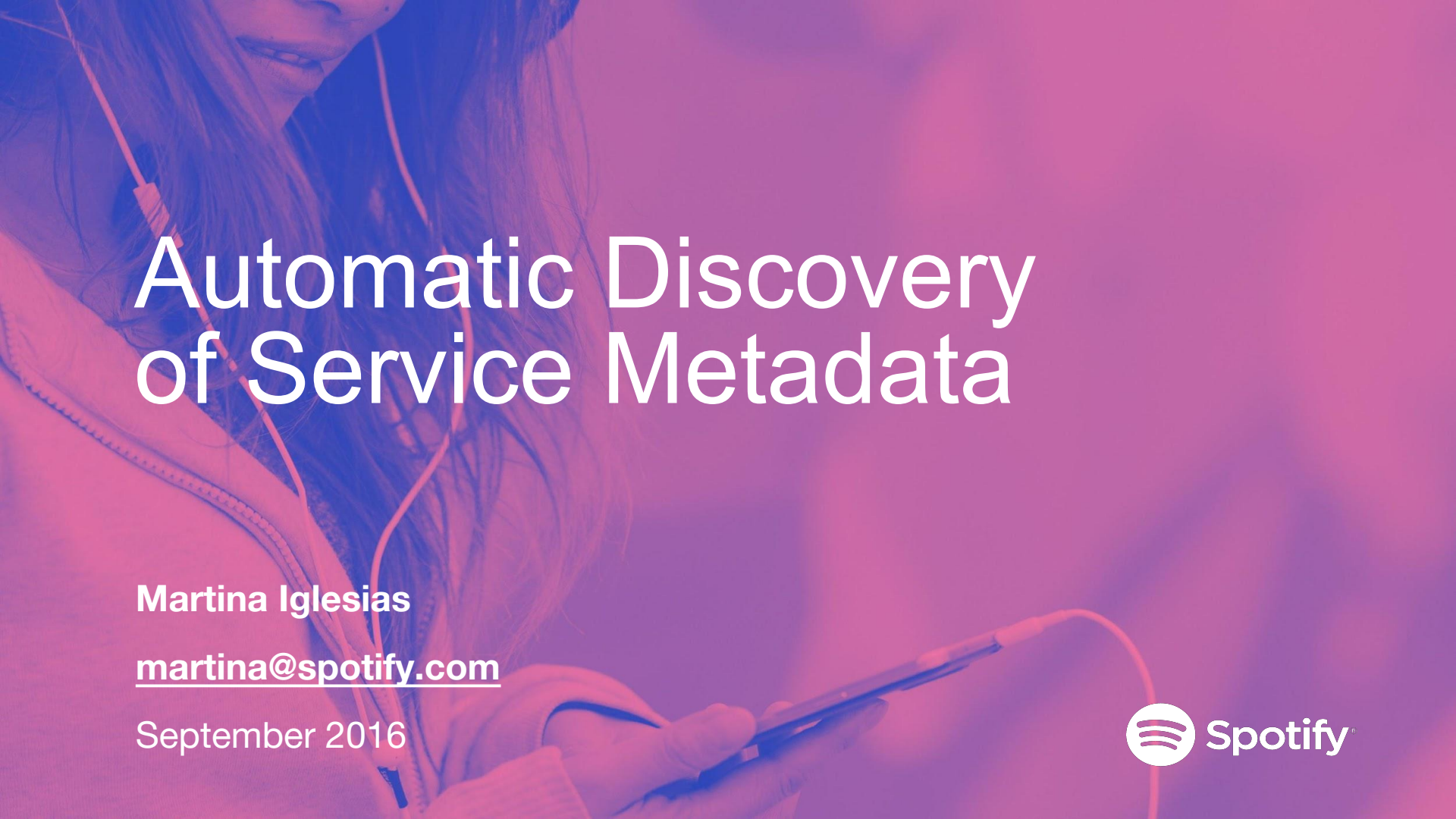


Automatic Discovery of Service Metadata

Martina Iglesias

martina@spotify.com

September 2016

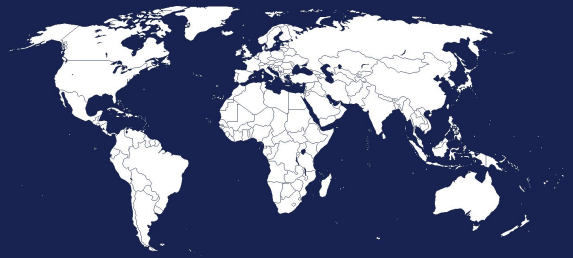
Spotify

Spotify scale

Spotify Users

100M
Active Users

40M
Paid Subscribers

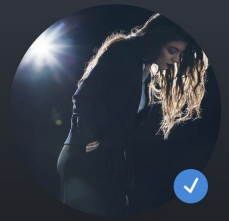


59 Countries

Spotify tech

- +800 tech employees
- 120 teams
- Microservices architecture (scale and work independently)

