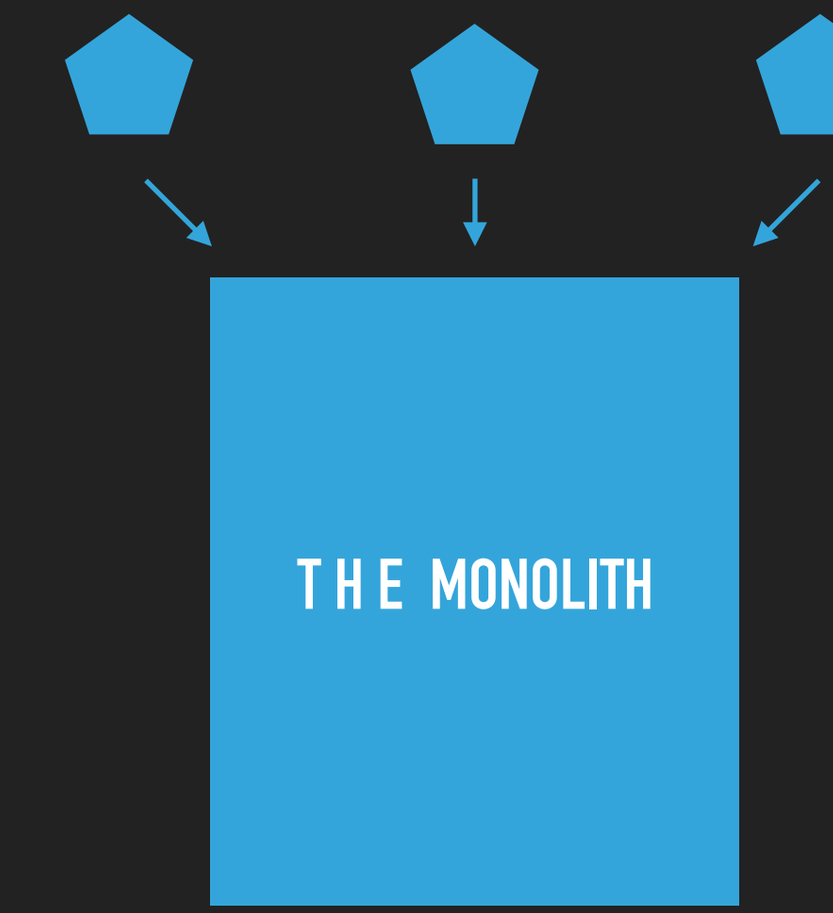
OLIVER WEHRENS - E-POST DEVELOPMENT

HOW NOT TO LOSE YOUR MIND WITH TOO MANY MICROSERVICES

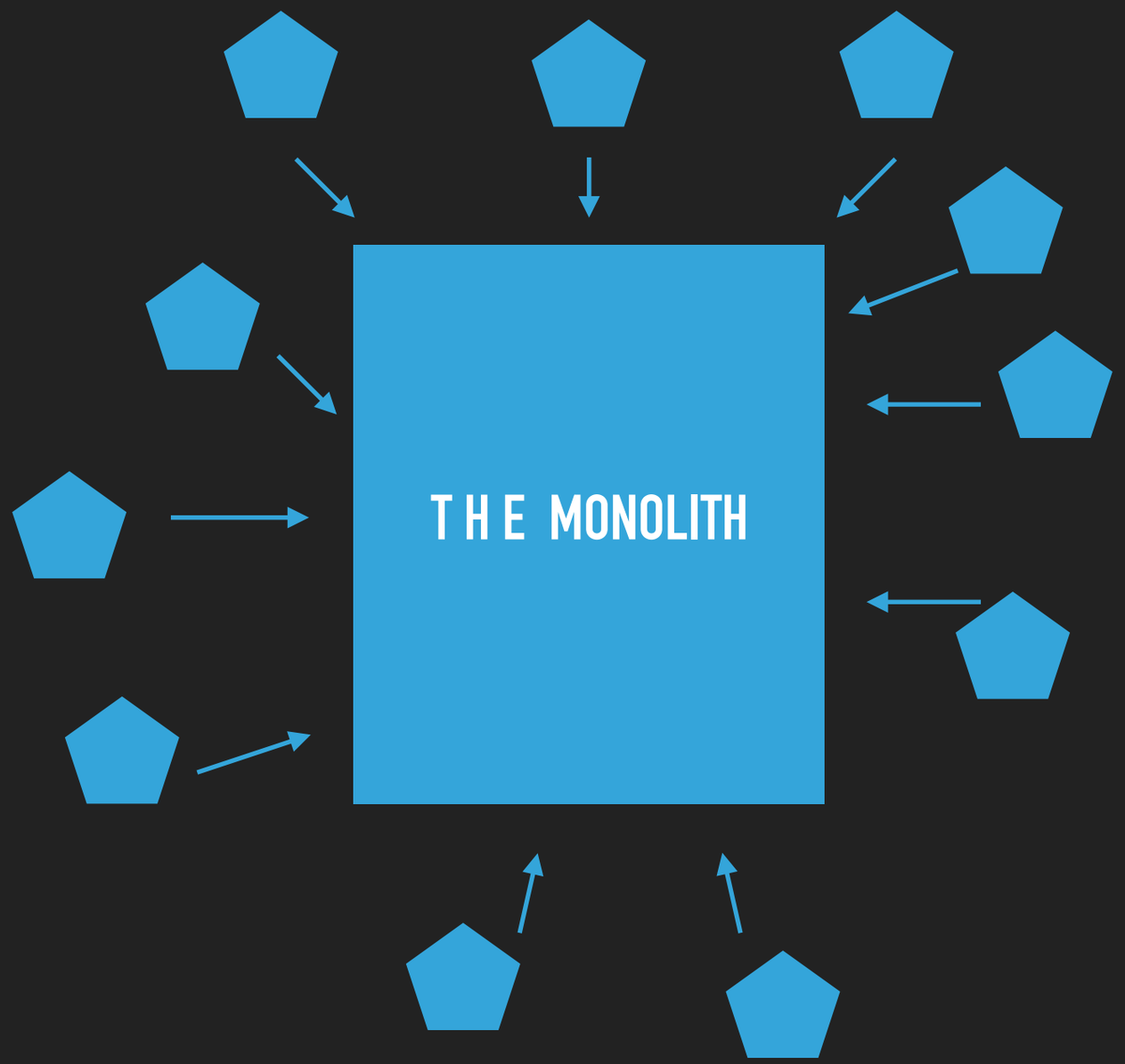
ONCE THERE WAS A MONOLITH.

