INFINITECH - Pilots Overview
BDVA Event - 14th May

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This project has received funding from the European Union's horizon 2020 research and innovation programme under grant agreement no 856632

Personalized Usage Based Insurance Products

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Categ.	Personalized Usage-Based Insurance Pilots
Pilto #11	**Personalized insurance products based on IoT connected vehicles**

Description	**Partners**

Improve the risk insurance profiles using the information collected by connected vehicles and applying IoT, HPC, Cloud Computing and Artificial Intelligence technologies	• ATOS
	  ○ Connected Car Platform
	  ○ IA Platform
	• CTAG
	  ○ On board units
	  ○ Real-Time/Historical data
	  ○ 80 vehicles during 4 by day
	• Gradient
	  ○ Anonymization Service
	• Dynamis
	  ○ Requirements
	  ○ insurance company's data

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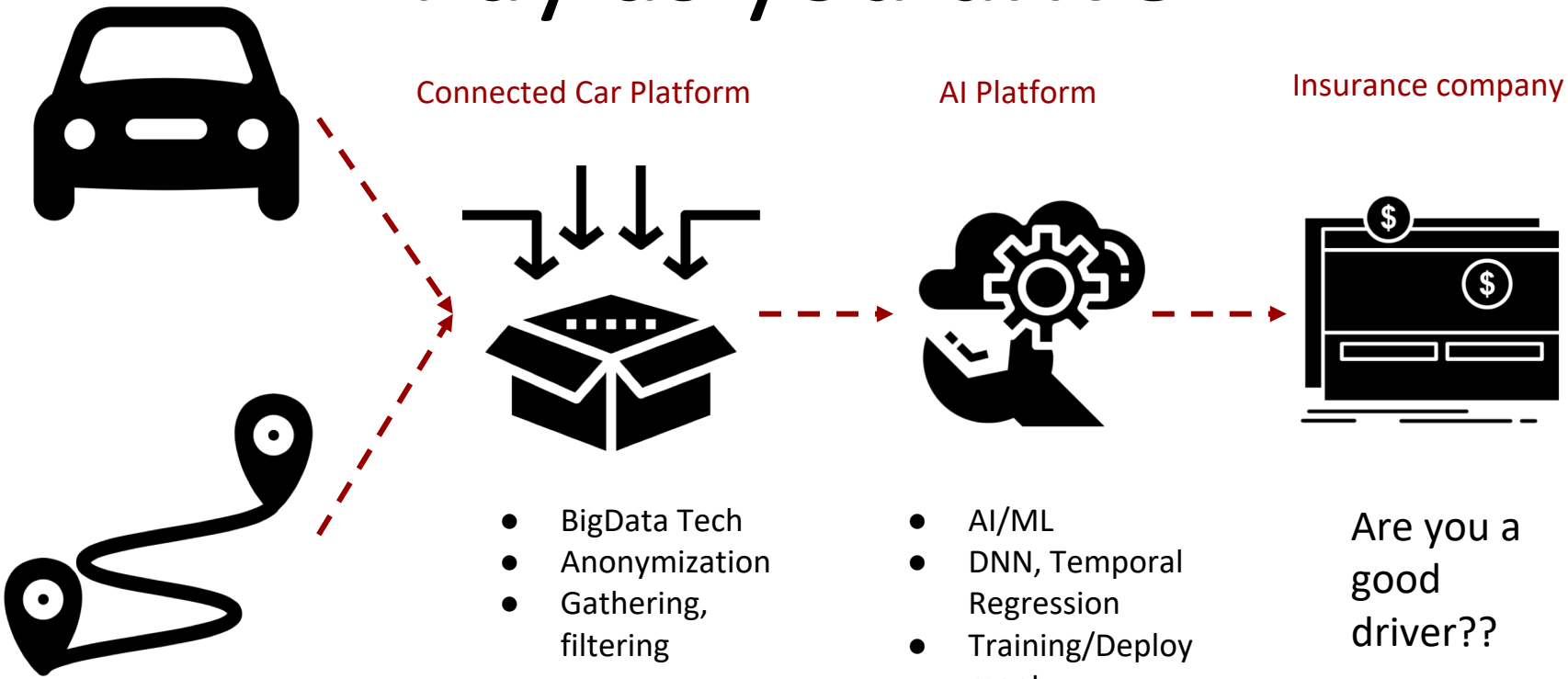
Pay as you drive



- BigData Tech
- Anonymization
- Gathering, filtering

- AI/ML
- DNN, Temporal Regression
- Training/Deployment

Are you a good driver??

