



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Landestopografie swisstopo

wissen wohin
savoir où
sapere dove
knowing where

QKEN 2019



geo.admin.ch and FSDI

03.10.2019



Agenda

1. Why
1. What
1. How
 - Development
 - Maintenance



Why



gesetzlicher Auftrag

- „Alltag“ :

„60 bis 80 Prozent aller Entscheide, die Bürgerinnen und Bürger betreffen, sind mit Geoinformation verbunden“¹

- **GeolG Art. 1 Zweck :**

Dieses Gesetz bezweckt, dass Geodaten über das Gebiet der Schweizerischen Eidgenossenschaft den Behörden von Bund, Kantonen und Gemeinden sowie der Wirtschaft, der Gesellschaft und der Wissenschaft für eine **breite Nutzung, nachhaltig, aktuell, rasch, einfach**, in der erforderlichen Qualität und zu **angemessenen Kosten** zur Verfügung stehen



Organisation

- **Swisstopo** is a ServiceProvider for the whole confederation for both development and maintenance of a geodata infrastructure
- **Steering comitee** is GKG, lead by Fridolin Wicki (swisstopo director). Every concerned federal office designate a representative for the GKG.

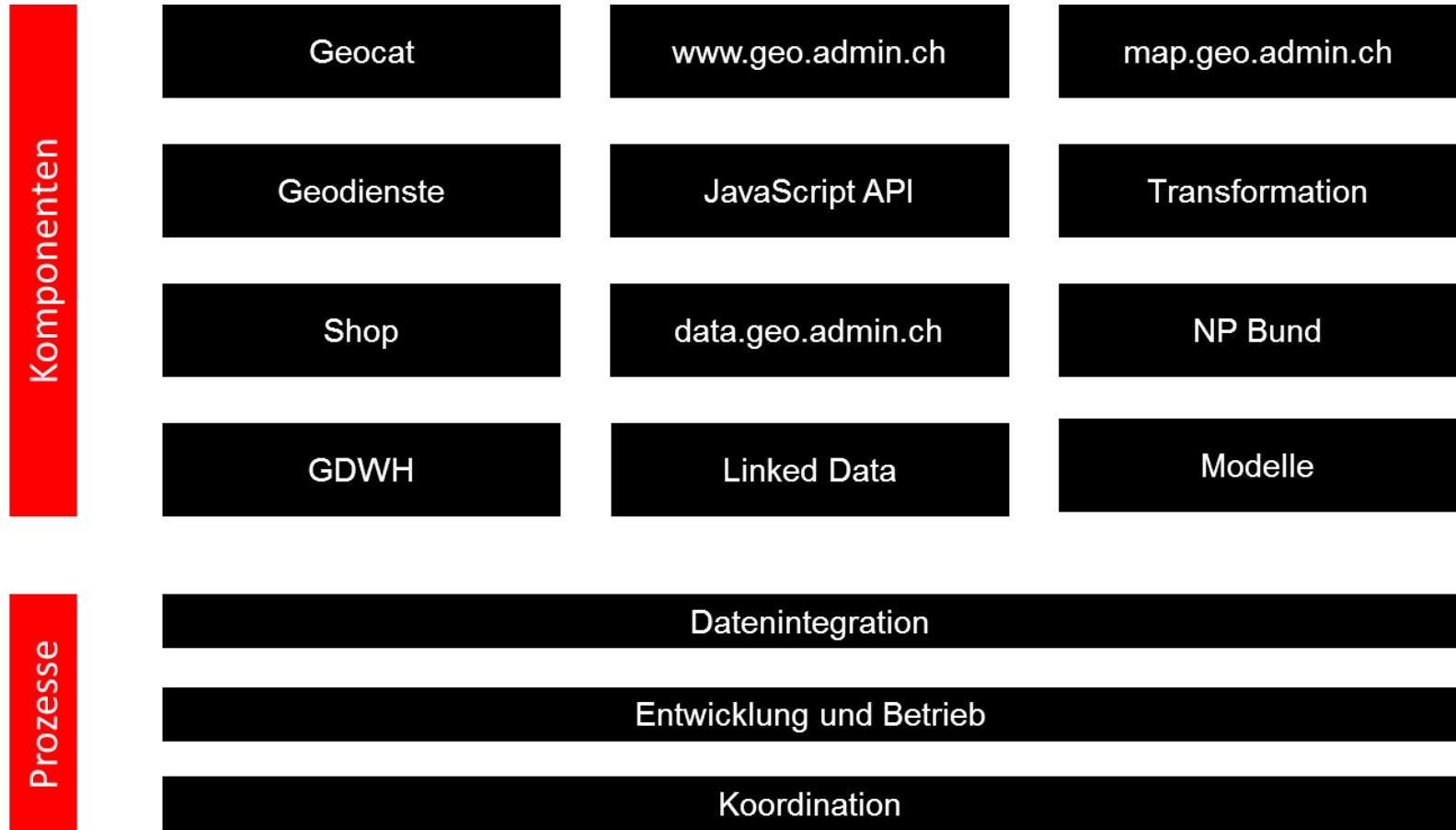
Therefore **geo.admin.ch** is more than only a platform for swisstopo



