

# Agentic automation of Trust Exchange in Gaia-X framework

Team Altitos | Tech-X 2026

 CENTRE OF EXCELLENCE  
DATA SHARING & CLOUD

Inés Martínez  
Giulia Biagioni



Ioannis Tolios

Ivo van Dijck

**TNO**



AI is here to stay

# How can we trust the information AI agents provide?

## Types of AI agents

### LLM agents

(e.g. Chat GPT)

✓ Good at understanding natural language



They can hallucinate

### Semantic agents

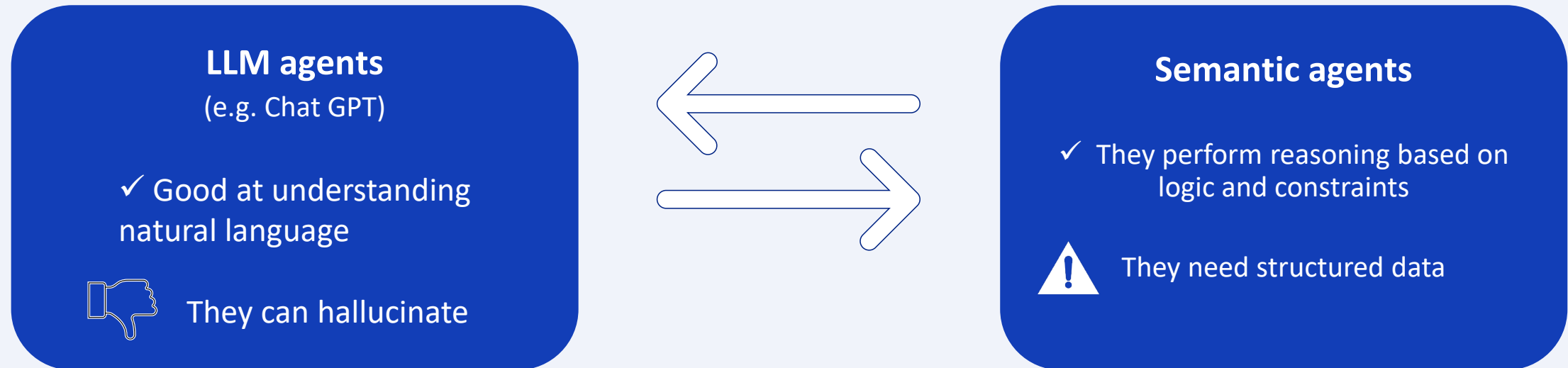
✓ They perform reasoning based on logic and constraints