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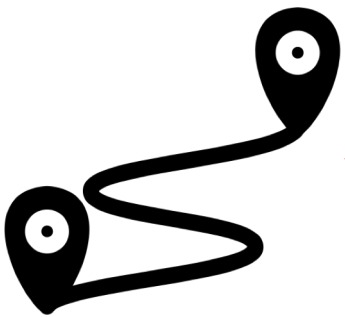
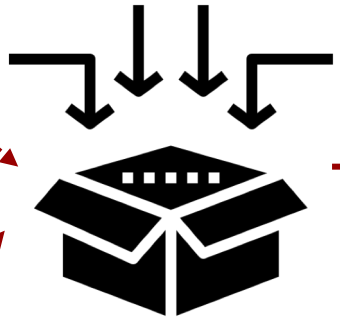
Fraud Detection



Connected Car Platform

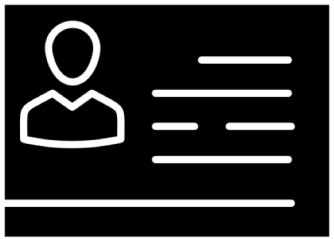


- BigData Tech
- Anonymization
- Gathering, filtering

AI Platform

- AI/ML
- Clustering Model
- Training/Deployment

Insurance company



Policy Agreements

Different drivers

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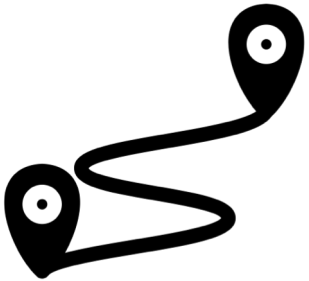
Main Data Sources

CAN/BUS
80 Vehicles 4h/day
Pre-Historical data

~600 GB

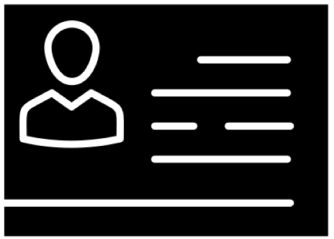
City of Vigo
Traffic Events

~1 TB



Different cities
simulated data

on demand



Insurance company data

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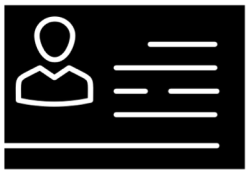
Real Life Challenges

Insurance company

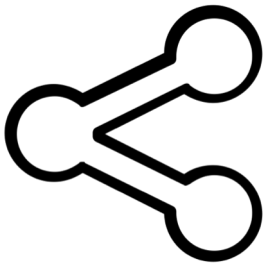


New adapted services

Bad drivers and fraud costs

No data from IoT/Connected

Data providers

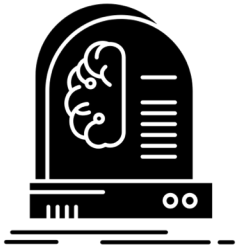


Quality/available data

Combine data sources

Standards protocols

Data intelligence



How to extract intelligence?

What does “good driver” means?

