Introducing

Multi Provider

Linked Infrastructure

Brussels, Belgium | 31st January 2025

Where is ECOFED active?
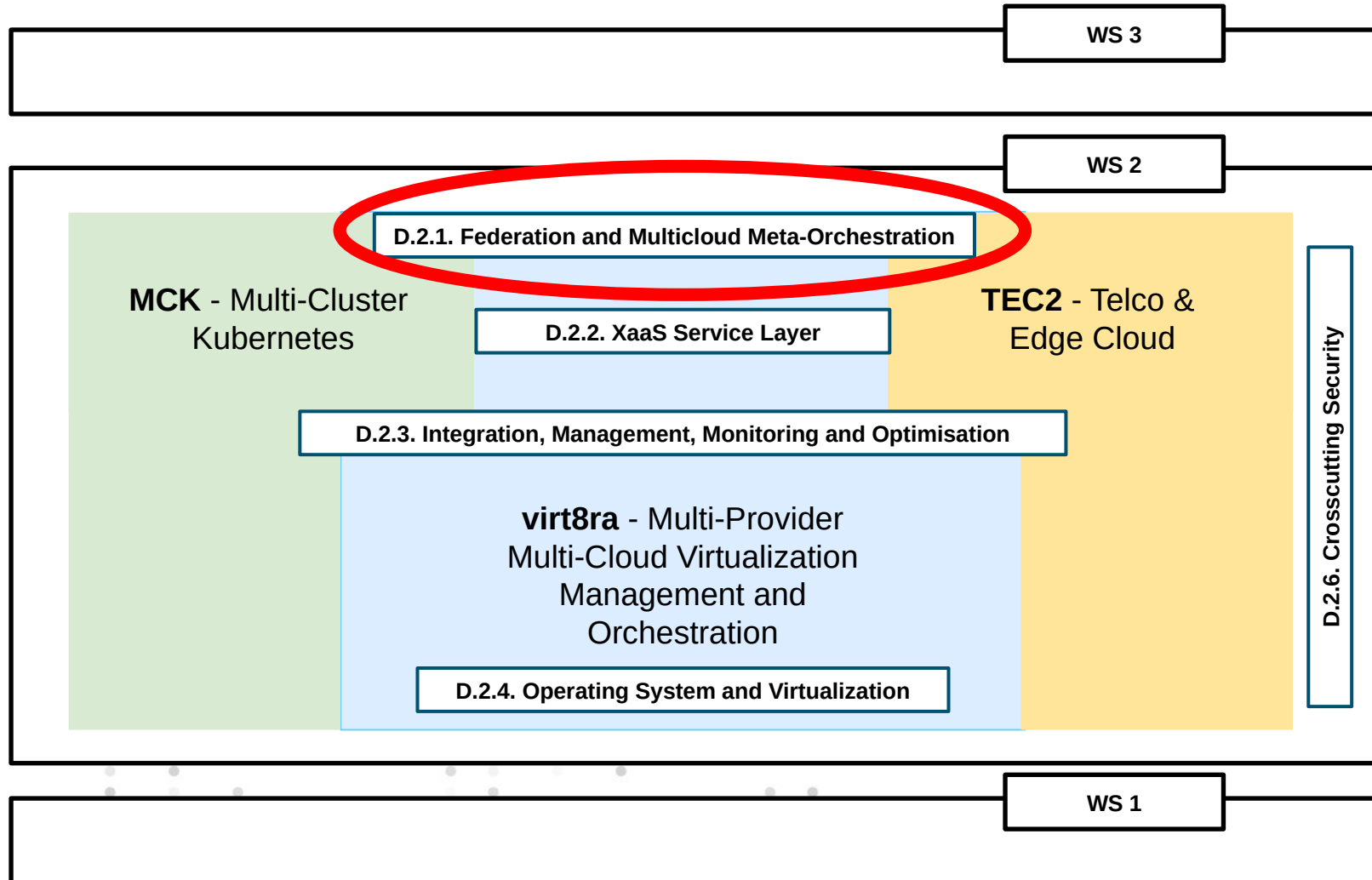
Problem Statement

- Google, Microsoft and Amazon are approaching near total domination over internet services.

- Billions of euros are funnelled out of EU economies every year, jobs are lost and small-scale independent infrastructure is at risk.

- **They provide a better product.** There is no real competition to the seamless access to the networks and infrastructure offered by these companies.

- For a lot of companies, they simply need to approve once, then they get:
  - One compliance framework
  - One unified bill
  - One integrated set of service offerings for the one-man band and the too big to fail enterprise

- Hyperscalers have slowly centralised the internet.

The Current European Cloud Landscape

- Every service under the sun is available in Europe.
- Europe has large sparse infrastructure spanning the continent.
- European providers operate essentially in isolation from each other, bar a few exceptions.

