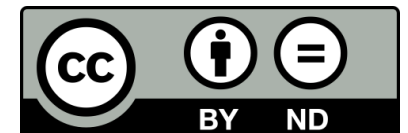


EOSC Platform: Enabling “fair” – EOSC Interoperability Framework

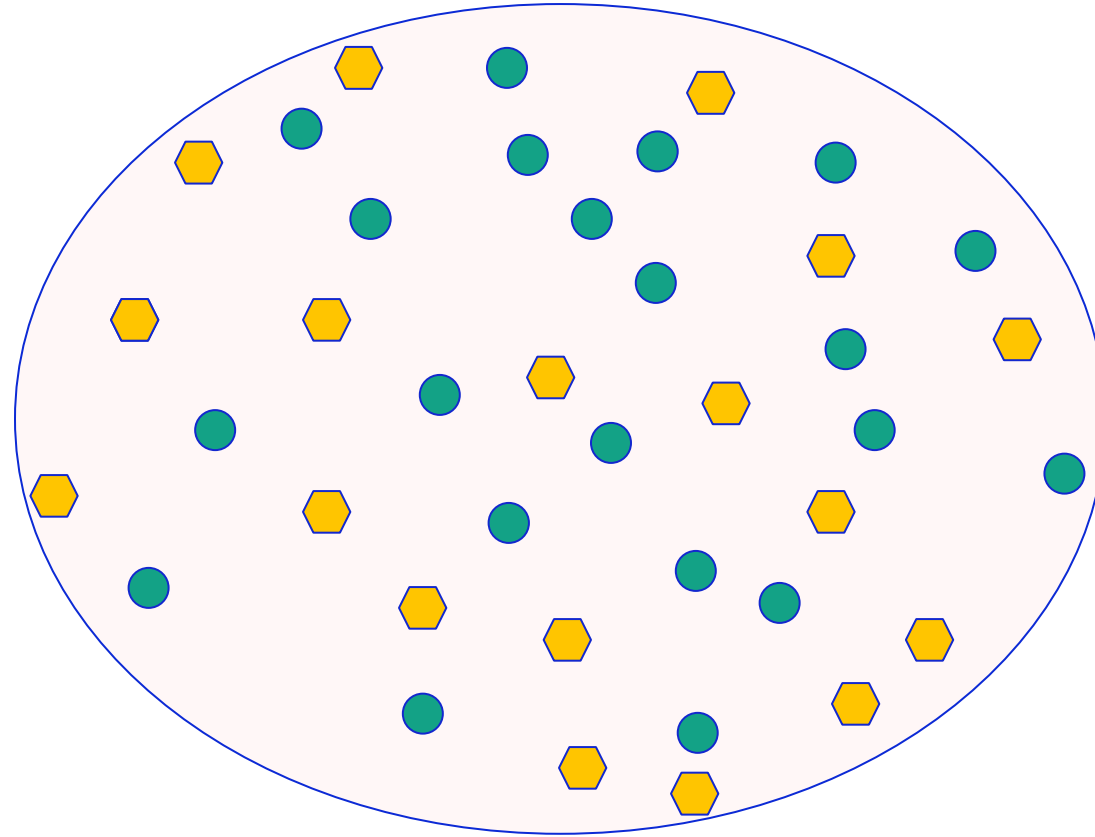
Mark Dietrich, EGI Foundation

The EOSC Future project is co-funded by the
European Union Horizon Programme call
INFRAEOSC-03-2020, Grant Agreement 101017536



