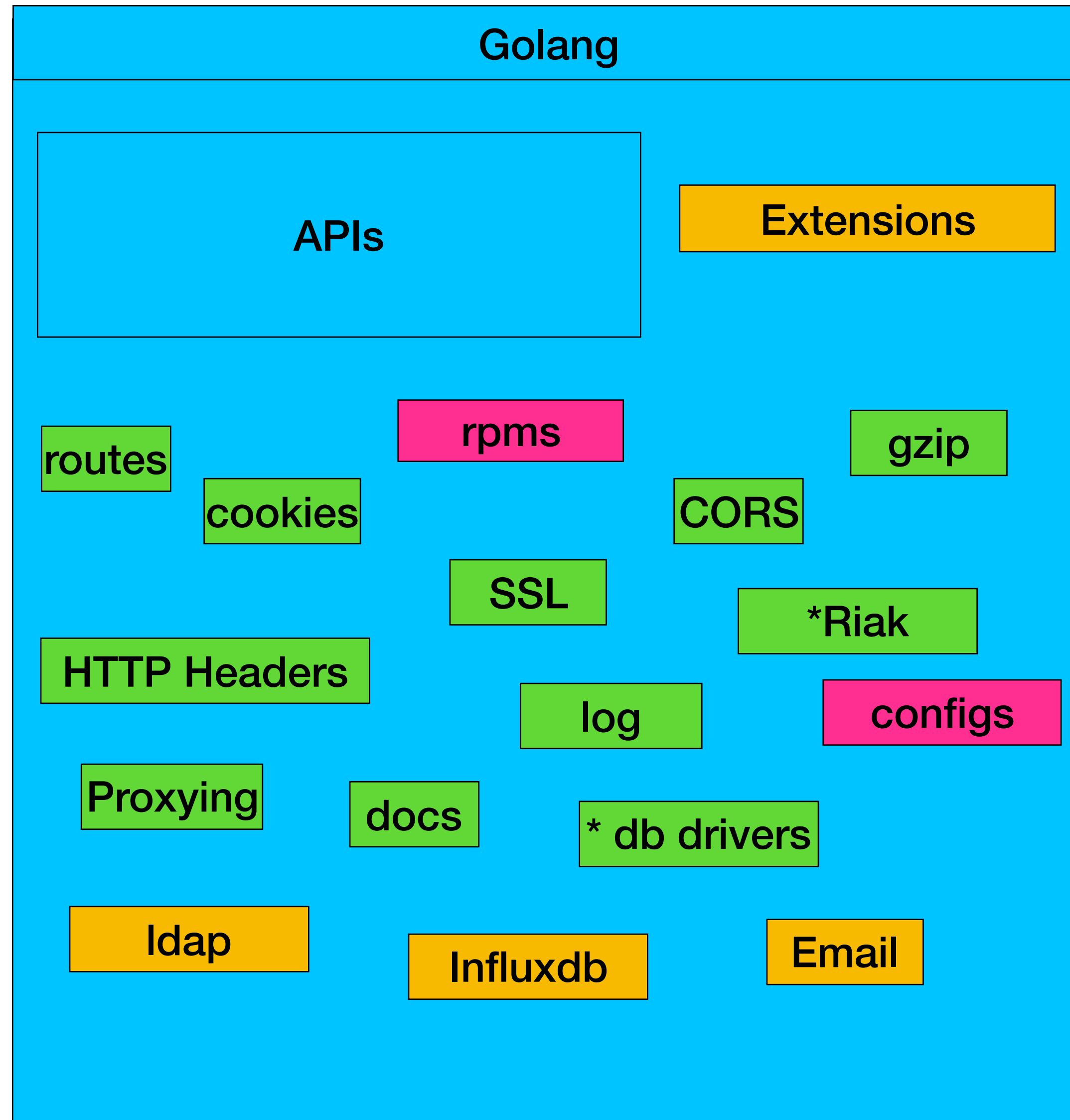


# Traffic Ops v2.2 Features

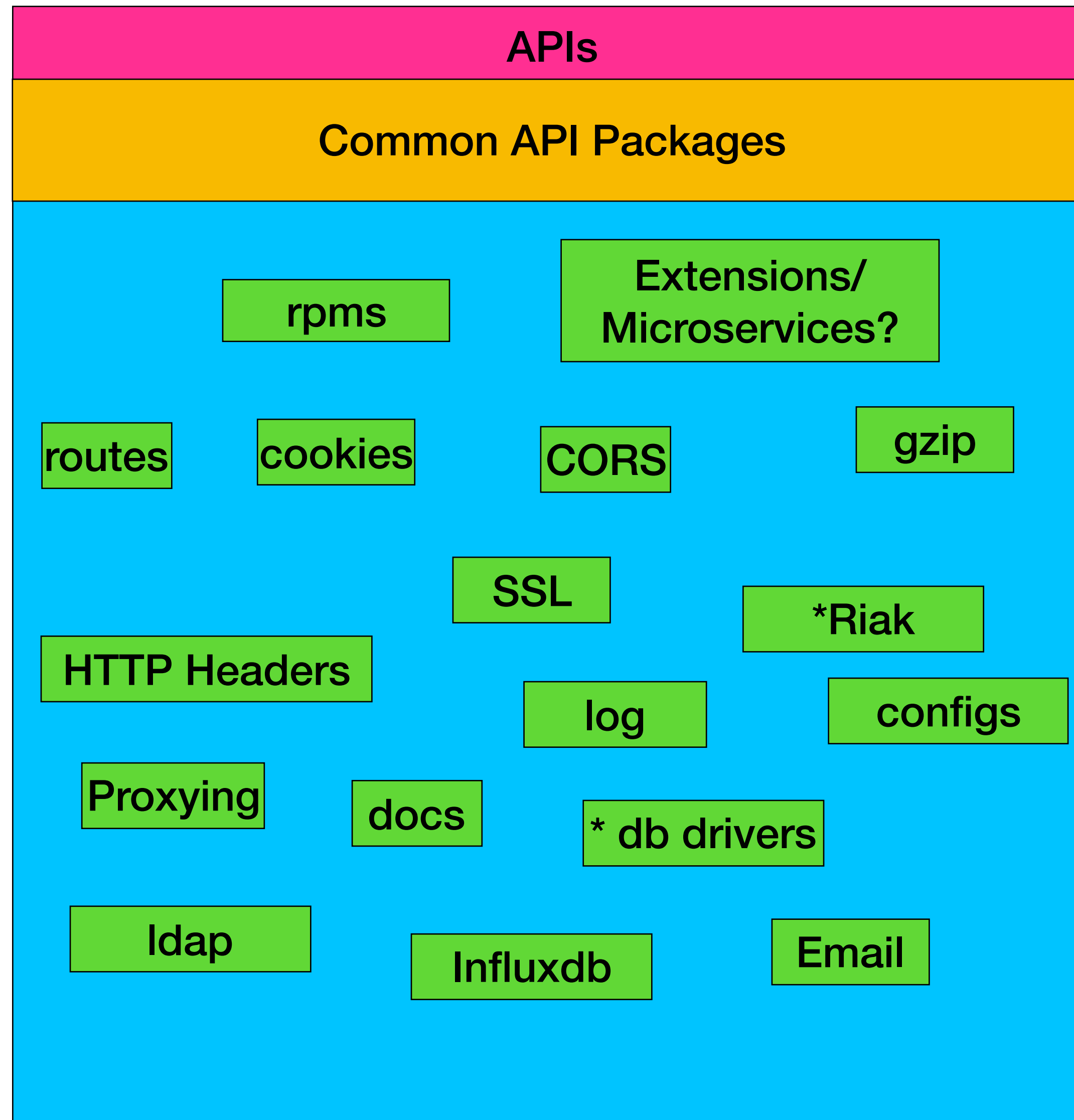
TBD

\* External Dependency

Reused



# Traffic Ops v2.x



How is the code base being affected?

