The Crick's collaborative secure research environment platform - TRELLIS

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The Francis Crick Institute
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Impact through partnership

Europe's largest Biomedical Research Institute, based in King's Cross
All **science is built on collaboration and partnership**. The Crick has an extensive international network of collaborators across academia, industry and healthcare, including around 38 different NHS trusts and organisations, many in London.

We have around 120 research groups about ¼ have some clinical activity

We develop long-term partnerships with a range of global organisations, creating new opportunities by bringing together people and ideas

- **NHS Partnerships:** UCLH, Royal Marsden, Royal Free, King's, Imperial, GSTT, Bart's and many more.
- **Research Institutes:** Alan Turing Institute, EMBL
- **Networks and conveners:** Crick African Network, BRIDGE, MedCity
- **Innovation partners:** LifeArc, Knowledge Quarter, CRUK
- **Funders/Charities:** British Heart Foundation, Wellcome Leap, CRUK, EU
- **Industry partners:** AZ, GSK, MSD, Pfizer, Deepmind - including collaborations and colocation
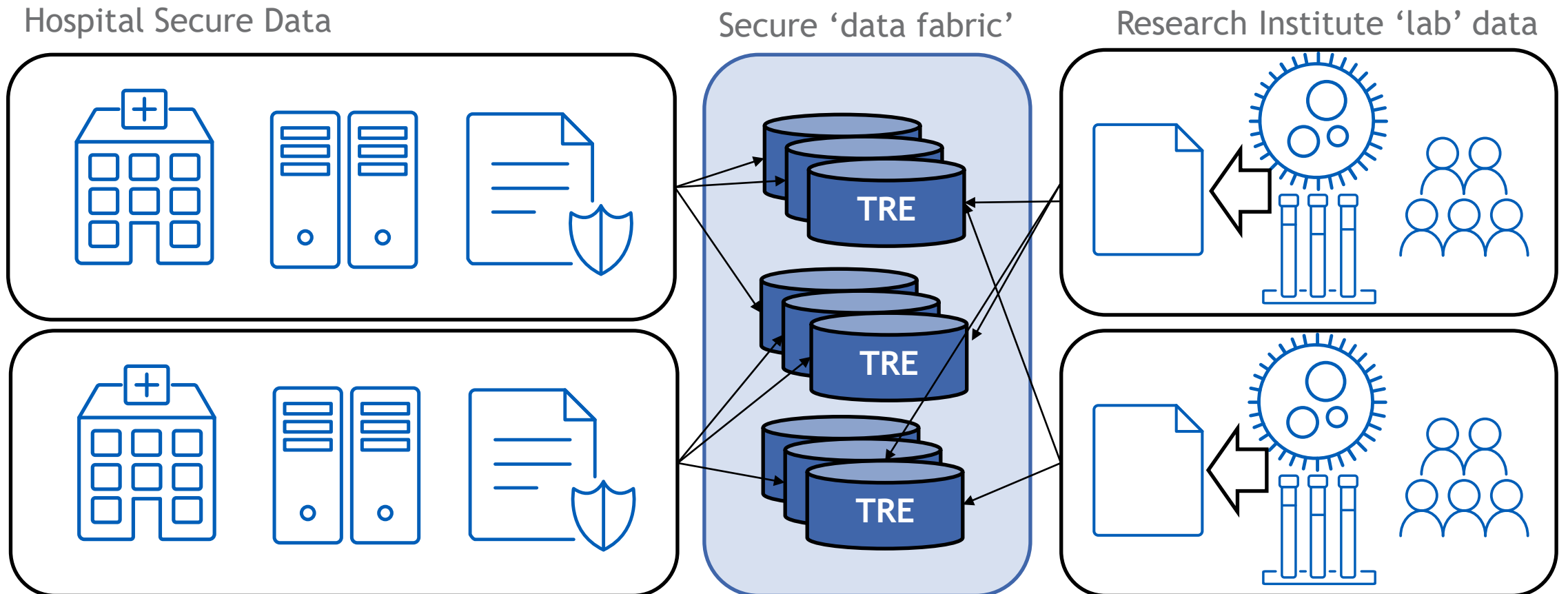- Embedded translation team working with majority of research groups
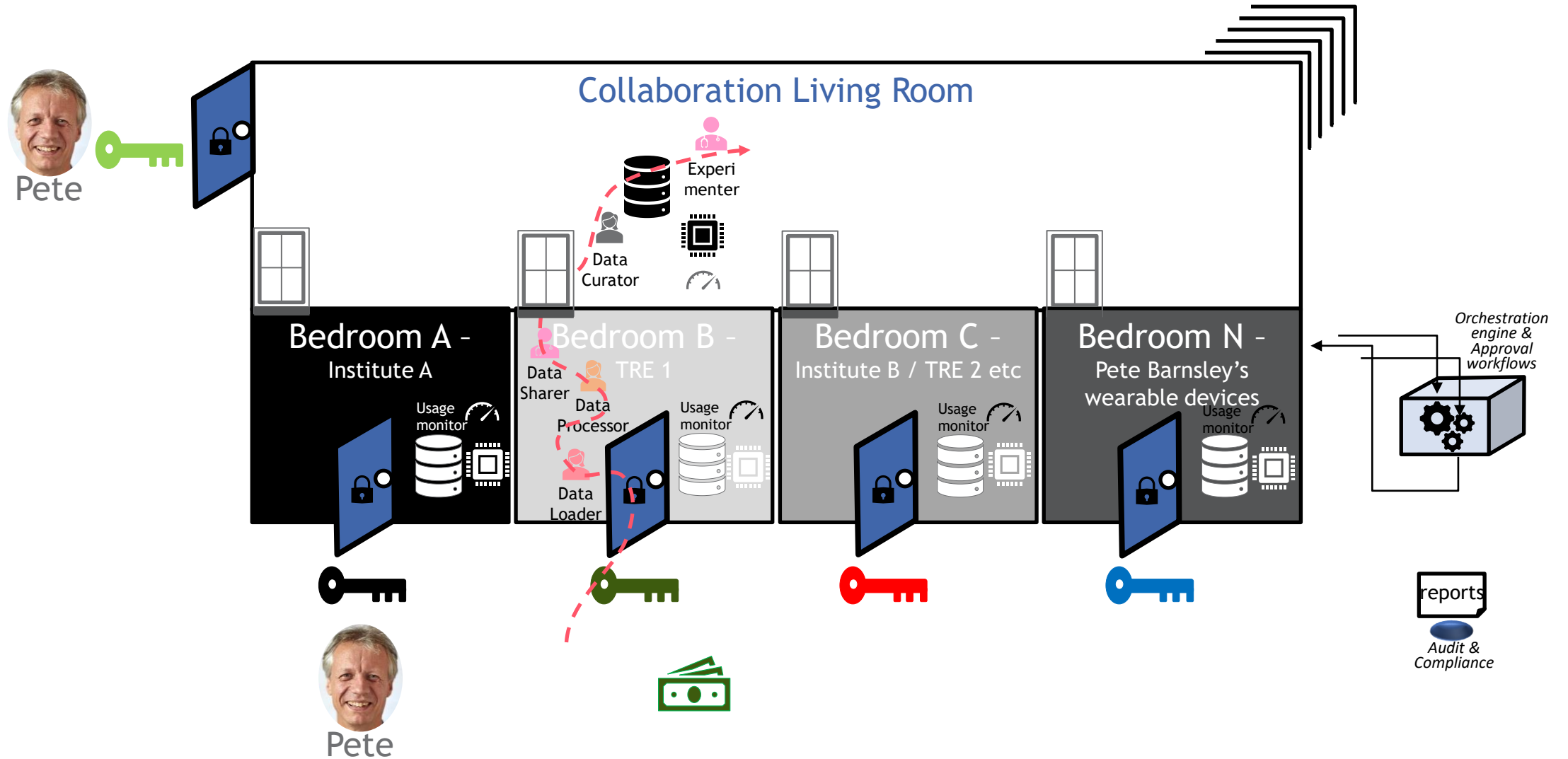
...and many others