Complexity combination of technologies

Privacy

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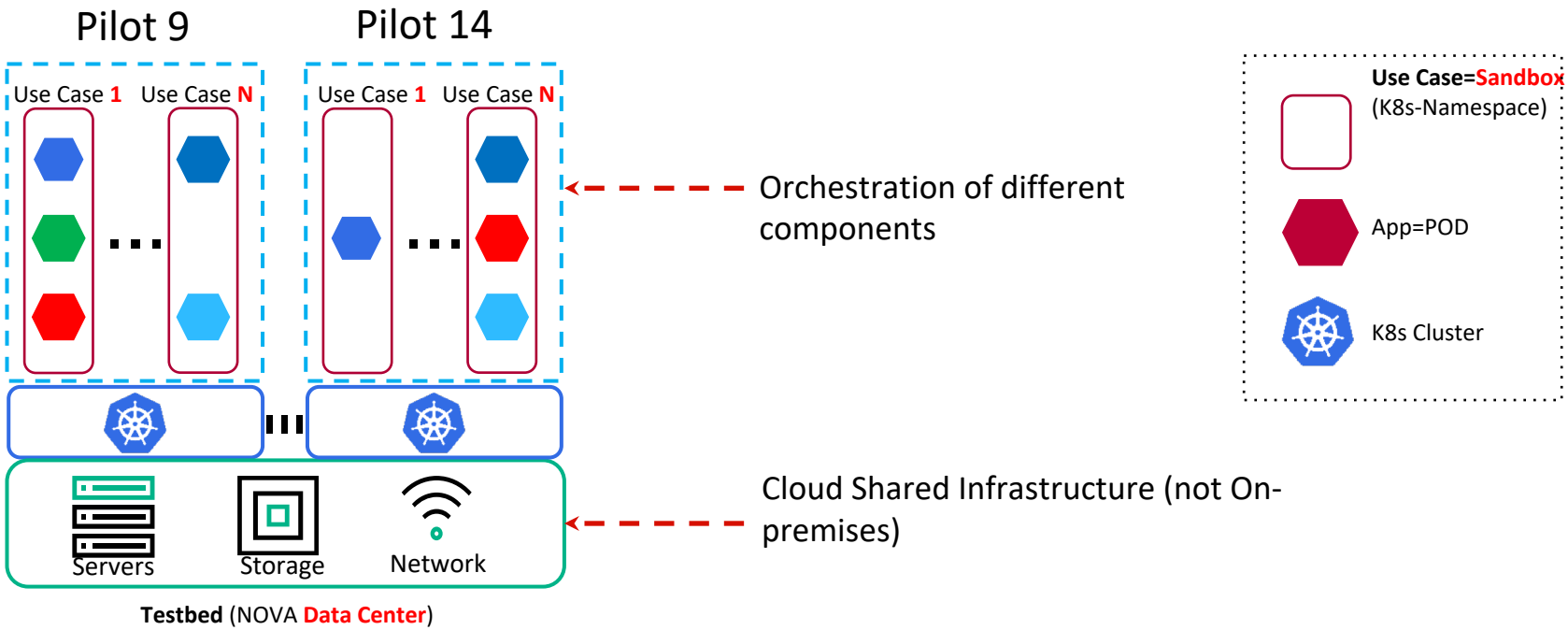
Infinitech

Sandbox and test bed



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Concrete example about:

exchange of health data in a secure way in the INFINITECH

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Categ. Personalized Usage-Based Insurance Pilots

Description	Partners
Customized products in a win-win case for insurer-customer based on the health activity and the risks of each person. ● ML/DL algorithms, Partners' IoT platforms & Data Governance building blocks for consent management and data anonymization ● 100s of individuals/users that will be engaged in the pilot by RRD; ● 100s' of Citizens' feedback datasets; ● 1000s' Nutritional information datasets; ● Simulated of activity datasets from 1000s of patients based on the simulation module of the Healthentia platform,	● SILO ● ISPRINT, ○ On board units ● RRD ● Gradient ● Dynamis

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Personalized Retail and Investment Banking Services

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Categ. Personalized Retail and Investment Banking Services

Pilot #5a Smart and Personalized Pocket Assistant for Personal Financial Management

Description

Smart Services for bank customers

- Smart alerts: prevent possible overdrafts
- Smart automations: identify recurrent payments
- Smart expense advisor: categories compared with other "similar" customers
- Smart recommendations of bank's products
- Smart sentinel: protection based on alerting on potential anomalies

Partners

- Liberbank
  - Final User
  - Data Provider
- GFT Spain
  - Integrator of LIBERBANK
- UNIVERSITY OF PIRAEUS
  - Machine Learning developer
- CrowdPolicy
  - Machine Learning developer

