DOME - A **D**istributed **O**pen **M**arketplaces for Cloud and Edge Services in **E**urope

Technical Overview

Juanjo Hierro
CTO, FIWARE Foundation
DOME Technical Coordinator

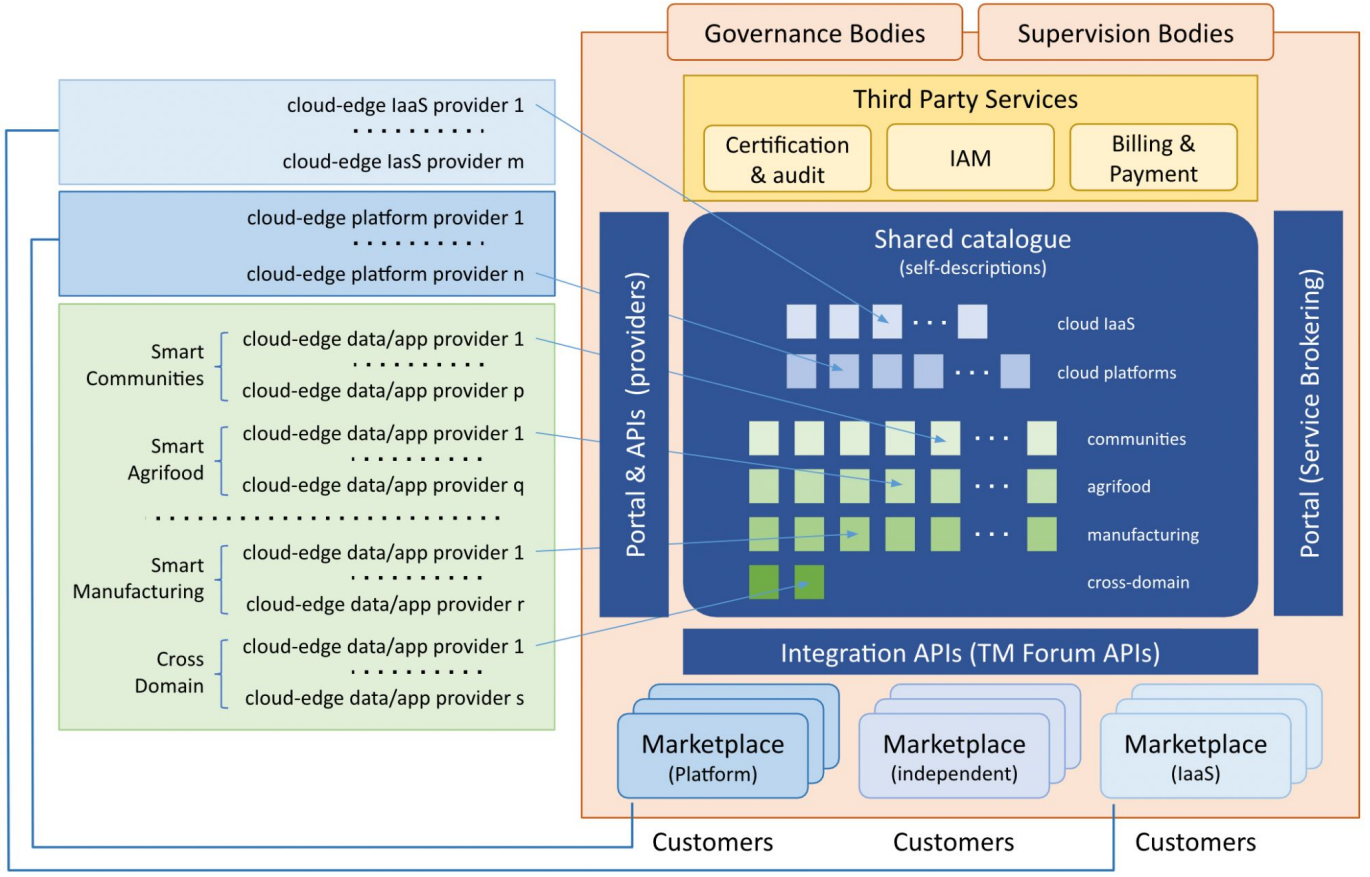
Background

About the CLOUD-AI-01-DS-MARKETPLACE-CLOUD Call

- The Commission stepped up its efforts to support cloud uptake in Europe as part of its strategy, notably with the pledge to facilitate “the set-up of a cloud services marketplace for EU users from the private and public sector”
- Within the first open call of its Digital Europe Programme, the EC launched a call targeted to the creation of such marketplace service: the DOME project was awarded
- The objective is to deploy and operate an EU online marketplace for cloud and edge services. The marketplace should be the single point of access for trusted services:
  - cloud and edge services
  - building blocks deployed under the Common Services Platform for Public Administrations
  - more generally any software and data processing services developed under EU programmes
- Duration of the project: 36 months
- Start date: 01/01/2023
- Budget and funding (50%): near to: 39,34 M € / 19,67 M€

DOME technical vision

- DOME will take the form of a **shared digital catalogue of cloud and edge services made available through**:
  - the **global DOME portal**; or
  - **federated marketplaces**
- A federated marketplace can be a**:**
  - **Marketplace connected to an IaaS provider**, which comprises a catalogue of cloud and edge data/app services which customers can pick and then easily deploy on top of the provided infrastructure
  - **Marketplace connected to a Platform provider** which comprises a catalogue of cloud and edge data/app services which customers can pick, easily activate and run integrated with the rest of data/app services already running, integrated with the provided Platform.
  - **Independent Marketplace**, which comprises a catalogue of cloud and edge data/app services not tied to an IaaS or Platform provider



Approach and Benefits

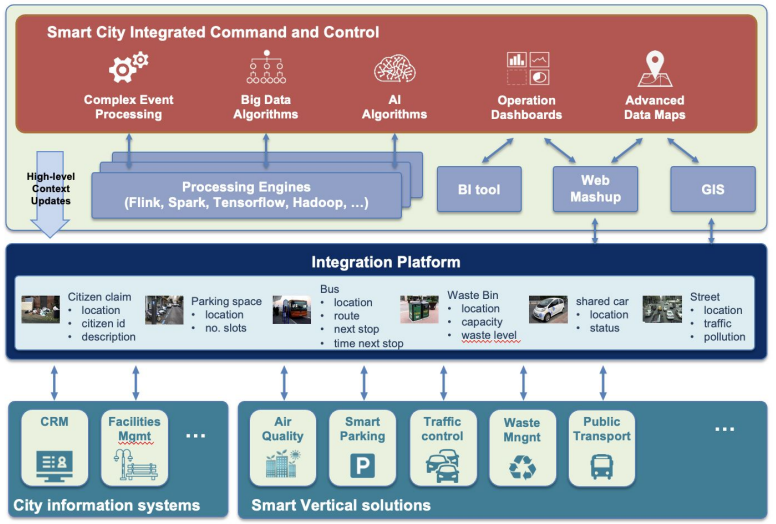
- **Data/Application service providers**, particularly SMEs, can publish their solutions in the shared catalogue of DOME only once and make them available through all those federated marketplace services they choose, thus reducing their costs while maximising their exposure through multiple channels in the market. This as opposed to the current situation where they have to adhere to the rules of specific marketplaces, typically run by individual IaaS/platform providers.
- **Platform and IaaS providers**, specially those from the EU can more easily enrich the portfolio of cloud applications they can import into their respective marketplaces from the shared catalogue of DOME, this way more easily able to reach a critical mass with regards to the number of data/application services offered.
- **Customer companies** will benefit from a personalised experience through each of the federated marketplaces, which may offer different user interfaces, incorporating discovery services better tailored to the kind of users or application domain, or complementing content with focused training material, match making opportunities, etc. They will also benefit from billing integrated with the billing of IaaS/platform services, potential discounts, etc.

What demands/needs we will address in DOME

- Platform integrators
- IaaS providers
- Cloud/edge service providers
- Cloud/edge service customers

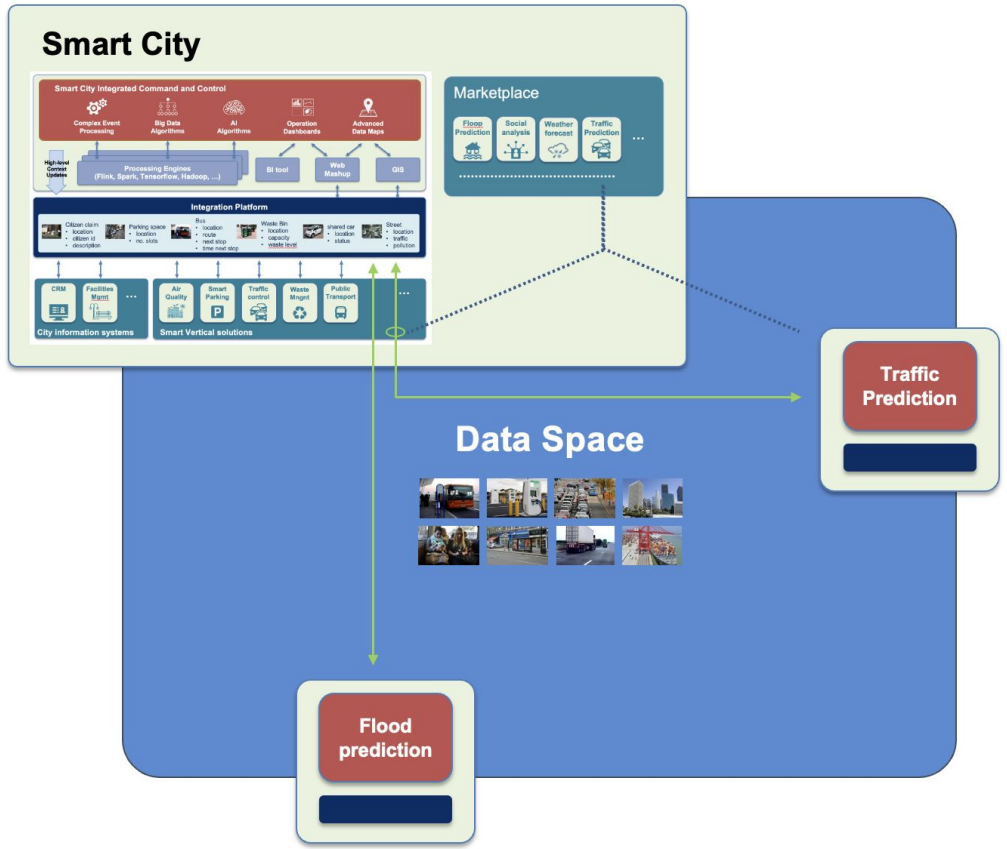
Platform Providers and Solution Integrators

- Two kinds of Platform Providers:
  - Integration Platforms providers, which provide platforms (e.g., FIWARE-compliant platforms) that rely on some concrete standard for integration, on top of which multiple vertical systems for a given organization can be integrated following a system of systems approach, and data from integrated systems can be merged to provide tools that support more intelligent decisions at organization level
  - Technology platform providers, which provide a concrete technology platform (e.g., a platform based on a specific ML framework) on top of which apps developed based on features of the platform can be deployed and run to be offered as a service
- Solution integrators rely on platforms to offer and build solutions satisfying the demand of their customers:
  - sometimes they play the role of platform providers (many times the case when the platform is available as open source)
  - they perform the integration of the platform and integrated solutions within the overall map of systems of their customer
  - The integrator builds over time a catalogue of applications from 3rd parties they have partnerships with or developed on their own that they can offer to their customers



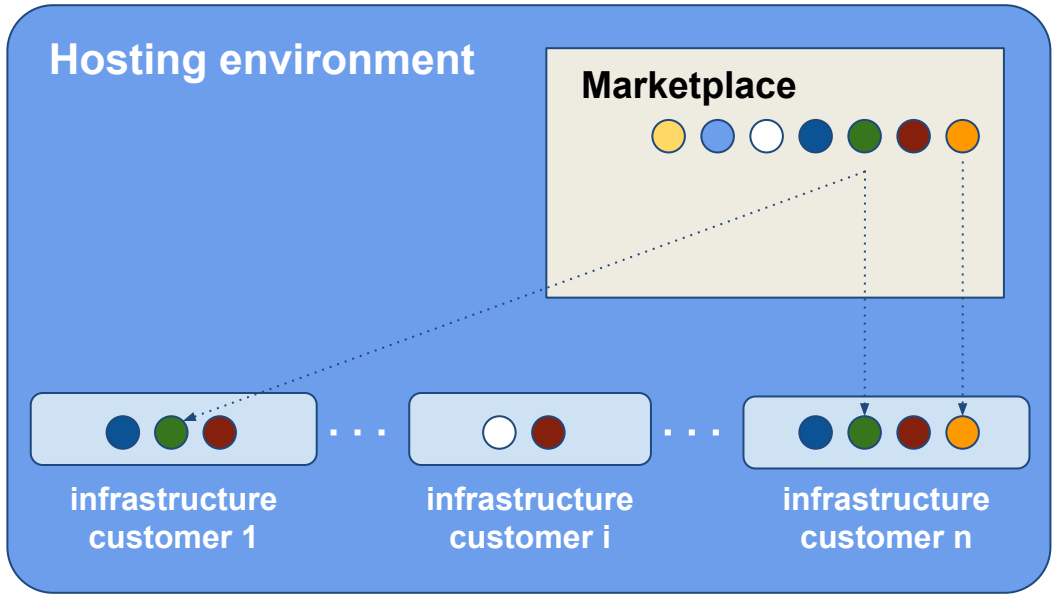
Platform Providers and Solution Integrators