They need structured data

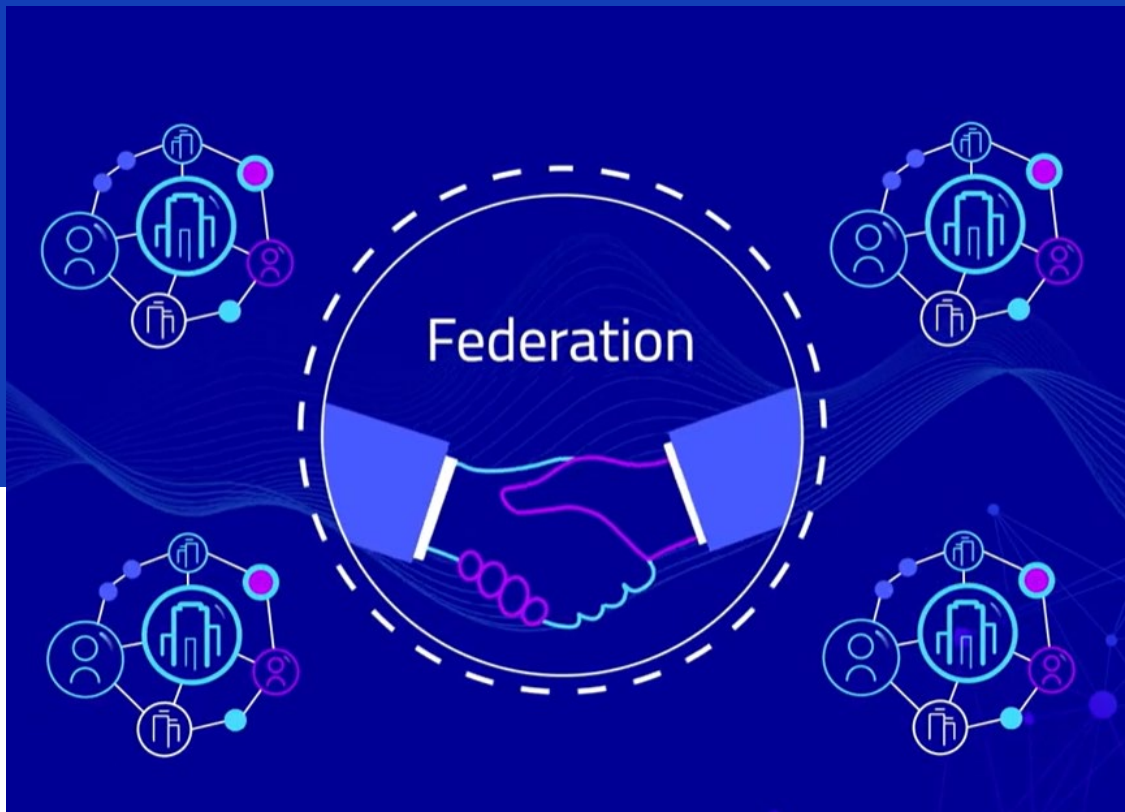
# How can we trust the information AI agents provide?

## Types of AI agents



**Solution:**  
neuro-symbolic workflow

# Federation solutions will shape the future



## Needs

IAM

Gaia-X  
credentials

API

etc...



## Available

Keycloak

Gulu Server

GXDCH

EBSI wallet

GraphQL

Liqo

etc...



# GaiaFlow

Federated marketplace intelligence

## Marketplace Discovery

Query Results

Compatibility Engine

Trust Results

## Our prototype

Bridges the gap between Gaia-X's federated infrastructure standards and practical end-user adoption.

### Features:

- Verification of the service compatibility
- Provider's trust check

### Limitations:

- TRL 4
- Only PaaS and SaaS are demonstrated

# GaiaFlow

Federated marketplace intelligence

Marketplace Discovery

Query Results

Compatibility Engine

Trust Results

## GaiaFlow Assistants

AI assistants for discovering and validating services across Gaia-X compliant marketplaces

Clear chat

A

Atlas AI

Hi! I can help you discover Gaia-X services across trusted marketplaces — for example containerized SaaS AI/software services or PaaS compute and platform environments. What are you looking for?

Type your answer...

Send

### Hide semantic query

#### Available trustworthy marketplaces

Select where the semantic query should be executed.