= Team



- One (big) codebase
- Many teams working on it
- Lots of communication overhead

THEN YOU TRY TO SCALE YOUR ORGANIZATION...



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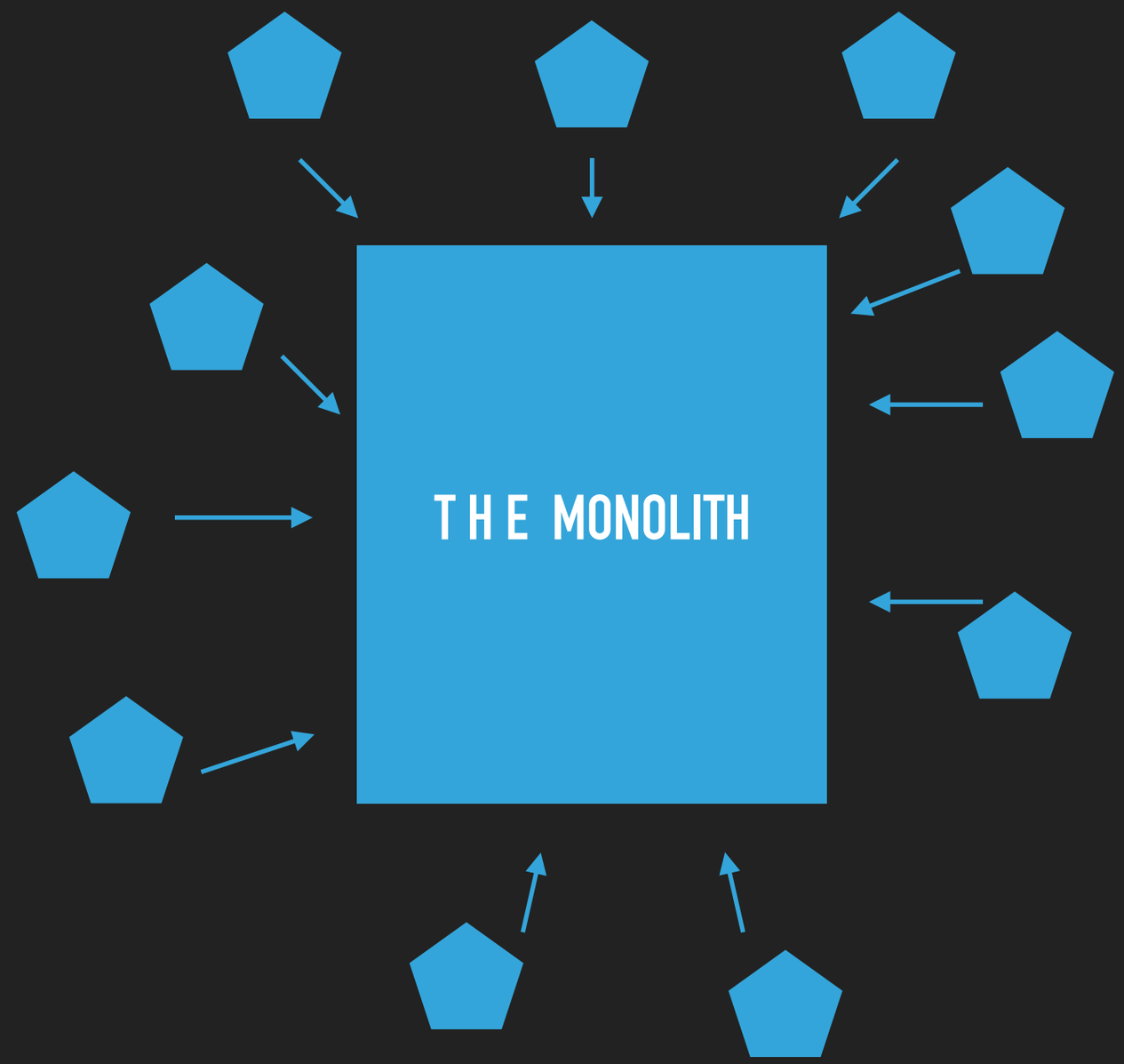
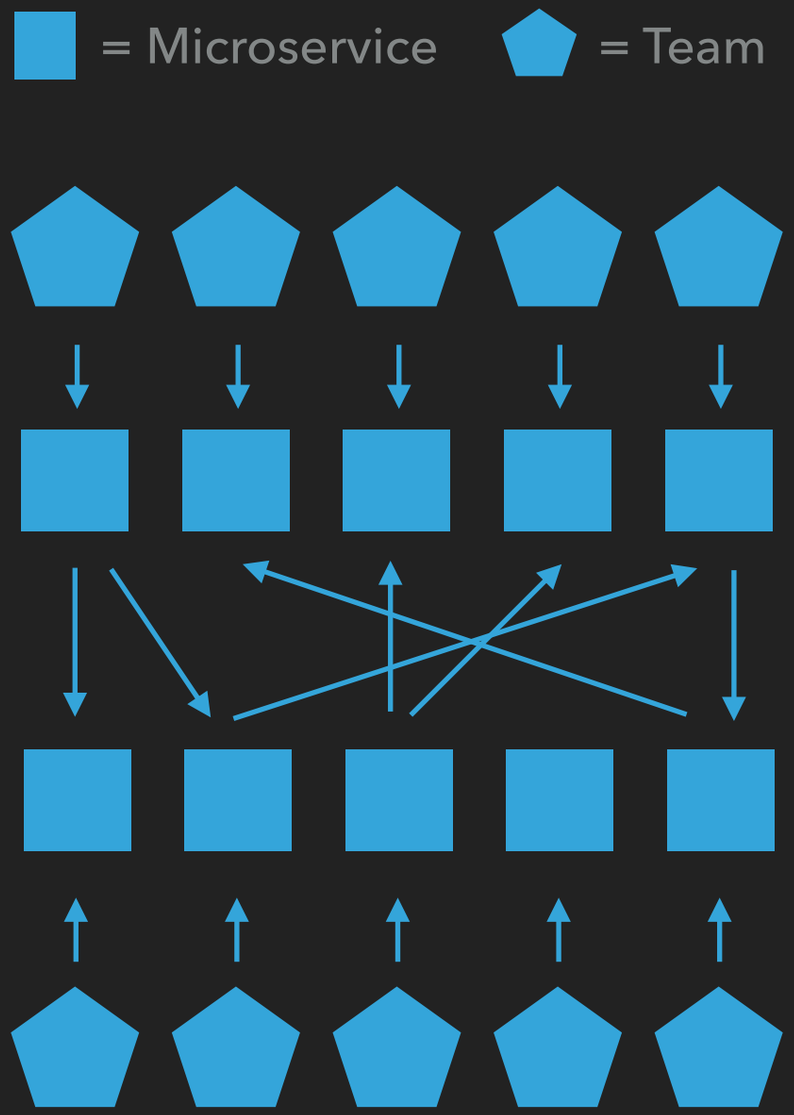