- A platform provider will be able to evolve its offering and bring additional value to its customers by connecting the integration platform it offers with a marketplace that:
  - brings a catalogue of trustful platform-compatible data/app services, provided by the platform provider or third data/app service providers, that can be plugged&play for extending the existing system of systems architecture of a given customer
  - brings customers the possibility to offer some of their own data/app services (linked to some of the systems in their architecture) to third users, and get some return out of that
- Platform providers may build such marketplace on their own or in partnership with some marketplace provider
- Solution integrators will be able to rely on such marketplaces to compose their solutions (and remember, some solution integrators will be platform providers)
- Challenge to solve: how can the catalogue linked to the marketplace associated to a given platform be populated fast and in a trustful manner



IaaS Provider

- Any IaaS Provider typically will look for bringing additional value to its customers by connecting their IaaS offering with a marketplace that:
  - brings a catalogue of trustful data/app services, provided by the own IaaS provider or third data/app service providers, that the customer can easily deploy on the provided hosting infrastructure and use
  - allows that the payments to be charged for using those data/app services can be included in the same bill where hosting services are charged (different pricing models may be supported)
- IaaS providers will typically build such marketplace on their own
- Challenge to solve: how to populate fast the catalogue of the marketplace linked to their IaaS platforms



Cloud or edge data/app service provider

- Any cloud or edge data/app service provider wish to reach the maximum number of customers
- They may be happy to partner with platform and/or IaaS providers and be registered in the catalogue of their respective marketplaces
- Marketplaces may bring not just catalog of data/app services but training material, description of best practices, forums for users that stimulate acquisition of rights to use data/app services
- Challenge to solve: if the mechanism for registering and managing procurement, activation and accounting of their services, as well as the means for monitoring contracts and get paid, differ too much from one marketplace to another, they will be selective in choosing what marketplace they wish their services to be offered through since they won't be able to afford the costs and burden derived of being present in all

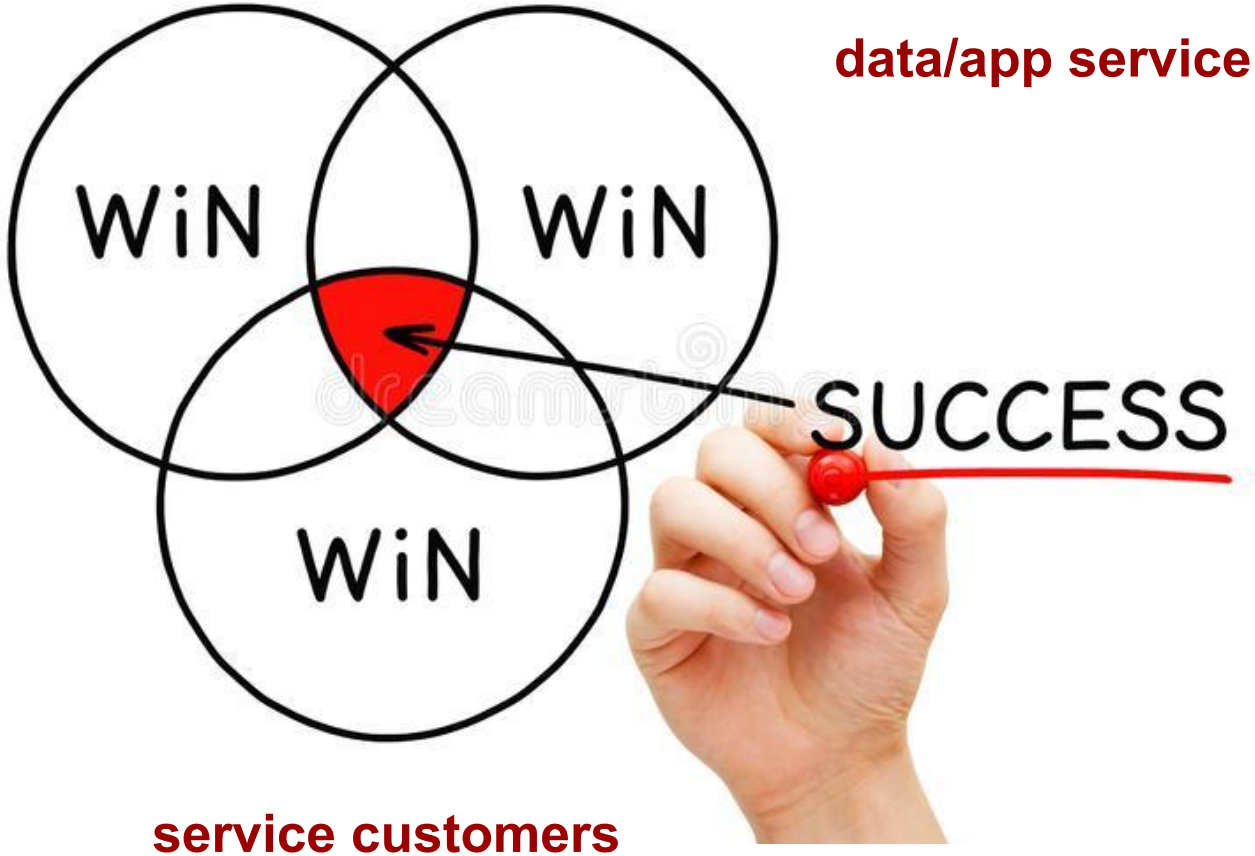
Customers of cloud/edge services

- They would value that platform and/or IaaS providers they select come together with a rich portfolio of compatible data/app services
- They would like to have means for verifying aspects of the description of services they want to consume:
  - compliance with certain regulations
  - compliance with certain standards
  - level of adoption
- Some of them, particularly Public Administrations and large corporations will need to interact with marketplaces supporting different procurement models:
  - off-the-sell: products and offerings around those products are clearly described and customer just pick and pay
  - tailored-offer: the customer expresses a request to a given provider that will answer with a formal offer to that request
  - tendering: the tailored offer is opened to many actors that need to compete

How do we create a win-win for all parties involved and create a virtuous circle of growth?

Platform / IaaS providers

data/app service providers

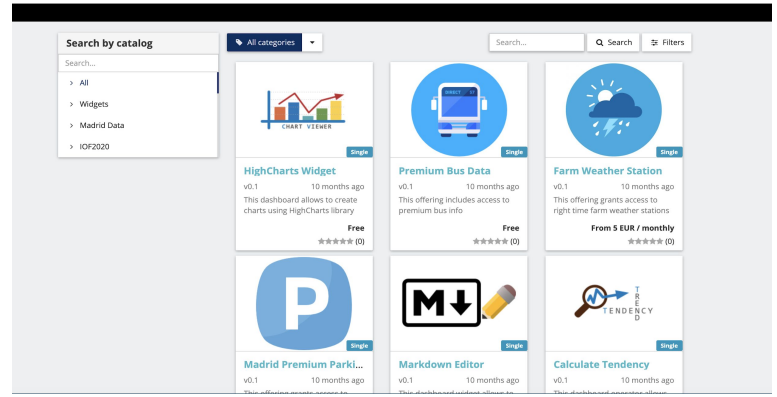


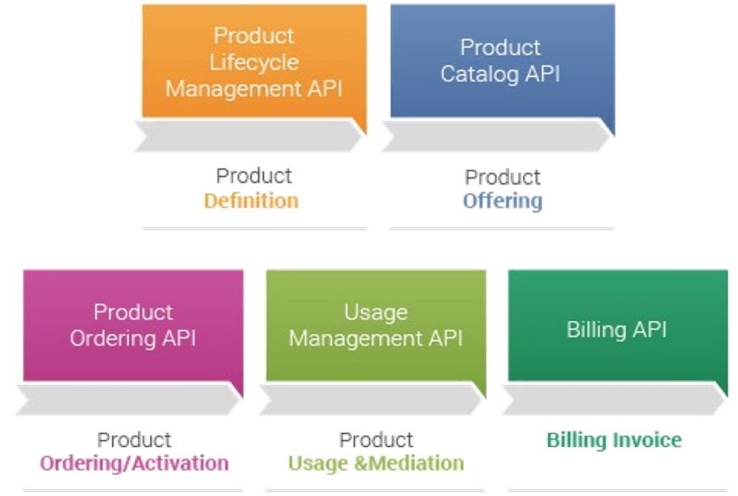
service customers

High-level DOME technical vision

Alignment with TM Forum Open APIs and Gaia-X

- DOME relies on a subset of TM Forum Open API recommendations with regards to the definition of its underlying information model as well as APIs supporting:
  - storage of information about products (= services and supporting resources instantiated for a particular customer), product specifications and product offerings
  - storage of logs along during procurement and usage of products
- Product specifications and product offering descriptions are made available as Verifiable Presentations (= set of Verifiable Credentials) defined according to Gaia-X specifications
  - VCs issued by certification agencies describing compliance with certain regulations/recommendations (e.g., GDPR, low carbon)
  - VCs issued by certification agencies on compliance with certain standards (e.g., NGSI-LD, support of standard data models)
  - VCs describing roles (claims) that are meaningful to assign to service users and policy rules that are defined on roles and other environment attributes
  - etc

