Multilateral Federations From Research and Education Identity Federations to eduGAIN

Davide Vaghetti (GARR)
eduGAIN Service Owner

Maarten Kremers (SURF)
GEANT Project Trust and Identity Work Package Leader

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Agenda

- Authentication: Local, Centralized, Single Sign On
- Federated Authentication
- Research and Education Identity Federations
- R&E federated identity standards
- AARC Blueprint Architecture

Single Sign On

Primordial Soup

- Nothing yet!

2009 (c) Guillermo Maldonado · Stone age stargate 2

Stone Age

- Application holds all info

Bronze Age

- Centralised credential e.g. LDAP
- Identity in app

Iron Age

- Central credentials and Identity
- App only has specific user data

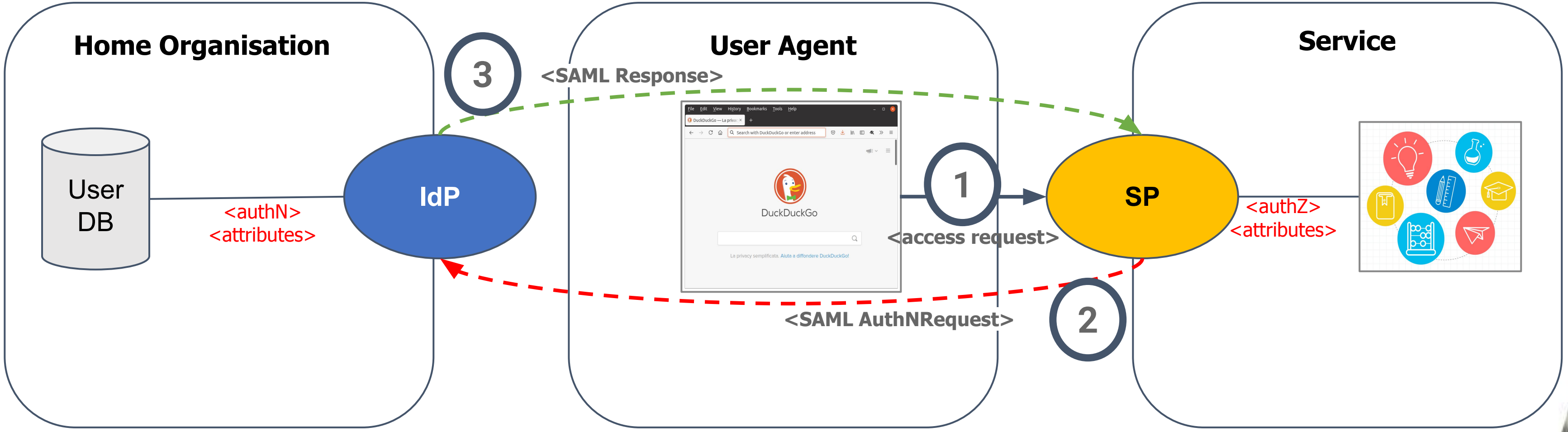
Diamond Age

- Federated Identity
- Share information outside one domain

Local, Centralized and SSO identity management

	Local	Centralized	Single Sign On
Users	Each application has its own user database.	One database or directory for the entire organization.	Users’ database and authentication systems are separated.
Credentials	Each application assigns a set of credentials to its users.	Applications collect user’s credentials and send them to centralized systems for authentication.	Applications access and authentication are completely decoupled. Credentials are managed only by the SSO system.

Federated Authentication in action

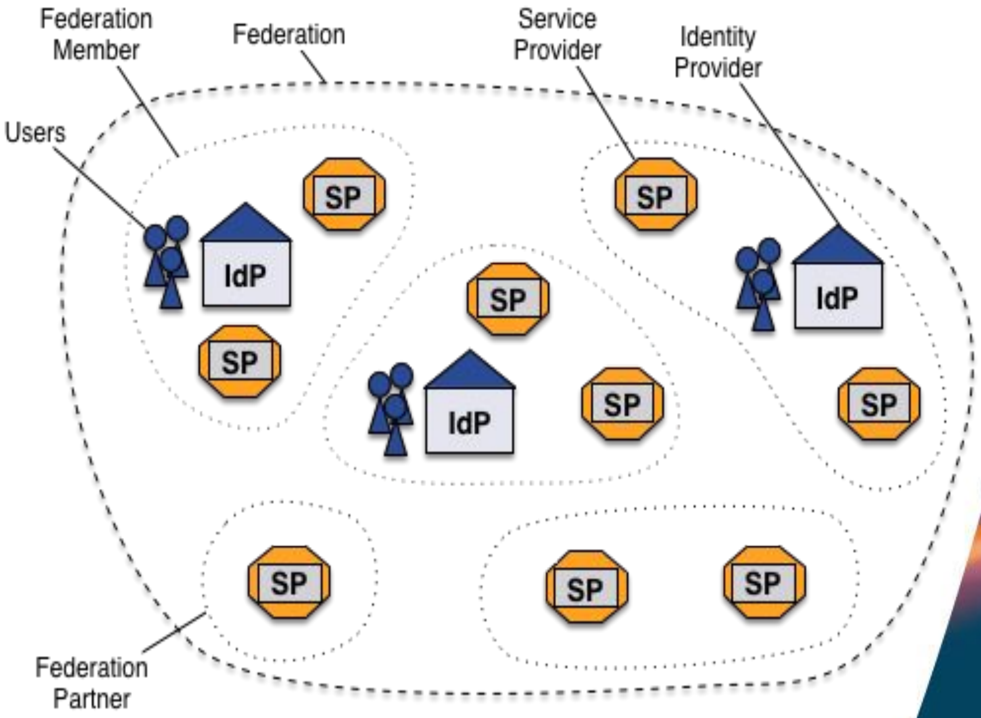


Identity Federation

An identity federation is a collection of organizations that agree to interoperate under a certain rule set.

