Putting Linked Data to Work: Semantic Data "Brokering" in Practice

HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

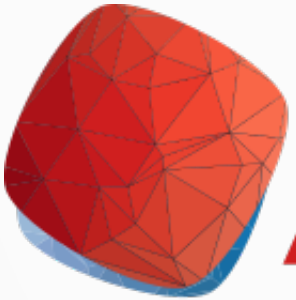
João da Silva
Stefan Negru

OUTLINE

- ATTX Project Overview
- ATTX Semantic Broker ”another” ETL tool
  - Use cases
  - Provenance tracking
- Demo
- Automation FTW … right?
  - CI/CD Automation
  - Deployment
  - Technology stack

KEYWORDS

- Easy Development
- Easy Deployment
- Easy Publishing and reuse of data



ATTX

Putting Linked Data to Work

SEMANTIC BROKER

USE CASE ORIENTED

UC1: Infrastructures and Publications In house proof of concept use case.	UC2: Parallel Publication Dashboard In cooperation with the University of Jyväskylä.
UC3: Metax Semantic Models mapping for CSC - IT Center for Science.	UC4: MILDRED Developing part of the University of Helsinki Research Infrastructure.

SEMANTIC BROKER

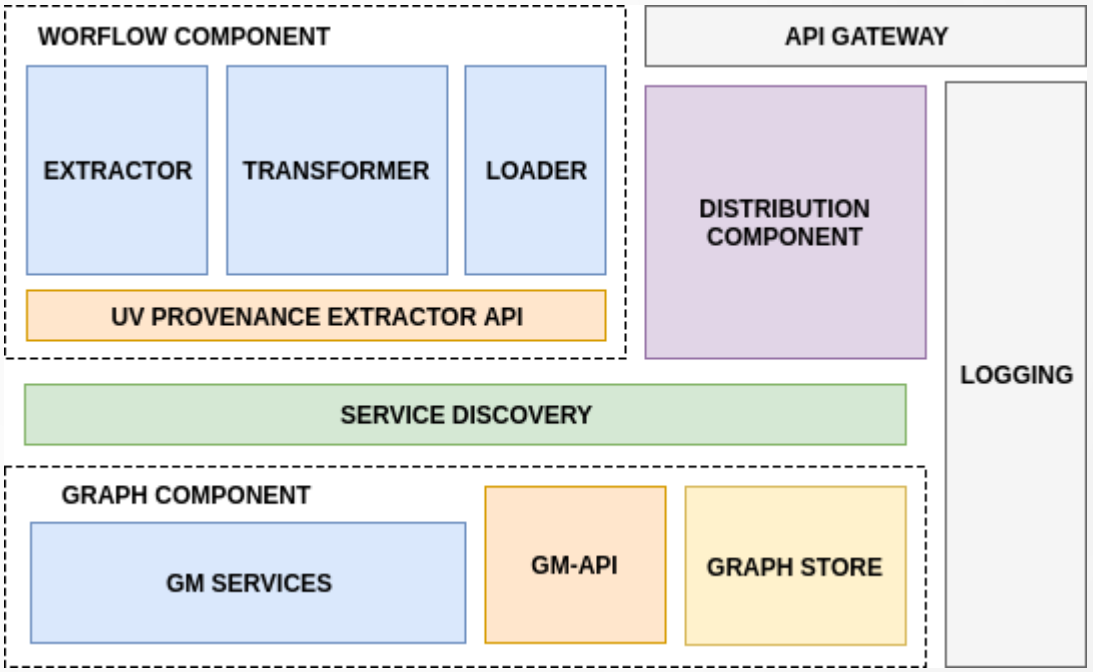
JUST ANOTHER ETL TOOL?

- Entity Linking (NER, reconciliation etc.)
- **Reasoning capabilities**
- **Data Validation (partly including Data Quality Standards)**
- **Statistics and Insights about the Data**
- Data Transformations
- Data Publishing (REST APIs, **HDT files etc.**)
- **Provenance Tracking**

SEMANTIC BROKER

ATTX SEMANTIC BROKER OVERVIEW

1. Use case oriented
2. Provenance tracking
3. Advance capabilities of enriching and generating new data
4. Flexible graph based internal data model
5. Containerised components: aiming for Micro-services Architecture



DEMO

DEPLOYMENT & USAGE

- Docker Swarm as platform for ATTX components: containerise everything (and run it everywhere);
- Infrastructure-as-Code approach (yml file with service stack definition);
- Automatic deployment via YML in own PC or Cloud (OpenStack)

