

SCALES: Supply Chain Architecture Leading to Enhanced Services

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Roundtable: ICT Verticals and Horizontals for Blockchain Standardisation: Digital Economy, SME's, Industry and Supply chains

- **SCALES - 2018-EN-IA-0053** - is a project funded by the **2018 eInvoicing call** of the **Connecting Europe Facility** programme.
- **AgID** coordinates a mixed public/private consortium formed by: **Politecnico di Milano DIG, UNINFO, InfoCert** and **Consorzio DAFNE**.
- The objective of **SCALES** is the design and implementation of a digital **supply chain architecture** enabling **value-added services** for enterprises and public administrations.
- SCALES architecture adopts Distributed Ledger (DLT) technologies and is designed in **multi-chain view (EBSI)**.
- Strong commitment to personal data protection (**GDPR**).
- Focus on **procurement post-award** and in particular on **electronic invoicing** in a transnational view based on **EN 16931**.
- Vertical use case (**VAS**) on **healthcare procurement**.





Data ecosystem

SCALES implements the Once only principle by creating a data ecosystem that facilitates the relationship between customers, suppliers, supervisory authorities and the development of value-added services.



Infrastructure independent

Possibility to deploy the system in on-premise & cloud mode, to respond to heterogeneous technical and compliance requirements.



Identity of participant nodes

in order to comply with privacy regulation and establish the correct accountability of transactions on data, the Scales node shall be run by legally identified parties.



Instant Finality

Since SCALES aims to build a more efficient and resilient architecture in order to manage large volumes of data or supporting the implementation of enhanced invoicing and eProcurement services, Instant finality is necessary.



Privacy

Being SCALES a solution based on DLT, privacy of information and correct sharing of data among different network nodes types is a critical constraint.