UPS!

YOU DECIDE TO GO FOR MICROSERVICE ARCHITECTURE.



- Only one team works on service codebase
- Independent deployment of business functionality
- Less blocking communication

EVERYTHING IS AWESOME !

EVERYTHING IS AWESOME ?

MICROSERVICES MEAN . . .

- More Services.
- More Teams.
- More Communication.
- More Documentation.
- More of everything.

PROBLEMS TO SOLVE

- What is available on the platform ?
- What does the whole platform look like ?
- Who is responsible for a service ?
- How to get more information about a service ?
- Which Software versions and licenses do we use ?

STANDARDS OR DIE.

. . . OR HAVE METADATA
(IN ONE PLACE).

WHERE INFORMATION KILLS ITSELF

WIKI (RANT)

- Created once
- Rarely updated
- Nothing can be found
- If updated, nobody knows if this is up to date
- Developers just don’t like update Wikis
- Use the source Luke.

. . . OR COLLECT METADATA.

MANUAL

AUTOMATED

BUILD TIME (SHOULD)

RUNTIME (ACTUAL)

MANUAL

THINGS THAT DON'T CHANGE OFTEN

AUTOMATED

EVERYTHING ELSE (AS MUCH AS YOU CAN)

BUILD TIME

- Everything available at Code Level & CI System
- VCS information
- License & Dependency information
- Build chain information
- Code Stats (Age, Committer, Language)

RUNTIME

- Service Level
  - Network connections
- Setup Level
  - Sizing

2013

Klaus

BACK THEN …

STATUS QUO SERVICE REGISTRY

OUR REQUIREMENTS

- Every VCS root needs documentation
- Description
- Type
- Team name
- VCS & CI Information

IN THE BEGINNING (Q4/2014) – THE GOOD

- Started with Wiki
- Description in yaml file in the Source Code
- Executed during CI Run
- Automated VCS root
- Automated Code Dependencies via Maven, Gradle, SBT
- Formatted to HTML and uploaded to Wiki

IN THE BEGINNING (Q4/2015) – THE BAD

- Search was limited
- Data could not be queried for additional benefit
- We had a couple of other places where we distributed information about services, what they do, how they get deployed etc.
- No immediate benefit, no problem when outdated

WE NEED SOMETHING BETTER.

OUR REQUIREMENTS

- General: Team name, Owner, a short name, description, type
- Runtime: memory needs, cpu, machine type, network zone
- Service: what do I provide, which port, protocol, private/public
- Dependencies to other services
- Software Dependencies and Licenses
- Query Language - do something with the data

WHAT'S OUT THERE?