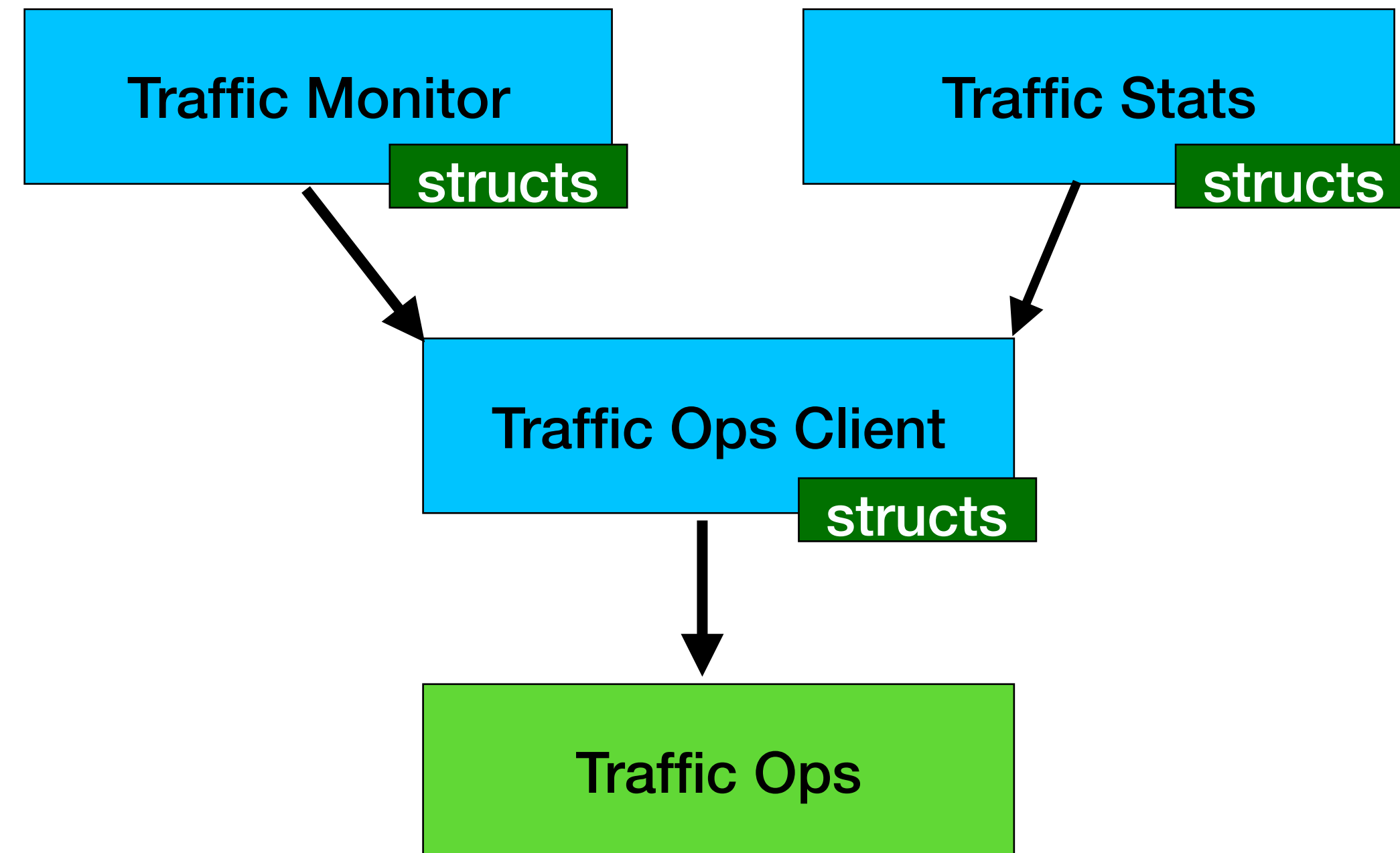
# Golang Struct

```
package tc
```

```
type ASNsResponse struct {  
    Response []ASN `json:"response"`  
}
```