13:08



Lorde

FOLLOW

4,539,285 MONTHLY LISTENERS

SHUFFLE PLAY

Popular

1 Royals
348,248,231

2 Team
217,987,391

3 Tennis Court
111,265,484

13:08

LORDE

SHUFFLE PLAY

Albums

Pure Heroine
10 SONGS • 2013

Pure Heroine (Extended)
15 SONGS • 2013

Artist Playlists

LATE P.M., EARLY A.M.
10,319 FOLLOWERS

A LITTLE LOVE, A LOT OF LOVE
5,331 FOLLOWERS

Current Favorites
4,584 FOLLOWERS

See All Playlists

13:08

LORDE

SHUFFLE PLAY

Caracal (Deluxe)
14 SONGS • 2015

Team Ball Player Thing
2 SONGS • 2015

See All Appears On

4,539,285
MONTHLY LISTENERS

256th in the world

Emerging as a fully formed enigma from her native New Zealand in 2013, Lorde tapped into an untouched well of alienation, becoming the poster ...

Offers

Tennis Court White T-Shirt
White short sleeve crew neck tee with black CRES...

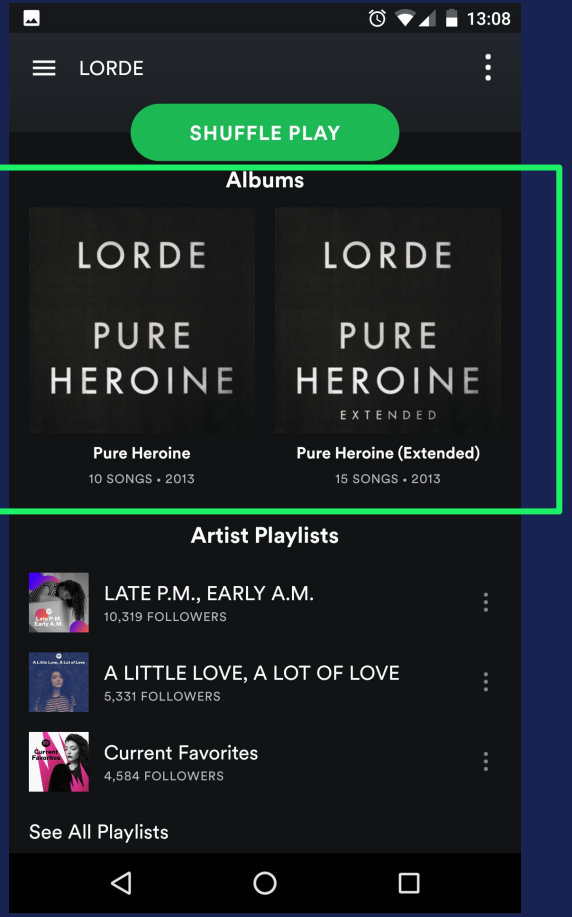
Pure Heroine Record T-Shirt
Pure Heroine Record T-Shirt Black short sleeve cre...