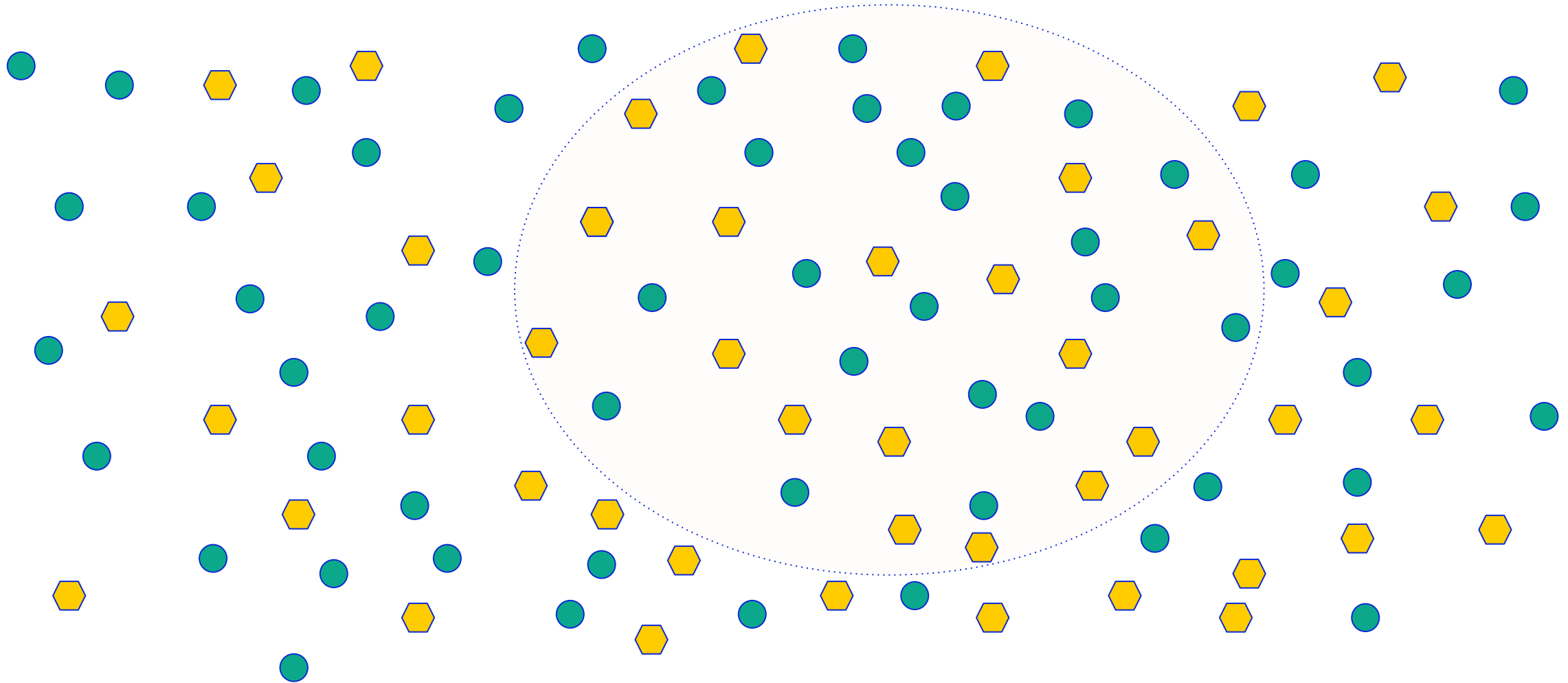


Without EOSC, Findability might be limited to my own community...