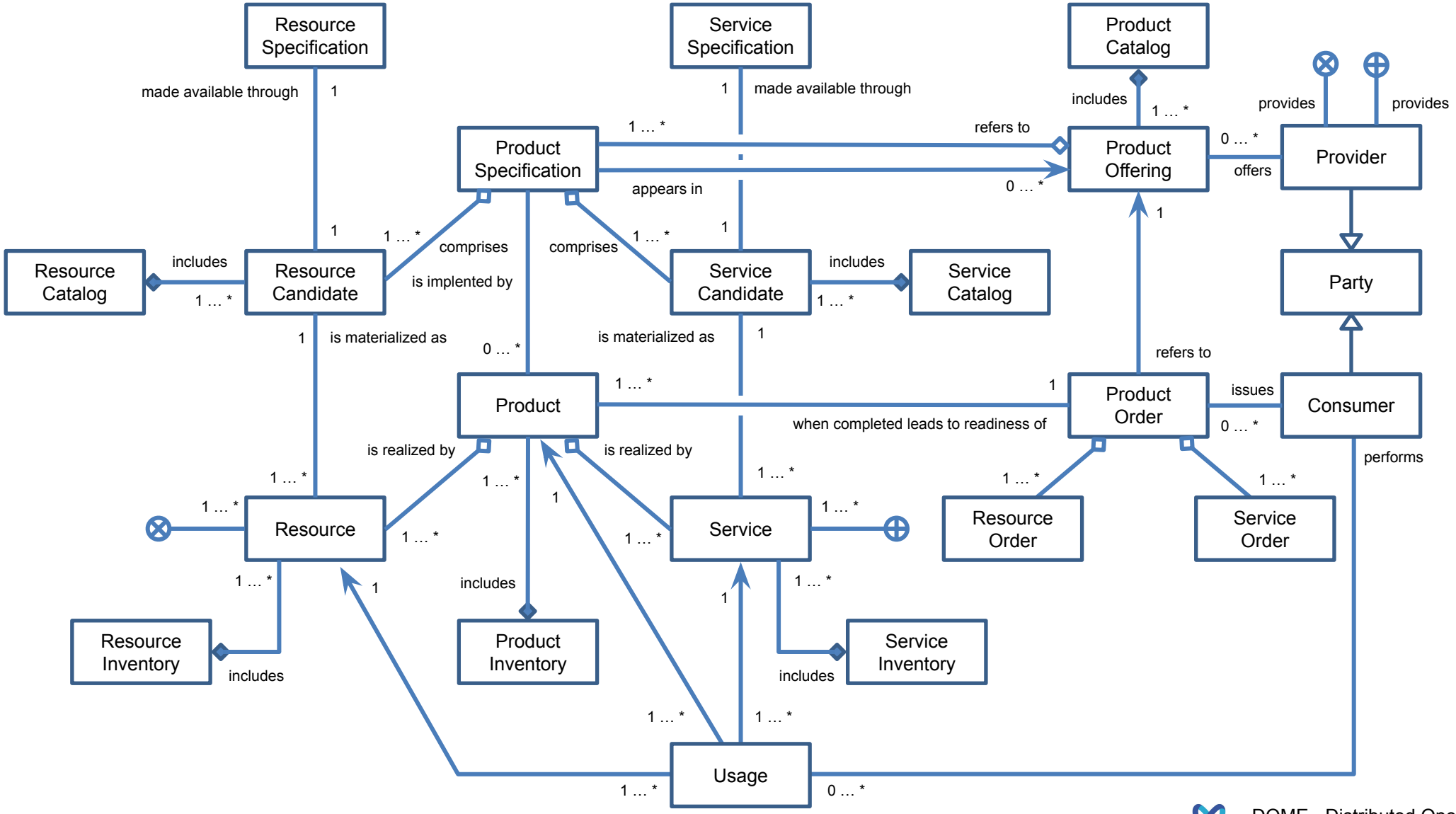




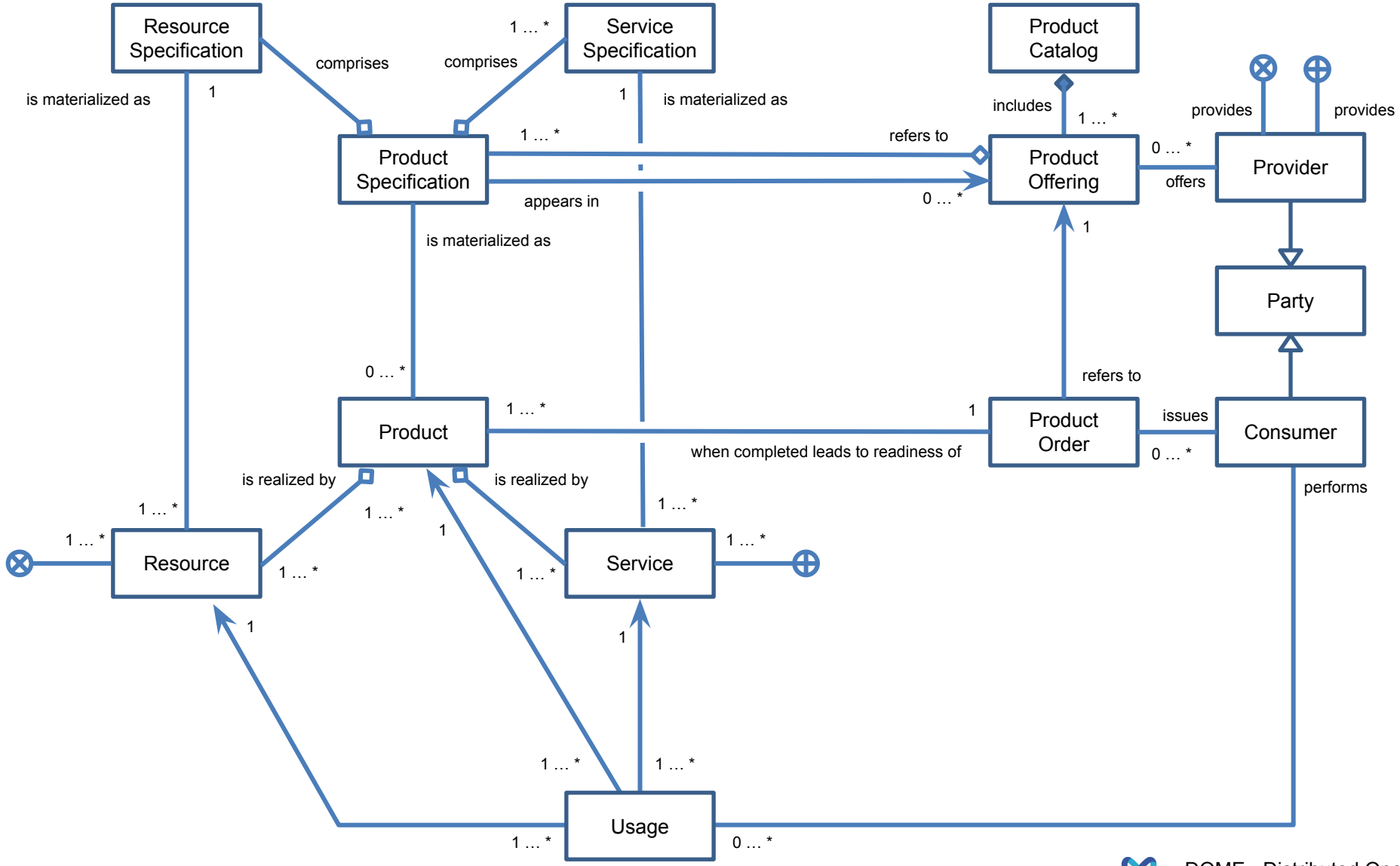
Some key concepts: Products, Services, Resources

- A Data/Application Provider is considered, using TM Forum terminology, a Product Provider
- A Product is realized as a combination of Services and/or Resources:
  - Services provide access to data or perform processing of data
  - Resources typically required for the execution of the Services
- Products (and corresponding services and resources) are provisioned and activated for a particular Customer:
  - Provision and activation may take days: not all automatically!
  - Not everything runs on the Cloud: cloud-to-edge products
- Example: Air Quality Monitoring Product
  - Comprises a number of Services (e.g., web portal, REST services endpoints, etc) some of which bring access to data (air quality measures) or perform processing of data (air quality predictions)
  - It requires that IoT devices are deployed in the field and some computing capacity provisioned on the cloud (resources)

TM Forum APIs for Marketplaces - Model (more details here)



TM Forum APIs for Marketplaces - Model (Simplification)



Main entities/concepts

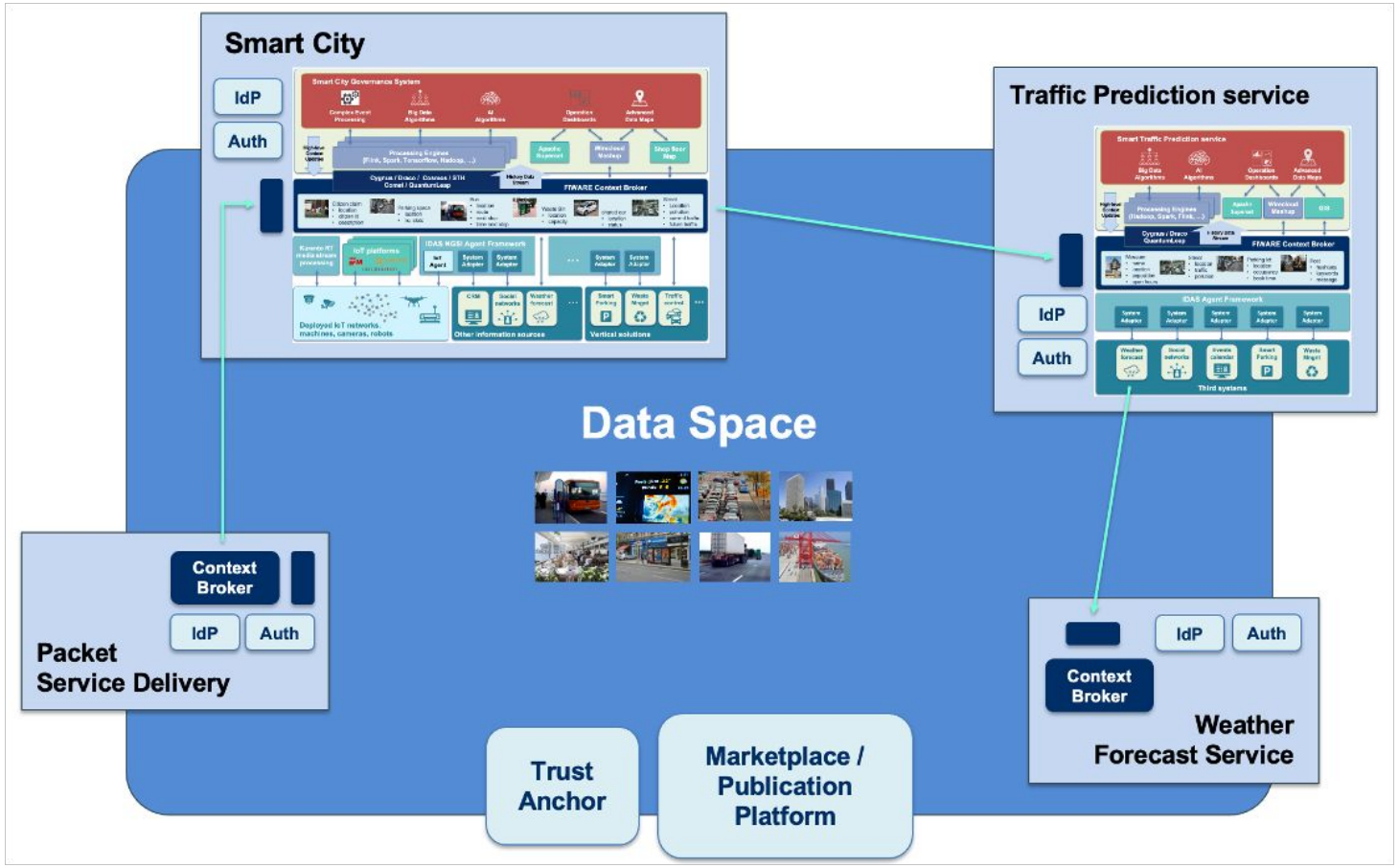
- A **Product Catalog** is a collection of Product Offerings intended for a set of specific Distribution Channels and Market Segments.
- A **Product** is created in the **Product Inventory** when a **Product Offering** is procured by a **Party** (customer or other interested party). This means that a **Product Order** has been issued and successfully completed.
- A Product is realized as a combination of **Services** and/or **Resources** which get instantiated in a **Service Inventory** and a **Resource Inventory**, respectively. **Resource Orders** and **Service Orders** are derived from a Product Order for that purpose.
- A Product Offering comprises:
  - the **Product Specification**, including characteristics of the derived products
  - the **Agreement** that governs usage of derived products,
  - the associated **Product Offering Price**,
  - etc
- Note that a Product is what is generated when a Product Offering is procured for a specific customer, that is, a Product is the instantiation of a Product Specification but in connection to a specific agreement, price, etc for the customer

Main entities/concepts

- A **Product Specification** includes references to a series of **Service Specifications** and/or **Resource Specifications** required to realize the Products linked to the Product Specification:
  - each **Service Specification** is made available through a **Service Candidate** in the **Service Catalog**
  - each **Resource Specification** is made available through a **Resource Candidate** in a **Resource Catalog**
- Note that here may be one or more Product Offerings around the same Product Specification (e.g., associated with different prices or targeted to different market segments).
- Each time a Product, Resource or Service is used, a **Usage** entity is created, which typically is used to calculate how much can be charged to consumers and paid to providers.

Some key concepts: Verifiable Credentials

- VCs will be used to describe participants in the DOME ecosystem
- VCs will be used to describe products offered by participants, e.g.:
  - issued by certification agencies, describing compliance with certain regulations (e.g., GDPR compliance) recommendations (e.g., low carbon emissions) or technical compliance (e.g., NGSI-LD compatible interface).
  - provided by the own service provider describing aspects of the service (e.g., access policies, technical standards supported, etc)
- VCs will be used to support Attribute Based Access Control (ABAC) in DOME:
  - claims linked to VCs will map to attributes (roles) assigned to users
  - policies will map to rules over those claims and other environment attributes
- VC-based ABAC can be also implemented by product providers, the DOME Trust and IAM framework will be available for them



Verifiable Credentials

- W3C Verifiable Credentials is an open standard for digital credentials
  - can represent information found in physical credentials as well as new things that have no physical equivalent, such as ownership of a bank account.
  - work as “badges” in the physical world
- Cryptographically secure, tamper-resistant and instantaneously verifiable
  - uses digital signatures
- Privacy respecting
  - can be sent and received peer-to-peer
- Machine-verifiable
  - uses JSON-LD data format


```
{
    "@context": [
        "https://www.w3.org/2018/credentials/v1",
        "https://www.w3.org/2018/credentials/examples/v1"
    ],
    "id": "0892f680-6aeb-11eb-9bcf-f10d8993fde7",
    "type": [
        "VerifiableCredential",
        "ComplianceCredential"
    ],
    "issuer": {
        "id": "did:elsi:VATBE-0762747721",
        "name": "DOME Trusted Entity"
    },
    "issuanceDate": "2023-05-11T23:09:06.803Z",
    "credentialSubject": {
        "id": "did:elsi:VATDE-309937516",
        "NGSI-LD": {
            "type": "EndpointCompliance",
            "name": "Endpoint is compliant with NGSI-LD "
        }
    },
    "proof": {
        "type": "Ed25519Signature2018",
        "created": "2023-05-17T15:25:26Z",
        "jws": "eyJhbGciOiJFZERTQYjY0Il19..nlcAA",
        "proofPurpose": "assertionMethod",
        "verificationMethod": "https://pathToIssuerPublicKey"
    }
}
```

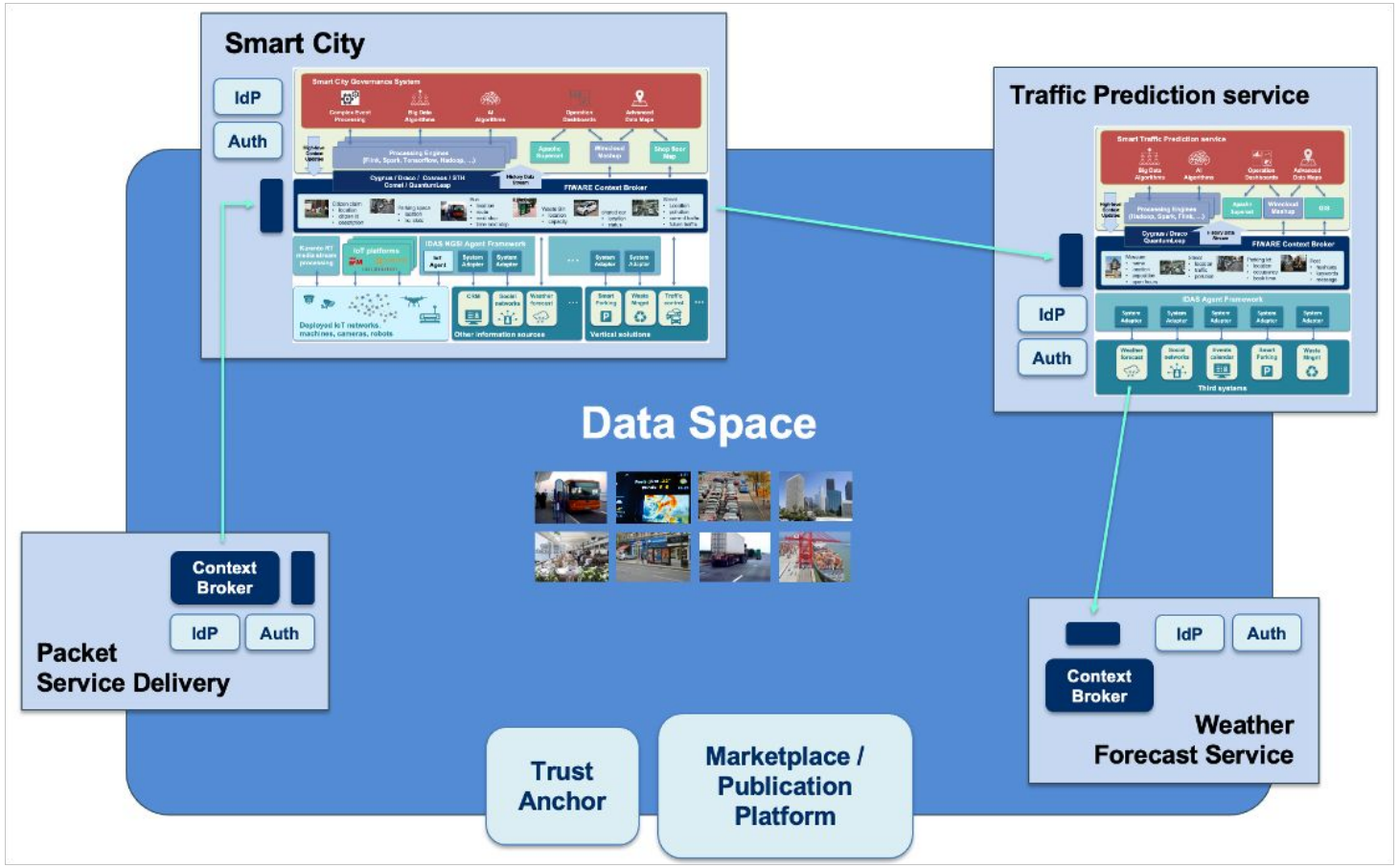
Verifiable Credentials

- W3C Verifiable Credentials is an open standard for digital credentials
  - can represent information found in physical credentials as well as new things that have no physical equivalent, such as ownership of a bank account.
  - work as “badges” in the physical world
- Cryptographically secure, tamper-resistant and instantaneously verifiable
  - uses digital signatures
- Privacy respecting
  - can be sent and received peer-to-peer
- Machine-verifiable
  - uses JSON-LD data format