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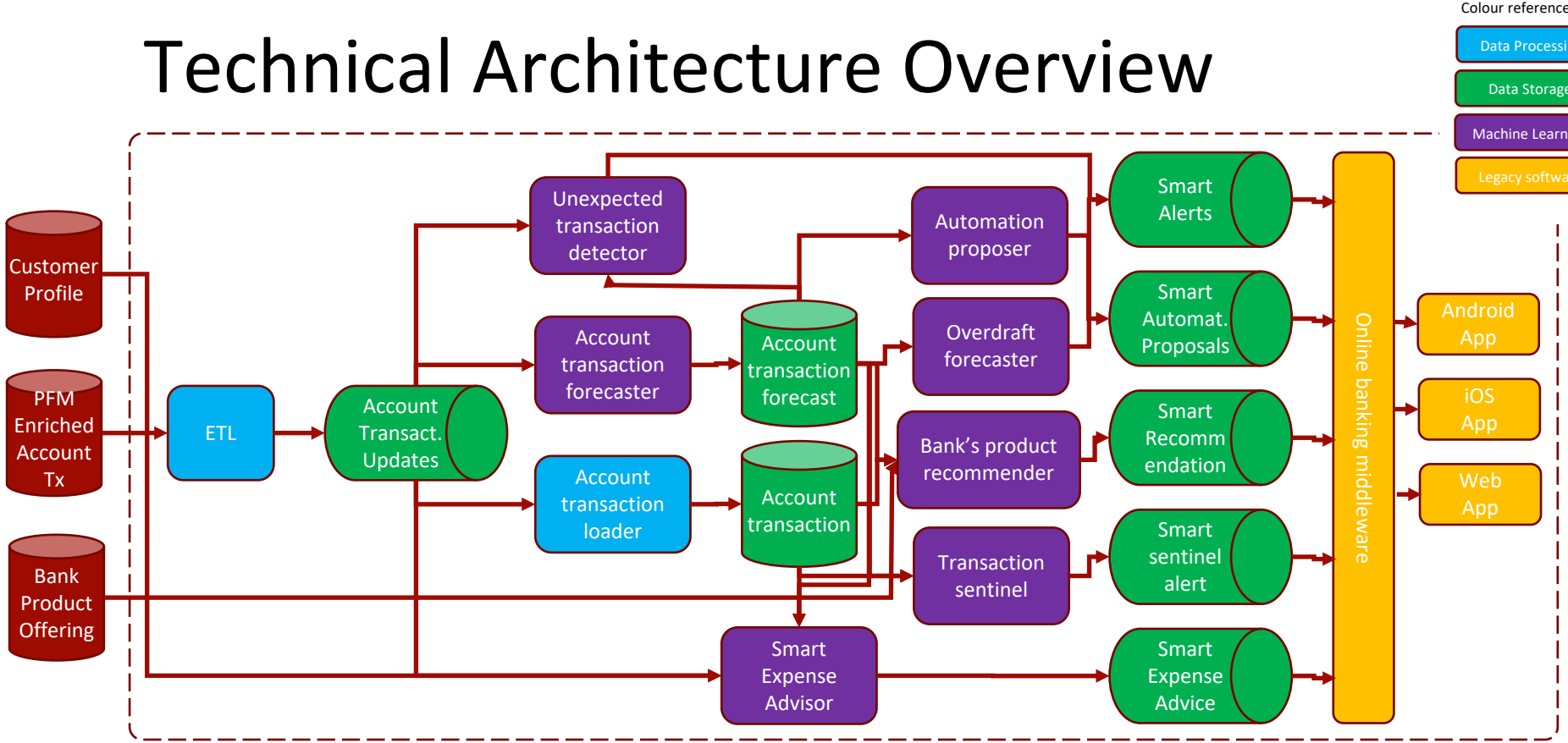
Infinitech