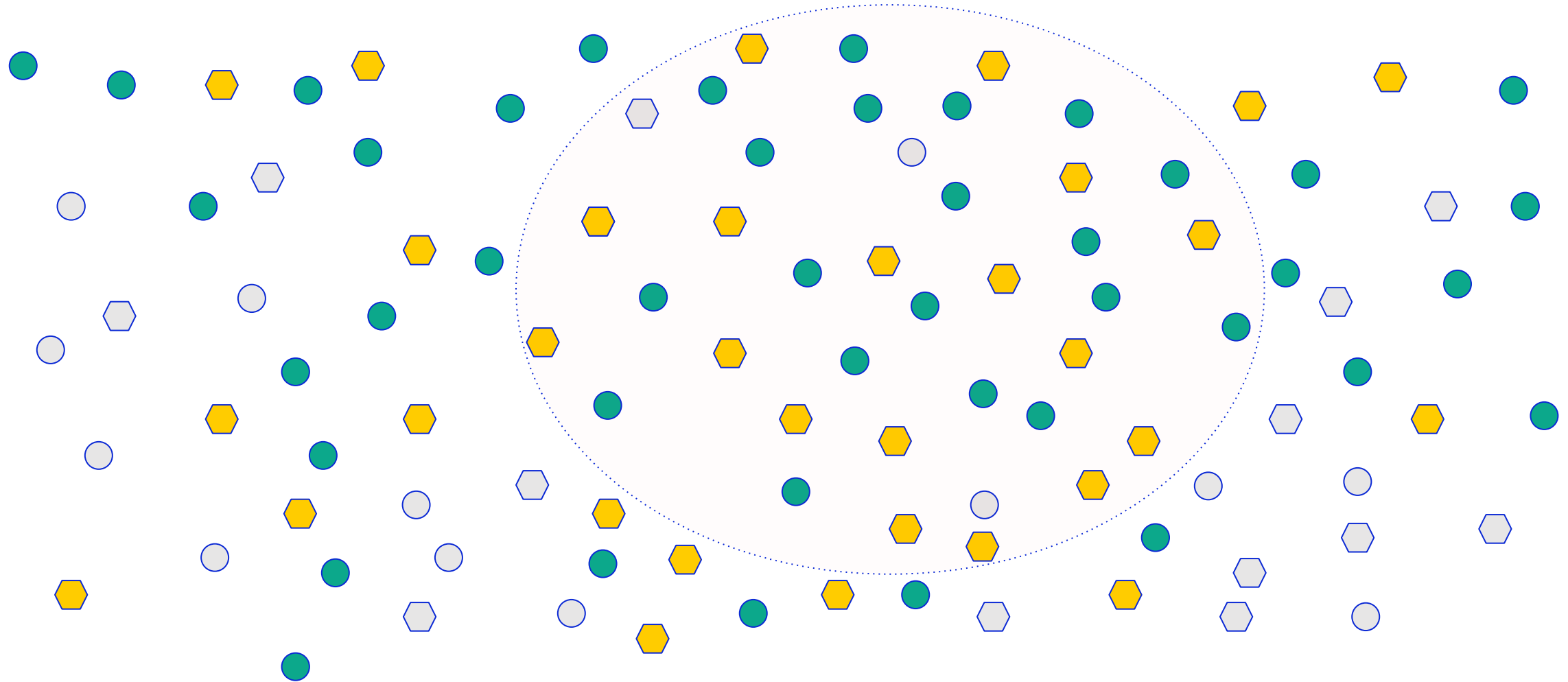


EOSC Catalogue Interoperability expands Findability

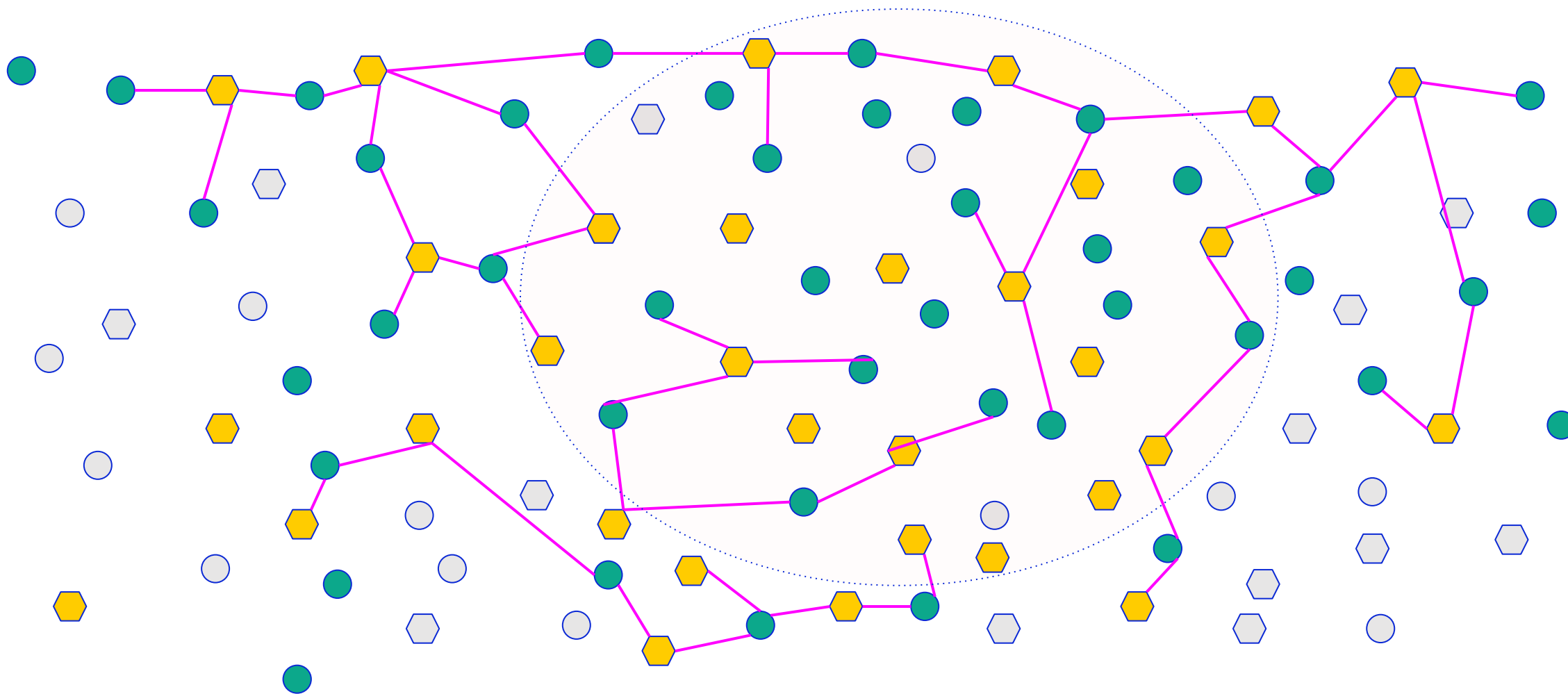