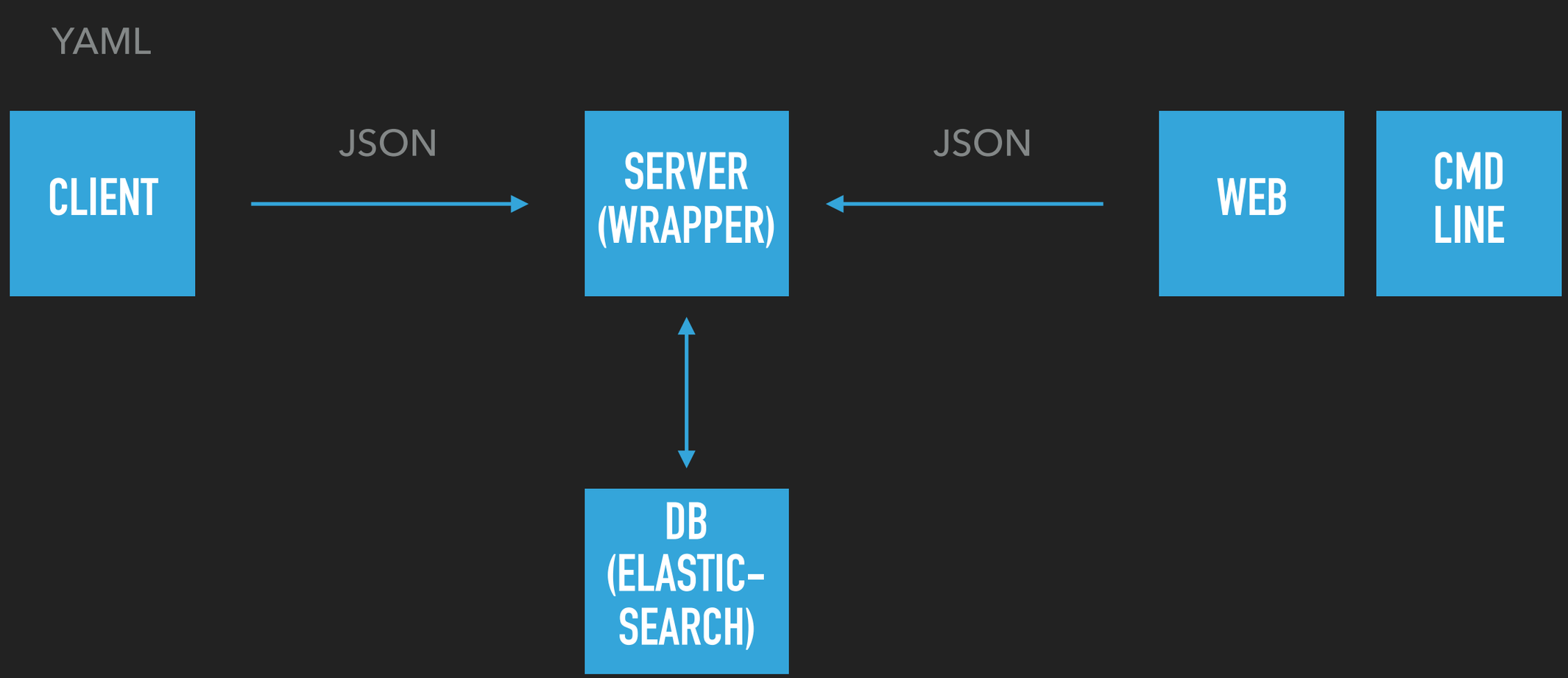
System-Z

S

Directory

PIVIO

- A system to describe service meta data



PIVIO – TECHNOLOGY

- Java
- Server in Spring Boot (~2k LoC)
- Executable command line client in Spring Boot (~1k LoC)
- Elasticsearch for document storage and Query Language

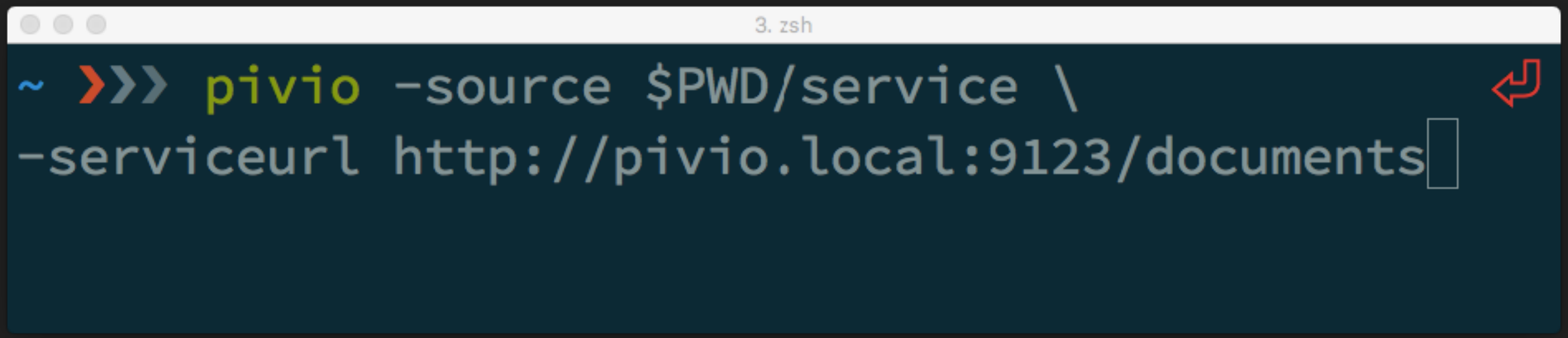
WHAT DOES IT LOOK LIKE ?