Technical Architecture Overview



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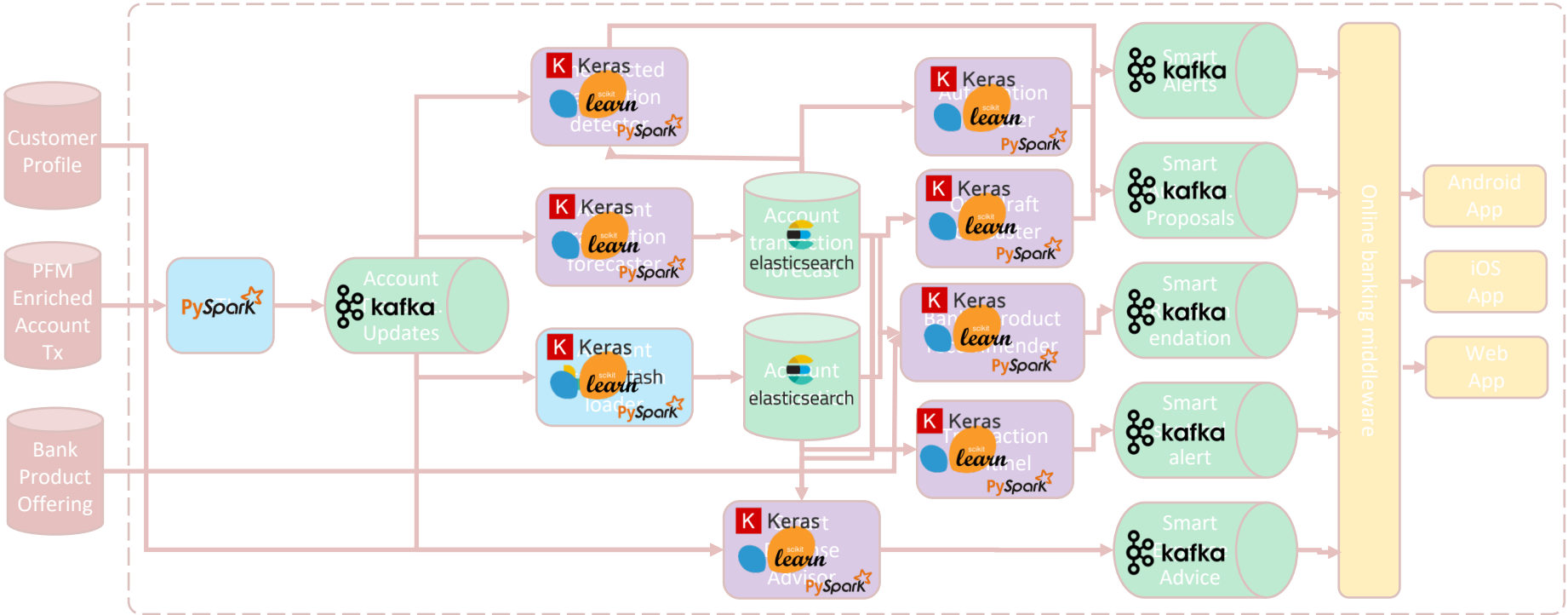
Software Infrastructure Overview



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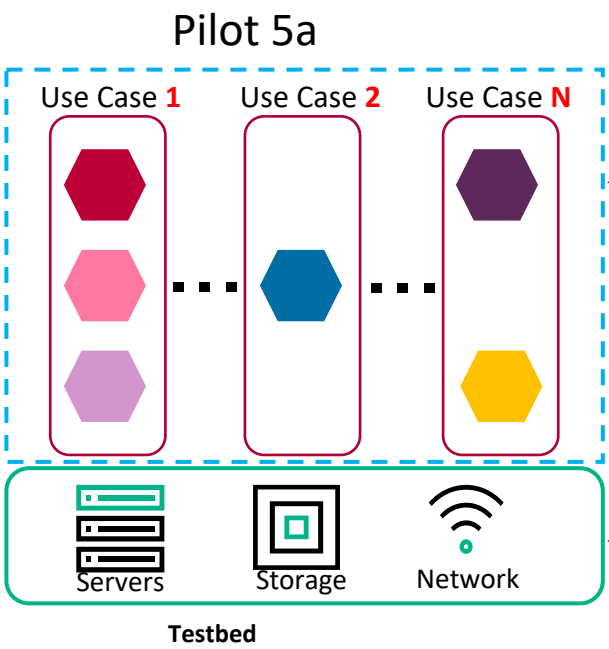
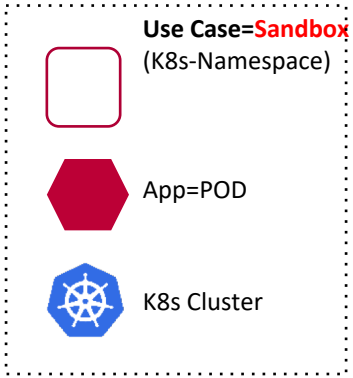
Sandbox and test bed



Orchestration of different components

Cloud or OnPremises (tbd). Maybe mix solution



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Financial Crime and Fraud Detection

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Categ.	Financial Crime and Fraud Detection
Pilot #9	**Analyzing Blockchain Transaction Graphs for Fraudulent Activities**

Description

Fraud Detection

Blockchain crypto currencies and tokenized assets that are obtained fraudulently. Transactions and tokens:

- Ethereum, Bitcoin (public not regulated)
- Also regulated chains like GUSD

A final transaction ends up into a bank product.
Holding stable coins that originated from fraudulent.