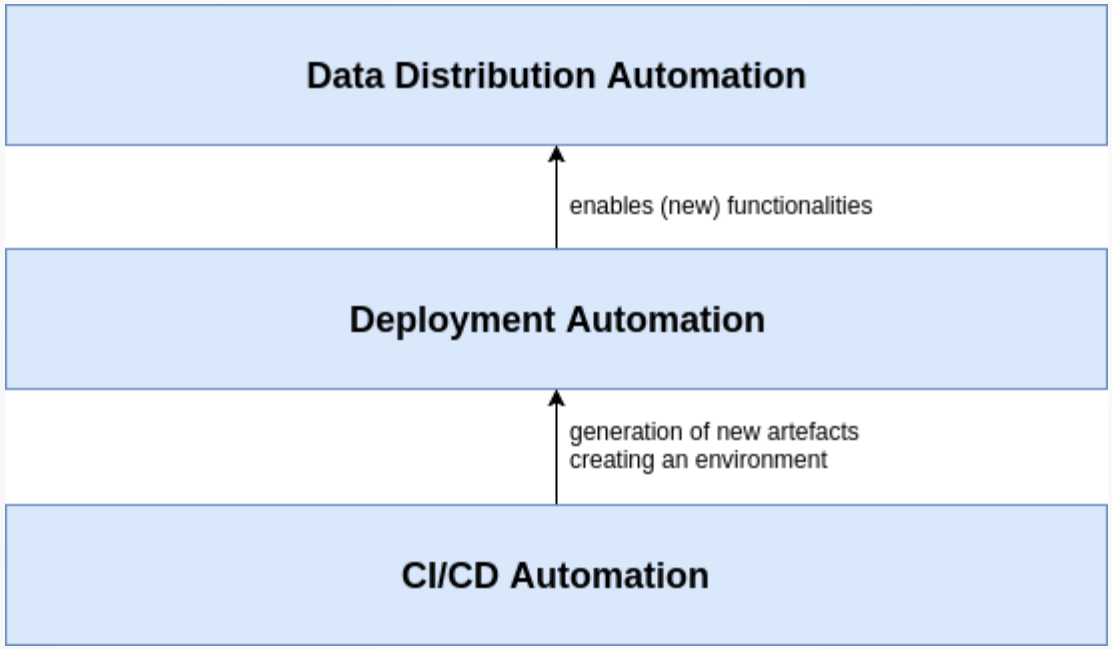
DEMO

DEPLOYMENT & USAGE

- We’ll start the demo by creating a three-node Docker Swarm on our own PC (but you could do it in your own IaaS or VMs);
- Next, we’ll deploy the ATTX Stack provisioned with YML;
- Then, we’ll demonstrate a sample workflow for the ATTX LOD solution :-)

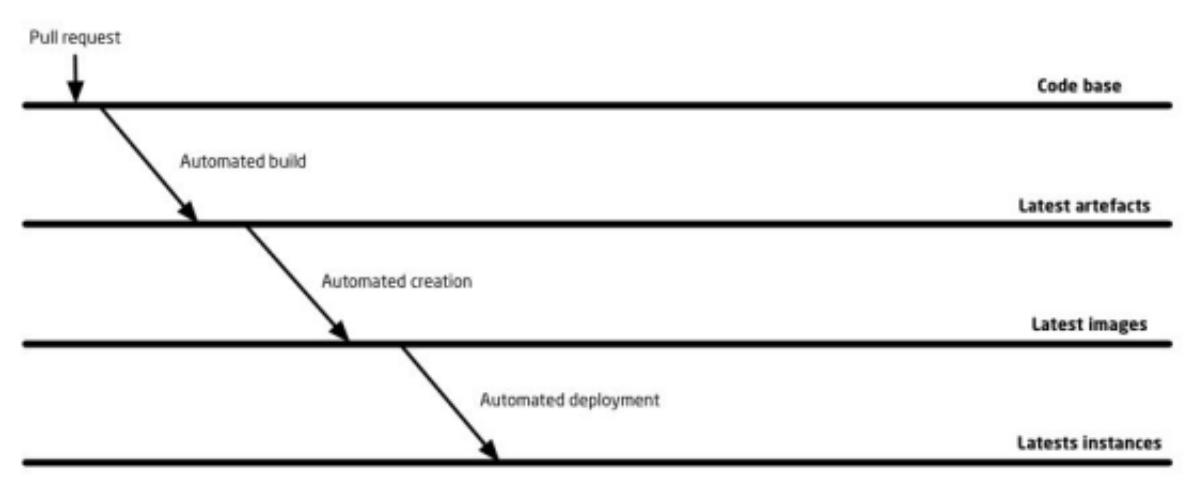

AUTOMATION FTW …
RIGHT?
https://www.flickr.com/photos/spacex/27294261525/

AUTOMATION LAYERS



AUTOMATION LAYERS

CI/CD WORKFLOW



TECHNOLOGY STACK

CI/CD ENVIRONMENT

- Gradle build tool - https://gradle.org/ with {py}Gradle
- Github - https://github.com/
- Jenkins - https://jenkins.io/
- Docker - https://www.docker.com/
- Archiva - https://archiva.apache.org/

AUTOMATION LAYERS

DEPLOYMENT

- Deploying updated components/services to each instance of the Semantic Broker
- Provisioning and deploying ATTX stack on own PC or Cloud (OpenStack)
- Rolling Updates with Docker Swarm

TECHNOLOGY STACK

ATTX SEMANTIC BROKER

- ElasticSearch - https://www.elastic.co/
- UnifiedViews - https://unifiedviews.eu/
- Jena + Fuseki - https://jena.apache.org

Next version:

- Consul - https://www.consul.io/ or Kontena (https://www.kontena.io/)
- RML - http://rml.io/
- SHACL - https://www.w3.org/TR/shacl/
- ShEx - http://shex.io/

THANK YOU

"They say it could not be done,
but we did it anyway, and it (kinda) worked"
Joonas Kesäniemi - @lunch 2017

- https://www.helsinki.fi/en/projects/attx-2016
- https://attx-project.github.io/
- https://github.com/ATTX-project/elag2017-demo