PIVIO YAML

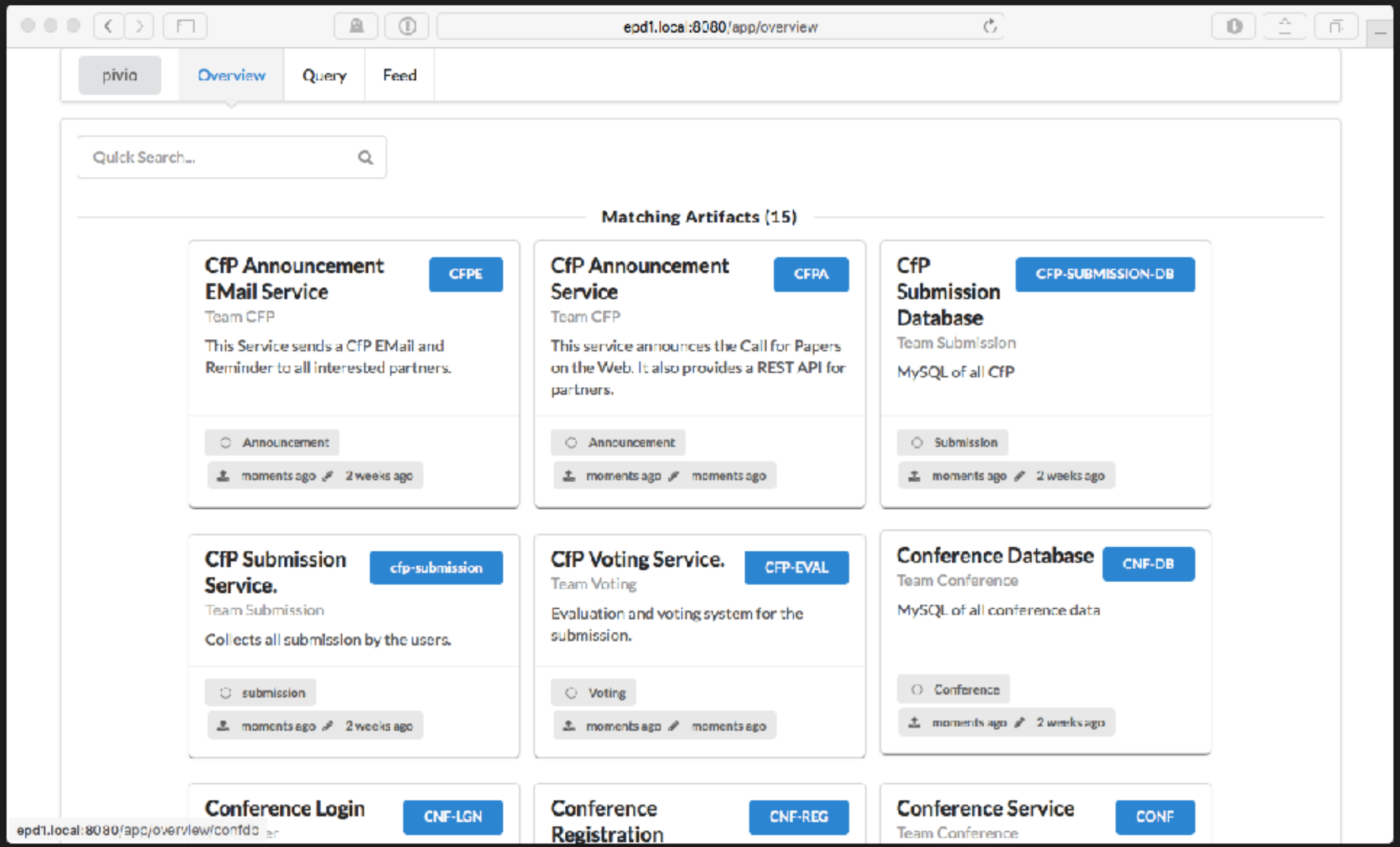
- One pivio.yaml file in root vcs directory
- Contains all information we need for running the service, information and services
- Flexible data format, extendable

```yaml
data_format_version: 0.6
# --- MUST HAVE
id: login
name: Conference Login
type: Service
owner: Team User
description: The Login for all conference needs.
short_name: CNF-LGN
# --- MUST HAVE END
contact: Stephan Paul
tags:
links:
  homepage: http://wiki.local/login
  buildchain: http://ci.local/login
#-------------------------------------------------------------
service:
  provides:
    - description: Logs in a user
      service_name: login-service
      protocol: https
      port: 443
      transport_protocol: tcp
      public_dns:
       - login.superconf.io
  depends_on:
    internal:
     - service_name: user-service
       why: need to figure out if this is a valid user.
#-------------------------------------------------------------
context:
  belongs_to_bounded_context: Login
  visibility: public
#-------------------------------------------------------------
runtime:
  cpu: S
```