Artist page

Number of streams

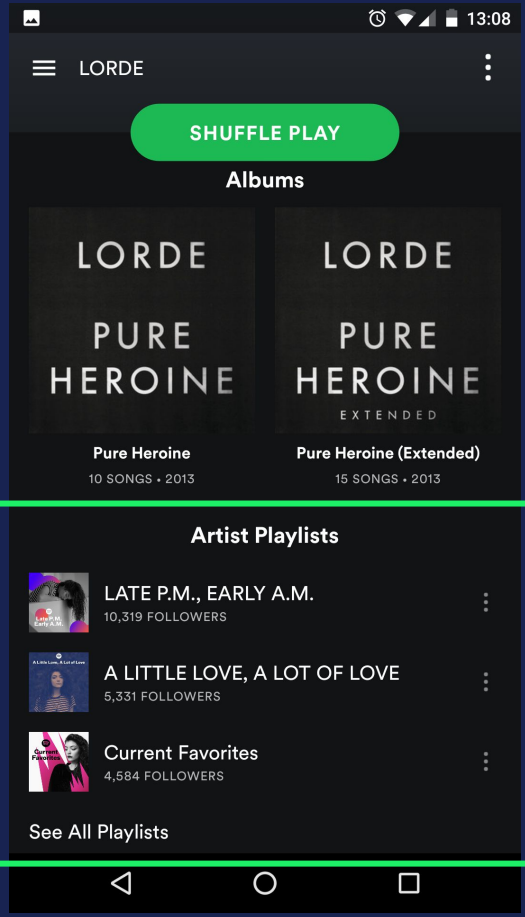
Artist page

Artist Discography



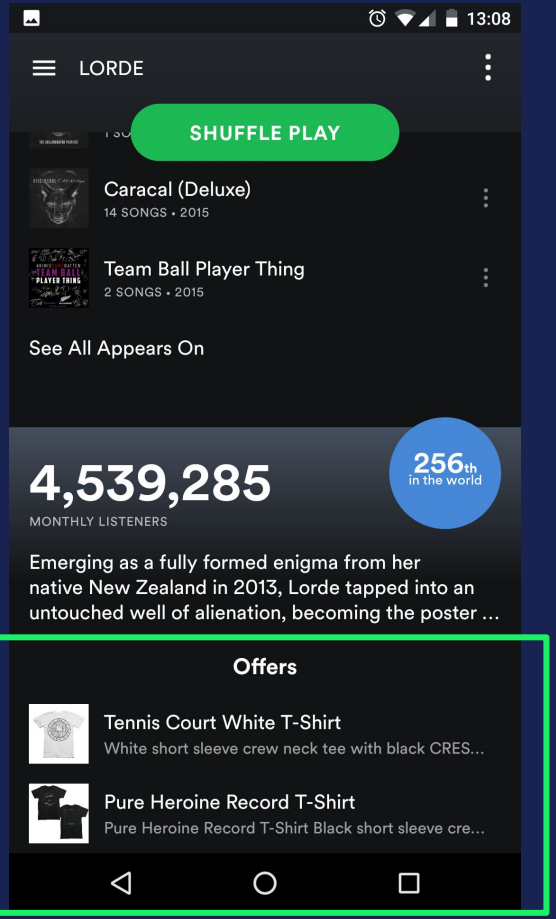
Artist page

Artist Playlists

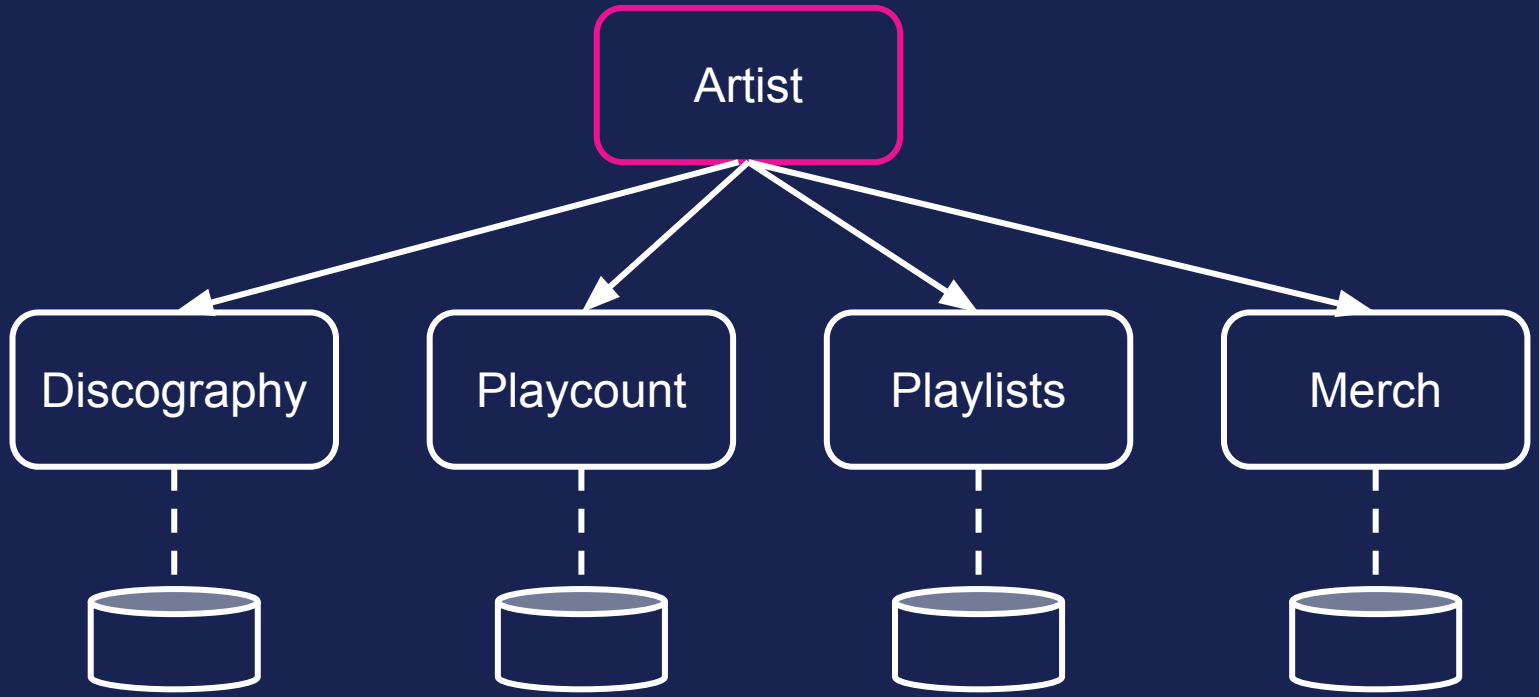


Artist page

Merchandise



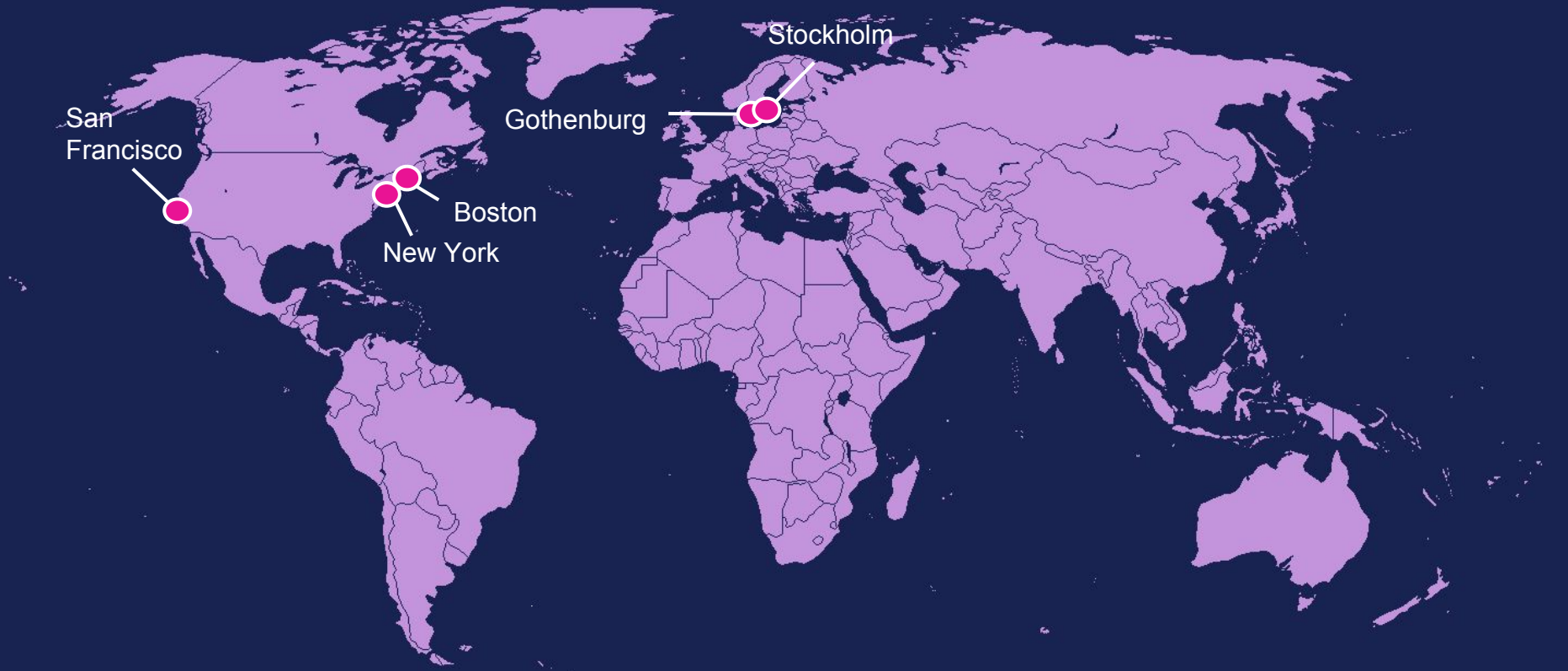
Example: aggregating service



Spotify infrastructure

- +1000 services
- The number of services grows as we add new features

Spotify offices



Previous situation

- Each team had doc. in different places
- README.mk
- Markdown files in doc/
- Wiki
- Link to a document somewhere else


WHAT DO WE WANT?
GOOD DOCUMENTATION!
WHO WANTS TO WRITE IT?
imgflip.com

System Z

System Z

- Web application
- Internal tool
- Catalogue of all our systems and its parts
- Very well integrated with our apollo services
- Easy to discover and access

artist

support #kiwi

lifecycle production

Information

buildVersion: 'artist 2.1-SNAPSHOT'
containerVersion: 'apollo-standalone 1.1.0'
serviceUptime: 3.65 hours to 4.50 days *details...*
systemVersion: 'java 1.8.0_60'

Configuration

```
spNode: {

    http: {
        server: {
            port: 8080
        }
    }
}
```

artist

support #kiwi

lifecycle production

These are all the endpoints on which artist will respond.

/v1/artist/<id>

GET

`/v1/artist/<id>`

Get an artist

Get the artist page for a specific id .

Spotify system-z

Go to component...