What



FSDI Components





FSDI Web Services

Visualisation (Raster, Vector)

-> in 4 projection systems

Search (Addresses, places, dates, etc)

Height services

Geolocalisation

Metadata

3D services

Much more -> <https://api3.geo.admin.ch>



FSDI Numbers

- 13.4 Millions visits (2017)
- 99.98% availability (24/7)
- 650+ layers
- 750+ layers/timestamp combinations
- 800 WMTS Tiles per seconds delivered (24/7)
- 100+ Layers automatically updated by customer (including all background layers)
- Services used in 1000+ Webportals and apps





FSDI Standards

Visualisation

-> WMTS, WMS

REST API

-> ESRI GeoServices Specification (inspired by)

Other

-> GeoJSON, KML, Mapbox Vector Tiles

The OGC standards are implemented as much as possible



How Development



Principles of development

<https://github.com/geoadmin/doc-guidelines>



Principle: Agile development

mostly Kanban, sometimes Scrum

Bi-Weekly Ticket Reviews

Bi-Weekly Deploys



Principle: Everything is code

We manage everything as we manage code (well, mostly)

Code, Configuration, SQL Statements, FME Workbenches,
Infrastruktur, etc

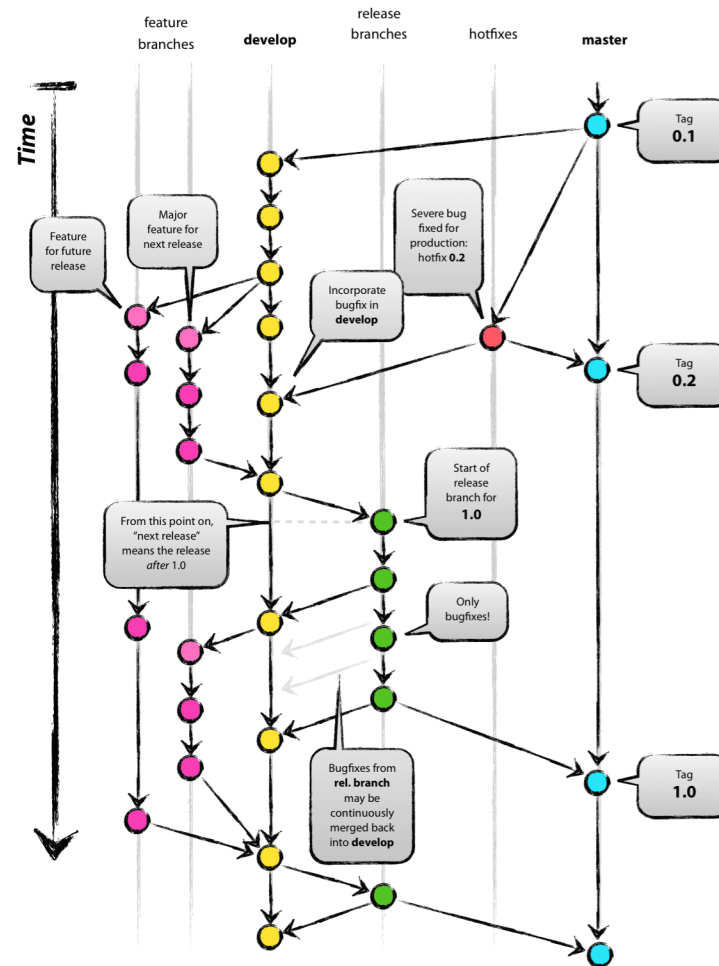
-> Source Control

-> Same principles

git on github as central tool (gitlab for sensitive
information)