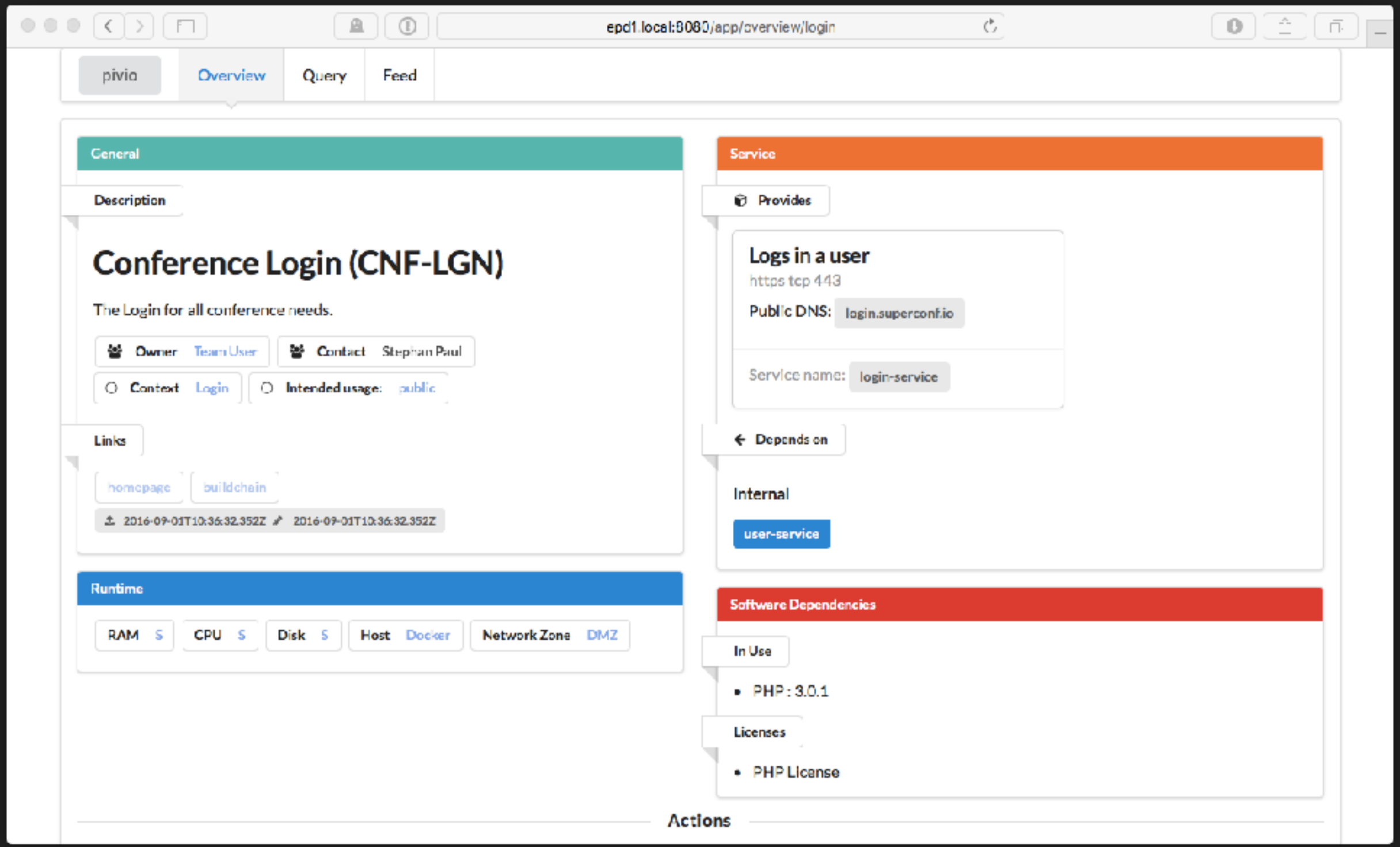
CHECKIN / CI RUN



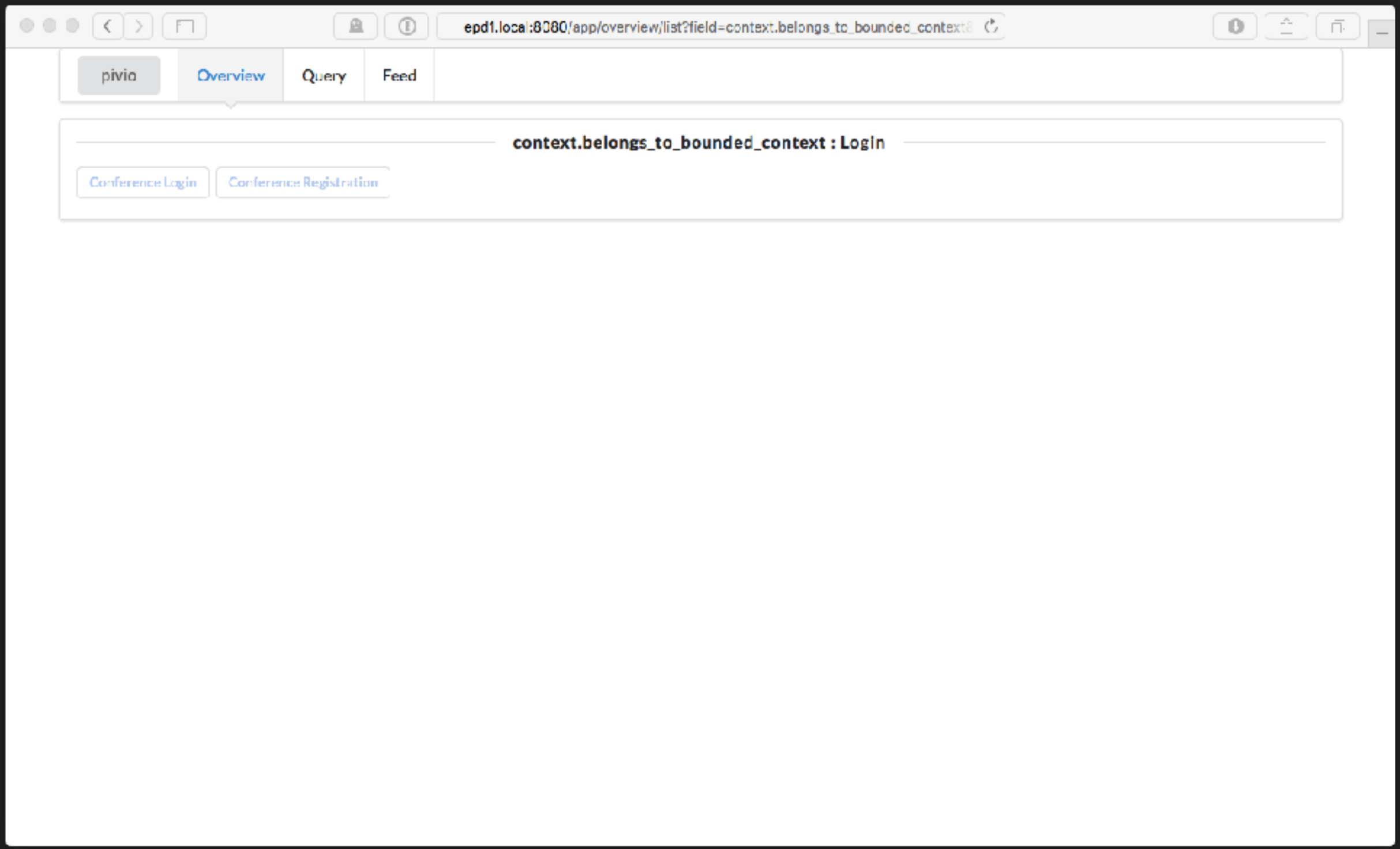
OVERVIEW


epd1.local:8080/app/overview
pivio
Overview
Query
Feed
Quick Search...
Matching Artifacts (15)
CfP Announcement EMail Service
CFPE
Team CFP
This Service sends a CfP EMail and Reminder to all interested partners.
Announcement
moments ago
2 weeks ago
CfP Announcement Service
CFPA
Team CFP
This service announces the Call for Papers on the Web. It also provides a REST API for partners.
Announcement
moments ago
moments ago
CfP Submission Database
CFP-SUBMISSION-DB
Team Submission
MySQL of all CfP
Submission
moments ago
2 weeks ago
CfP Submission Service.
cfp-submission
Team Submission
Collects all submission by the users.
submission
moments ago
2 weeks ago
CfP Voting Service.
CFP-EVAL
Team Voting
Evaluation and voting system for the submission.
Voting
moments ago
moments ago
Conference Database
CNF-DB
Team Conference
MySQL of all conference data
Conference
moments ago
2 weeks ago
Conference Login
CNF-LGN
Conference Registration
CNF-REG
Conference Service
CONF
Team Conference
epd1.local:8080/app/overview/confdb