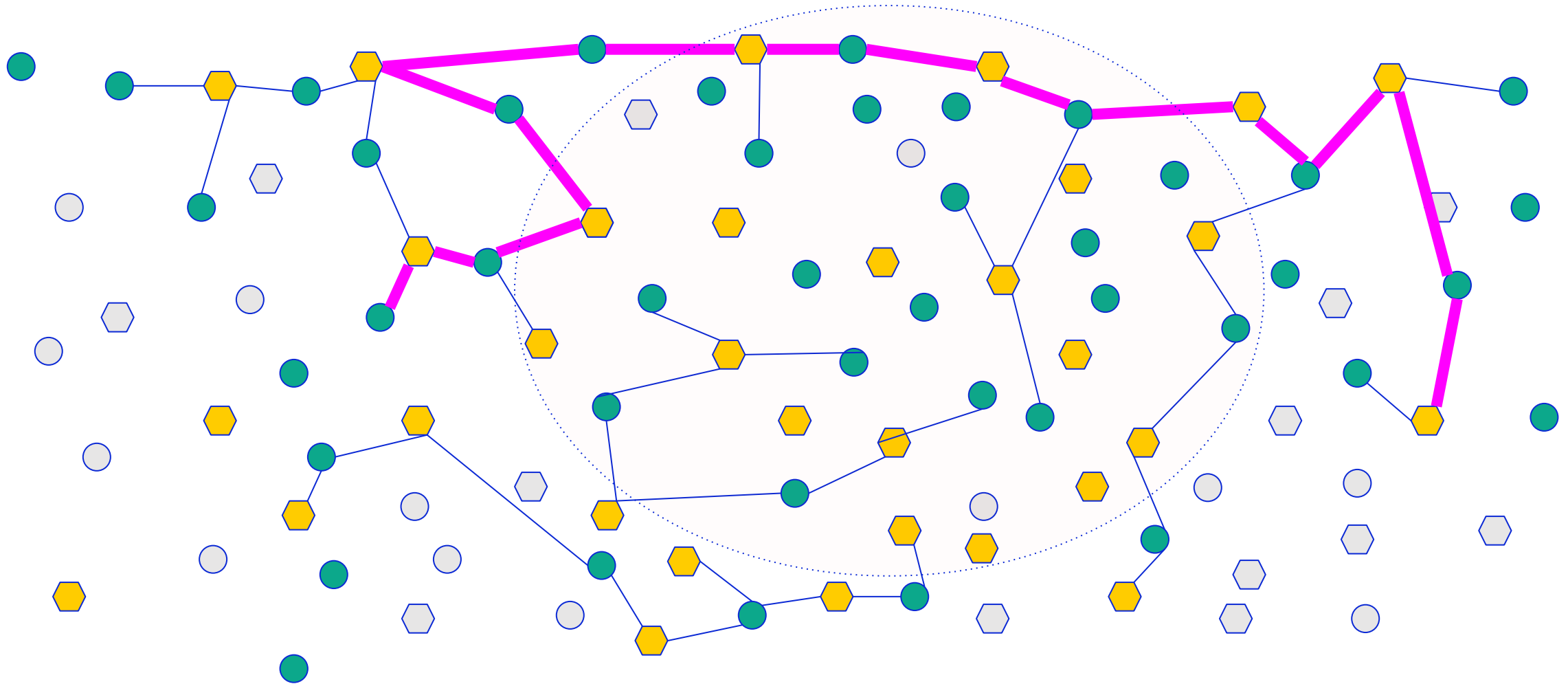
Interoperable Authorization (AAI Federation) focusses what I can