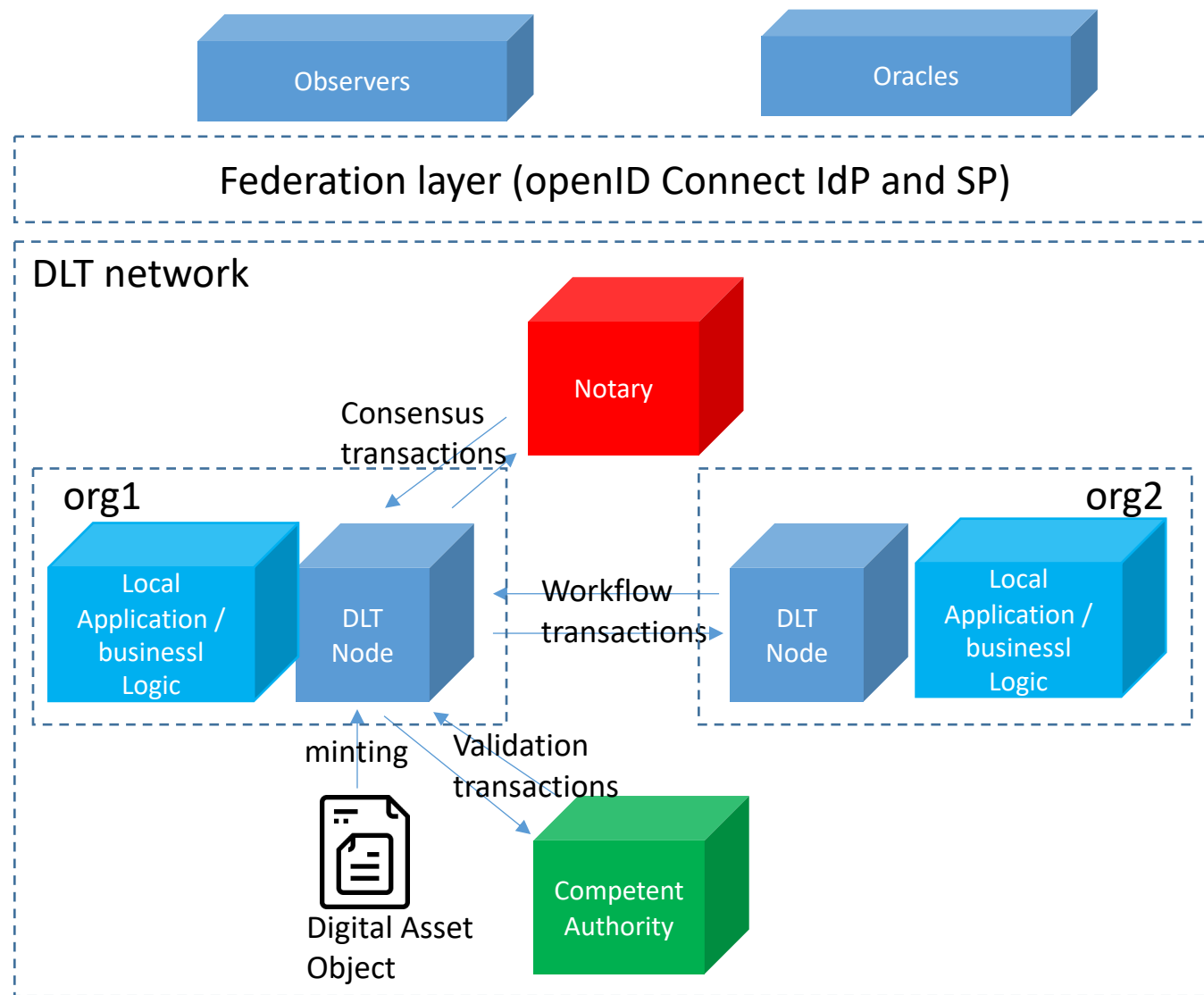
Software Licensing

Build a software stack based on Open Source components, leaving to the specific instance provider the freedom to upgrade community / open source version to commercial edition, preserving backward compatibility of software



SCALES decentralized network approach in brief:

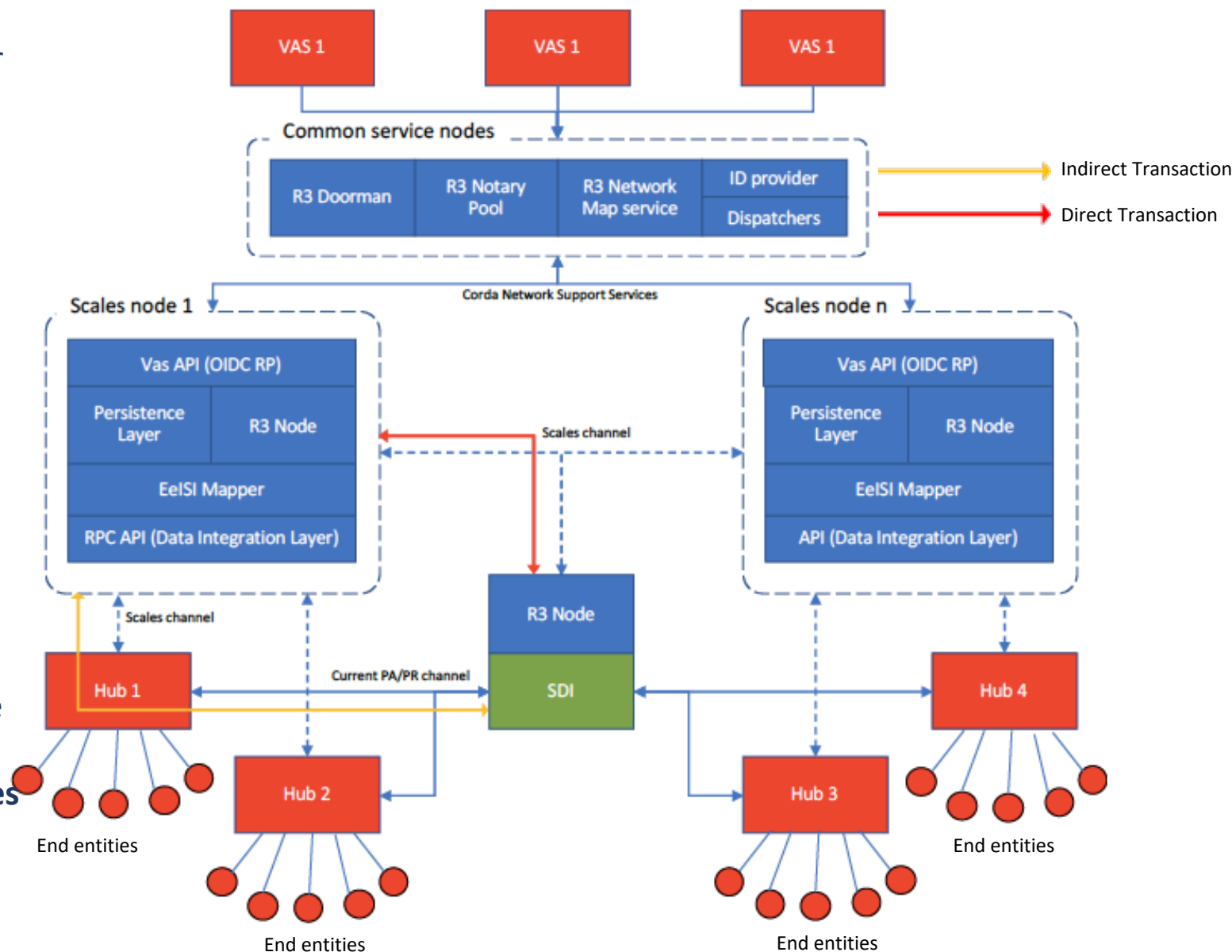
- The object is created on a specific node of the DLT network and it is visible only to that node and all the counterparty nodes involved in a workflow
- The **Workflow is distributed** among different nodes, where each node participate via signed transaction, once it has completed its own task
- **The only nodes that holds the data is the one where the data has been uploaded to.** All the other nodes, involved in the workflow, participate by getting the data form the source node, doing some work on it and signing back their own transaction in order to let the workflow progress.
- The blue nodes are involved on a **need-to-know basis**: one is the source node, where the data is uploaded, the other is asked to participate to the workflow.
- Some nodes are always involved. The **Competent Authority** node checks the correctness of data. The **Notary** node signs the last step of the workflow, in order to avoid double spending of it (i.e. repeating the workflow on the same instance of data)