DETAIL


epd1.local:8080/app/overview/login
pivio
Overview
Query
Feed
General
Description
Conference Login (CNF-LGN)
The Login for all conference needs.
Owner Team User
Contact Stephan Paul
Context Login
Intended usage: public
Links
homepage
buildchain
2016-09-01T10:36:32.352Z
2016-09-01T10:36:32.352Z
Runtime
RAM S
CPU S
Disk S
Host Docker
Network Zone DMZ
Service
Provides
Logs in a user
https tcp 443
Public DNS: login.superconf.io
Service name: login-service
Depends on
Internal
user-service
Software Dependencies
In Use
PHP : 3.0.1
Licenses
PHP License
Actions

DETAIL (II)


epd1.local:8080/app/overview/list?field=context.belongs_to_bounded_context
pivio
Overview
Query
Feed
context.belongs_to_bounded_context : Login
Conference Login
Conference Registration

FEED

epd1.local:8080/app/feed

pivio | Overview | Query | Feed

CNF-LGN

2 minutes ago

/software_dependencies [{"name":"PHP","version":"3.0.1","licenses":[{"name":"PHP License","url":"http://php.net/license/3_01.txt"}]}]

CFPA

2 minutes ago

/service/depends_on/internal/0/service_name

/service/depends_on/internal/1/service_name

CFP-EVAL

2 minutes ago

/short_name CFP-EVAL

ELASTIC SEARCH BASED QUERY

epd1.local:8080/app/query

Pivio View | Pivio View

pivio | Overview | Query | Feed

Query (Query DSL Help)

```
{
  "match":{
    "runtime.network_zone": "DMZ"
  }
}
```

Fields

name

Search

URL for Query

```
http://EPD1.local:9123/document?fields=name&query=%7B%0A%20%20%20%20%22match%22:%20%7B%0A%20%20%20%20%20%20%20%20%22runtime.netwo
```

Result


```
[
    {
        'name': "CfP Announcement Service",
        "id": "CFPAnnouncement"
    },
    {
        'name': "CfP Announcement EMail Service",
```

MAIN FEATURES

- General information
- Ownership
- Service information
  - Who do I need?
  - What do I offer?
  - ...
- Dependencies & Licensing
- Deployment information, Sizing

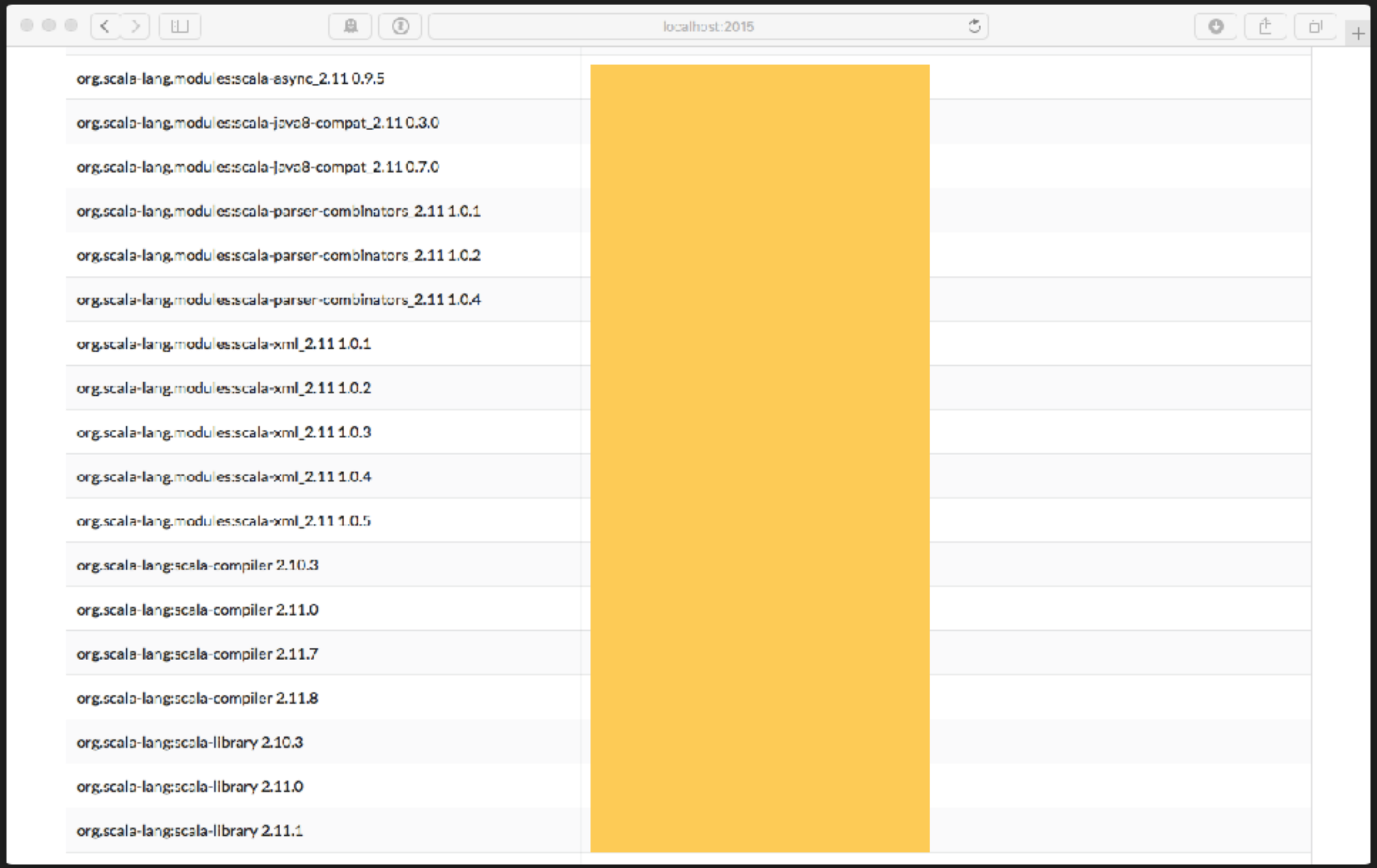
DATA QUALITY

- … is key!
- Organisational changes not reflected sometimes
- Infrastructure changes (new network zones)
- Owners don’t benefit from quality
- Make use of the data that are relevant to the creator!
- You will have dirty data.