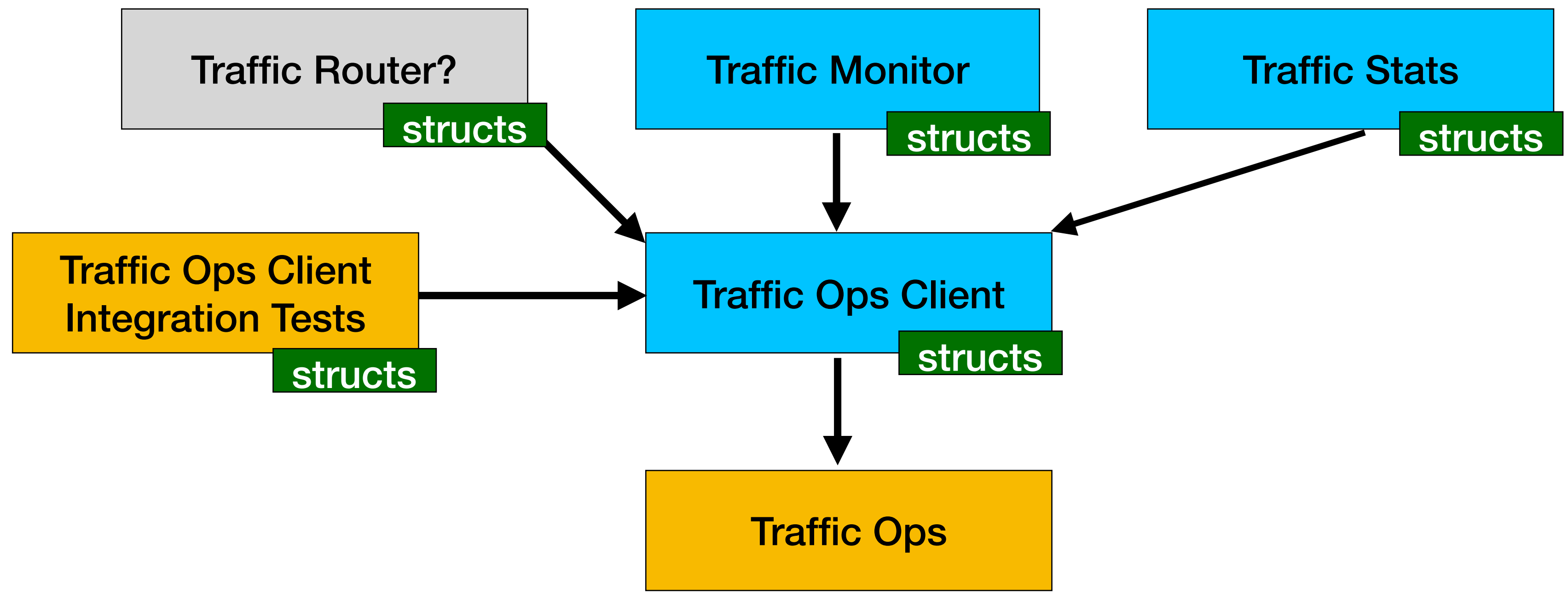
```
type ASN struct {  
    ASN            int    `json:"asn" db:"asn"`  
    Cachegroup     string `json:"cachegroup" db:"cachegroup"`  
    CachegroupID   int    `json:"cachegroupId" db:"cachegroup_id"`  
    ID             int    `json:"id" db:"id"`  
    LastUpdated    Time   `json:"lastUpdated" db:"last_updated"`  
}
```