- It's…….a mess.

Solution Requirements

- We need a way to align our existing individual scale Cloud Service Providers (CSP's).

- We need a way to do it without essentially making our own hyperscaler (read: one mega company, defacto or not).

- It needs to be fair and open, permissively regulated.

- It needs to avoid hampering the CSP's competitive environment, in marketing, business and infrastructure.

- It needs to fit in with existing decentralised internet standards.

Approach

- We need to bridge the gap between a lot of services, in lots of configurations.

- We need to provide guidelines to allow easy to implement interoperability between CSP's.

- We need to split focus equally between infrastructure and business requirements.

- We need to take aim at convenience, being the hyperscalers biggest selling point.

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- We're building a specification that will allow CSP's to implement a common service using a common protocol to allow services to be described and delivered automatically.

- This unified interface will allow one user to interact with all CSP's in the same manner.

- This unified interface will exist in a space that CSP's have not moved into, the gap between the customer and the provider.

- It acts as middleware and allows total freedom for providers and consumers to implement their services as they wish and consume their services as they wish.

- Providers do not need to rearchitect their infrastructure. It is **100% stack agnostic**.

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- Specially chosen W3C standards are used to work in tandem with each other.

- We use RDF and other graphing technologies to represent all services and service requirement information as a single coherent graph.

- We use Verifiable Credentials to asertain legitimacy with (legal) documents and credentials, to cut down red tape in a federated manner.

- We provide a single coherent REST endpoint for all of this.