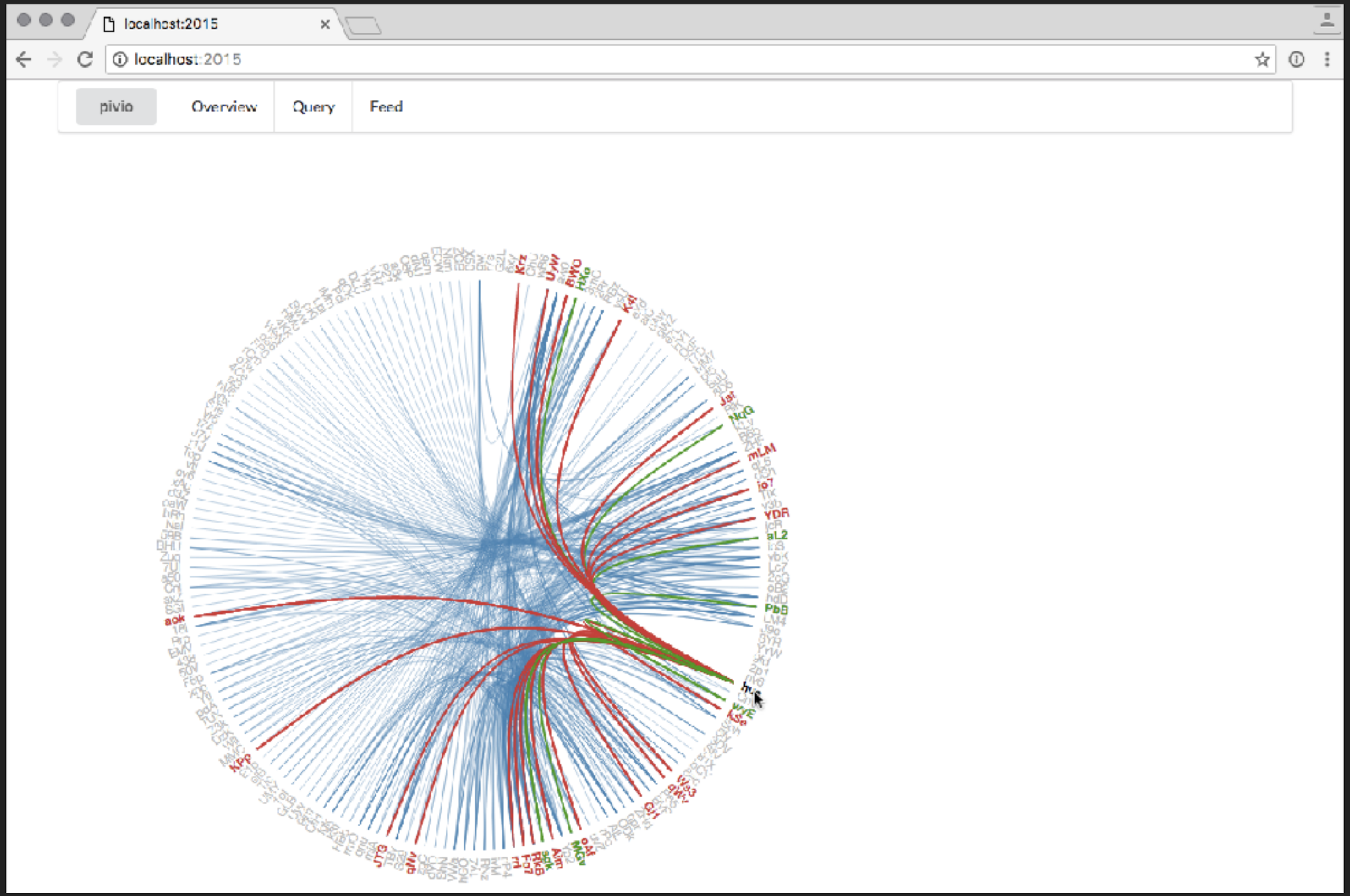
USE CASES FOR E-POST DEVELOPMENT

- Machine sizing for Open Nebula
- Service names for Consul
- General information
- Visualize dependencies of teams and bounded contexts
- Impact analysis of changing APIs

SOFTWARE VERSION DEPENDENCY CHECK (60 LINES OF JS)



SERVICE DEPENDENCY CHECK (284 LINES OF JS)



CONCLUSION

- Big Picture with micro services is hard
- Metadata helps to understand the system
- Needs to be easily editable (e.g. in the IDE)
- Needs to be useful to the creator (or necessary)
- Metadata will be dirty
- Link build time and runtime information
- Build tools on top of it, have a Query Language!

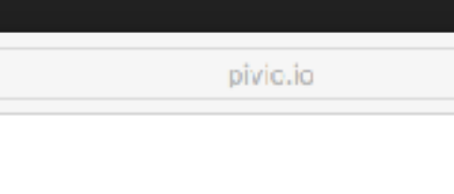
pivic.io

Pivio

Microservice documentation for your platform.

Quickstart

Requirements:



(alpha)

```
curl https://raw.githubusercontent.com/pivio/pivic-boot/master/pivio.sh
```

Full Documentation →

http://pivio.io http://github.com/pivio

THANKS.
QUESTIONS?

HTTP://PIVIO.IO

@OWEHRENS