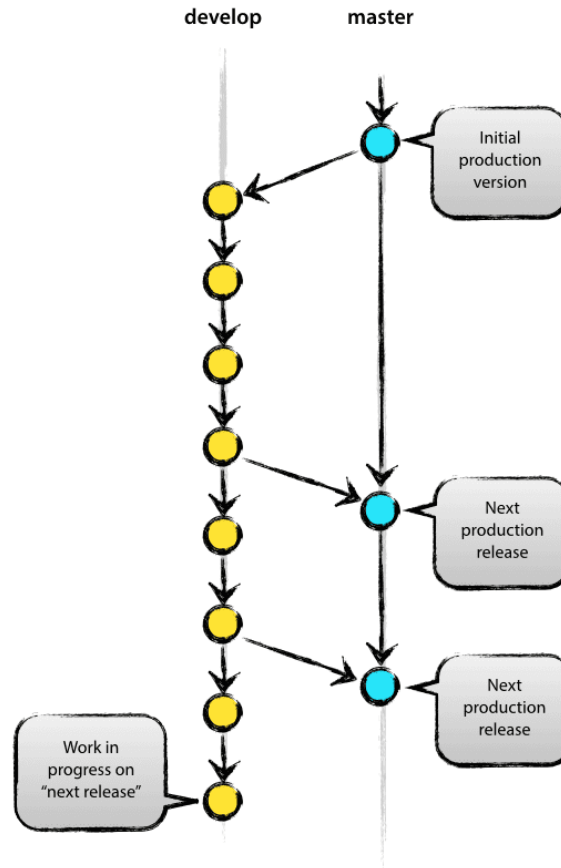


Used Workflow -> gitflow, best parts





Used Workflow -> gitflow





Principle: Reviews

Everything that goes into production has been reviewed and tested in detail (4 Eyes Principle)

At least one other pull request will be reviewed per created pull request

Independent changes (one issue per PR)

Connecting parallel developments



Principle: Testing

Connecting Parallel Developments Whenever possible:
Unit Tests and Automated Tests

High Code Coverage - 100% targeted in critical areas

-> Example in jenkins



Principle: Staging

Dev

Int

Prod

(exceptionally dev=int)



Deploy

- Every 2 weeks
- No downtime (blue/green where needed)
- Half of the Team (4-6 people, incl. DI)
- Test and acceptance



Tech stack map.geo + api3 + wmts/wms

- AWS Services
 - Computing: EC2, EBS
 - Storage: S3 / EFS
 - CDN: Cloudfront
 - Serverless: AWS Lambda, AWS Batch
- PostGIS for Vector Data
- UMN Mapserver as mapping engine
- Debian / Docker / Rancher as base systems
- Varnish / NGINX / Apache as service front-ends



