Introduction to TREs and Other Es

Setting the Scene

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Luxembourg National Data Service

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Motivating Questions

- But, this session is about TREs?

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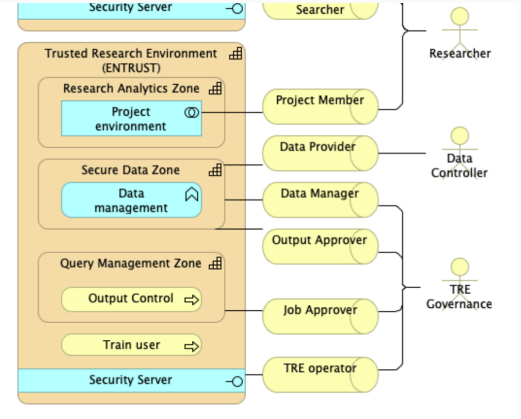
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Definitions?

- TRE (EOSC-ENTRUST): UK secure research data environment concept.
- TRE (SATRE): Secure computing environments specifically designed for research using sensitive or personal data.
- SPE (EOSC-ENTRUST): A TRE contains a functional domain, a Research Analytics Zone (TRE-RAZ), that is equivalent to an SPE.

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What is a TRE?



- **RAZ** provides controlled environments for analytical work
- **SDZ** host sensitive datasets under strict access and processing constraints
- **QMZ** indirect queries/federated analyses of data via job submission

Sætrom, P., Lehväslaiho, H., Stansberg, C., Awan, H., Dijkstra, F., Winge, I., & Hesam, A. (2026). EOSC-ENTRUST D14.3 Year two version of EOSC-ENTRUST Blueprint & Interoperability Framework.

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SPE Is a Legal Term

> *'secure processing environment' means the physical or virtual environment and organisational means to ensure compliance with Union law, such as Regulation (EU) 2016/679, in particular with regard to data subjects' rights, intellectual property rights, and commercial and statistical confidentiality, integrity and accessibility, as well as with applicable national law, and to allow the entity providing the secure processing environment to determine and supervise all data processing actions, including the display, storage, download and export of data and the calculation of derivative data through computational algorithms;*

Regulation (EU) 2022/868 (Data Governance Act), art. 2(20), OJ L 152, 3 June 2022, p. 1.

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SPE is a vehicle of compliance.

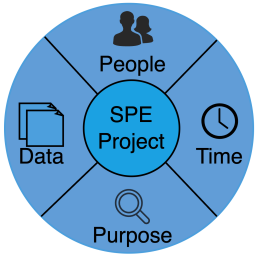
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... That Boils Down To:

Ensure that the *right* people process the *right* data for the *right* purpose.

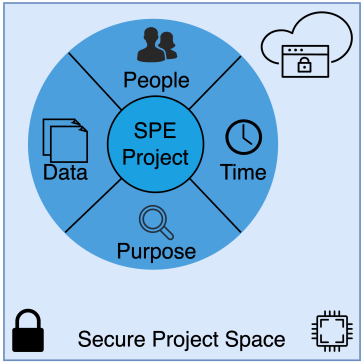
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Common SPE design



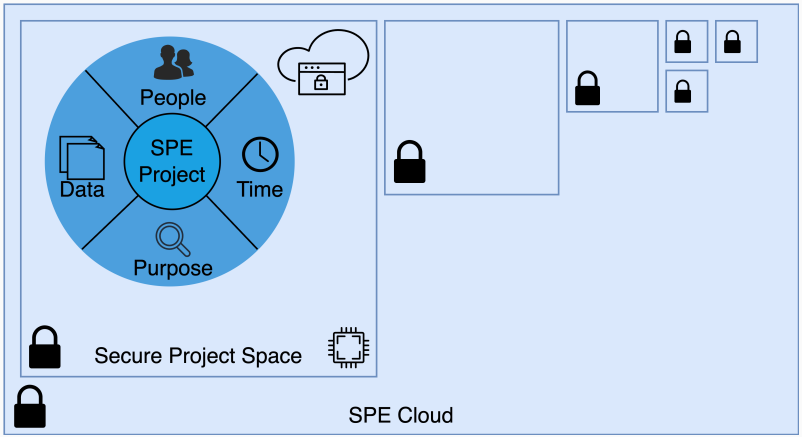
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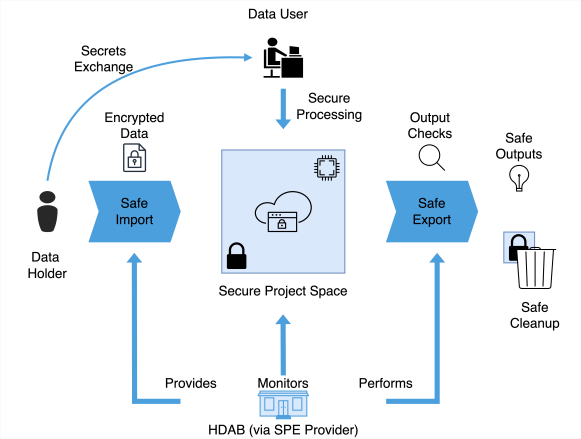
Digression: TEHDAS2