Co-financed by the Connecting Europe Facility of the European Union

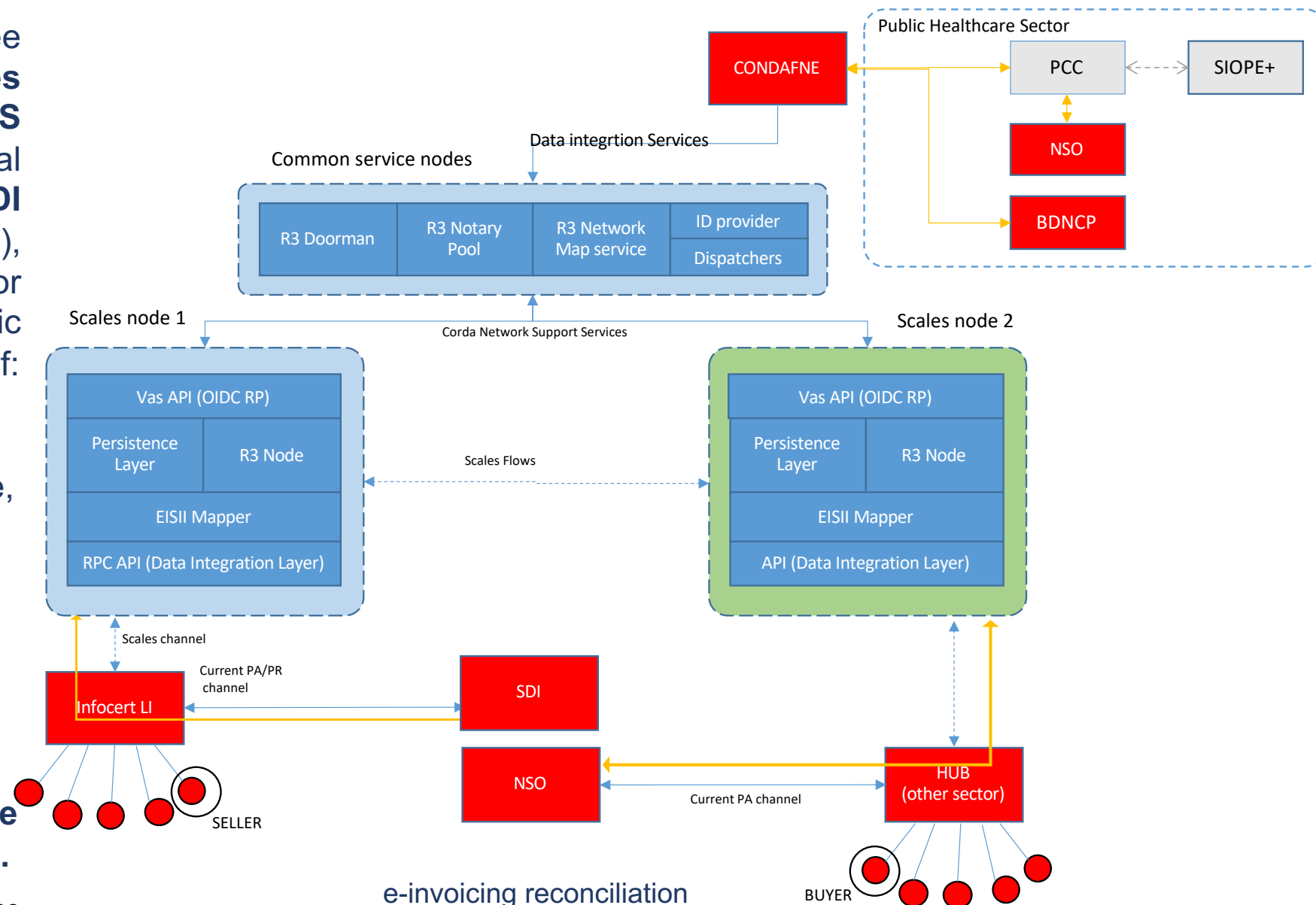
Components:

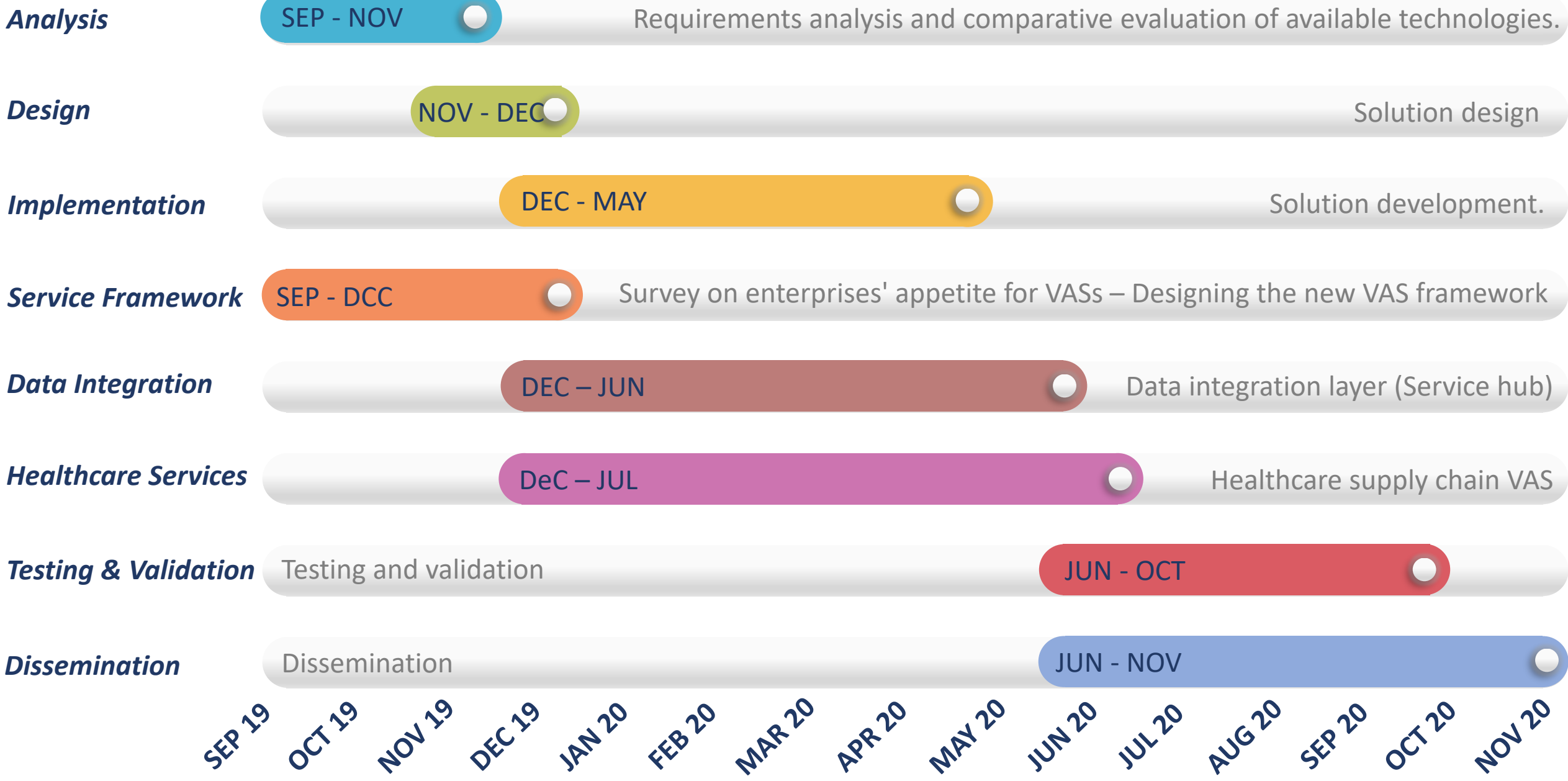
- **End entities:** the legal persons that act as supplier and buyer in the purchase-to-pay process supported by Scales.
- **Hub** are intermediaries between End entities and Scales network.
- The **Scales Node** is in charge of:
 - Offer a **data integration layer** allowing Hubs to create digital object (i.e. invoices, order, etc) in the DLT
 - Offer a **VAS** partner set of **APIS** in order to allow to propose a service to the involved parties
 - Offer **mapping services between formats**
 - Implement **persistence layer** of all the data and metadata of objects
 - Implement the **Corda R3 flows**
- **Scales Common Services** are in charge of: Provide x.509 Pki credentials to Scales node, i.e. a **legal identity**; Notarize transaction; **Map IPs onto Scales node names**, in order to let the Corda R3 flows happen; provide **Federated identity** service to External parties; provide **dispatching service**