# Traffic Control Golang with Mojo Components

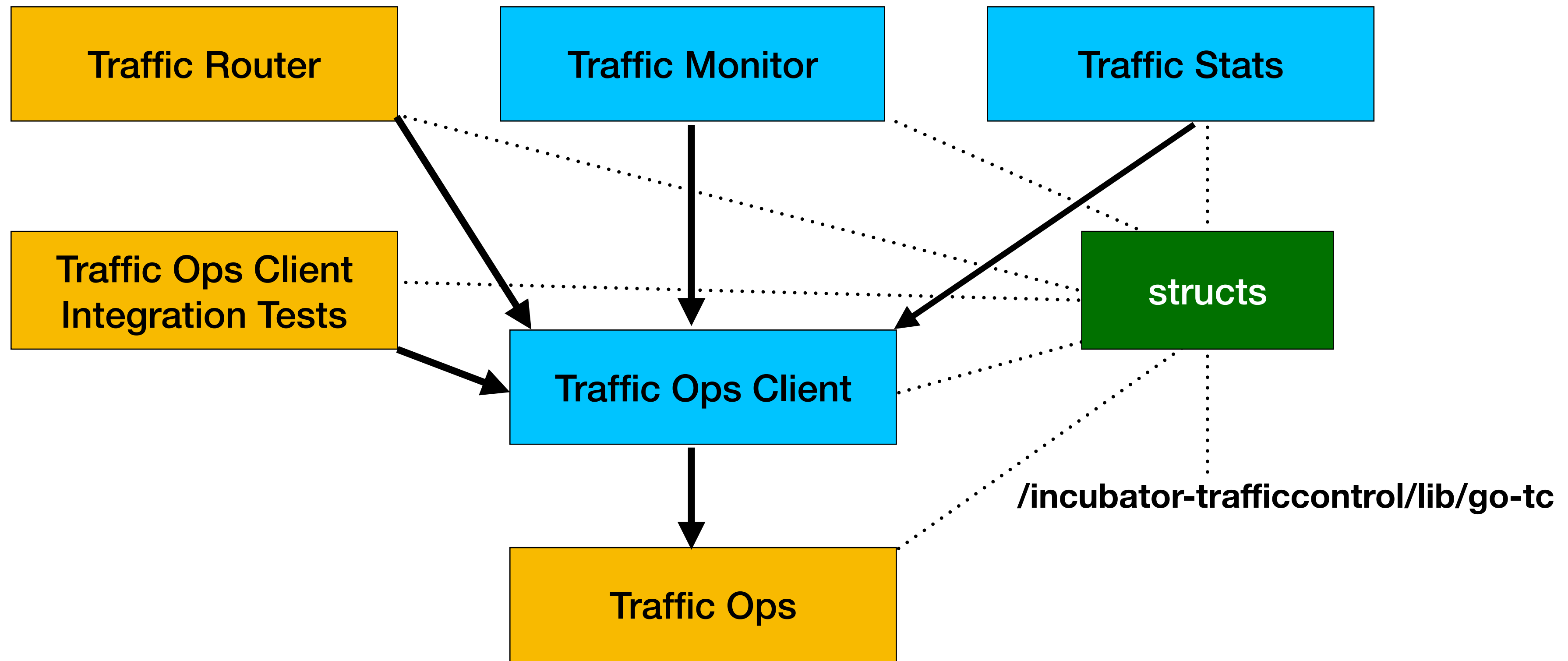




# Traffic Ops Golang Components "Future State"



# Traffic Ops Golang Components "Future State"



# Config Files

**/opt/traffic\_ops/app/conf/cdn.conf**

**/opt/traffic\_ops/app/conf/production/database.conf**

**/opt/traffic\_ops/app/conf/production/influxdb.conf**

**/opt/traffic\_ops/app/conf/production/riak.conf**

**/opt/traffic\_ops/app/conf/production/log4perl.conf**

## Mojolicious formatted cdn.conf

```
{
  hypnotoad => {
    listen => [
      'https://[::]:443?cert=/etc/pki/tls/certs/localhost.crt&key=/etc/pki/tls/private/
localhost.key&verify=0x00&ciphers=AES128-GCM-SHA256:HIGH:!RC4:!MD5:!aNULL:!EDH:!ED'
    ],
    user      => 'trafops',
    group     => 'trafops',
    heartbeat_timeout => 20,
    pid_file  => '/var/run/traffic_ops.pid',
    workers   => 96
  },
  cors => {
    access_control_allow_origin => '*'
  },
  to => {
    base_url    => 'http://localhost:3000',
    email_from  => 'no-reply@traffic-ops-domain.com'
  },
  portal => {
    base_url    => 'http://localhost:8080',
    email_from  => 'no-reply@traffic-portal-domain.com'
  },
  secrets => [ 'mONKEYDmONKEYSEE.' ],
  geniso => {
    iso_root_path => '/opt/traffic_ops/app/public',
  },
  inactivity_timeout => 60
};
```

## JSON formatted cdn.conf

```
{
  "hypnotoad" : {
    "listen" : [
      "https://[::]:60443?cert=/etc/pki/tls/certs/localhost.crt&key=/etc/pki/tls/private/localhost.key&verify=0x00&ciphers=AES128-
GCM-SHA256:HIGH:!RC4:!MD5:!aNULL:!EDH:!ED"
    ],
    "user" : "trafops",
    "group" : "trafops",
    "heartbeat_timeout" : 20,
    "pid_file" : "/var/run/traffic_ops.pid",
    "workers" : 12
  },
  "traffic_ops_golang" : {
    "port" : "443",
    "proxy_timeout" : 60,
    "proxy_keep_alive" : 60,
    "proxy_tls_timeout" : 60,
    "proxy_read_header_timeout" : 60,
    "read_timeout" : 60,
    "read_header_timeout" : 60,
    "write_timeout" : 60,
    "idle_timeout" : 60,
    "log_location_error": "/var/log/traffic_ops/error.log",
    "log_location_warning": "",
    "log_location_info": "",
    "log_location_debug": "",
    "log_location_event": "/var/log/traffic_ops/access.log"
  },
  "cors" : {
    "access_control_allow_origin" : "*"
  },
  "to" : {
    "base_url" : "http://localhost:3000",
    "email_from" : "no-reply@traffic-ops-domain.com",
    "no_account_found_msg" : "A Traffic Ops user account is required for access. Please contact your Traffic Ops user
administrator."
  },
  "portal" : {
    "base_url" : "http://localhost:8080/!#/ ",
    "email_from" : "no-reply@traffic-portal-domain.com",
    "pass_reset_path" : "user",
    "user_register_path" : "user"
  },
  "secrets" : [
    "mONKEYDmONKEYSEE."
  ],
  "geniso" : {
    "iso_root_path" : "/opt/traffic_ops/app/public"
  },
}
```