find to what is Accessible



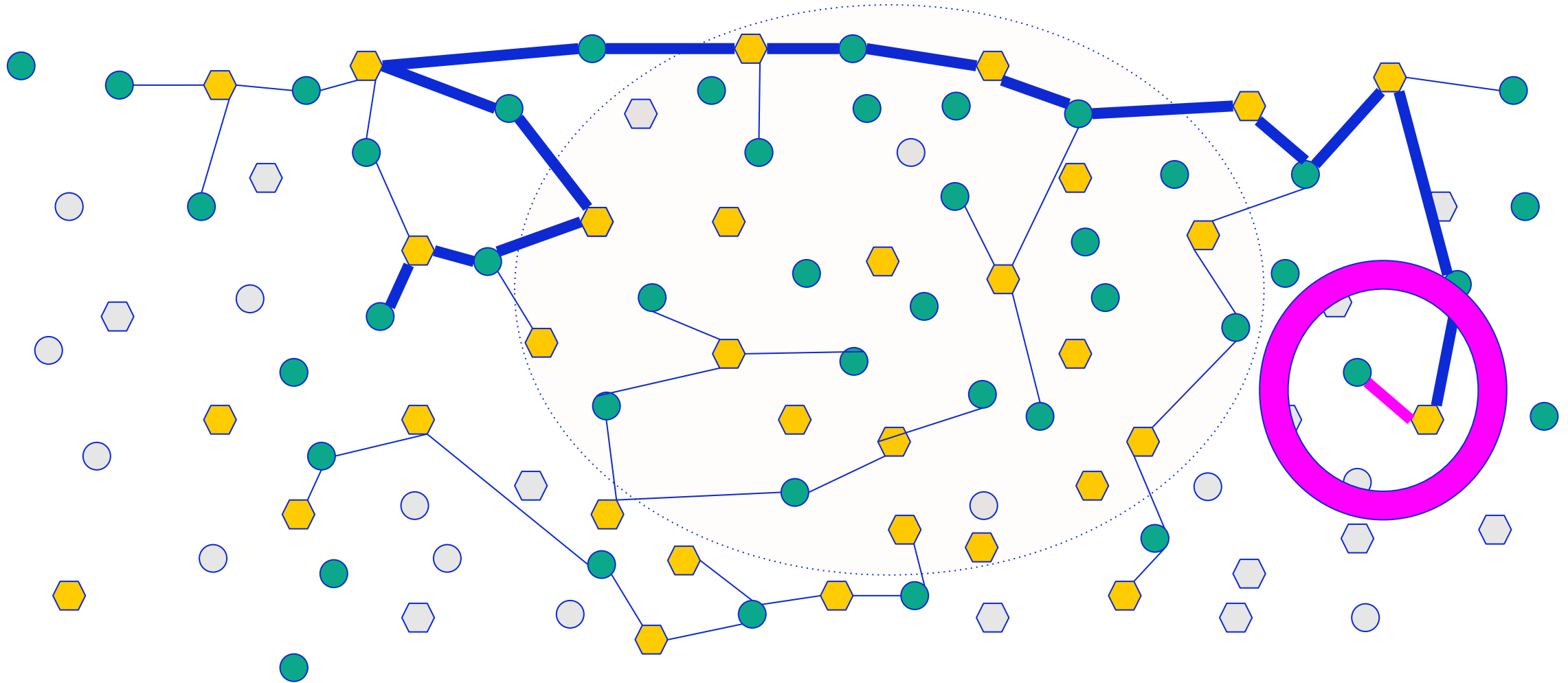
Interoperability identifies what works together