> *... used to mean the SPE service run by the operator and to refer to collective functionalities of SPE user accessible instances.*

Lehväslaiho, H. et al. (2026) D7.4 Technical specification for Health Data Access Bodies on the implementation of secure processing environments: Technical, functional and security specifications of secure processing environments. TEHDAS2 Deliverable D7.4. TEHDAS2 Consortium.

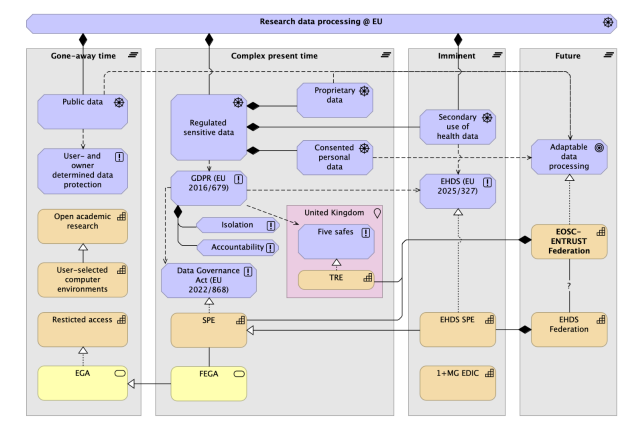
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Common SPE workflow



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Evolution



Sætrom, P., Lehväslaiho, H., Stansberg, C., Awan, H., Dijkstra, F., Winge, I., & Hesam, A. (2026). EOSC-ENTRUST D14.3 Year two version of EOSC-ENTRUST Blueprint & Interoperability Framework.

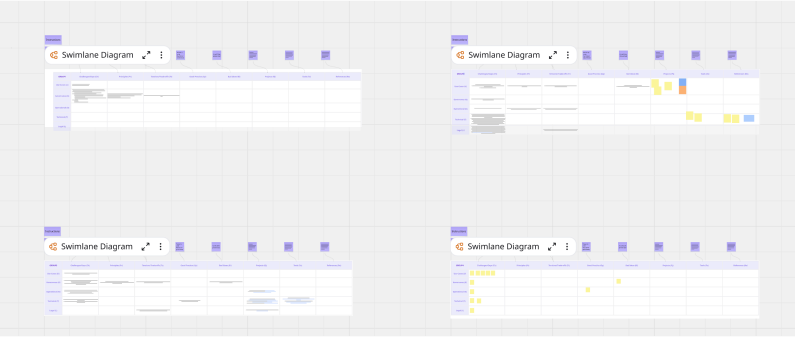
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End No 1

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NextGenSPE 2026: Discussion on challenges for the future



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The point of the workshop

- Increasing scale and complexity of research/compute
- Cross-organisational and international collaboration (federation)
- AI and advanced analytics requirements
- Trust, accessibility

Presentations available on Zenodo

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Principles

- Trust is built through governance as well as technology
- Security should be proportionate to risk
- “Usability is a security requirement”
- Federation requires shared trust frameworks (including on disclosure control)
- SPEs should enable research, not merely restrict access

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Challenges

- Lack of common understanding of federation
- Governance complexity across organisations
- Inconsistent security requirements
- Interoperability barriers
- Slow onboarding and approval processes
- Balancing security, usability and scalability

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Good Practice

- Adopt risk-based approaches
- Use open standards where possible
- Design for researchers, not only administrators
- Harmonise governance and operational practices
- Focus on practical interoperability
- Build trust frameworks before technical federation

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Bad Ideas

- Security at the expense of usability
- Creating new standards where existing ones suffice
- Treating governance as an afterthought
- Assuming technical solutions can solve organisational problems (“first design SPE, then HPC”)
- Over-restrictive environments that drive users elsewhere
- Federation without clear trust arrangements

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Some news from EHDS2 SPE CoP

- We mapped the common SPE workflows, needs and location in business capability mapped
- We don't share the view, nor understand (cross-country) federation .. yet
- Training and using AI models on/for sensitive data is getting in focus and is a big source of anxiety
- Output control, in general, seems unscalable

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End No 2

THANK YOU (2)

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