Home / Components / artist

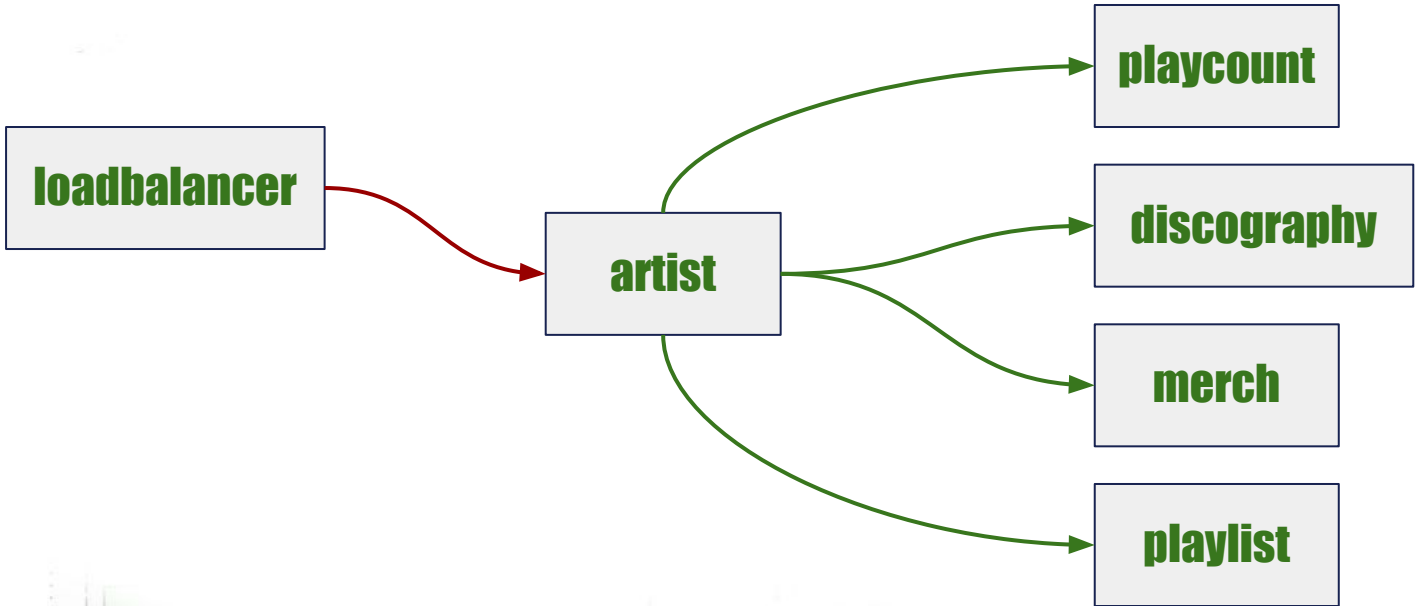
artist

support #kiwi

lifecycle production

OVERVIEW ACTIVITY α CAPACITY DEPLOYMENT α PIPELINE HISTORY α ROUTING CONFIGURATION API SYSTEM MAP

This view is powered by sysmap



System Map

- Generated from runtime and declared dependencies
- Uses graphviz

System Z overview

ARTIST SERVICE:
DNS: _artist._http
OWNER: martina

Register artist service

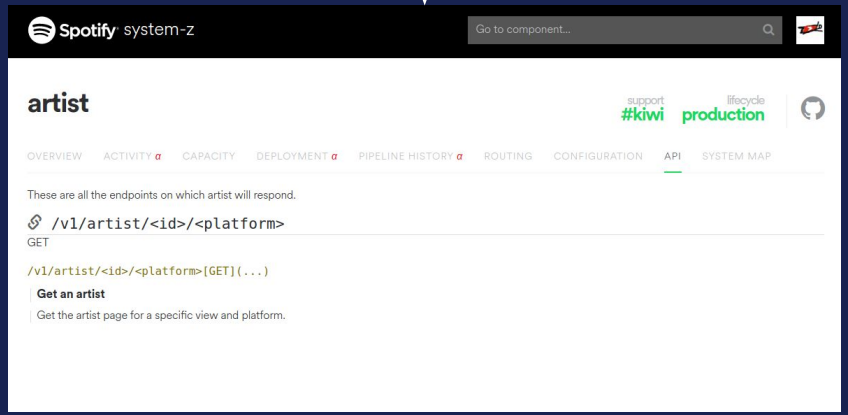
SYSTEM Z (backend)