Connecting Interoperable Resources → Usability



Resource Publishing Processes enable REusability





What Does It Mean To “Connect the Dots”?

Defining Interoperability (ISO/IEC: 19941:2017)

“The ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged” (ISO/IEC 17788:2014)

- Cloud interoperability (more generally platform interoperability)

| Scope | Purpose | Examples |
|--------------------|---|---|
| Transport | Data transfer between systems | REST-based HTTP/S, MQTT |
| Syntactic | Receive data in an understood format | JSON, XML, ASN.1 |
| Semantic | Receive data using an understood data model | OData, shared understanding and meaning, OWL |
| Behavioural | Obtain expected outcomes to service requests | UML, pre- and post-conditions, constrain specifications (ODRL) |
| Policy | Assurance that interoperating system follow applicable regulatory and organisational policies | Security policies, cross border transfer restrictions, control of Personal Data |

- Data portability
- Application portability

Key point: standards alone are not meaningful outside the context of the intended purpose



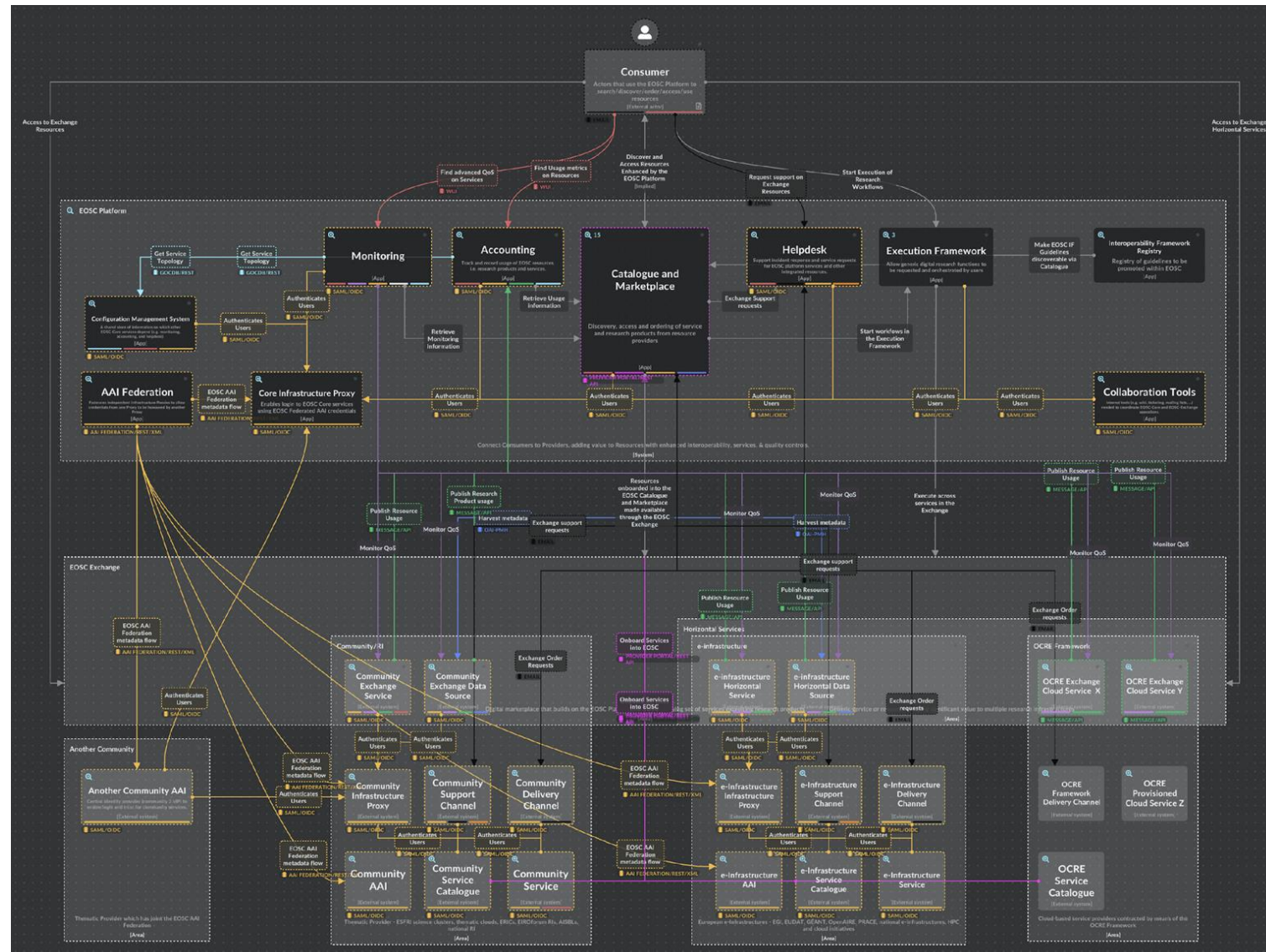
EOSC Interoperability Guidelines

Define each context and purpose where interoperability is required

3 Main Types:

1. Core-Core
 - Connect components of EOSC Core (internal to EOSC Architecture)
2. Core-Exchange: connect Exchange services with EOSC Core Services
 - Onboarding to Exchange using EOSC Profiles
 - EOSC Research Product Harvesting from EOSC Data Sources
 - EOSC Monitoring Service
3. Exchange-Exchange: connect 2 Exchange resources (helped by the Core)
 - EOSC Data Transfer Service

1. Core-Core Interoperability – Standards/API View





2. Onboarding to Exchange: EOSC Profiles

- *Syntactic, Semantic, Behavioural Interoperability:*
 - EOSC resource metadata must be clearly identified,
 - representing information with agreed meaning,
 - with predictable outcomes from onboarding (i.e. resulting resource records can be effectively searched, accessed and used by Users)
- *Guidelines* will published (different DOIs for each type of EOSC resource)
- Interoperability required to enable EOSC resource onboarding, specific guideline for each type of resource:
 - Version-controlled EOSC Profile Specifications under development, including incorporated standards, APIs, controlled vocabularies.



2. EOSC Research Product Harvesting Guidelines

- *Syntactic, Semantic, Behavioural Interoperability:*
 - Research Product metadata must be clearly identified,
 - representing information with agreed meaning,
 - with predictable outcomes from harvesting (i.e. resulting Research Product records can be effectively searched and found)
- *Guidelines* already published (different DOIs for each type of Research Product)
- Interoperability required to enable EOSC Research Product Harvesting, specific guideline for each type of Research Product:
 - [OpenAIRE Guidelines for Literature, institutional, and thematic Repositories](#)
 - [OpenAIRE Guidelines for Data Archives](#)
 - [OpenAIRE Guidelines for CRIS Managers](#)
 - [Draft OpenAIRE Guidelines for Software Repository Managers](#)
 - [Draft OpenAIRE Guidelines for Other Research Products](#)
- All guidelines rely on OAI-PMH harvesting protocol: [OAI-PMH v2.0 protocol](#)



2. EOSC Monitoring Service Integration Guidelines

- *Syntactic, Semantic, Behavioural Interoperability:*
 - Monitoring data must be understood,
 - representing information with agreed meaning,
 - with predictable outcomes from transmission of monitoring data.
- *Guidelines* posted in Zenodo: <https://zenodo.org/record/7118591#.Y3LOu-zMIsc>
 - Specific guideline for each integration scenario
- Interoperability required to enable EOSC Monitoring Service Integration (“Use Case 2: Monitor an Infrastructure (community)”)
 - Infrastructure topology format (4 possibilities)
 - Contact information for personnel responsible for managing profiles
 - Monitoring probe type(s) to be used (from https://poem.argo.grnet.gr/ui/public_probes/)
 - Installed URLs for monitoring probe(s) and corresponding UI(s)
 - Probe source(s) (link to <https://argoeu.github.io/argo-monitoring/docs/Monitoring/guidelines/>)
 - Metric template(s) to be measured: (from https://poem.argo.grnet.gr/ui/public_metrictemplates)
 - Abstracted (“tagged” for reporting) using <https://argoeu.github.io/argo-monitoring/docs/profiles/metrics-tags>
 - Aggregated using Aggregation profile (<https://argoeu.github.io/argo-monitoring/docs/profiles/aggregation-profile>)



