# AAI as an essential part of a TRE

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# TRE

- Trusted

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824087

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- Research

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- Environment

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# TRE - Trusted Research Environment

- Trusted
- Research
- Environment

- Where does the AAI fit in?

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# Authentication and Authorization Infrastructure

- Complex solution
- Authentication capabilities
  - Interfaces for services to let users authenticate
    - E.g. using their Home Organization (or other) accounts
- Authorization capabilities
  - Performs basic authorization (allowed to access, approved all policies)
  - Packs services with data for making authorization decisions

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# Authentication and Authorization Infrastructure

- In addition
  - Identity management (IDM) - manage user identities (link, attributes, …)
  - Authorization management (AM) - define rules for authorization (member of group)
    - Define representation of “resource”
    - Define representation of “access conditions”
  - Manage authorization data (e.g. via identity management)
- Examples - ELIXIR AAI, Life Science AAI (LS Login), EGI Check-In

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# Activities in a TRE (GDI example)

| Data Journey | | Data Infrastructure |
|---|---|---|
| Data Preparation | Pre-processing to agreed standards, annotation with metadata etc | Data Reception |
| Data Inclusion | Physical transfer of data incl., legal transfer of data to 1+MG to enable visibility in data catalogue | |
| Data Storage & Management | Including GDPR Compliant processing environment, data versioning, backup etc | Storage and Interfaces |
| Data Discovery | Discovery of data using GDPR compliant APIs e.g., Beacon | Data Discovery |
| Data Access | A mechanism(s) by which the data controller can authorise access to select dataset(s) | Data Access Management Tools |
| Data Use | Data processing for the approved purposes | Data Processing |

Data discovery

Access management tools

Data processing

Data reception

Storage and interfaces

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# Different parts of a (sample) TRE

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# Interconnecting components

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# Interconnecting components (a better way)

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# Example user walkthrough

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# Putting AAI into a TRE

- AAI in the frontend
  - Log in to components via AAI
- But also in the backend
  - Holding authorization information (e.g. GA4GH Passports & Visas)
  - Token issuer for API interactions (e.g. OAuth2)
  - Provisioning
- Hidden benefits
  - Common user ID - components understand each other who the user is
  - Familiar authentication flow
  - Single-Sign On - login once, access the whole infrastructure

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# Genomic Data Infrastructure

- Support the EU 1+Million Genomes (1+MG) initiative (Digital Europe policy) ambition
- Establishing a federated, sustainable, interoperable and secure infrastructure based on open community standards.
- 20 1+MG signatory countries in GDI
  - Will provide a node or Data Hub
  - Each country manages their own data (e.g. regional hubs)
  - Data hubs provide cross-border data analysis
- Expected that genomic and phenotypic data clinically derived and from Genome of Europe
- Overall data infrastructure provides 5 main functionalities
- **Life Science AAI** is a key product in the infrastructure
- https://gdi.onemilliongenomes.eu/

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