This rule set typically consists of **legal frameworks**, **policies** and **technical profiles** and standards.

It provides the necessary **trust** and **security** to exchange home organizations' **identity** information to **access services** within the federation.



Identity Provider, Service Provider, Discovery Service

Identity Provider

The system component that authenticates a user (e.g. with username and passwords) and issues identity assertions on behalf of the user who wants to access a service protected by a Service Provider.

Service Provider

The system component that evaluates identity assertions from an Identity Provider and uses the information from the assertion for controlling access to protected services.

Discovery Service

The Discovery Service service, also known as "Where Are You From (WAYF)" service, lets the user choose his home institution from a list and then redirects the user to the login page of the selected institution for authentication.

The Federation Operator

The Federation Operator is the **trusted third party** that manages and signs the metadata about the federation entities

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    xmlns:mdrpi="urn:oasis:names:tc:SAML:metadata:rpi"
    xmlns:mdui="urn:oasis:names:tc:SAML:metadata:ui"
    xmlns:ds="http://www.w3.org/2000/09/xmldsig#" entityID="https://wiki.idem.garr.it/rp" ID="_20240126T080128Z"
validUntil="2024-01-28T08:01:28Z" cacheDuration="PT1H">
    <ds:Signature>
        <ds:SignedInfo>
            <ds:CanonicalizationMethod Algorithm="http://www.w3.org/2001/10/xml-exc-c14n#"/>
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            <ds:Reference URI="#_20240126T080128Z">
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                </ds:Transforms>
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        </ds:SignedInfo>
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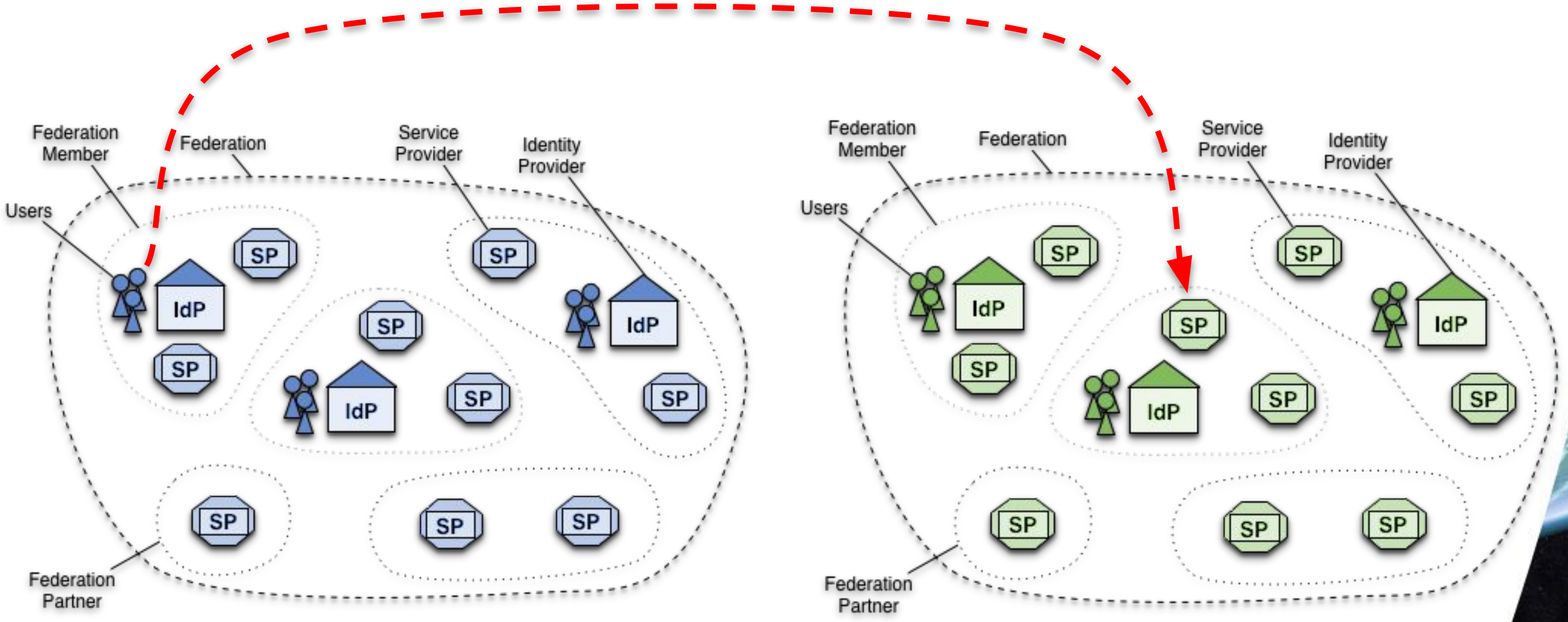