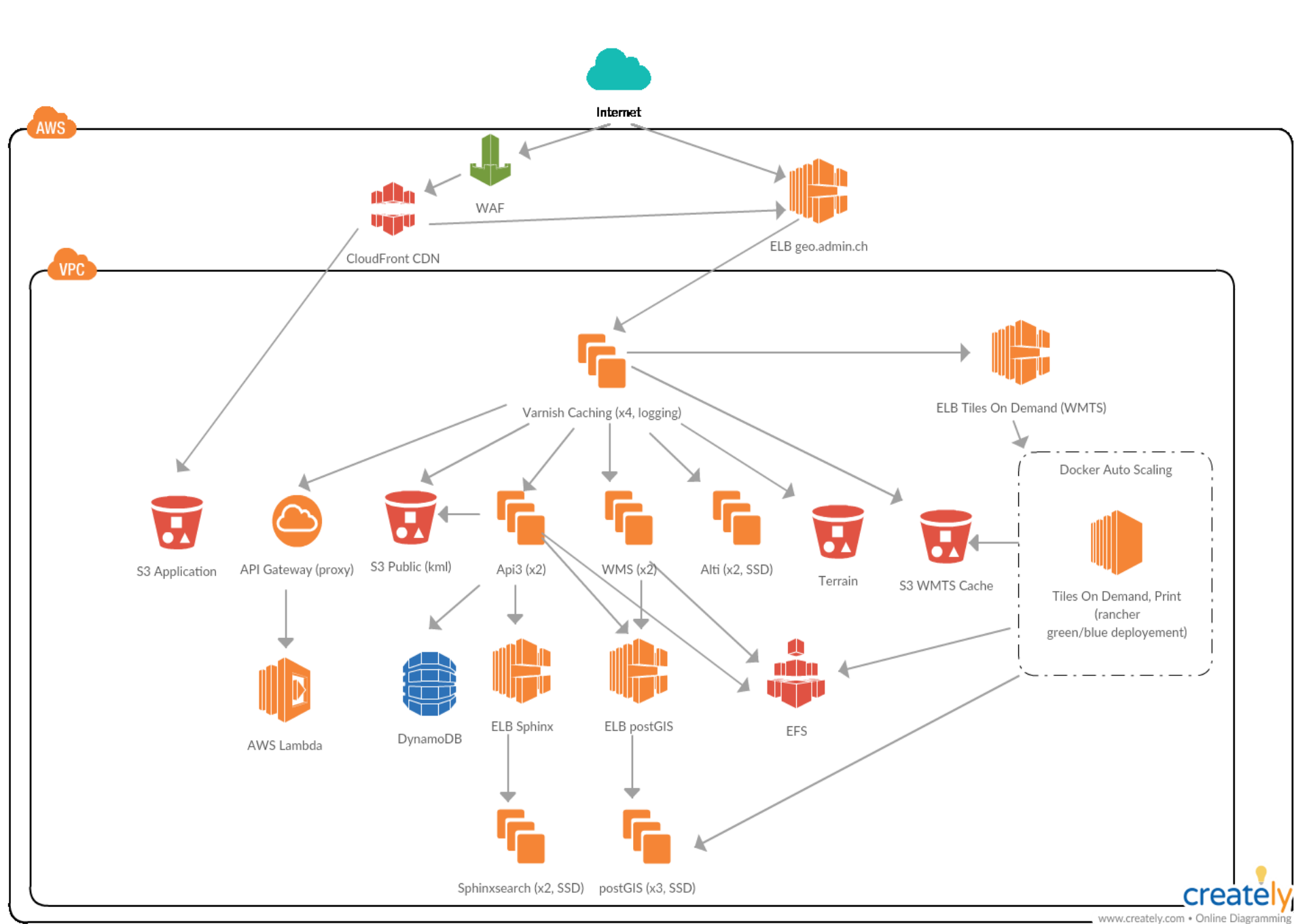
How Maintenance



Infrastructure managed as code

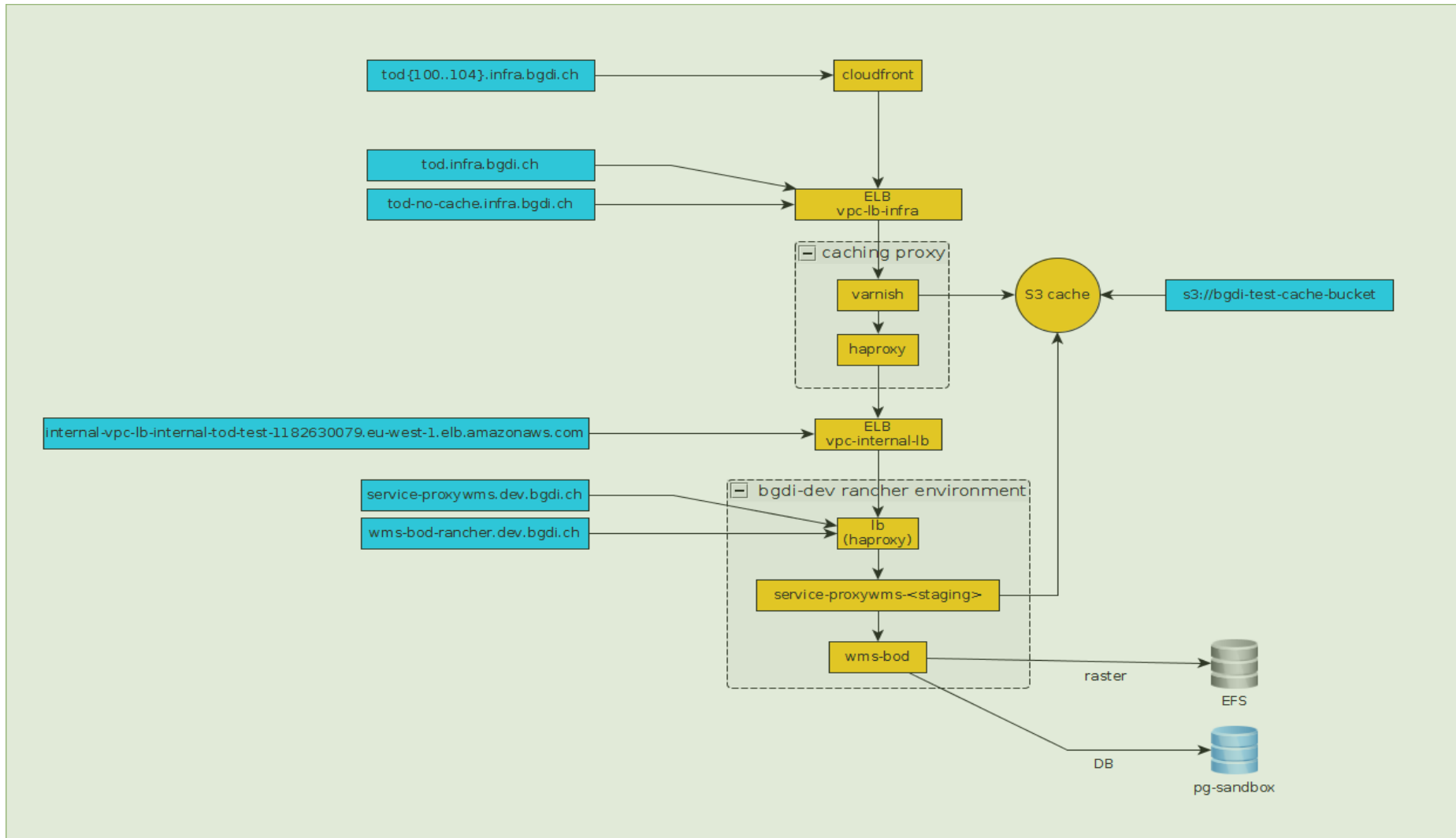
- Puppet for traditional computing (virtual machines)
- Terraform for serverless
- Devops

example of gitlab





Architecture Tiles On Demand





DIEMO

DIEMO = Nationale Daten-Infrastruktur Elektromobilität

Provide a public service that collects all the **Electric Vehicle Supply Equipments (EVSEs)** from swiss providers. The providers are responsible to push the charging facilities **DATA** (coordinates, plugs, power, etc) and **STATUS** (available, charging, reserved, out of order, etc) using the Open Interchange Protocol (OICP)

Provide a download service (JSON, via data.geo.admin.ch)