The big picture
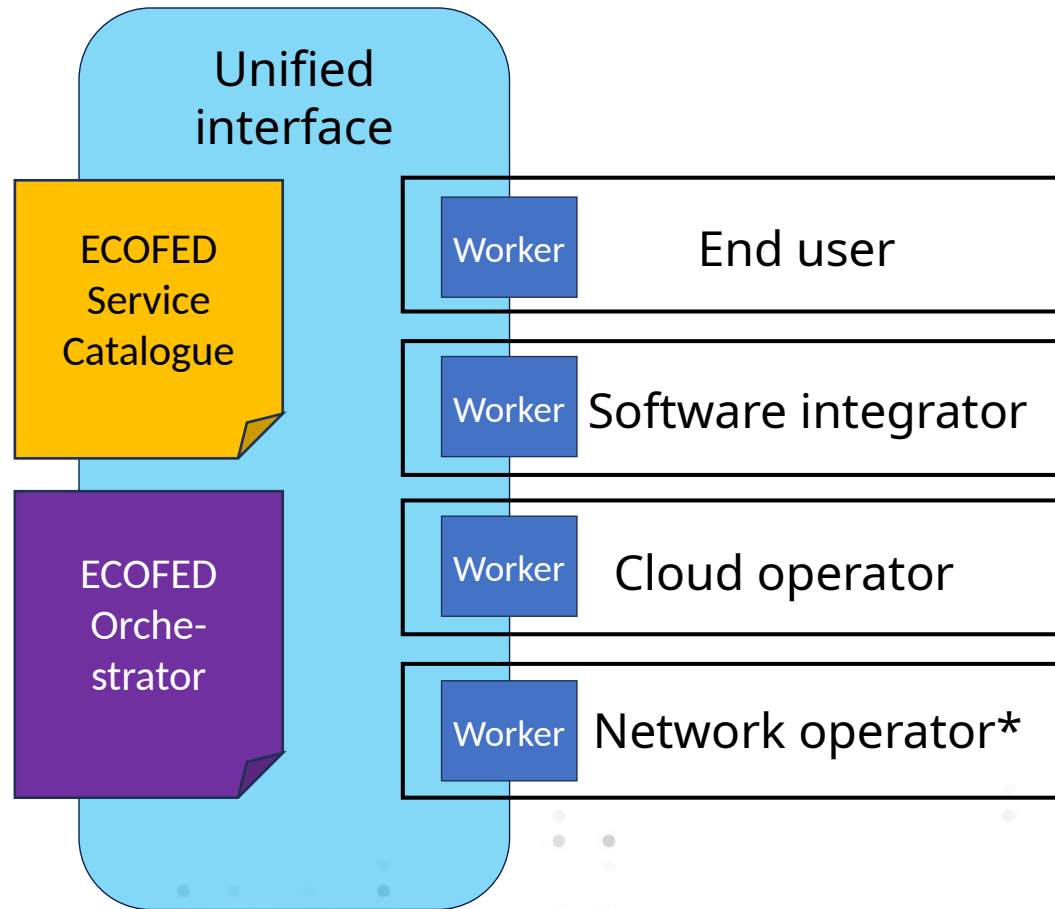
Example
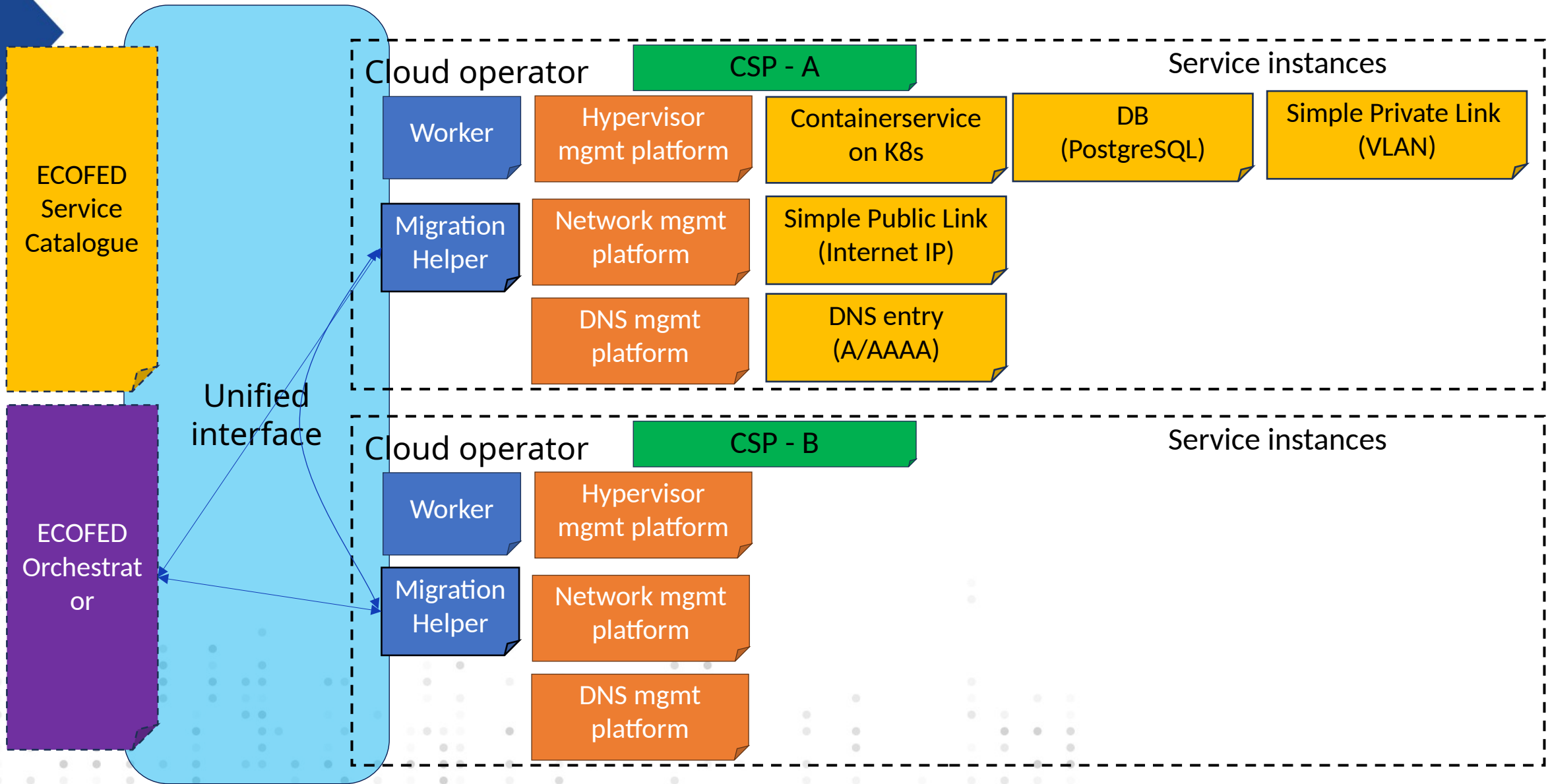
What MPLI covers

- MPLI splits the problem domain into five sections:
  1. Discoverability
  2. Compatibility Resolution
  3. Trust
  4. Service Delivery
  5. Portability
- This becomes a fine gradient from bureaucracy to technology.

1. Discoverability

- People need to be able to find things, people need to be able to advertise things.

- The MPLI specification allows each CSP to have available a machine readable manifest that provides a detailed description of every single service sold by them.

- Multiple marketplaces can request this manifest, it is public knowledge, and even internal infrastructure tools can use it.

- Marketplaces can discover CSP's.

- ECOFED has an interest in projects like DOME, as its first target for a compatible Marketplace.

2. Compatibility Resolution

- The same manifest that provides the service description also entails prerequisites for doing business with them, such as an eIDAS VC, it can describe their certifications (ISO) or geographical location.