   DnMrtmT</ds:SignatureValue>
        <...>
```

eduGAIN

“eduGAIN ***interfederation service*** *connects identity federations around the world, simplifying* ***access*** *to content, services and resources for the* ***global*** *research and education community”*

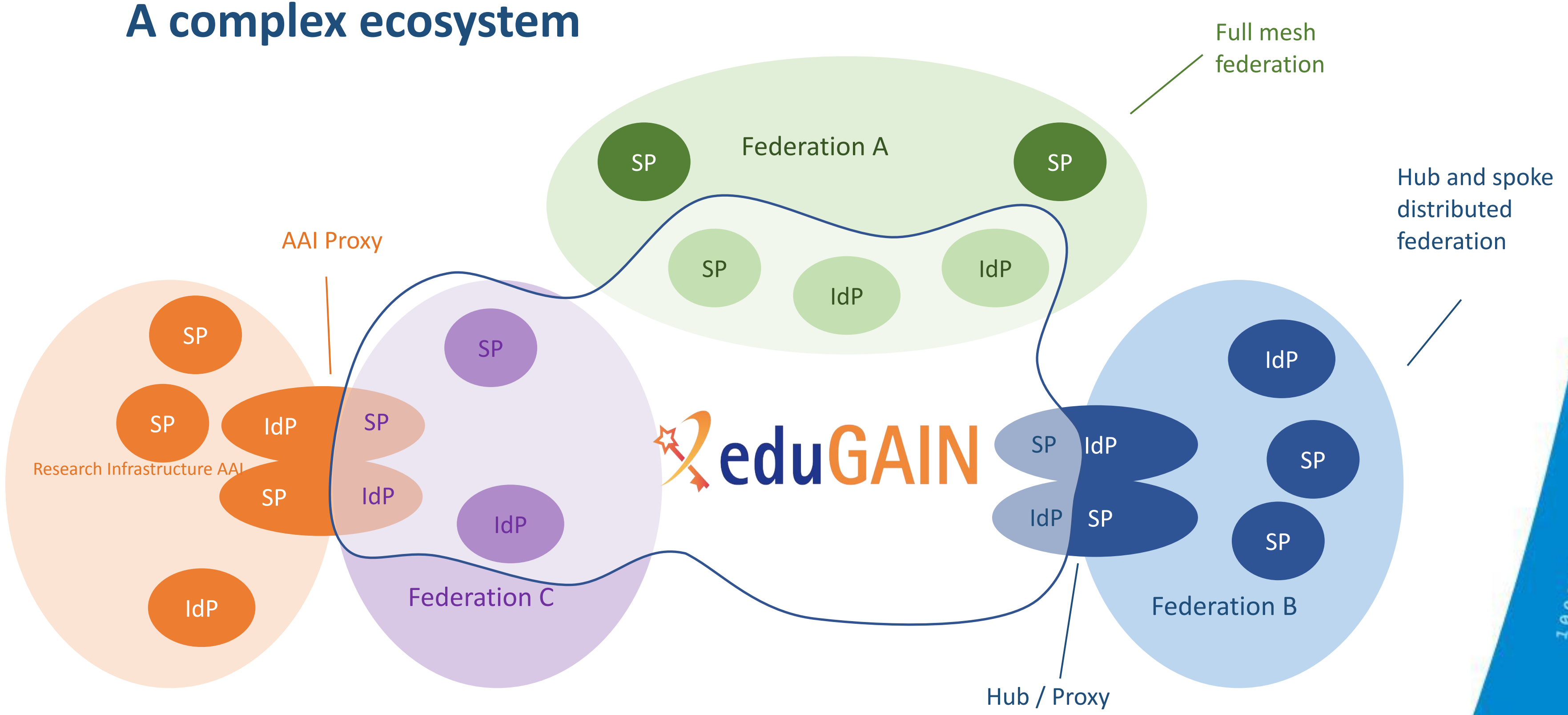
Interfederated access



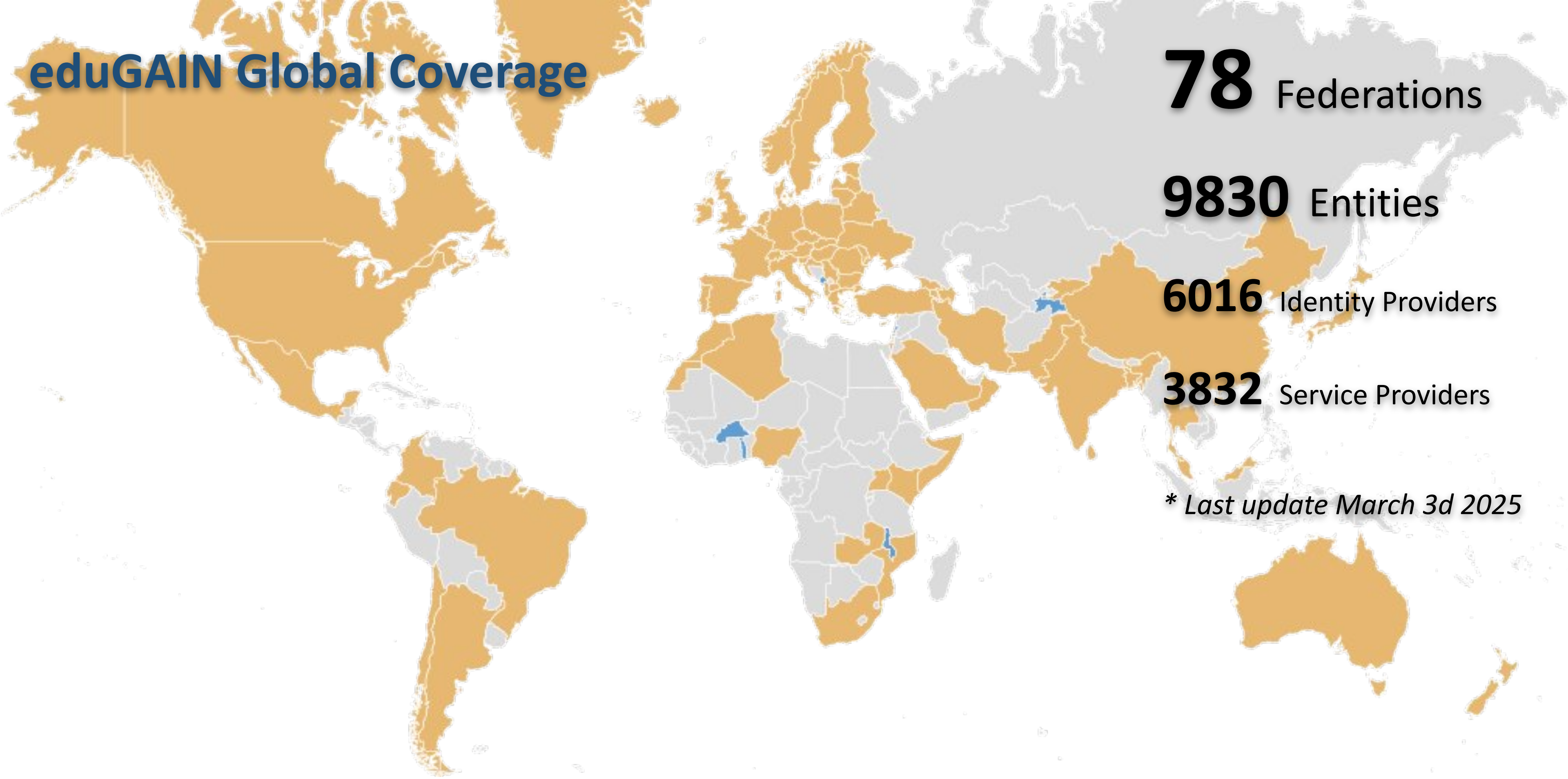
Federation Blue

Federation Green

A complex ecosystem



eduGAIN Global Coverage



78 Federations

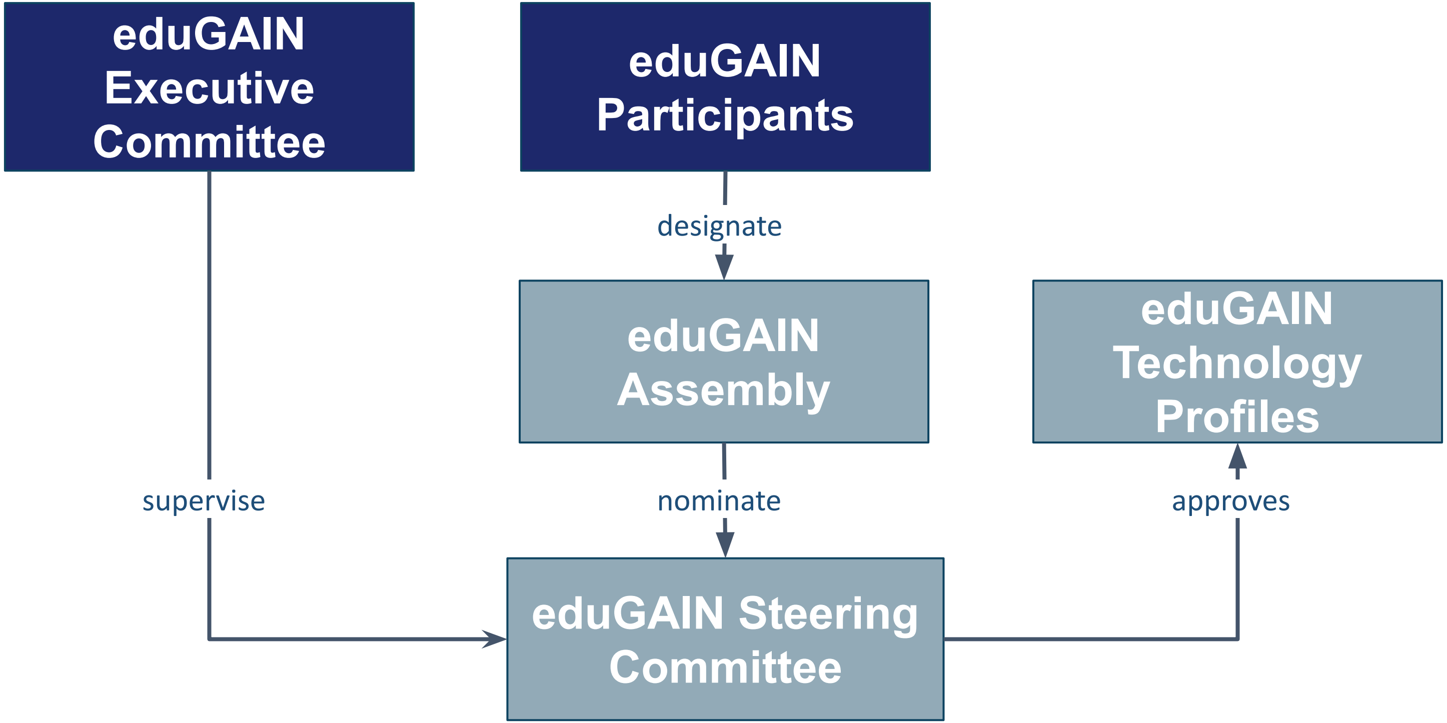
9830 Entities

6016 Identity Providers

3832 Service Providers

** Last update March 3d 2025*

eduGAIN Governance and Tech Profiles


eduGAIN Executive Committee
eduGAIN Participants
designate
eduGAIN Assembly
eduGAIN Technology Profiles
supervise
nominate
approves
eduGAIN Steering Committee

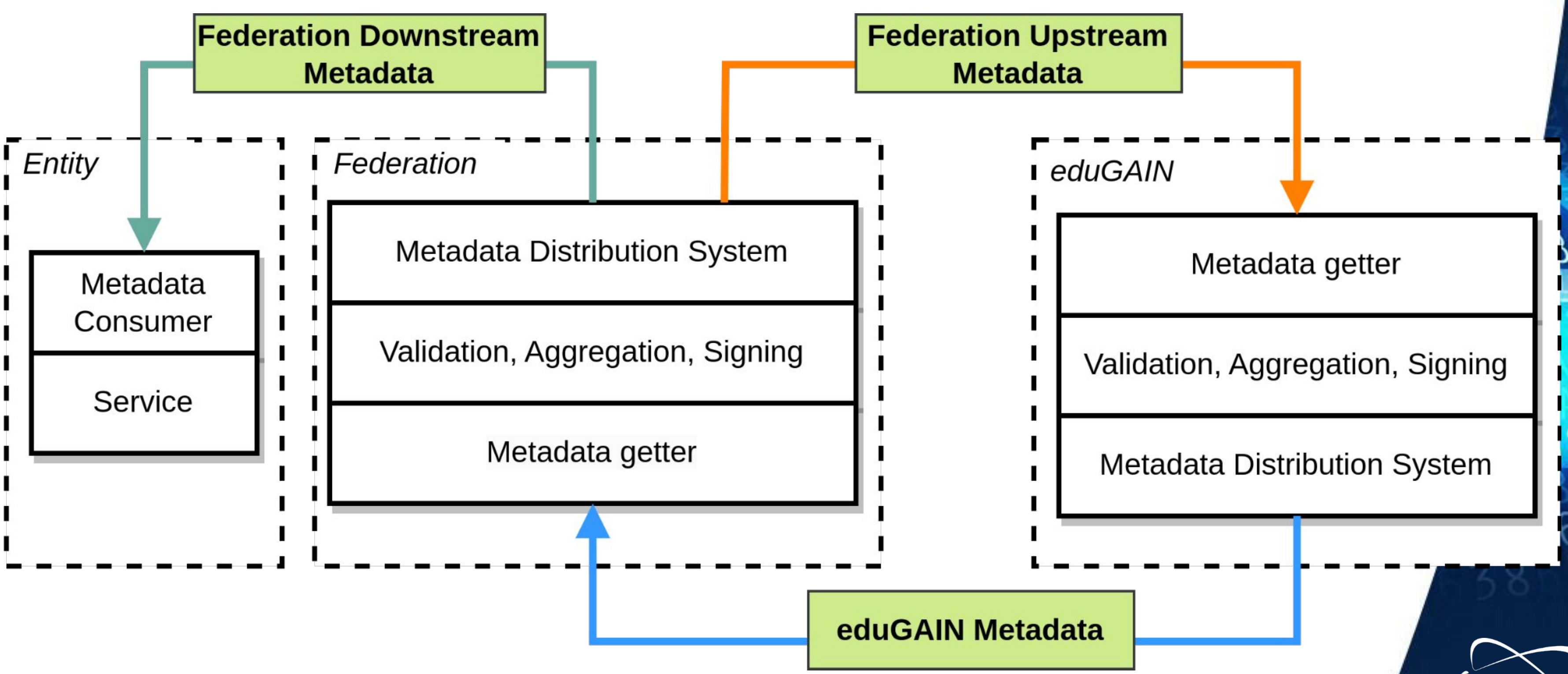
ref https://technical.edugain.org/documents

eduGAIN SAML Profile

Policy requirements	Metadata Registration Practice Statement