3. EOSC Data Transfer Service Interoperability Guideline

- *Transport Interoperability:*
 - Transfer of Research Product from source location to selected storage system
- *Guideline* in development: <https://github.com/EGI-Federation/eosc-future-data-transfer>
- Based on a flexible DTS API: <https://eosc-data-transfer.vm.fedcloud.eu/q/swagger-ui/#/>
- Interoperability required to enable EOSC Data Transfer Service:

| Source types | Transfer system(s) | Storage protocols |
|---|--|---|
| <ul style="list-style-type: none">● Zenodo records● B2SHARE records● Any URLs that resolve to Zenodo/ B2SHARE records● Signposting URLs <link> | <ul style="list-style-type: none">● EGI Data Transfer Service (link to record in EOSC Catalogue) | <ul style="list-style-type: none">● WebDAV with token (=dCache)● S3● FTP● WebDAV with username/pass (EUDAT B2SAFE) |



Guidelines Work Together

- Each compatible File Transfer System could be integrated with the EOSC Monitoring Service, as well as other EOSC Core Services, using the respective guidelines
- Harvesting of Research Products can be enhanced to test for compatibility with the EOSC Data Transfer Service guideline
 - i.e. Zenodo/B2SHARE formats, or signposting compliance
- EOSC Data Transfer Service could be enhanced to check monitoring status of destination storage system, using defined Metrics templates.

EOSC Interoperability Guideline registry would support machine navigation of relevant information