Lookup machines

DNS

HTTP req to /meta/0/

artist-1.spotify.com

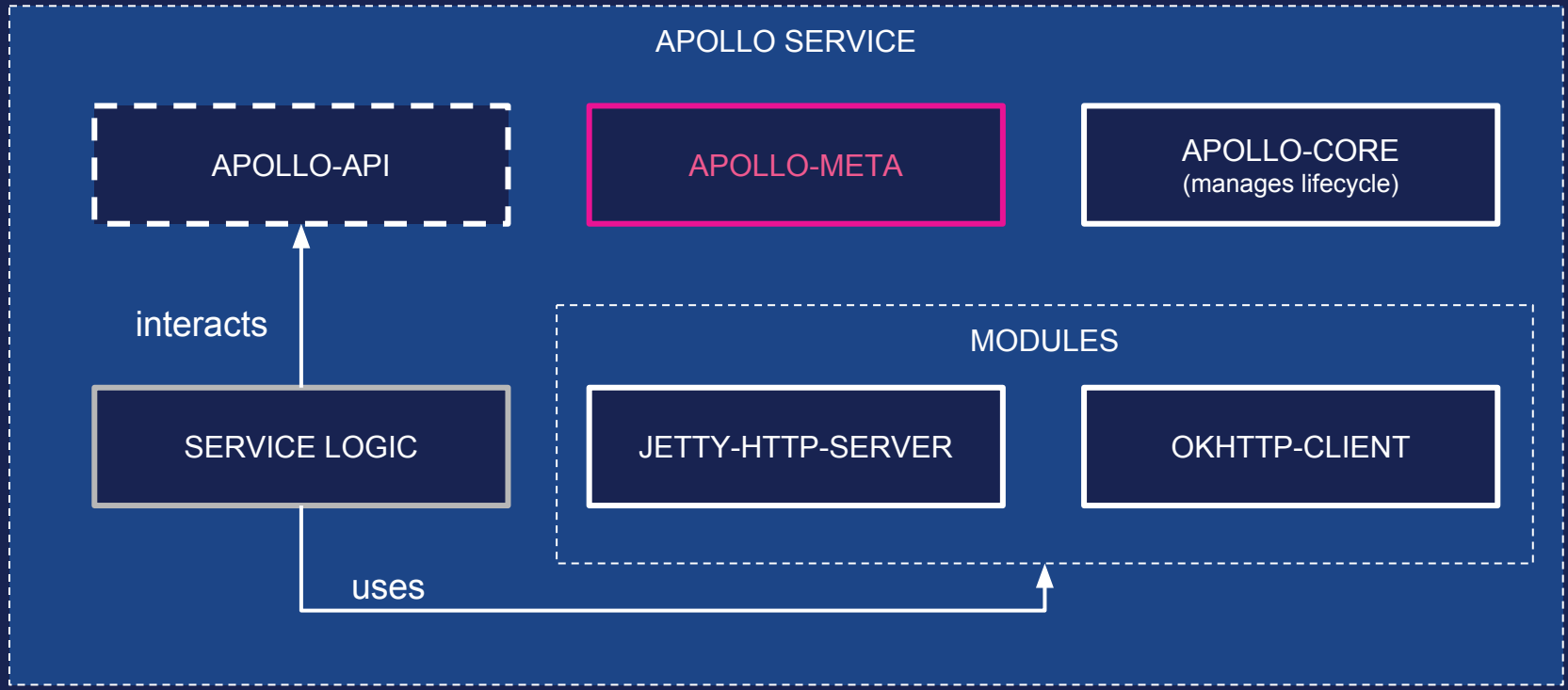


Apollo and apollo-meta

Apollo

- Java libraries for writing microservices
- Open Source
- https://github.com/spotify/apollo
- In production since 2014

Apollo service overview



Apollo-meta

- Metadata module
- Open Source
- https://github.com/spotify/apollo-meta
- Exposes endpoints with metadata of the service
- Runtime generated - source of truth

Example: Creating a route

```
Route.async("GET", "/v1/artist/<id>",
    request-> getArtist(request))
    .withDocString("Get the artist page for a specific id.")
)
```

Endpoints exposed by apollo meta

1. Instance information
2. Configuration
3. Endpoints
4. Call Information

1. Apollo-meta: instance info

- Collects information about the service: build version and uptime
- Useful to get the full picture when making rolling upgrades.

1. Apollo-meta: instance info

```
curl http://artist-a1/_meta/0/info =>

{
  "result": {
    "buildVersion": "artist 2.1-SNAPSHOT",
    "containerVersion": "apollo-standalone 1.1.0",
    "systemVersion": "java 1.8.0_60",
    "serviceUptime": 303577.347
  }
}
```

2. Apollo-meta: configuration

- The current loaded config of the service, possibly filtered

2. Apollo-meta: config

```
curl http://artist-a1/_meta/0/config =>
{
  result: {
      http: {
          server: {
              port: 8080
          }
      }
  }
}
```

3. Apollo-meta: endpoints

- Lists the endpoints of the service

3. Apollo-meta: endpoints

```
curl http://artist-a1/_meta/0/endpoints =>
{
  methodName:  "/v1/artist/<id>[GET]",
  uri: "/v1/artist/<id>"
  method: [
      "GET"
  ],
  docstring: "Get the artist page for a specific id.",
  queryParameters: []
},...
```

4. Apollo-meta: call info

- Lists services that make incoming requests
- Lists all other services we make requests to

4. Apollo-meta: call info

```
curl http://artist-a1/_meta/0/calls =>

    incoming: {
      loadbalancer: {
        endpoints: [
          uri: "/v1/artist/<id>",
          method: ["GET"],
          queryParameters: [catalogue, locale]
        ],
      },
    },..
```

4. Apollo-meta: call info

```
    ...
    outgoing: {
      discography: [],
      playcount: [],
      playlist: [],
      merch: []
    }
  }
}
```

Apollo meta <-> System Z

- System Z calls these endpoints
- Displays a merged version of all the data

Conclusions

Situation now

- Quicker access to relevant information
- Know immediately where to go when solving an incident
- Less interruptions
- Less boring work

Learnings

- Think about growth and scaling
- Automate all boring tasks that you can
- Put all the information related in one, easy to access, place
- All related links in one place

Documentation generators

- apollo
- swagger.io
- raml.org (jax-rs)

Blog: labs.spotify.com

Jobs: spotify.com/jobs

Martina Iglesias
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Spotify

Questions?

Blog: labs.spotify.com

Jobs: spotify.com/jobs

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Spotify