Metadata Requirements	SAML V2.0 Metadata Extensions for Registration and Publication Information Version 1.0, SAML V2.0 Metadata Extensions for Login and Discovery User Interface Version 1.0
Metadata Signing	Metadata for the OASIS Security Assertion Markup Language (SAML) V2.0, SAML V2.0 Metadata Interoperability Profile Version 1.0
Metadata Publication	*Federations MUST provide their members with trustworthy SAML Metadata about eduGAIN Entities, signed with their own signing key [..]*
Participant requirements	*Produce and register a URL to the (participant) SAML Metadata export* *Register a signing certificate and an* `mdrpi:registrationAuthority`

ref https://technical.edugain.org/documents

eduGAIN SAML Metadata Creation and Distribution


Federation Downstream Metadata
Federation Upstream Metadata
Entity
Metadata Consumer
Service
Federation
Metadata Distribution System
Validation, Aggregation, Signing
Metadata getter
eduGAIN
Metadata getter
Validation, Aggregation, Signing
Metadata Distribution System
eduGAIN Metadata

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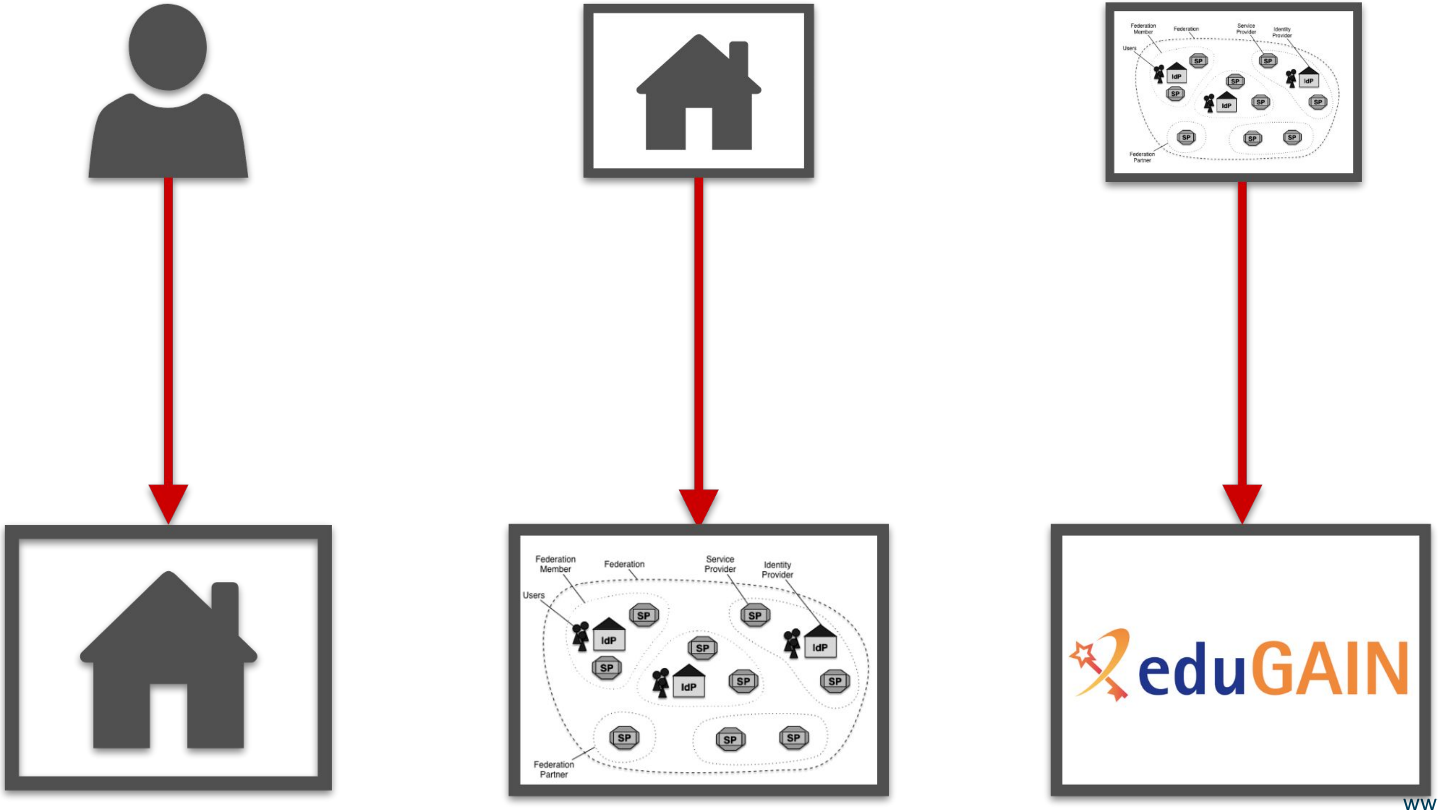
eduGAIN Trust Flow



Users trust Home Organisation

HomeOrgs trust Federations

Federations trust eduGAIN

Challenges of eduGAIN

TRUST ACROSS BORDERS

Establishing trust for identity providers (IdPs) to release attributes and service providers (SPs) to trust data is challenging at federation borders

ATTRIBUTE SHARING

Variability in the types and quality of user attributes shared across federated identity systems complicates resource access and authorization

DISPARATE POLICIES

Differences in privacy, security, and operational policies between participating identity federations hinders harmonized access control

OVERCOMING THESE CHALLENGES REQUIRES DEFINING A COMMON BASELINE OF TRUST AND INTEROPERABILITY STANDARDS ACROSS EDUGAIN PARTICIPANTS.

eduGAIN Contributors

REFEDS

AARC

eduGAIN

FIM4R