Discovery Research is all about collaboration – between researchers, institutes, hospitals and industry Partners: Inception to Archive (I2A)

Aim:-
Have a secure 'data fabric' to allow SAFE 'pop-up' research environments – quickly, cheaply and securely


Hospital Secure Data

Secure 'data fabric'

Research Institute 'lab' data

TRE

TRE

TRE

The TRELLIS Platform – A hotel suite with multiple bedrooms

THE FRANCIS CRICK INSTITUTE

Pete

Collaboration Living Room

Experi menter

Data Curator

Bedroom A –
Institute A

Usage monitor

Bedroom B –
TRE 1

Data Sharer
Data Processor
Data Loader

Usage monitor

Bedroom C –
Institute B / TRE 2 etc

Usage monitor

Bedroom N –
Pete Barnsley's wearable devices

Usage monitor

Orchestration engine & Approval workflows

reports

Audit & Compliance

Pete

The Crick trusted research environment (TRELLIS) Platform …

The Platform Reference Architecture – items coloured purple constitute 'the platform' – primary process flow of **Inception to Archive (I2A)** process is left to right
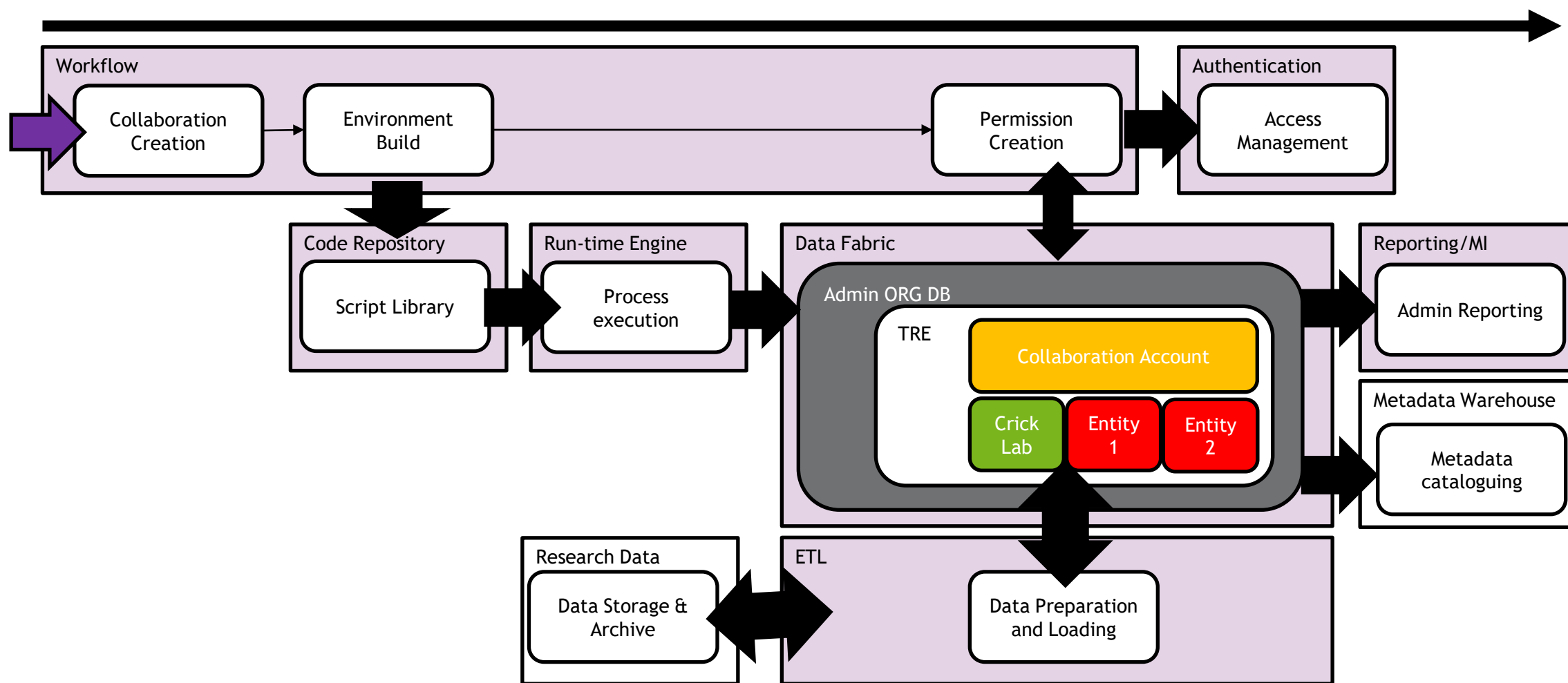
Cloud eco system for Crick TRELLIS TRE environment