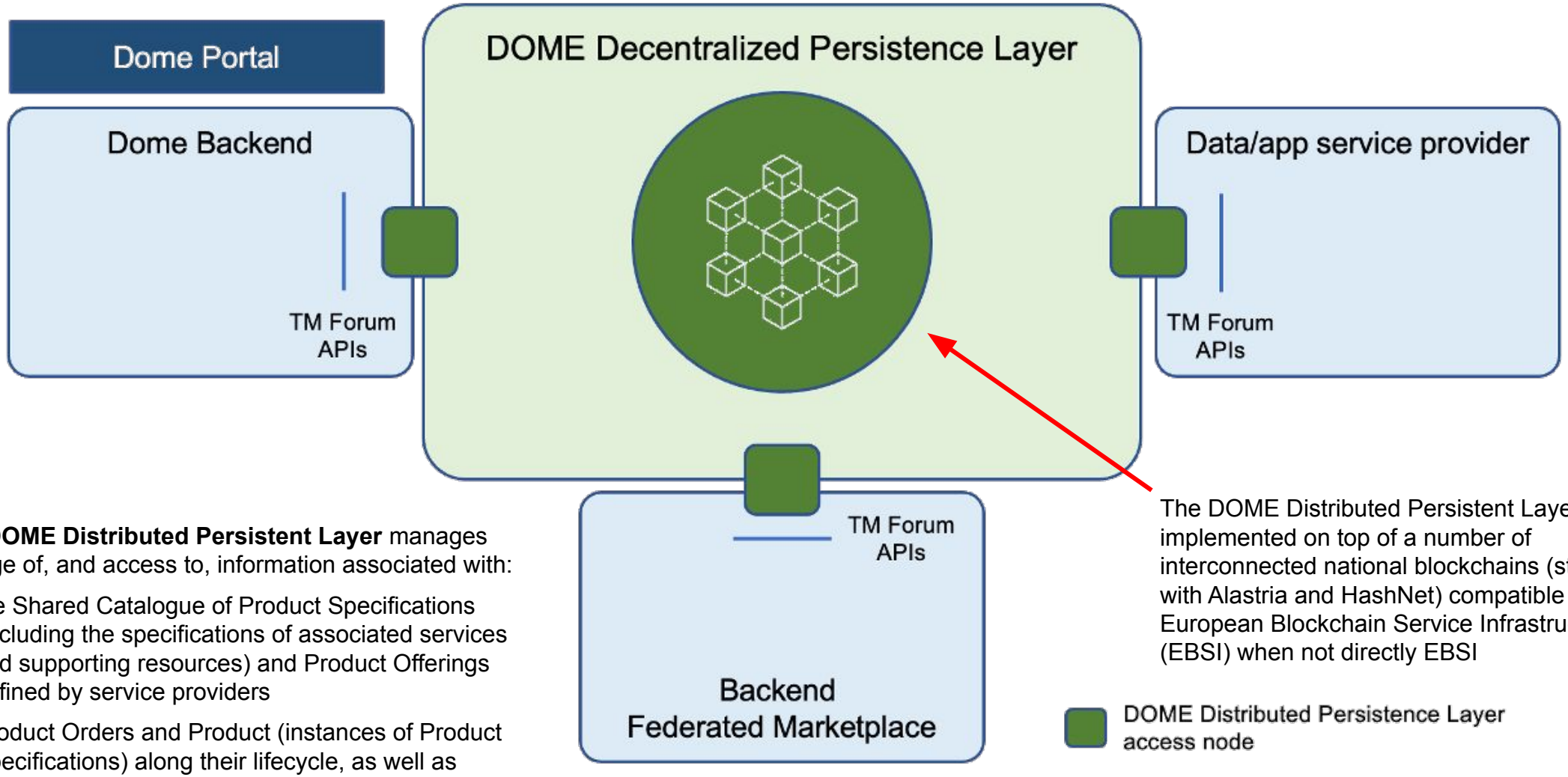

```
{
   "@context": [
       "https://www.w3.org/2018/credentials/v1",
       "https://www.w3.org/2018/credentials/examples/v1"
   ],
   "id": "0892f680-6aeb-11eb-9bcf-f10d8993fde7",
   "type": [
       "VerifiableCredential",
       "ComplianceCredential"
   ],
   "issuer": {
       "id": "did:elsi:VATES-3782747521",
       "name": "ACME GDPR Certification Body"
   },
   "issuanceDate": "2023-05-11T23:09:06.803Z",
   "credentialSubject": {
       "id": "did:elsi:VATDE-309937516",
       "DataService01": {
           "type": "ServiceGDPRCompliance",
           "name": "Compliance of a specific service with GDPR"
       }
   },
   "proof": {
       "type": "Ed25519Signature2018",
       "created": "2023-05-17T15:25:26Z",
       "jws": "eyJhbGciOiJFZERTQYjY0Il19..nlcAA",
       "proofPurpose": "assertionMethod",
       "verificationMethod": "https://pathToIssuerPublicKey"
   }
}
```

What it means acquiring rights to use a product/service?

- Organizations onboarded in DOME:
  - become trusted issuers of VCs including claims relevant for DOME access
  - They can issue such VCs for users within their organizations
- Organizations acquiring rights to use a product from a provider that decides to use the DOME Trust & IAM framework:
  - become trusted issuers of VCs including claims relevant for product services access
  - They can issue such VCs for users within the organization
- Authentication and Authorization in both cases is then performed at several levels:
  - Verifying whether participants can be trusted (Trust service)
  - Verifying whether access rights were properly acquired (e.g., via some marketplace or directly) → whether the organization performing the request is a trusted issuer of the VCs connected to access policies
  - Verifying that the given VCs presented by the requesting application/user allow to perform the requested operation



Marketplaces federation + Shared Catalogue (Architecture)



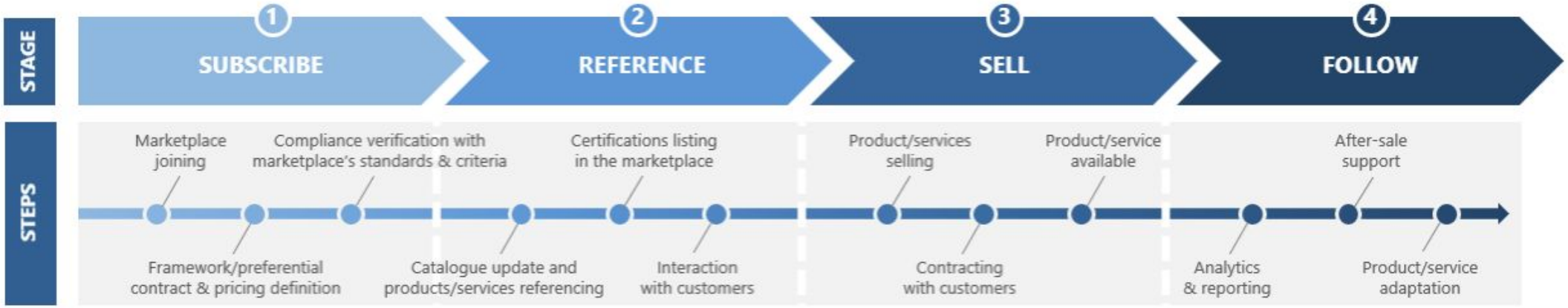
The **DOME Distributed Persistent Layer** manages storage of, and access to, information associated with:

- the Shared Catalogue of Product Specifications (including the specifications of associated services and supporting resources) and Product Offerings defined by service providers
- Product Orders and Product (instances of Product Specifications) along their lifecycle, as well as information about actual Usage of Products