kantara INITIATIVE

RENATER CONNECTEUR DE SAVOIRS

AUSTRALIAN ACCESS FEDERATION

Colfire

Edugate

AFIRE

Tuakiri

AAI @EduHr

eduID.cz

SIR

WAYF Where are you from

InCommon

idem garr aai

aconet

eduID

SIFULAN

TAIFE

DFN-AAI

GakuNin

FEIDE

MiNGA

TAAT

confia

Carsi

SURF CONEXT

Belnet R&E Federation

arnes

RCTSaai

haka

grnet

COFRe Comunidad Federada REUNA

SWITCHaai

The UK Access Management Federation FOR EDUCATION AND RESEARCH

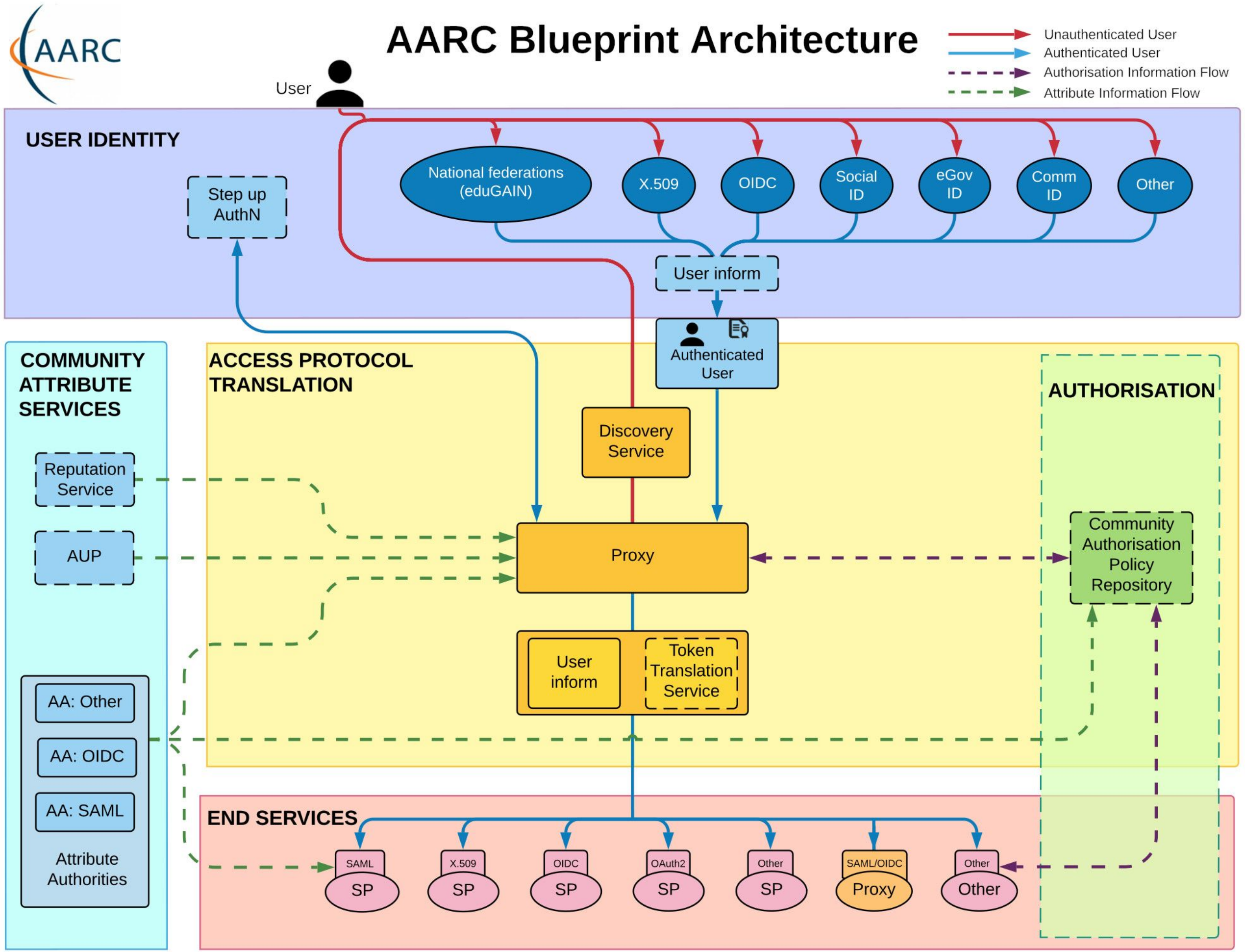
cafe

SWAMID

AARC Blueprint Architecture

- Blueprint for Research Infrastructure (RI) AAIs

- RI AAI Specifics:
  - Manage roles and membership attributes that are in context of that research project
  - Connect specific SPs in context of that collaboration via one AAI Proxy
  - Integrate IdPs not available in context of eduGAIN



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Thank you

Any questions?

davide.vaghetti@garr.it

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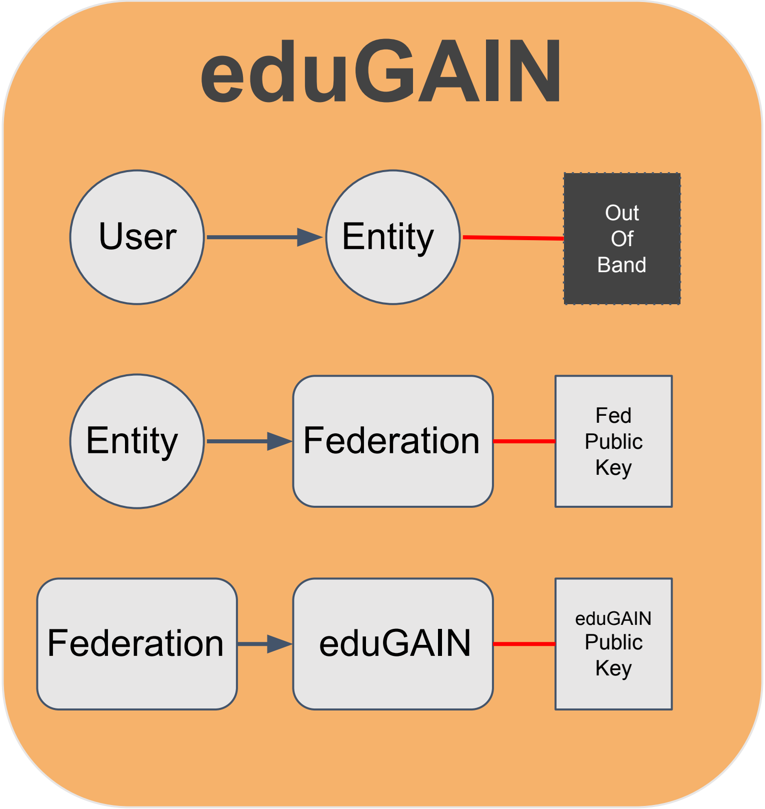