Construction of the massive blockchain transaction graph

Partners

- Aktifbank (AKTIF)
  - Responsible for user interfaces and regulations and banking services.
- Bogazici Univ. (BOUN)
  - Responsible for HPC software development for big blockchain data and parallel graph analysis.

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Transaction Graph Sizes

- Transaction graph sizes are big and growing.
- Currently transactions-per-second is low on public blockchains: Bitcoin (7 tps) and Ethereum (15 tps). Ethereum performance is expected increase in future releases.
- Hyperledger reported to achieve 3500 transactions-per-second in cloud environment:

  https://www.ibm.com/blogs/research/2018/02/architecture-hyperledger-fabric/
- A parallel / distributed graph system is needed whose performance can scale by simply increasing processing nodes on an HPC cluster.

As of May 2020

Bitcoin transaction count:

527 Million

Source: https://www.blockchain.com/charts/n-transactions-total

Ethereum transaction count:

700 Million

Source: https://etherscan.io/chart/tx

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HPC Requirements

- HPC Cluster with 16-32 nodes with a total of around 1TB memory is expected to handle the *current* transaction sizes.
- As the graph size increase, these requirements will increase and cluster node count and memory size can be scaled.
- HPC cluster supporting MPI (message passing interface) is needed.
- External Metis or Scotch software can be used to partition graphs in order to minimize communication volume between processors.

http://glaros.dtc.umn.edu/gkhome/metis/metis/overview

https://www.labri.fr/perso/pelegrin/scotch/

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Technologies

Blockchain Transaction Dataset Preparation Component	
Description	Extracts Bitcoin, Ethereum and major ERC20 token transactions (such as Gemini USD (GUSD), Tether USD (USDT), Tether Gold (XAUT), Statis Euro (EURS) and Turkish BiLira (TRYB)) from blockchain.
Owner	BOUN
BDVA Layer	Data Management

Scalable Transaction Graph Analysis Component	
Description	Constructs distributed/partitioned transaction graph in parallel using MPI. It will utilize graph and machine learning algorithms to analyse fraudulent transactions.
Owner	BOUN
BDVA Layer	Data Processing Architectures/Data Analytics

User Interface for Blockchain Transaction Reports and Visualization Component	
Description	Will provide user interaction with the Scalable Transaction Graph Analysis component within the bank and collect/manage user as well as annotated blacklisted blockchain addresses . It will utilize OpenAPIs (REST APIs) to submit queries and and provide visualization based on received results using vis.js graph drawing package
Owner	AKTIF
BDVA Layer	Data Visualization and User Interaction