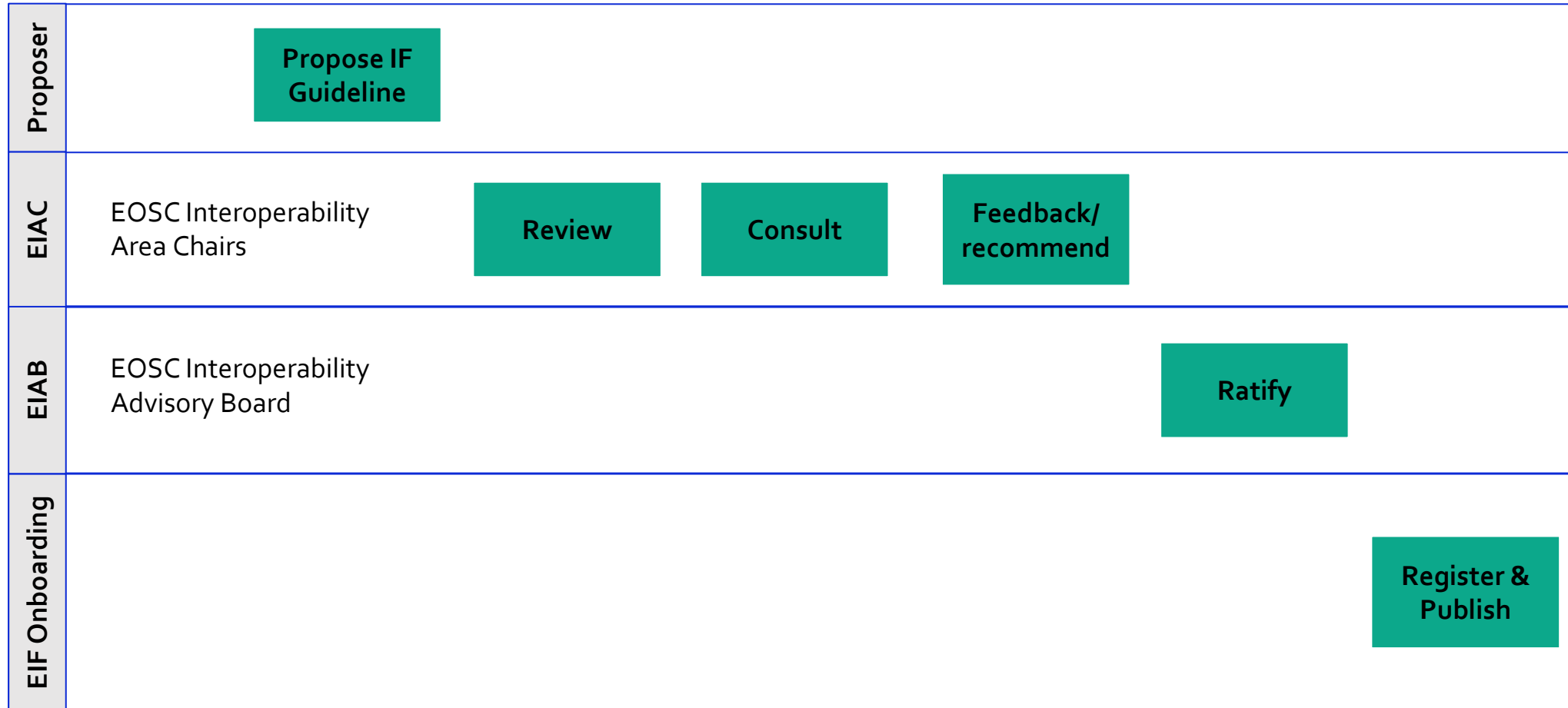


EOSC Interoperability Guideline Registry

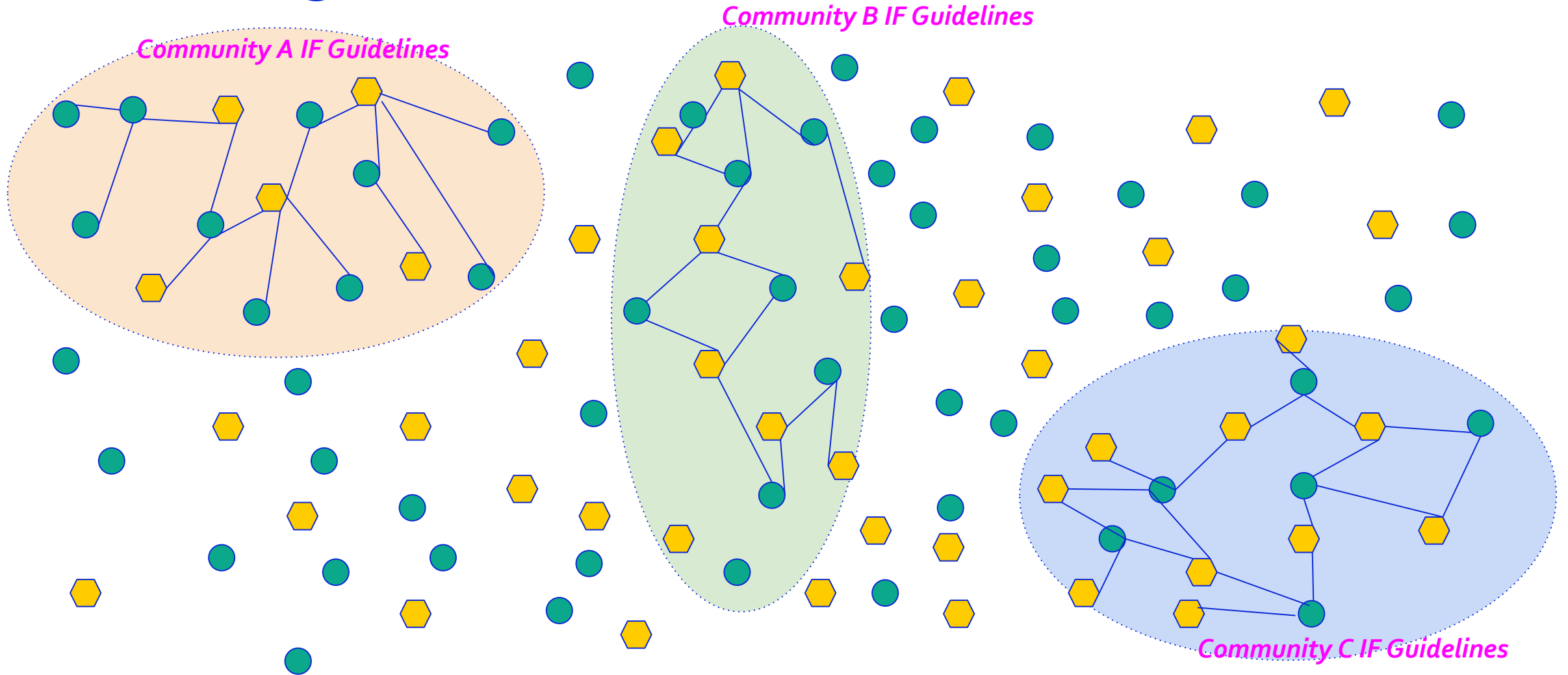
- Publicly available
- Link resources, services and research products to supported guidelines
 - help resource/service owners integrate with the resource catalogue
 - help users discover resources on the basis of the guidelines they support
- Help identify gaps in interoperability.

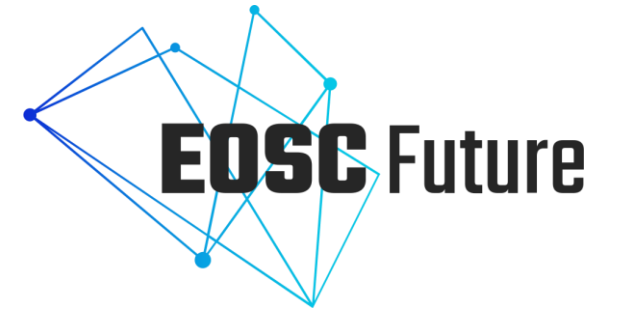


EOSC IF Governance Proposal, Consultation & Ratification Processes



Interesting Next Step: Enhancing New Research Products in EOSC with IF Guidelines





Thank you for your attention!