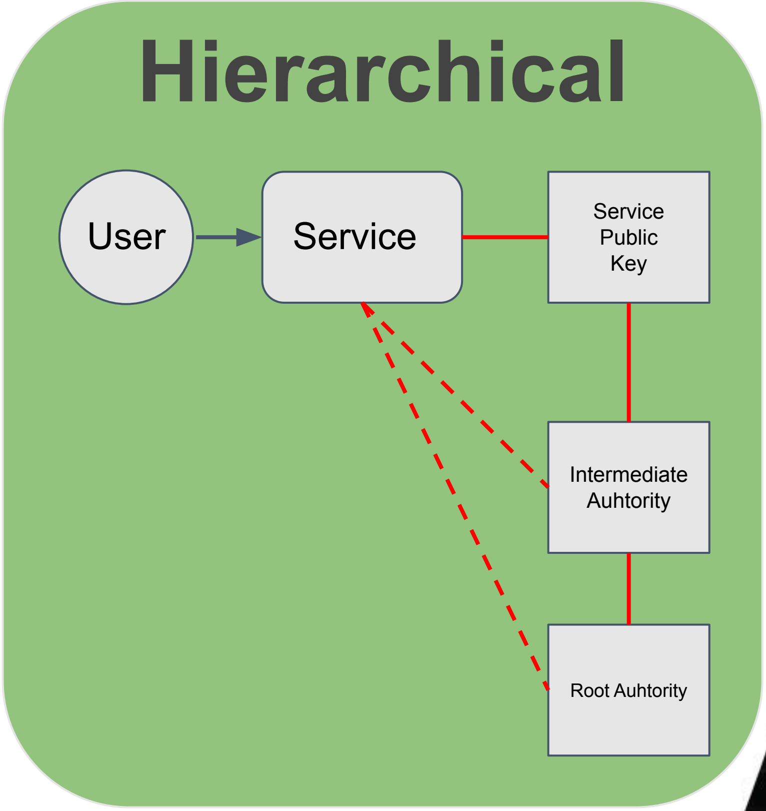
BACKUP SLIDES

eduGAIN vs Hierarchical Trust Flow



eduGAIN



Hierarchical

REFEDS Specifications

The mission of REFEDS (the Research and Education FEDerations group) is to be the voice that articulates the mutual needs of research and education identity federations worldwide. The group represents the requirements of research and education.

Research and Scholarship (R&S) v1.3	**Entity Category**
Hide From Discovery v.1	**Entity Category**
Anonymous Access v.2	**Entity Category**
Pseudonymous Access v.2	**Entity Category**
Personalized Access v.2	**Entity Category**
MFA Profile v.1.2	**Profile**
SFA Profile v.1	**Profile**
Security Contact	**Metadata Extension**
Sirtfi v1 & v2	**Entity Attribute**
Error Handling v.1	**Profile**
Baseline Expectations v.1	**Framework**
Assurance v.2	**Framework**
Code of Conduct v.2	**Entity Category and Best Practice**

https://refeds.org/specifications