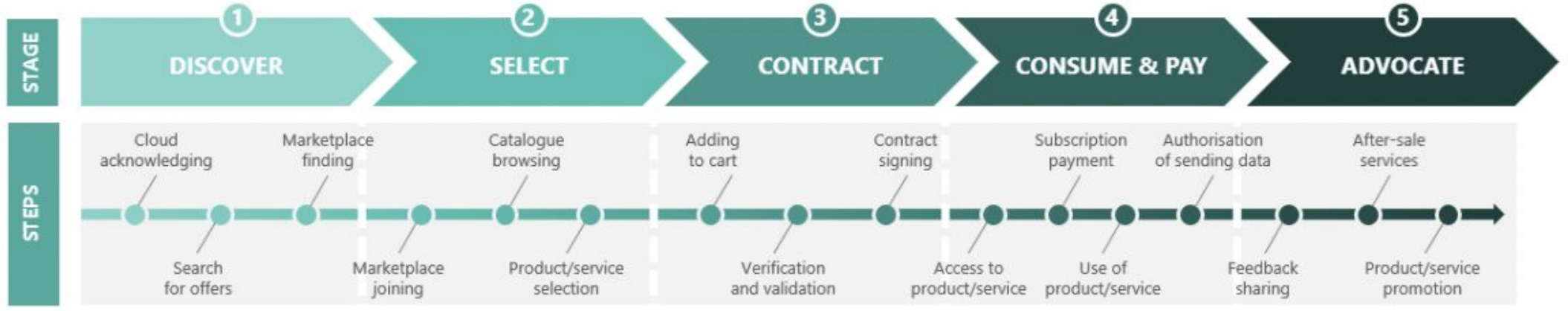
User journeys

Service Provider and Customer journeys

Cloud and Edge Service Provider journey*

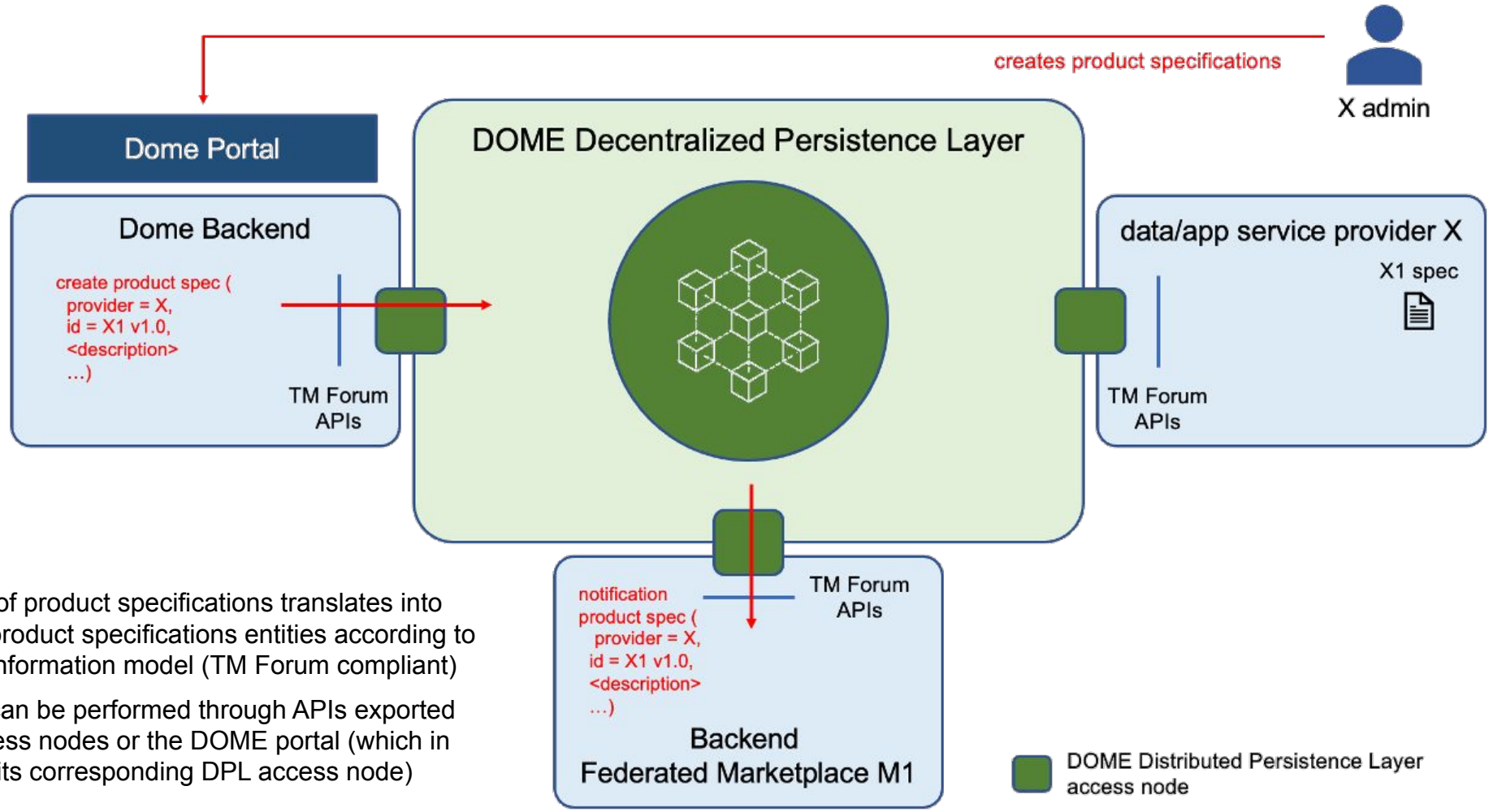


Customer journey*



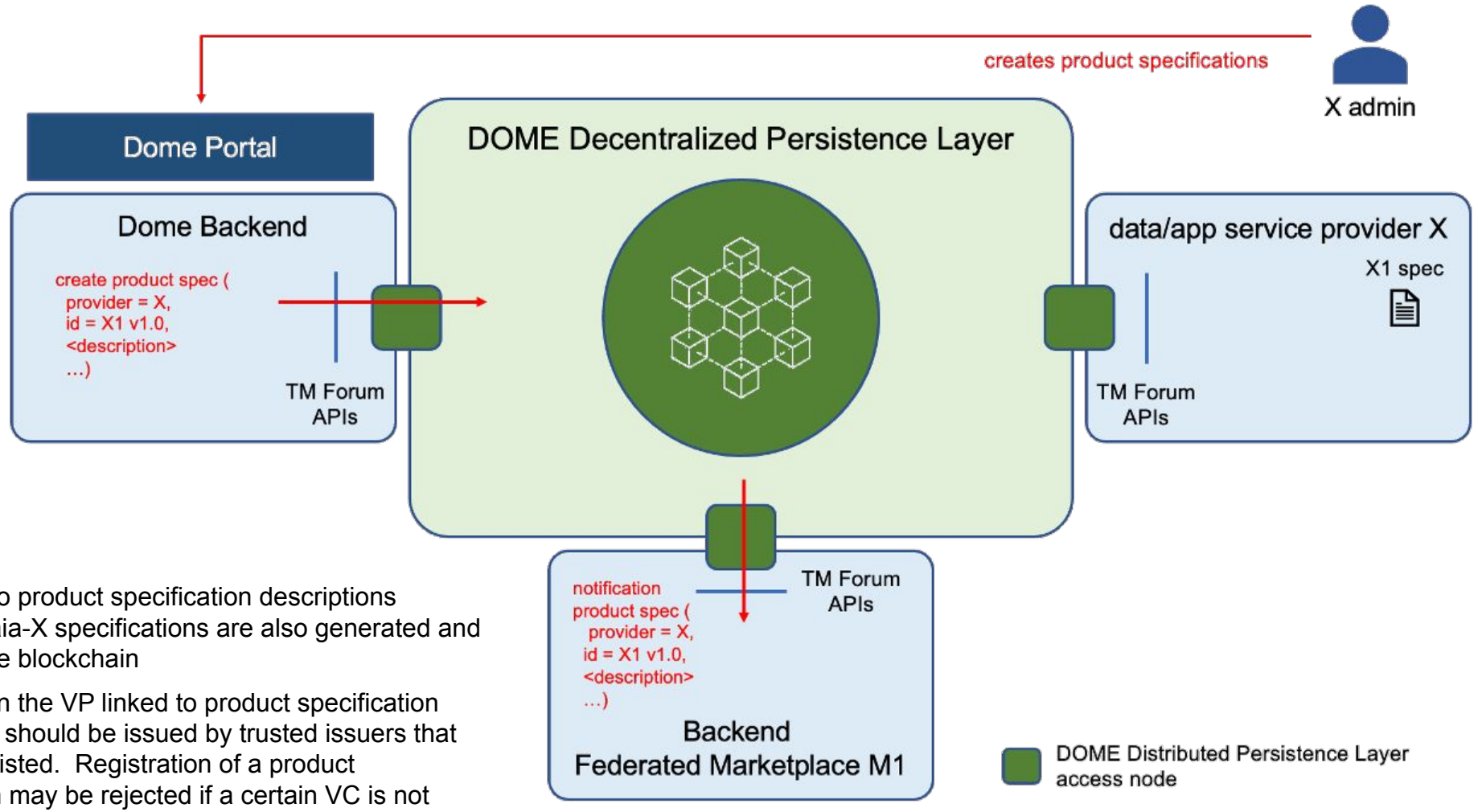
* source: “conceptualization study on the European cloud marketplace” - Cap Gemini

Registration of product specification



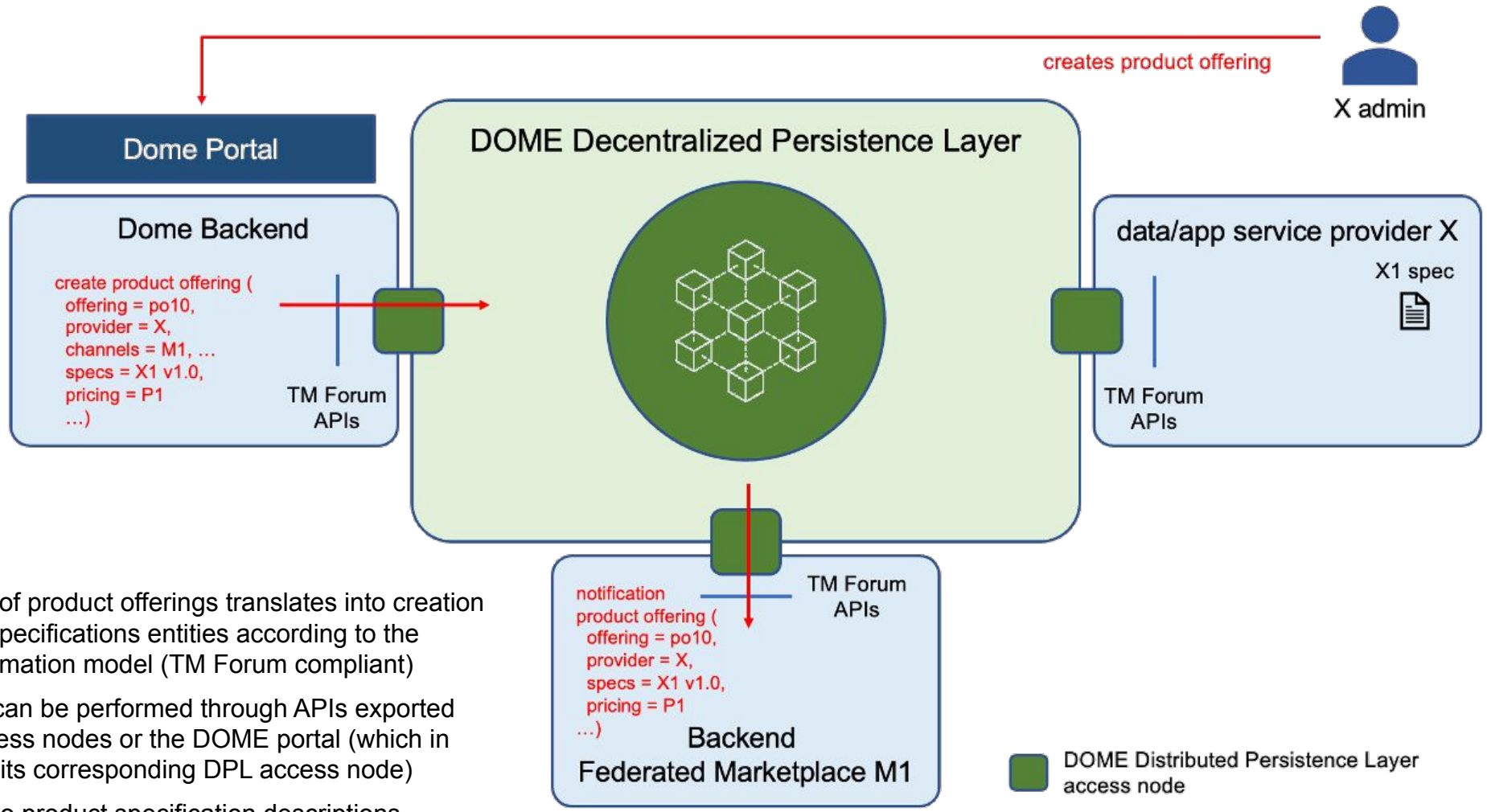
- registration of product specifications translates into creation of product specifications entities according to the DOME information model (TM Forum compliant)
- operations can be performed through APIs exported by DPL access nodes or the DOME portal (which in turn rely on its corresponding DPL access node)

Registration of product specification (cont.)



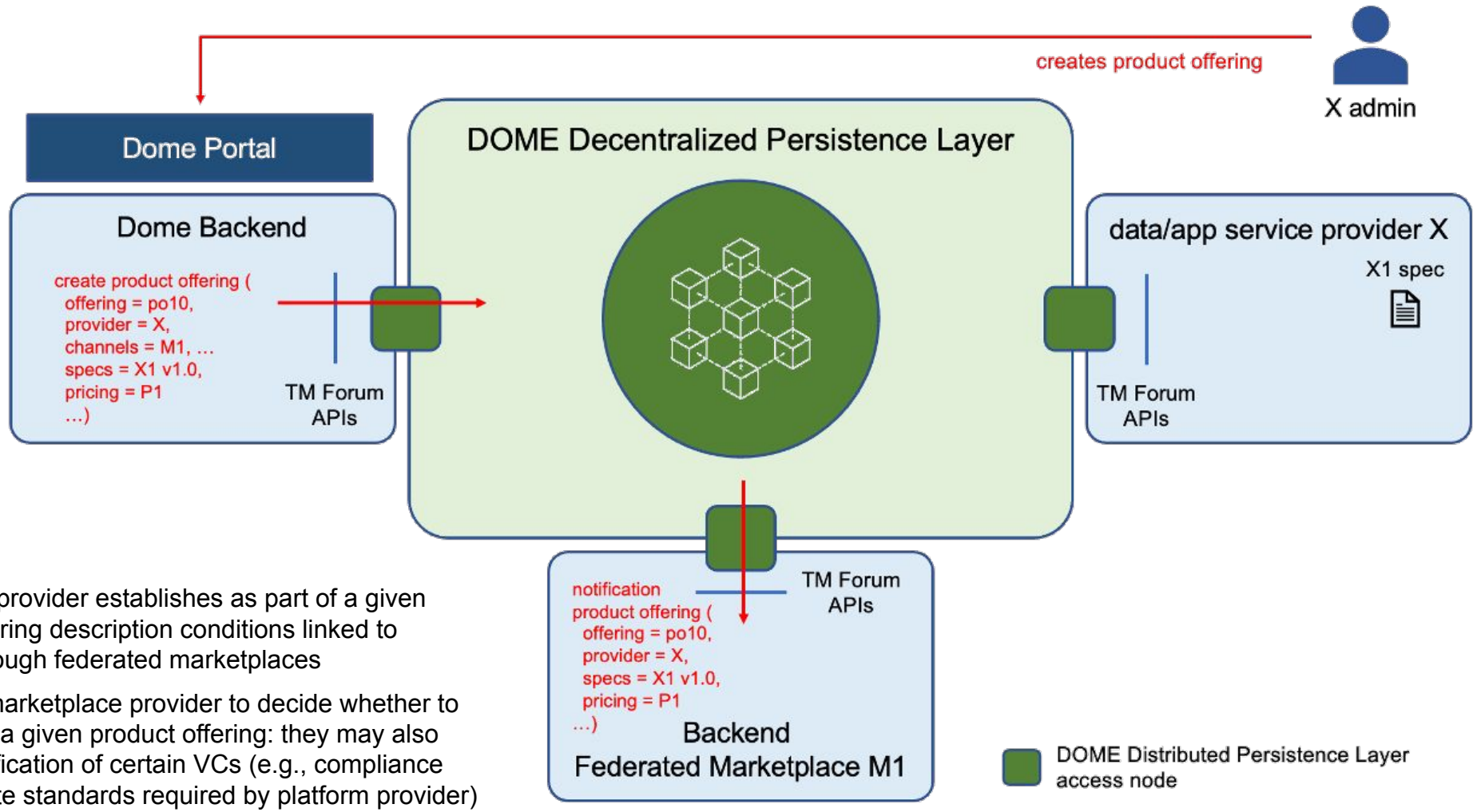
- VPs linked to product specification descriptions following Gaia-X specifications are also generated and stored on the blockchain
- Some VCs in the VP linked to product specification descriptions should be issued by trusted issuers that DOME has listed. Registration of a product specification may be rejected if a certain VC is not present or cannot be verified