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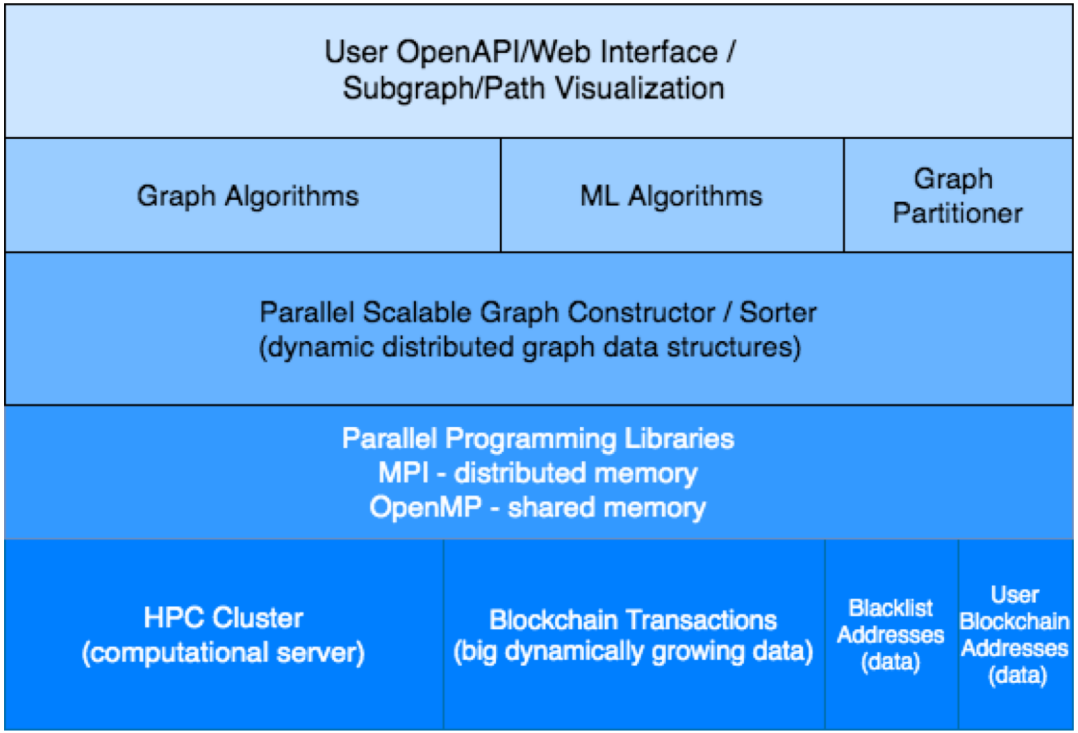
Architecture



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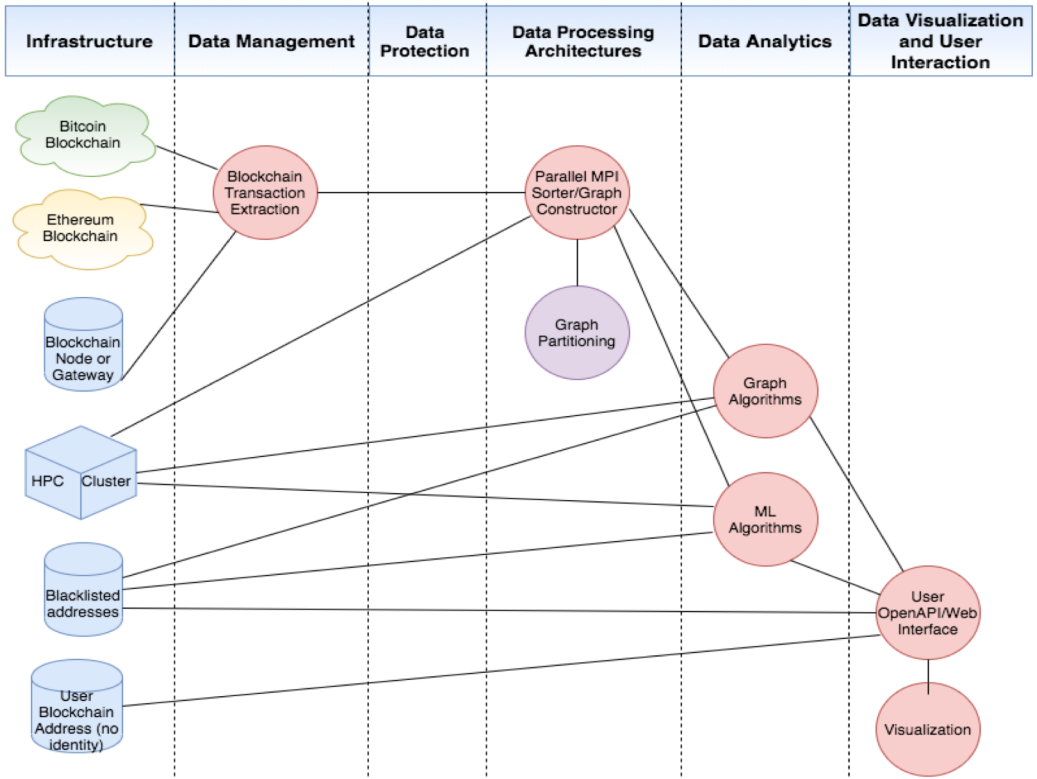
BDVA Reference Model



BDVA RA

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