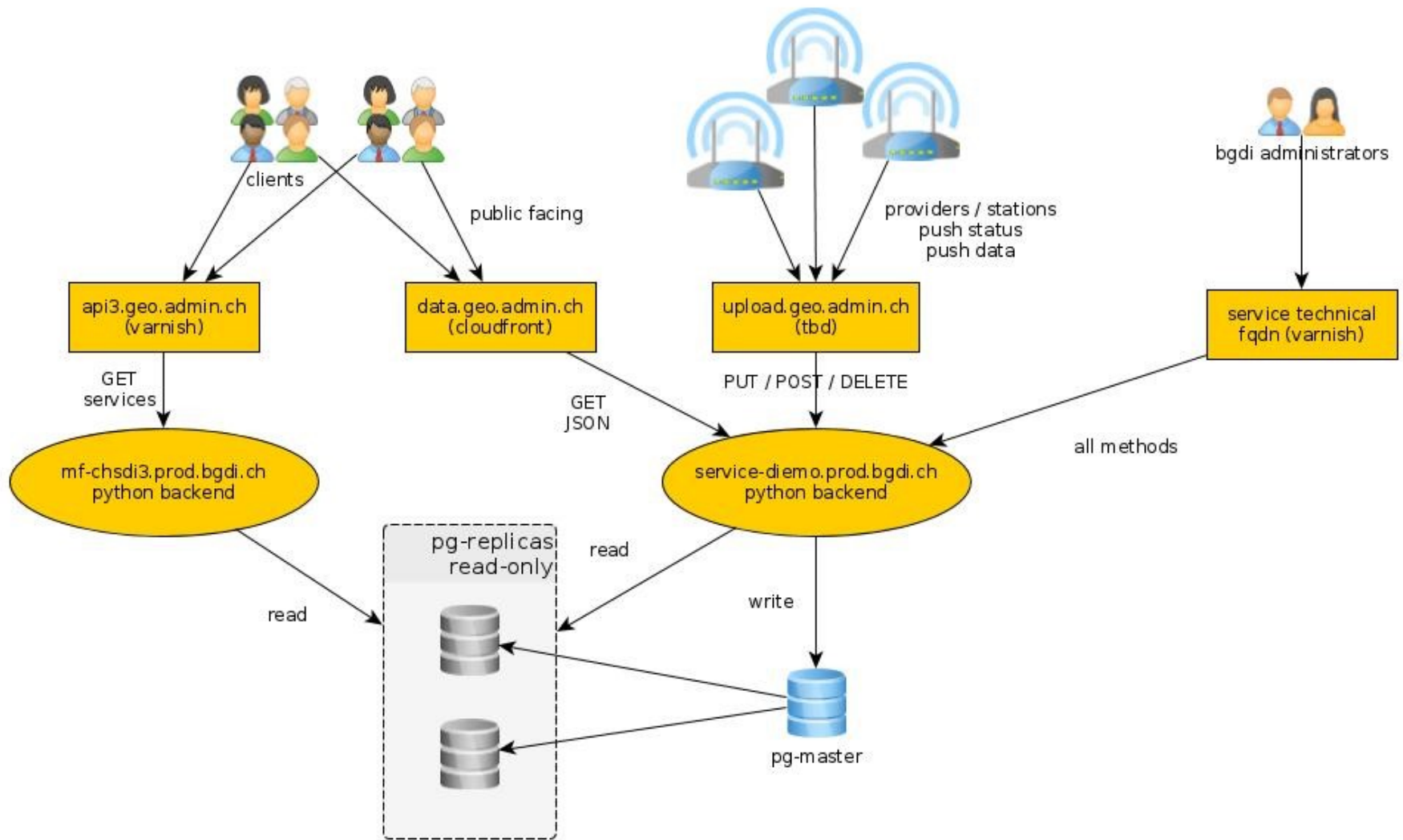
Provide API services: request around points, etc (via api3.geo.admin.ch)

Provide a map representation with informative tooltips (map.geo.admin.ch, json layer)





DIEMO Architecture





DIEMO key features

Real time updates: services and JSON must be updated in less than 5 seconds

IOT : the stations themselves send the status updates when they change (available, occupied, etc)

Dynamical data: the providers can add, remove locations (data events) when they want.

Open protocol: (OICP Open InterCharge Protocol)

Will be in production in august 2019



Statistics

- WMTS -> accounting
- awstats



Pingdom

- Availability Monitoring
- Alerting



Kibana (KELK)

- Real Time Monitoring
- Key Metrics
 - Response Times
 - Error Rates
 - Total Traffic



Infrastructure Dashboard

- Dashboard
- Per Instance Monitoring and Alerting