Creation of Product Offering



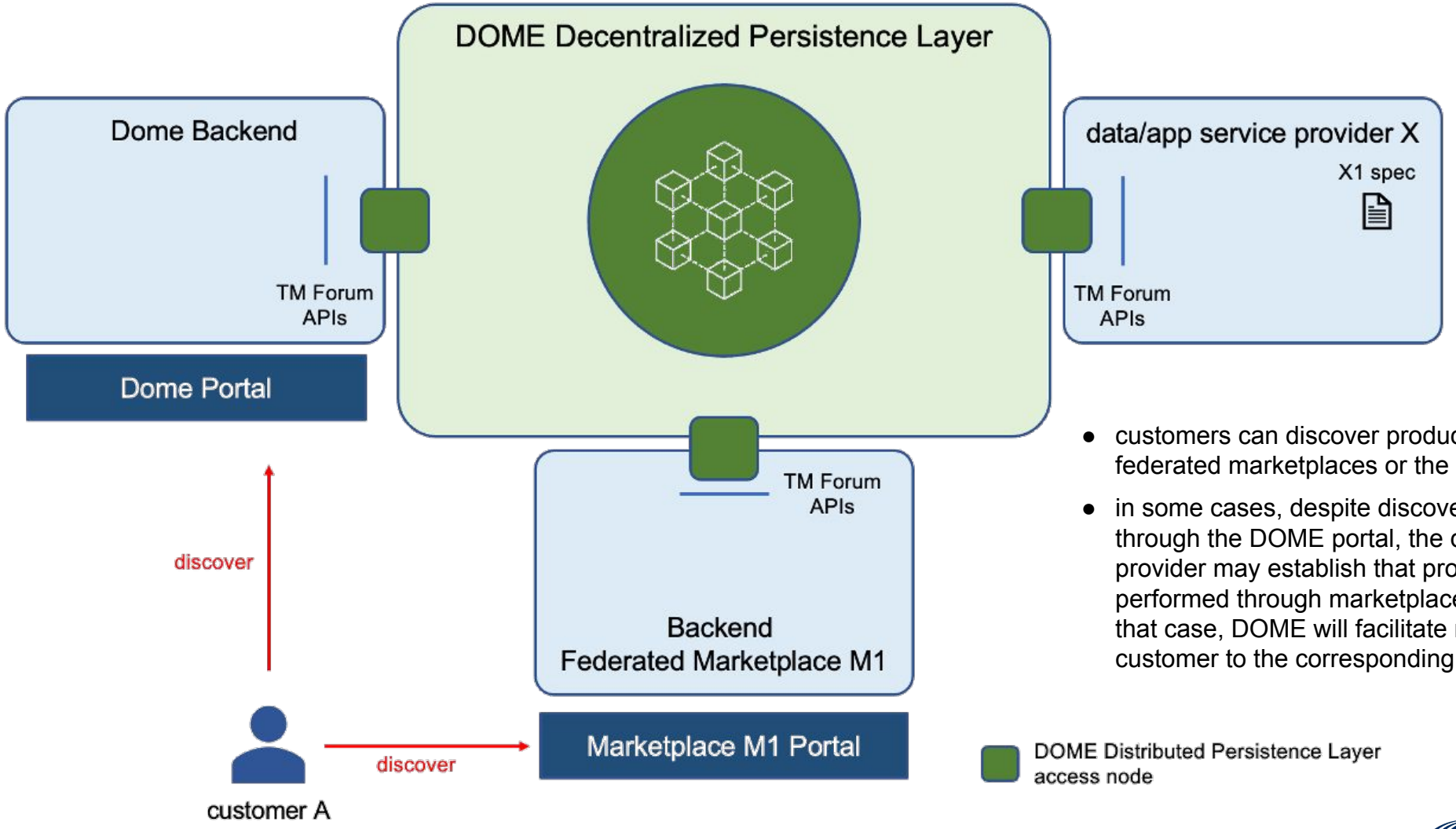
- registration of product offerings translates into creation of product specifications entities according to the DOME information model (TM Forum compliant)
- operations can be performed through APIs exported by DPL access nodes or the DOME portal (which in turn rely on its corresponding DPL access node)
- VPs linked to product specification descriptions following Gaia-X specifications are also generated and stored on the blockchain

Creation of Product Offering (cont.)



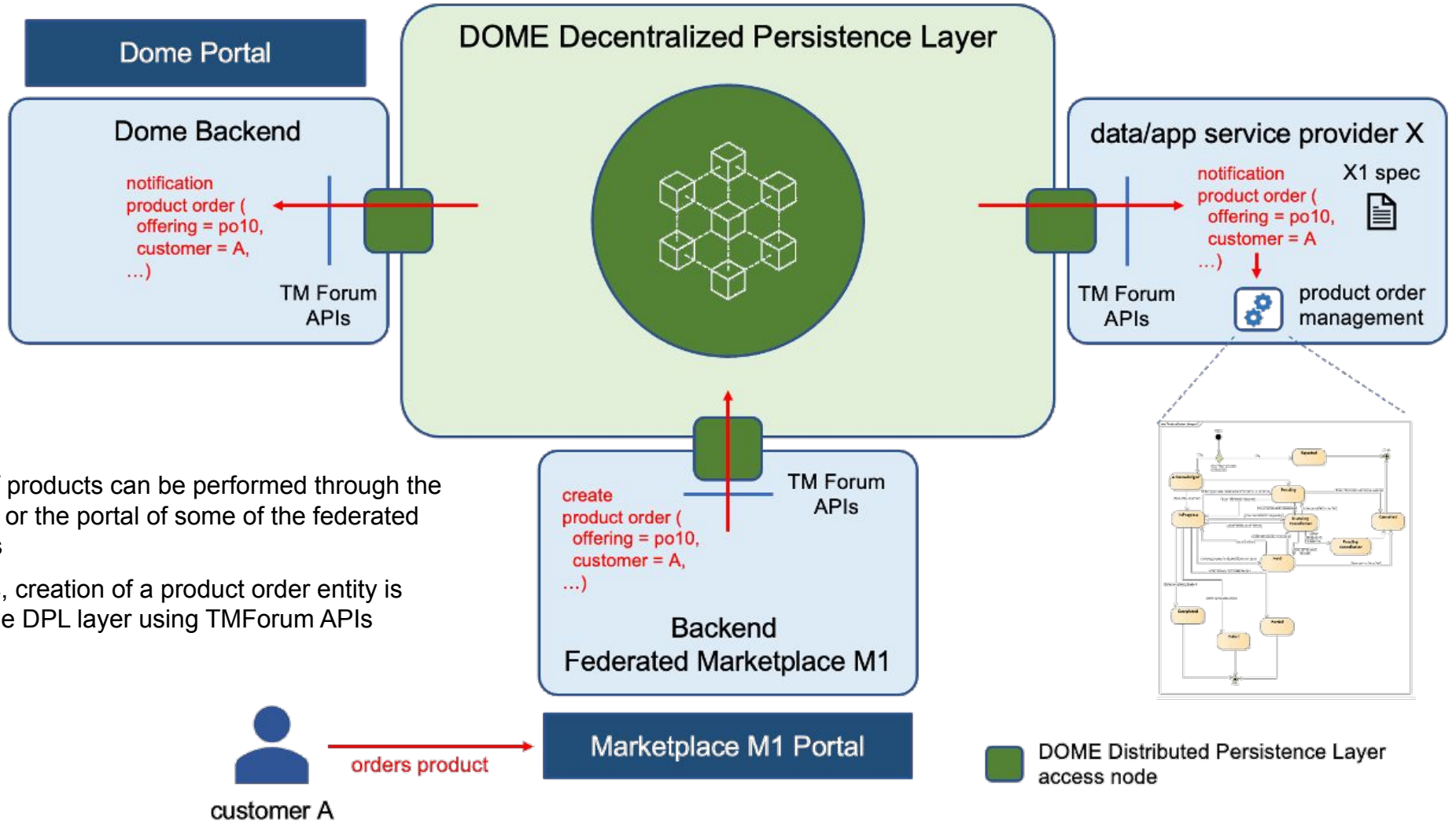
- the service provider establishes as part of a given product offering description conditions linked to visibility through federated marketplaces
- its up to a marketplace provider to decide whether to incorporate a given product offering: they may also require verification of certain VCs (e.g., compliance with concrete standards required by platform provider) beyond those that are mandatory for DOME

Product offering discovery



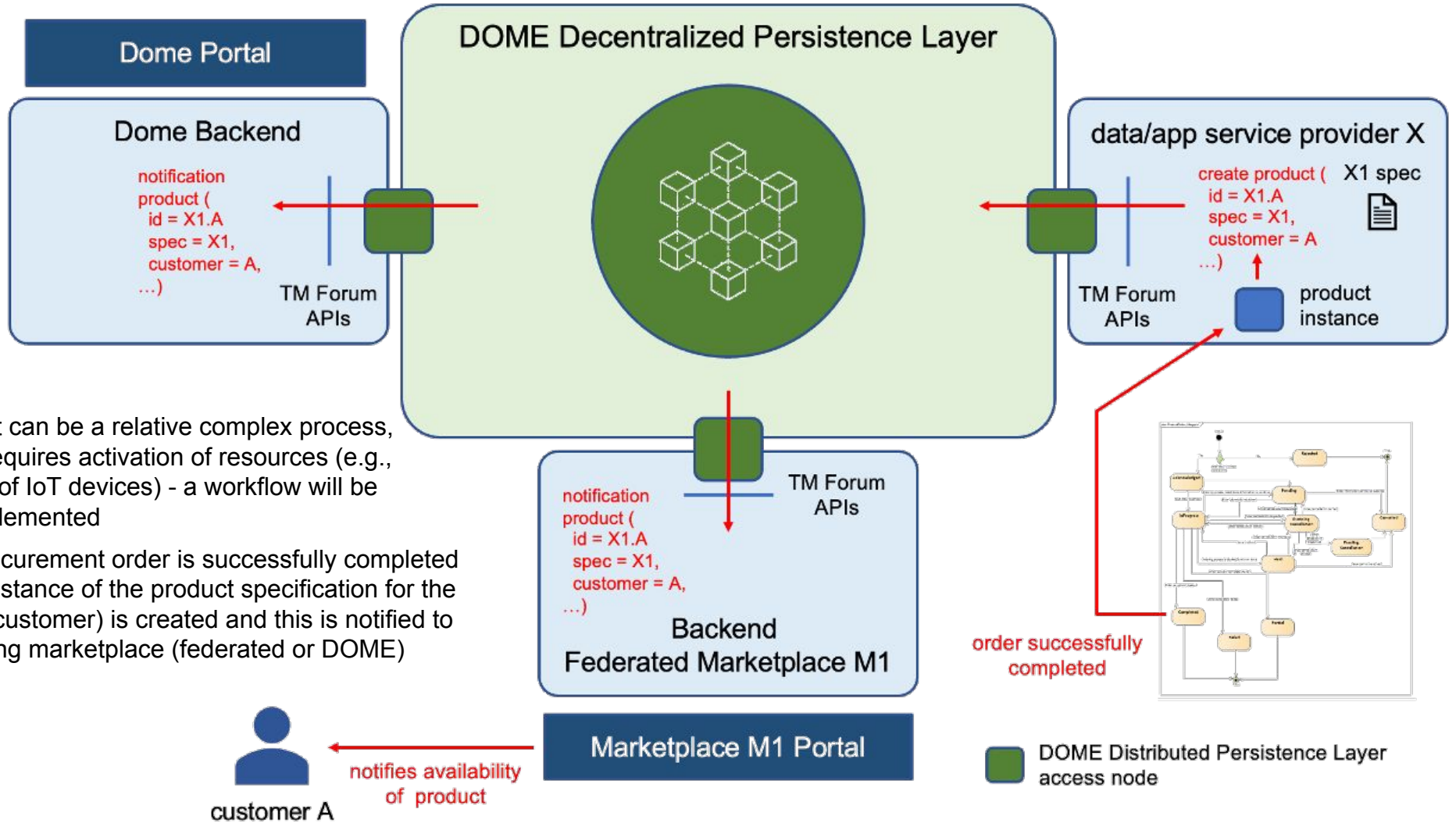
- customers can discover product offerings through a federated marketplaces or the DOME portal
- in some cases, despite discovery can take place through the DOME portal, the data/app service provider may establish that procurement has to be performed through marketplaces of its choice - in that case, DOME will facilitate navigation of the customer to the corresponding portal

Product acquisition (through federated marketplace)