Gaia-X Service Hub

Active · trustworthy

EuroCloud Federation Hub

Coming soon

SovereignGrid Marketplace

Coming soon

TrustedEdge Catalogue

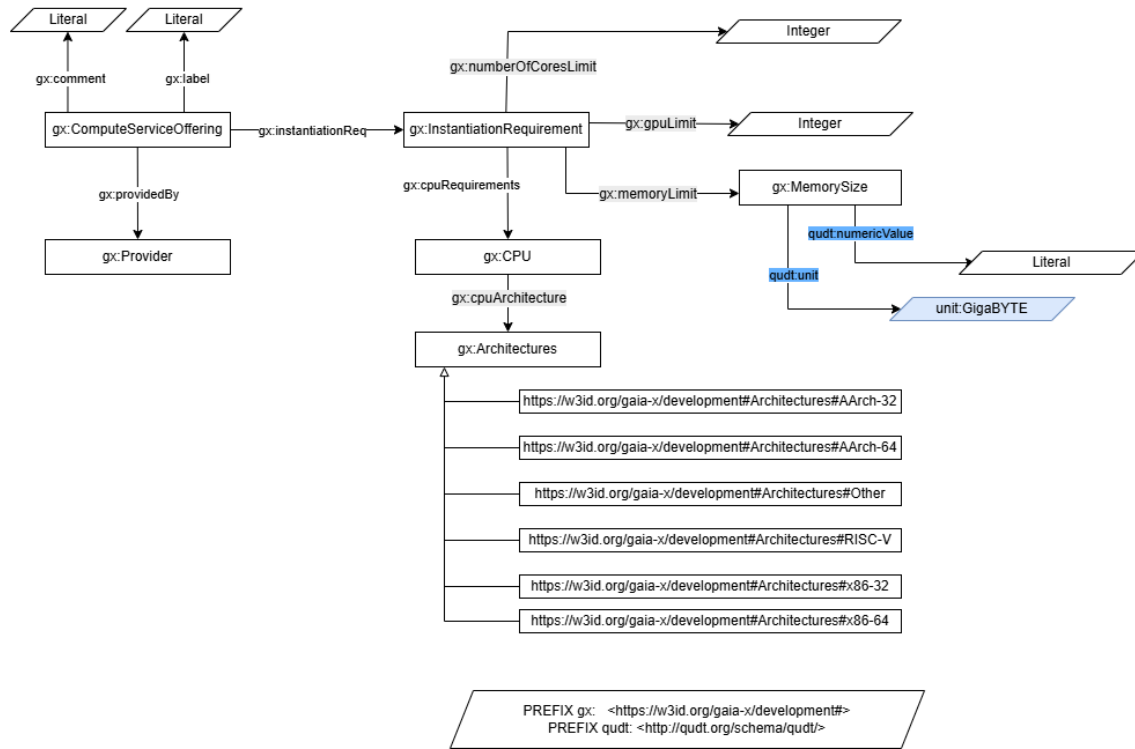
Coming soon

Semantic Query

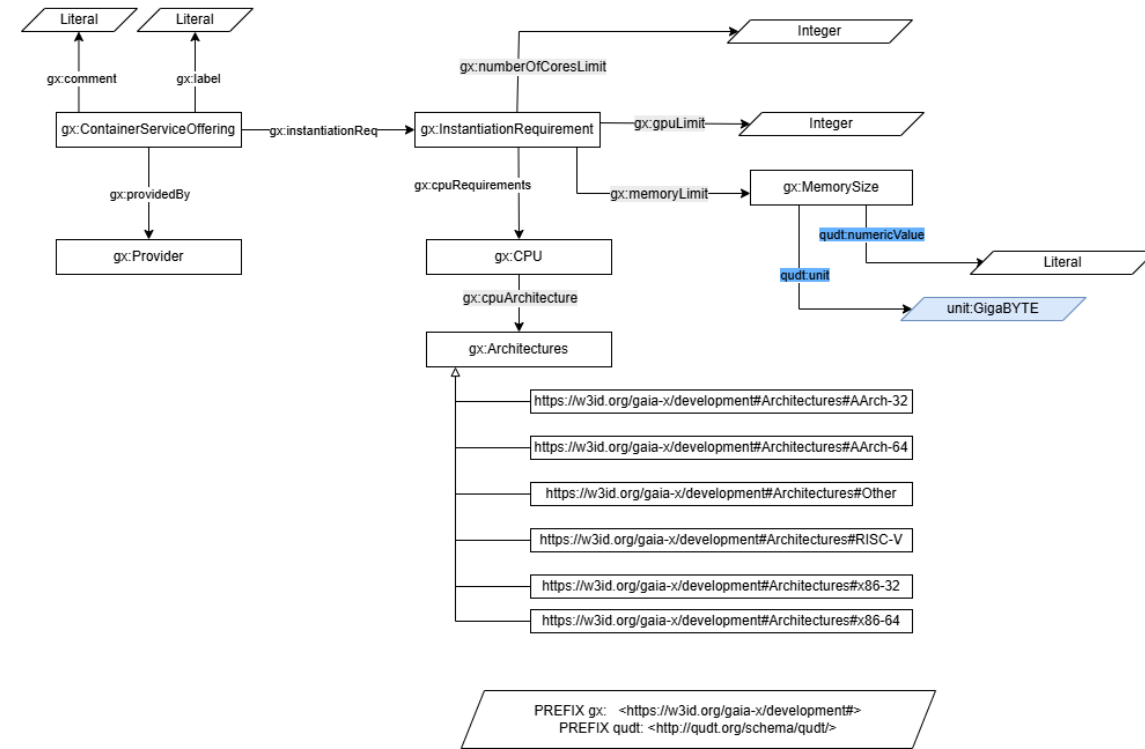
• Query marketplace

# Knowledge graph using the ontology of Gaia -X

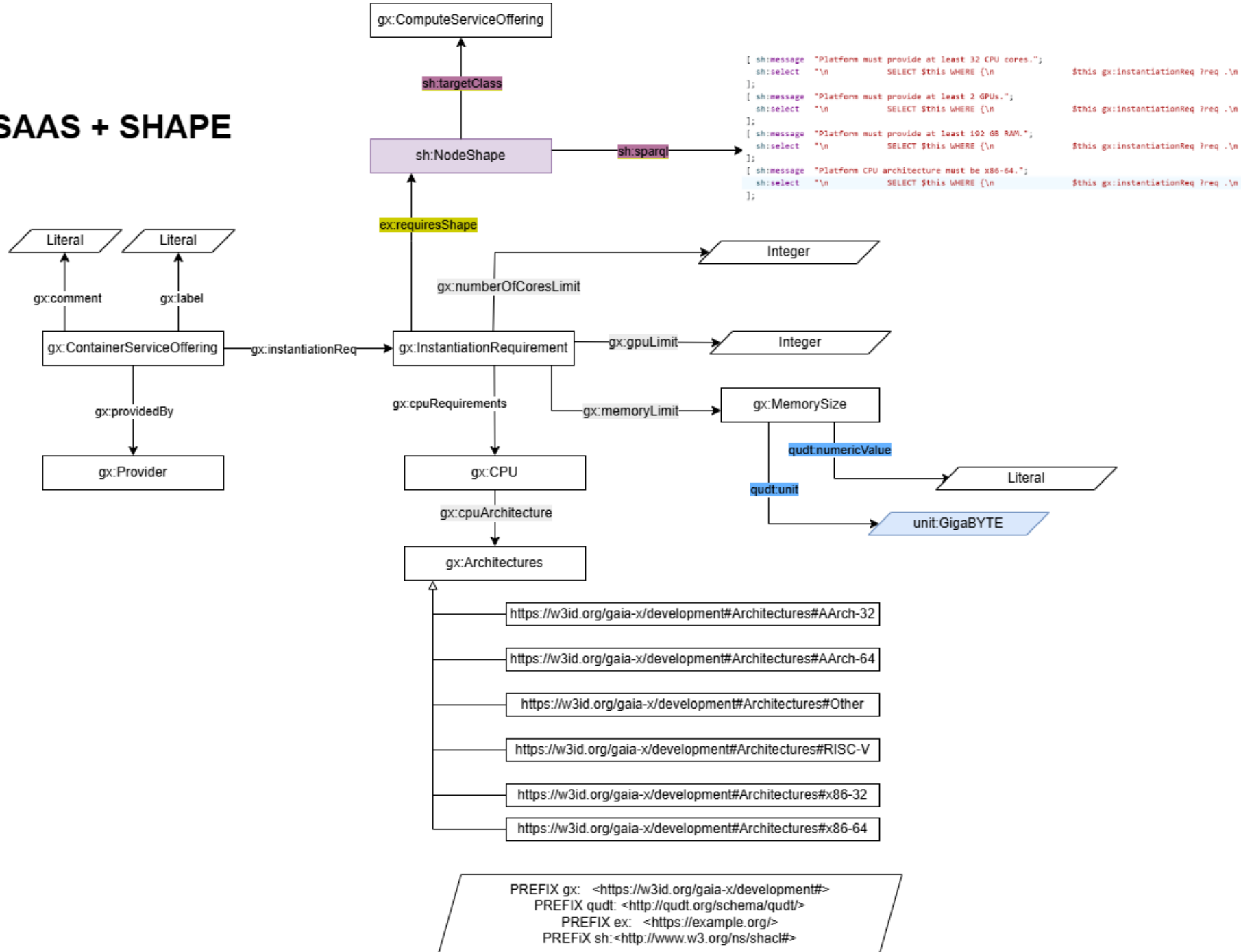
## PAAS



## SAAS



# SAAS + SHAPE



Compatibility between service characteristics:

- Extension with SHACL shapes to represent the constraints of the service characteristics.

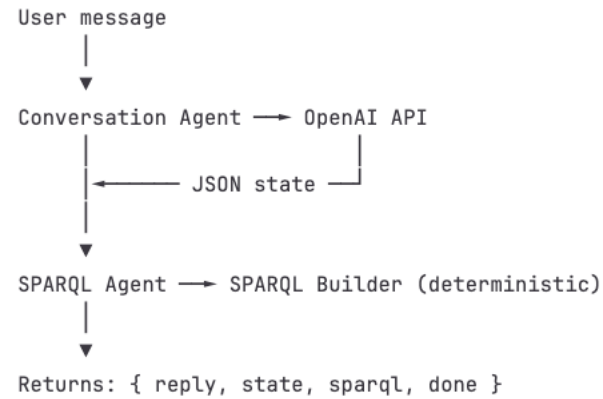
# Next steps

Future work should be focused on the following aspects:

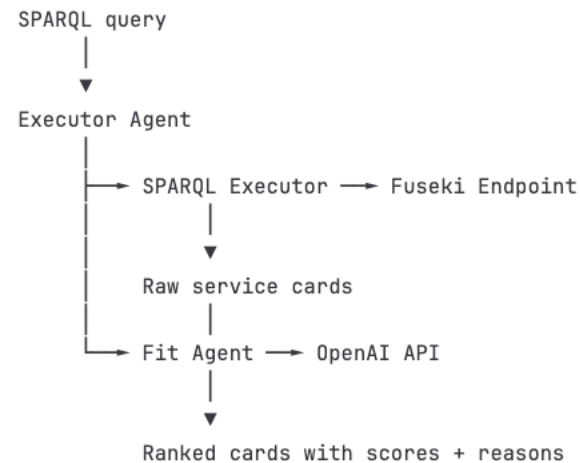
- Signed Verifiable Credentials for service compatibility of their characteristics.