# Benefits of Testing

- **Makes the Process Agile**
- **Quality of Code**
- **Finds Software Bugs Early**
- **Facilitates Changes and Simplifies Integration**

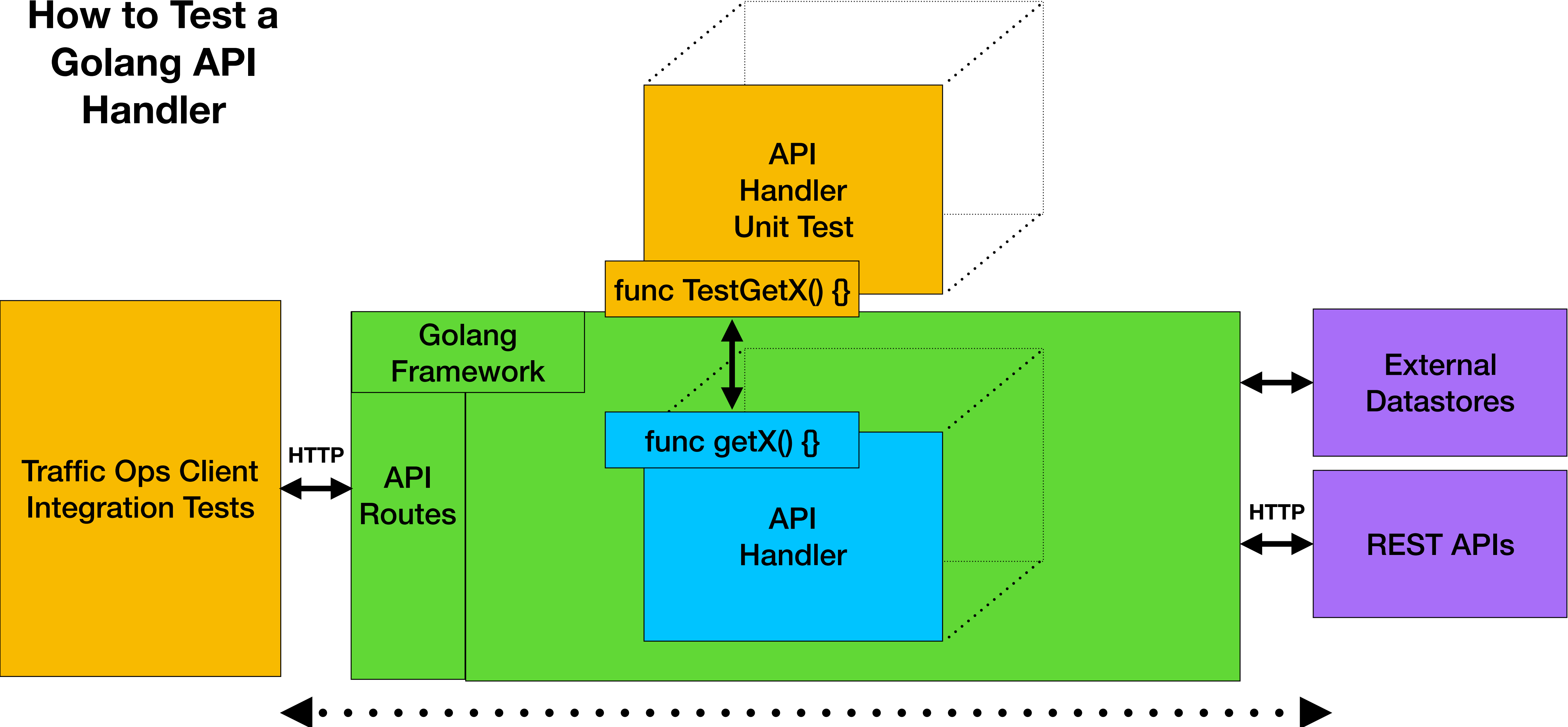
**<https://dzone.com/articles/top-8-benefits-of-unit-testing>**

# Benefits of Testing

- **Provides Documentation**
- **Debugging Process**
- **Design**
- **Reduces Cost**

<https://dzone.com/articles/top-8-benefits-of-unit-testing>

# How to Test a Golang API Handler



Integration Testing  
is  
End-to-End



**<https://cwiki.apache.org/confluence/display/TC/API+Guidelines>**

# Anatomy of a Golang Handler