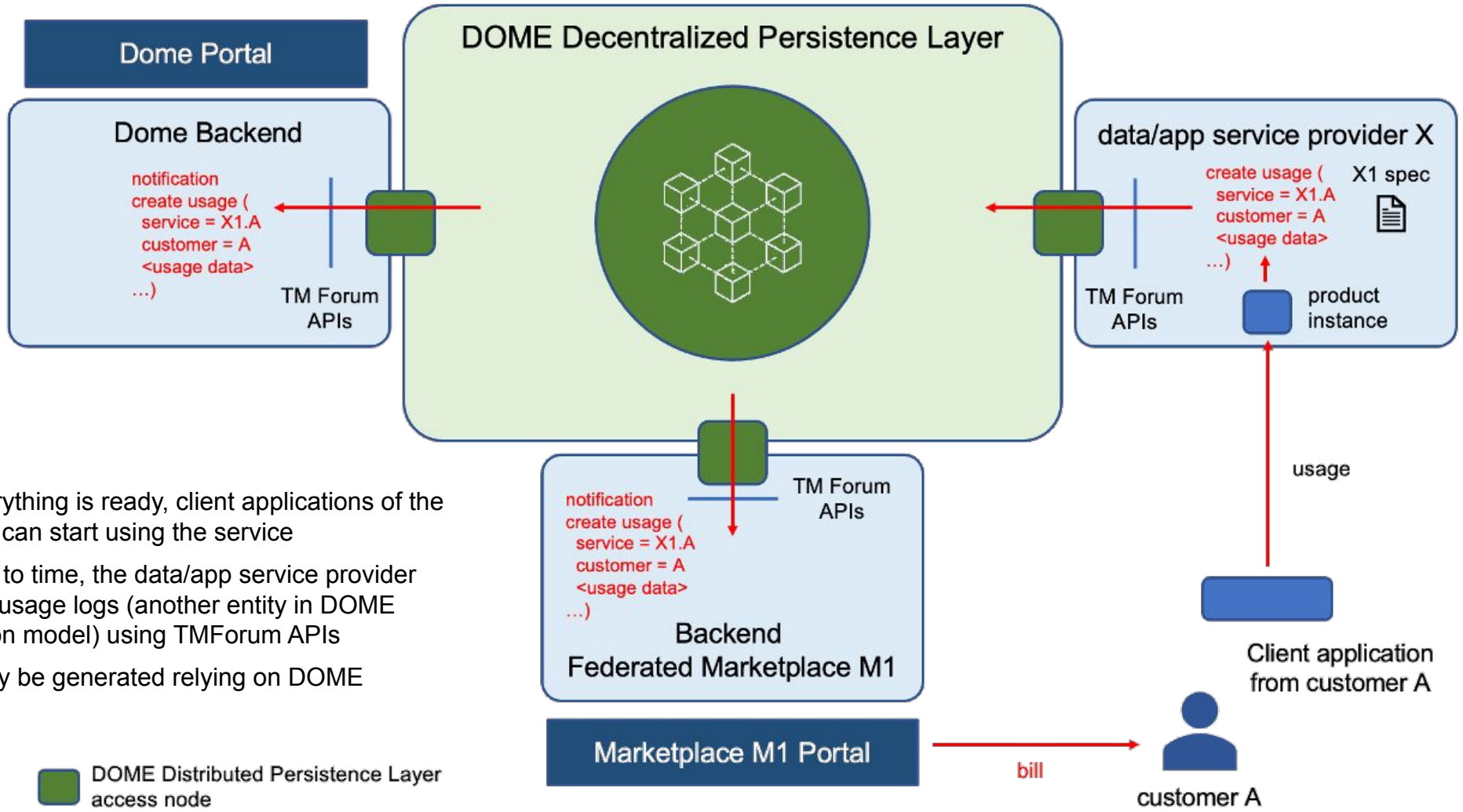
- acquisition of products can be performed through the DOME portal or the portal of some of the federated marketplaces
- in both cases, creation of a product order entity is issued into the DPL layer using TMForum APIs

Product activation (product becomes available for use)



- procurement can be a relative complex process, overall if it requires activation of resources (e.g., deployment of IoT devices) - a workflow will be typically implemented
- once the procurement order is successfully completed a product (instance of the product specification for the demanding customer) is created and this is notified to the generating marketplace (federated or DOME)

Product usage



- once everything is ready, client applications of the customer can start using the service
- from time to time, the data/app service provider generate usage logs (another entity in DOME information model) using TMForum APIs
- billing may be generated relying on DOME

Decentralized Trust Anchor and IAM (Identity and Access Management)

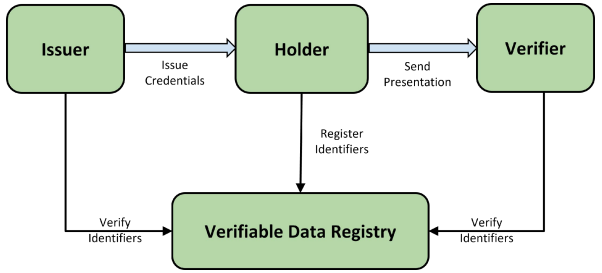
Trust Anchor Framework and Decentralised IAM

- **Trust Anchor Framework**
  - **ID Binding**: a given identifier corresponds to a valid legal identity of an entity in the real world
  - **Proof of participation**: the entity is trusted because it is a subscribed participant in a given ecosystem
  - **Proof of Issuing Authority**: the credentials have been issued by an entity which is authorised

- **Decentralised IAM Framework**
  - **Identification**: the identifier received from a participant is not sent by an impostor
  - **Authorization**: How to use the attested facts in the Verifiable Credentials presented by a participant to perform advanced ABAC access control and policy enforcement?

Trust Anchor Framework

- Trust Anchor Framework characteristics:
  - ID Binding using identifiers in eIDAS digital certificates issued by **EU Trust Service Providers** (TSP).
  - Proof of participation using **Decentralized Trusted Participant List** stored in the Verifiable Data Registry.
  - Proof of issuing authority using one or more **Decentralized Trusted Issuers List** stored in the Verifiable Data Registry.
  - Verifiable Data Registry can be implemented with any technology, but we are using **Decentralized Ledger Technology** (blockchain/DLT) based on EBSI (European Blockchain Services Infrastructure)
- Used for:
  - Verifying identities of organizations interacting with DOME
  - Verifying credentials of services a provider wishes to register in DOME (users are also offered the possibility)



ebsi
European Blockchain

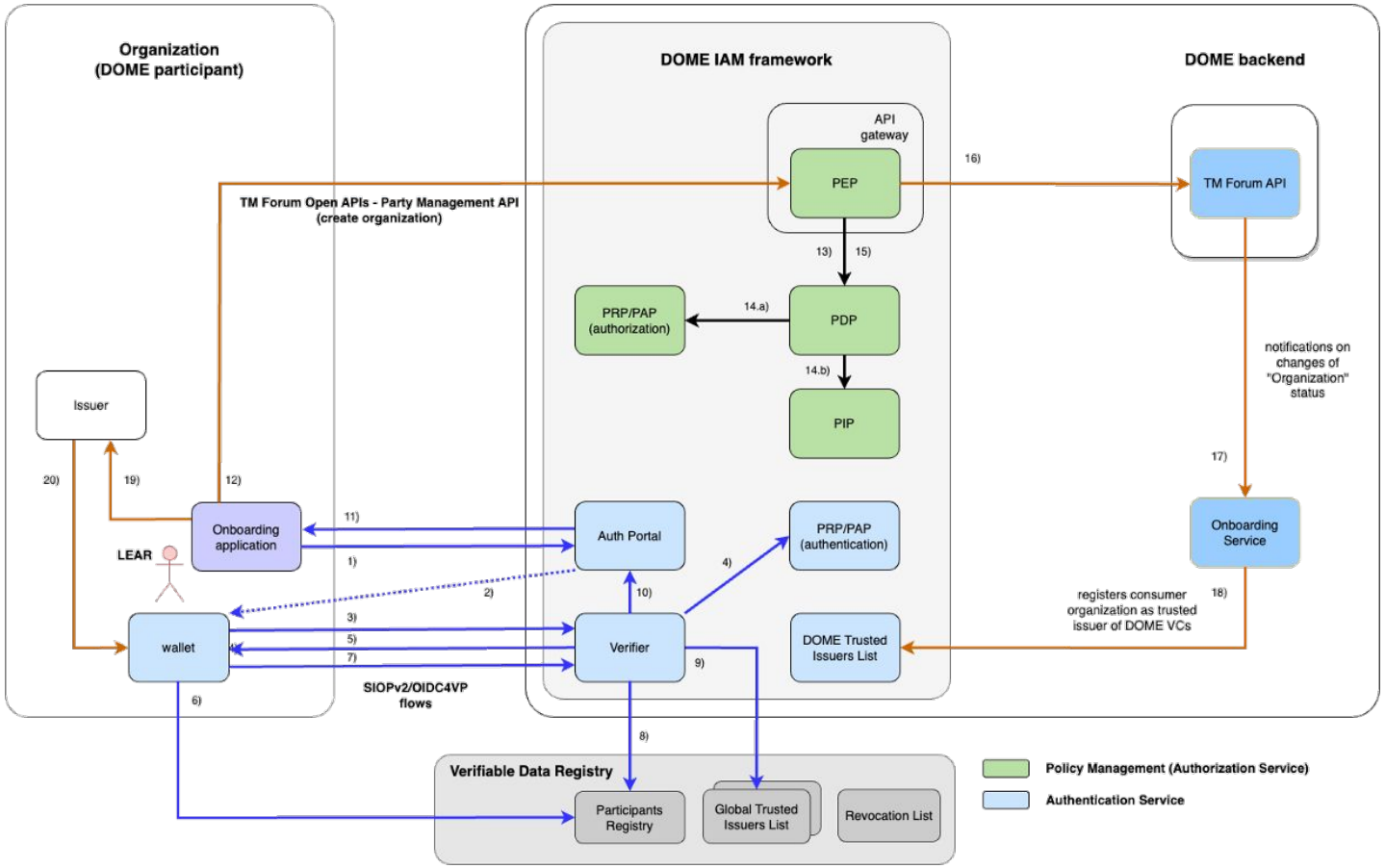
FIWARE

Identification and Access Management (IAM)

- Decentralised IAM Framework characteristics:
  - Based on **W3C Verifiable Credentials** to avoid centralised identity providers and enable all participants to send identity data
  - Uses **OpenID Connect for Verifiable Presentations (OIDC4VP)** and **Self-Issued OpenID Provider v2 (SIOPv2)** → Transports VC/VP in the flows of OpenID Connect, therefore leveraging proven, standard and secure mechanisms
  - Aligned with **EBSI (European Blockchain Services Infrastructure) APIs** for interfacing with Trust Services
- Used to manage Identity and Access to:
  - DOME portal and exported APIs
  - portal and APIs of any federated marketplace (optional)
  - data/app services offered in DOME (optional)

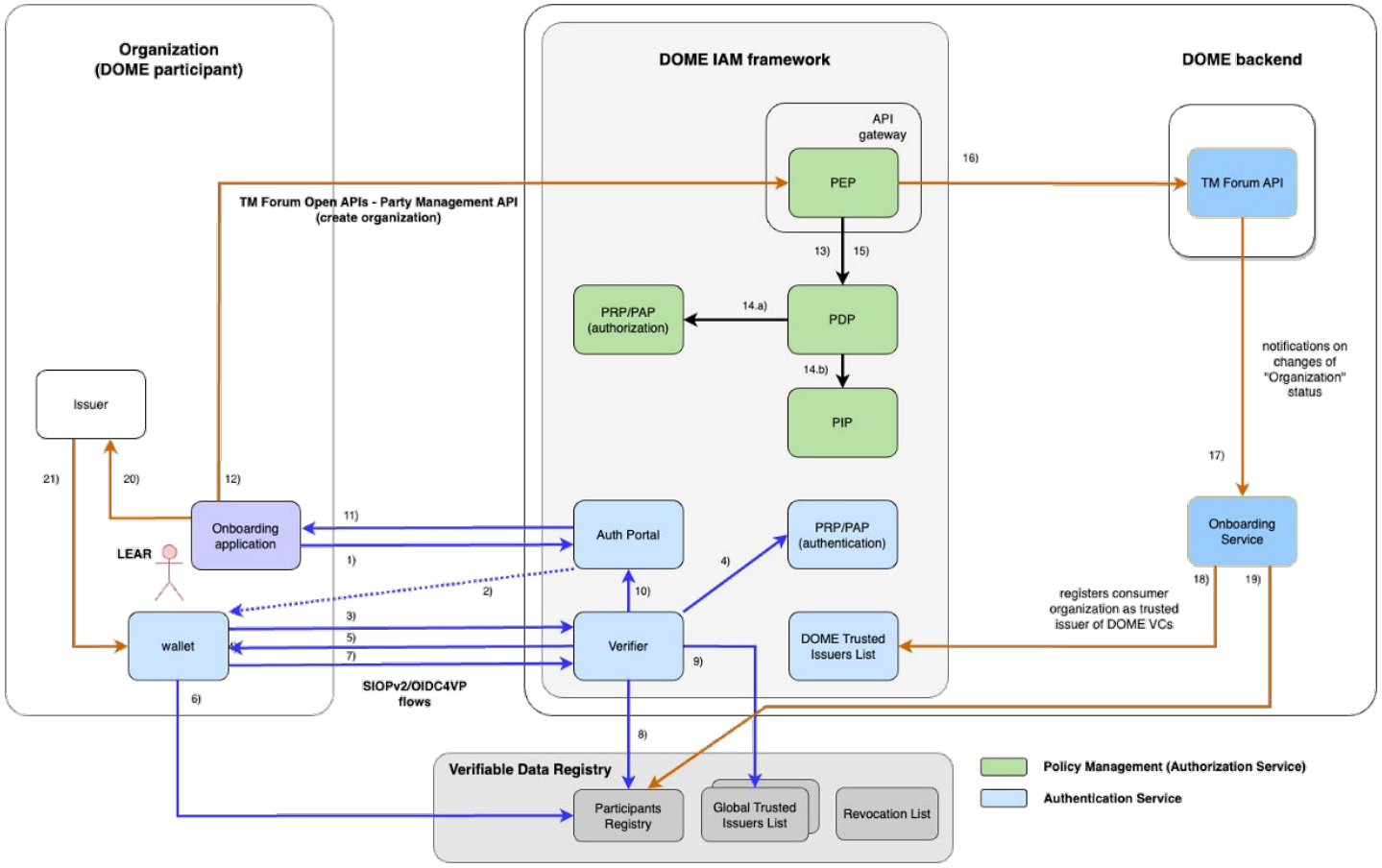
Organization onboarding through the DOME portal (take 1)