SCALES partners developed three classes of **Value-added services exploiting the potential of SCALES architecture** and integrating national monitoring systems such as **SDI** (National gateway for eInvoicing), **NSO** (National gateway for eOrdering) and **PCC** (Public Commercial Credit Platform). In brief:

- VAS for Public Administrations: **eInvoicing Reconciliation** (invoice, payment and credit).
- VAS for Healthcare Wholesalers: **eInvoicing Reconciliation** (invoice, payment and credit).
- VAS for National Health System Buyers: **Dashboard for expenditure planning and contract monitoring**.





Solution design

Solution design defines the architecture of the SCALES network, considering the results of the state of the art analysis on DLT and BC technologies and the requirements of the Italian eInvoicing infrastructure (B2B, B2G and G2B) and end-to-end eProcurement systems.

National Guidelines on eProc

AgID led the feasibility study for the adoption of the SCALES architecture by national eProcurement systems including SDI. AgID will update the AgID Circular 3/2016 "Guidelines for Public eProcurement Systems" in order to support the adoption of DLT and BC based architectures by national public procurement systems.

VAS for health sector

Consorzio DAFNE has developed value-added services addressed to the National Health System entities and suppliers (pharmaceutical companies, distributors, depositories) exploiting the potential of SCALES and integrating national monitoring systems such as SDI, NSO and PCC.

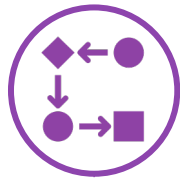
Nov 19



Report on BC & DLT

POLIMI carried out a research on BC and DLT technologies suitable for the public supply chain and the national e-invoicing process. The analysis addressed the DLT-based architecture for public procurement post-award.

Dec 19



Jan 20



New Service Framework

POLIMI carried out a survey of value-added services provided by existing supply chain ecosystems. Case studies were analysed to identify the criticality of existing services and the appetite of companies for new services.

Feb 20



Software

The building blocks of the SCALES architecture developed by Infocert will be published on Github under EUPL licence to facilitate their adoption and reuse by public administrations and companies.

<https://github.com/AgID/SCALES>

May 20



Jul 20



Whitepaper

UNINFO issued a Whitepaper with the results of the project and in-depth analysis of GDPR compliance and SCALES' contribution to international eInvoicing, blockchain and DLT initiatives.

Nov 20



Thank you!

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