- A consumer creates, or have a marketplace create it for them, a similar style of manifest that entails the service needs (technical, legal) of this customer.

- MPLI compatible software will take care of comparing the consumer manifest with the manifests of all CSP's.

A sample graph (manifest)
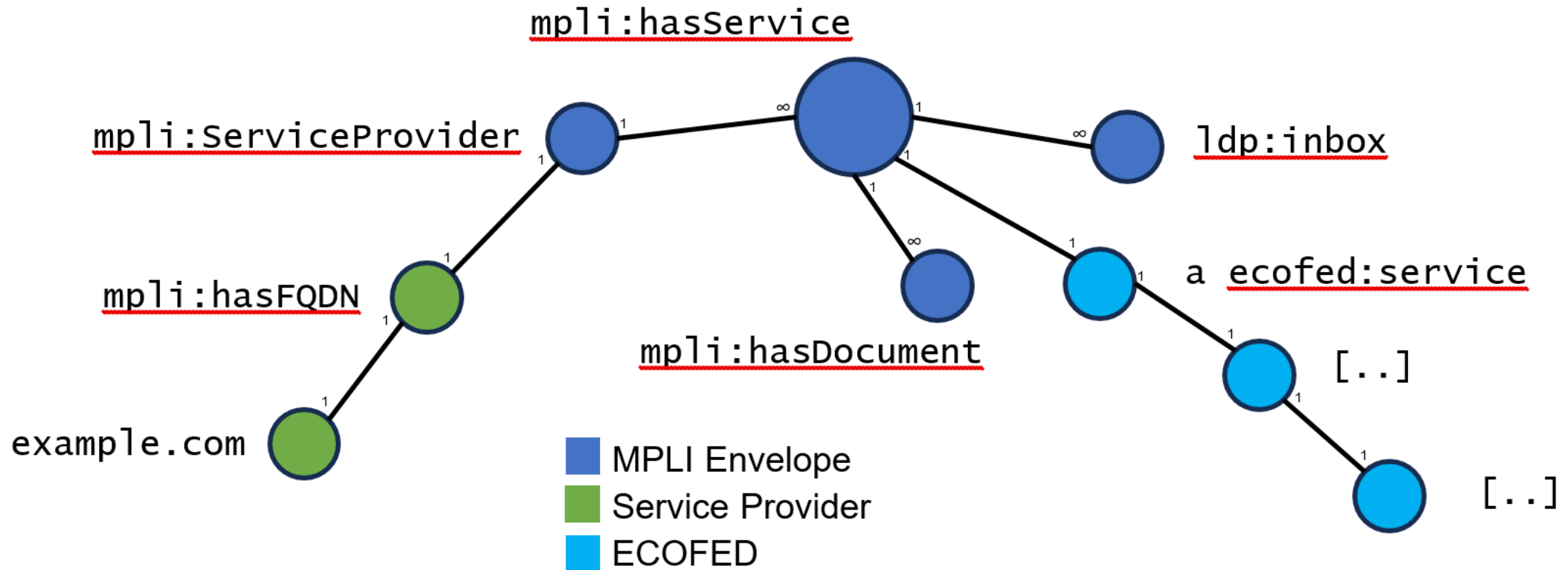
3. Trust

- Trust must be federated too. You can choose who to trust.

- We base our trust system on Verifiable Credentials.

- We initially look towards the Gaia-X Digital Clearing House as a basis for verifying identity and certification documents

- Verification can be automatic, it can include Service Level Agreements or any other required document.

- We intend to leverage this for:
  - Billing
  - SLAs
  - Certification
  - Individual Identity

4. Service Delivery

- The actual provisioning of services will not be done by MPLI.
- Any existing or new infrastructure deployment strategies can be used like Terraform, OpenTofu and Ansible.
- MPLI will tap into these existing provisioning tools and have them take care of the delivery/provisioning.
- A minimum set of new technologies and tools are required to join a federated cloud enabled by MPLI.
- A layered delivery should be possible which allows for white-labeling/automatic use of other MPLI powered services.

5. Portability

- Portability is obliged in the Data Act and MPLI will solve this problem.

- You will be able to move seamlessly/frictionless between services from different CSP's.

- Allows for portability within the current contract with already agreed terms, using the same trust framework, etc.

Current state

- The overall design of MPLI is done.

- MPLI has been validated against different use cases.

- As a proof of concept a virtual machine has been migrated using MPLI from an OpenStack hypervisor to an OpenNebula hypervisor to a custom libvirt-based hypervisor. All three hypervisors were running in different networks not directly connected to each other.

Contact and questions

- More info when available will be shared using the IPCEI-CIS communication possibilities.

- This info will also be published on https://ecofed.eu.

- Drop us an email on info@ecofed.eu.

- We love to hear what you think of our ideas/proposal. Would it be useful for you?