- Using an onboarding app (or a web portal), a LEAR of the organization to onboard in DOME will request authentication into the DOME service (steps 1-3 involving scanning of QR code using the wallet)
- The Verifier will request from the user's wallet a VC that acredits him/her as LEAR of the organization, eventually other VCs (steps 4-5).
- Still to be determined, we define the concept of "DOME ecosystem" in which participants have to comply with certain rules. If so, the wallet will check whether the verifier belongs to a participant in the data space (step 6) and return the requested VCs (step 7). Since DOME will be part of that exosystem, it will return that is the case.
- The Verifier checks whether the LEAR's VC was issued by a trusted participant of the DOME ecosystem (step 8), and also checks whether other VCs required were issued by trusted issuers (step 9)
- If verifications were ok, it issues a token (step 10) that is transmitted to the user (step 11)
- Using the returned token, the user invokes TM Forum API to register the consumer organization at the Connector (steps 12-17) establishing the necessary access control (steps 12-14)
- Once the organization is registered and completes all the necessary information (which may take even days), it is registered in the DOME trusted issuers list as trusted issuer of VCs that may include claims as buyer, seller or marketplace of products in the connector (step 18)
- Once onboarding is completed, the system for issuance of VCs at the organization can issue DOME VCs (steps 19-20)



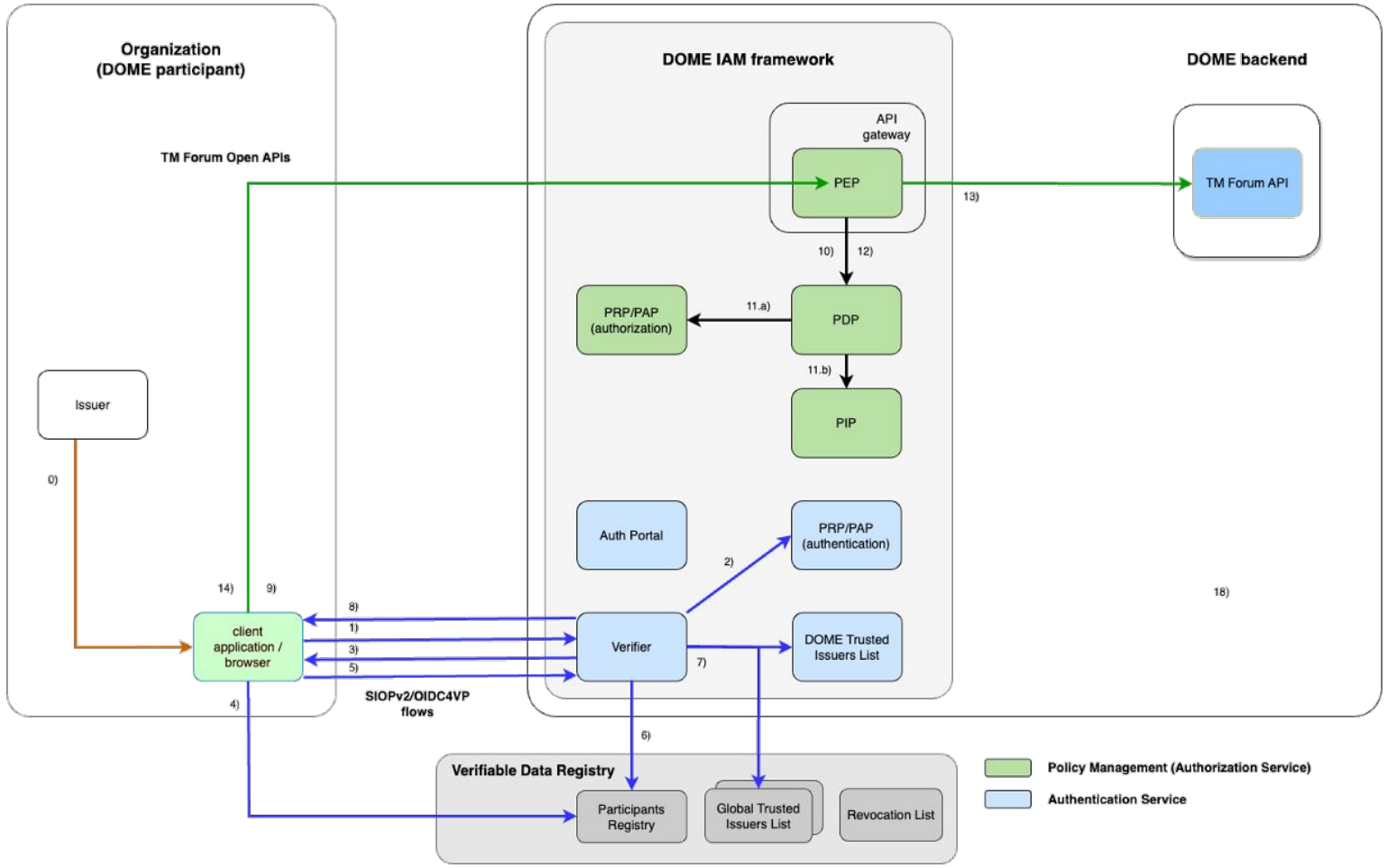
Organization onboarding through the DOME portal (take 2)

- Using an onboarding app (or a web portal), a LEAR of the organization to onboard in DOME will request authentication into the DOME service (steps 1-3 involving scanning of QR code using the wallet)
- The Verifier will request from the user's wallet a VC that acredits him/her as LEAR of the organization, eventually other VCs (steps 4-5).
- Still to be determined, we define the concept of "DOME ecosystem" in which participants have to comply with certain rules. If so, the wallet will check whether the verifier belongs to a participant in the data space (step 6) and return the requested VCs (step 7). Since DOME is itself part of the ecosystem, it will return that is the case.
- The Verifier checks whether the LEAR's VC was issued by a trusted participant of the DOME ecosystem (step 8), and also checks whether other VCs required were issued by trusted issuers (step 9)
- If verifications were ok, it issues a token (step 10) that is transmitted to the user (step 11)
- Using the returned token, the user invokes TM Forum API to register the consumer organization at the Connector (steps 12-17) establishing the necessary access control (steps 12-14)
- Once the organization is registered and completes all the necessary information (which may take even days), it is registered in the DOME trusted issuers list as trusted issuer of VCs that may include claims as buyer, seller or marketplace of products in the connector (step 18) and it will be also registered in the Participants Registry (step 19)
- Once onboarding is completed, the system for issuance of VCs at the organization can issue DOME VCs (steps 20-21)



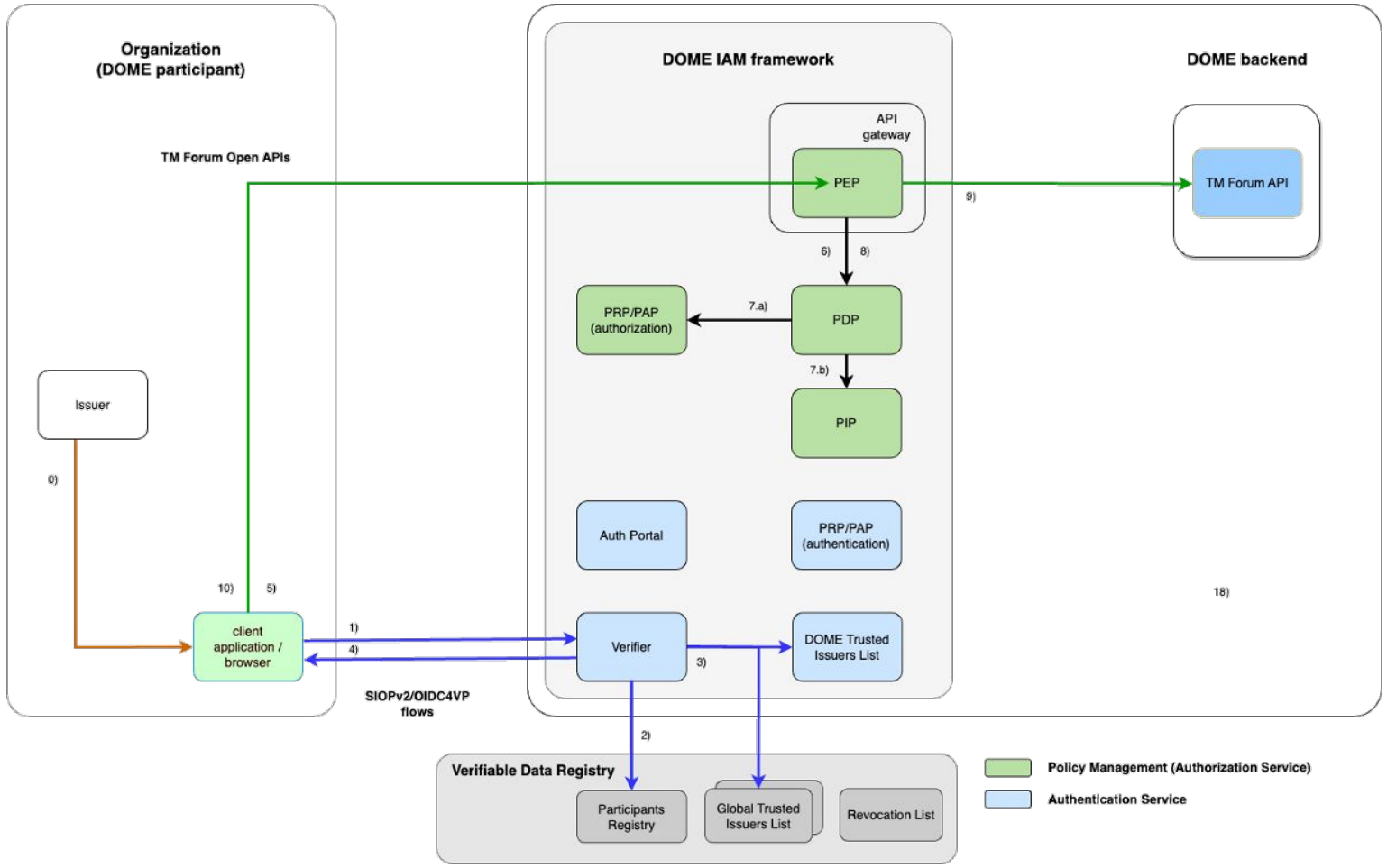
Invocation of TM Forum operations (M2M)

- An application from a DOME user organization (data/app provider or federated marketplace provider) already onboarded in DOME requests its authentication in DOME (step 1)
- The Verifier will check in the PRP/PAP what VCs to request: a) the VCs linked to roles meaningful for DOME the organization willing to authenticate should be a trusted issuer of if it actually had onboarded and b) some other VCs (steps 2-3). The application will check that the verifier belongs to a participant in the DOME ecosystem (step 4) and returns the requested VCs (step 5)
- The DOME Verifier verifies whether the VC was issued by an organization that is a trusted participant of the DOME ecosystem (step 6) and is a trusted issuer of the VCs meaningful for DOME (that is, VCs that only organizations that got on board of DOME can issue), also checks whether other VCs required were issued by trusted issuers (steps 7)
- If verifications is ok, it issues a token that is transmitted to the application (steps 8)
- Using the returned access token, the application invokes an DOME TM Forum API operation (step 9)
- The PEP proxy will verify whether the application with the claims (attributes) included in the VCs extracted from the access token is authorized to perform the given operation request (steps 10-12)
- If authorization is ok, the request is forwarded (step 13) and a response returned to the app (step 14)



Invocation of TM Forum operations (simplified M2M)

- Step for the authentication can be simplified so that the application willing to access TM Forum operations exported by DOME sends via POST an authentication response with vp_token that contains the VCs it is well known that DOME will ask for
- The DOME Verifier verifies whether the VC was issued by an organization that is a trusted participant of the DOME ecosystem (step 2) and is a trusted issuer of the VCs meaningful for DOME (that is, VCs that only organizations that got on board of DOME can issue), also checks whether other VCs required were issued by trusted issuers (steps 3)
- If verifications is ok, it issues a token that is transmitted to the application (steps 4)
- Using the returned access token, the application invokes an DOME TM Forum API operation (step 5)
- The PEP proxy will verify whether the application with the claims (attributes) included in the VCs extracted from the access token is authorized to perform the given operation request (steps 6-8)
- If authorization is ok, the request is forwarded (step 9) and a response returned to the app (step 10)



Summary

DOME Distinctive features

- Aligned with conceptualisation study on the European cloud marketplace carried out by Capgemini Invent for the EC but relying on the powerful concepts of federation and decentralization
- Relying on open standards:
  - Description of cloud and edge services and service offerings based on W3C Verifiable Credentials / Presentations (VC/VP)
  - Shared Catalogue and Marketplace functions based on TM Forum Open APIs implemented on top of EBSI-compliant blockchain
  - Decentralized Identity and Access Management (IAM) based on W3C DID – VC/VP and EBSI-compliant APIs for interfacing Trust Services
  - Logs generated through the full lifecycle of cloud application service offerings stored on blockchains aligned with the European Blockchain Service Infrastructure (EBSI)
  - Data services to be visible through existing Data Publication Platforms supporting DCAT/DCAT-AP
- Vision integrated in first results of Technology Converge discussions under the umbrella of the Data Spaces Business Alliance (DSBA) created by BDVA, FIWARE Foundation, Gaia-X, IDSA

Thank you!

DOME - Distributed Open Marketplace for Cloud and Edge Services in Europe

Potential connection with AI on Demand initiative

- AI services are the kind of services that can be made visible through DOME and this way reach easier to potential customers
- Some providers may also offer through DOME data services that may be useful for AI services
- AI frameworks created based on AI on Demand proposed standards can be extended with marketplaces that are implemented as DOME federated marketplaces, this way providers of these AI frameworks also can reach better their end customers either directly or through integrators
  - these marketplaces would bring a catalog of AI services/modules plug&play integratable using AI o Demand standards
  - these marketplaces could also bring a catalog ready-to-process valuable data resources
- Incorporating concepts around the definition of Verifiable Credentials for fair AI may be interesting to explore