- Having more visualization mediums to analyse the structure of the semantic data in order to foster explainability and transparency.

# High level architecture of the neuro-symbolic workflow process

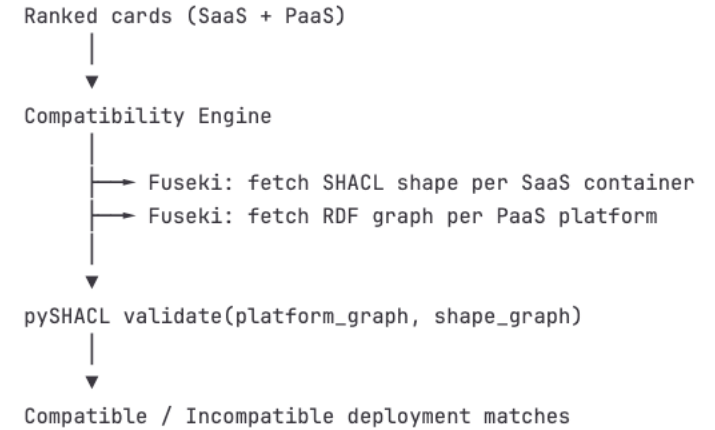
## Step 1: DISCOVERY (iterative, per user message)



## Step 2: EXECUTION (once, after discovery completes)



## Step 3: COMPATIBILITY (once, user-triggered)



## Step 4: TRUST (once, user selects a compatible match)