The Platform Reference Architecture – components used to deliver the TRE
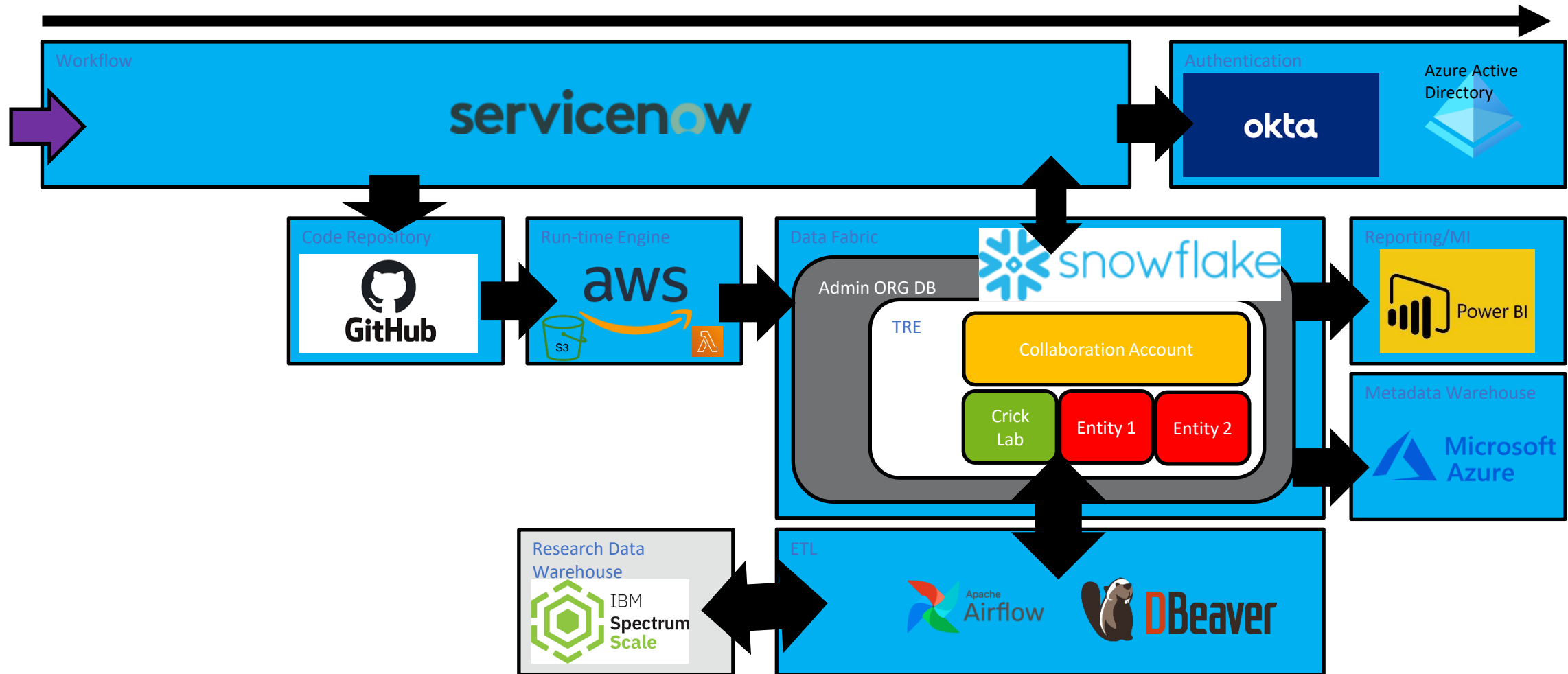
Demo! Let's risk it ☺

How is trust responsibilities distributed between the parties?

TRE Performing Organisations and Research Performing Organisations share the delivery of the 5 safes. It is not the TRE provider that takes this on alone

A=accountable
R=Responsible
C=Consulted
I=Informed

5 Safes	TRE (TREPO)	Researcher (RPO)	Comments
Project	✓ CI	✓✓✓ AR	Ethics approval, grant funding and signing legal agreement
People	✓ CI	✓✓✓ AR	Affiliation of researchers, training and brand image.
Setting	✓✓✓ AR	✓ CI	The TRE environment and tools are services provided
Data	✓✓✓ AR	✓✓ AR	The access to data and its control. But choice of data stays with RPO
Output	✓ CI	✓✓✓ AR	Researchers release, TRE contracts can stipulate and sanction.

- TRE service contract needs to embed this distribution of accountabilities (in a RACI type model) within it.
- The TRE should not take over project assurance but a handshake (API) between the workflow orchestrating approvals should trigger the setup of project spaces (the hotel suite – living and bedrooms).
- People need to be identified by the TRE and accredited by an accredited Research PO.
- The TRE will orchestrate access to datasets approved for use. The RPO and researchers will be accountable for sharing the data into the TRE project space.
- Recording outputs needs to be enhanced as a disciple, and sanctions used to encourage and ensure adoption.

TRELLIS and the 5 safes

Safe	Design points	Score
Projects	1. A proposal needs ethics approval and legal approval before a collaboration can be started and a TRE created solely for, and explicitly restricted to, that project.	
People	1. All people joining have to be part of a established, and approved, Research performing Organisation. The organisation has signed a legal document confirming its involvement in the collaboration TRE. 2. All people can only get access through their work email and not by any "home" non affiliated address. 3. All people can only do what is provided for them by one of the 5 different roles related to research process (Load, Process, Share, Curate or Experiment)	
Settings	1. Secure cloud technology (ISO27001, HIPPA) held in any region available around the world. 2. Data share means full control rests with owner / processor. 3. Individual approvals, by accountable people, for person setup, only using affiliated research entities. 4. Account email validation, Multi-factor passworded access 5. Specific roles – separating out the end-end research process. Ensuring conscious action. 6. Full metadata on login, access, activity, usage, roles, etc. allows strong standardised audit and compliance reporting	
Data	1. Data is anonymised as per need and agreement. 2. Data is held in secure "bedroom" and released to the "living room" under the terms of the agreement and by approval of someone with the *Data Sharer* role. 3. Possibility of monitoring audit for copy / duplication commands and remedial action (incl. automatic removal of new table of data / suspend user)	
Outputs	1. Handled by the individual research collaborations.	