How might NREN's support TREs?
A UK perspective

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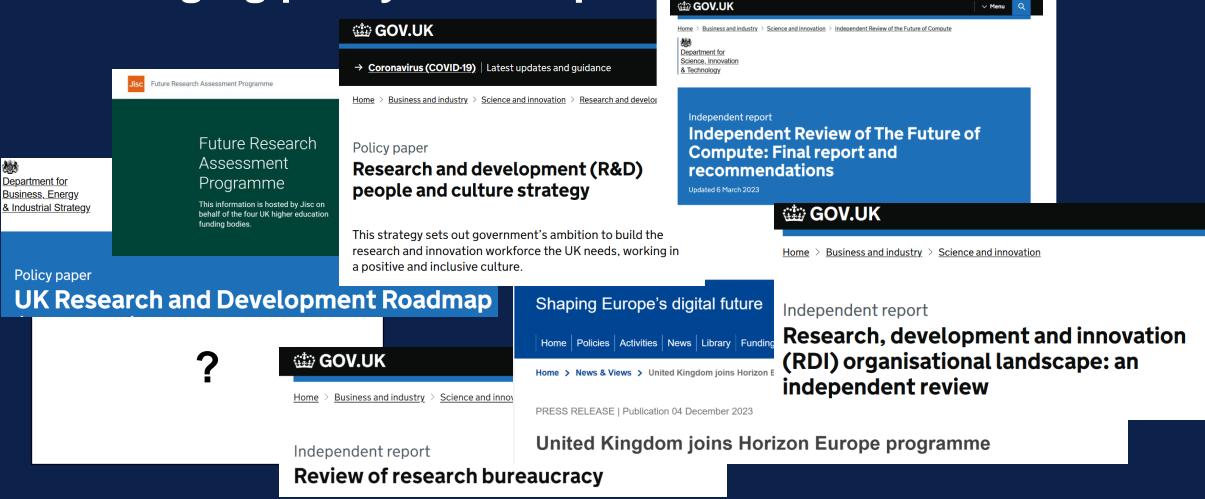
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What the session covers

1. The changing policy space: Developing Jisc's strategic themes for R&I

2. The TRE: An exemplary part of the international research landscape

3. Jisc's role and support: Scope, challenges, opportunities

4. The NREN role: Scope, challenges, opportunities

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1. Changing policy landscape

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→ **Coronavirus (COVID-19)** | Latest updates and guidance

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Policy paper

Research and development (R&D) people and culture strategy

This strategy sets out government's ambition to build the research and innovation workforce the UK needs, working in a positive and inclusive culture.

Jisc Future Research Assessment Programme

Future Research Assessment Programme

This information is hosted by Jisc on behalf of the four UK higher education funding bodies.

Department for Business, Energy & Industrial Strategy

Policy paper

UK Research and Development Roadmap

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Independent report

Review of research bureaucracy

Shaping Europe's digital future

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PRESS RELEASE | Publication 04 December 2023

United Kingdom joins Horizon Europe programme

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Department for Science, Innovation & Technology

Independent report

Independent Review of The Future of Compute: Final report and recommendations

Updated 6 March 2023

GOV.UK

Home › Business and industry › Science and innovation

Independent report

Research, development and innovation (RDI) organisational landscape: an independent review

High level of influence on the R&D space

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1. Jisc's strategic themes for R&I

Trusted, secure and open research

Sector-wide and scalable facilitation of research and its management

Sustainable digital research infrastructure

Pursuing collaborative efficiencies in digital research infrastructure

Reducing research burdens

Leading the further integration of the research ecosystem

Research innovation with integrity

Advanced technologies for research with integrity as an innovation driver

Helping things work better - for us all - as beneficiaries of research

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2. The TRE: An exemplary part of the research landscape

"A TRE is a digital system, managed according to the Five (or six, or seven) Safes principles, that securely holds and provides access to de-identified sensitive data for approved researchers.

"TREs are highly secure computing environments that provide remote access to resources for approved or accredited researchers to use in research"

Office for National Statistics, UK Data Service, HDRUK, ADRUK

Expertise, implementation and community grown over decades

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2. The TRE: An exemplary part of the research landscape

- ISO 27001 Information security, cybersecurity and privacy protection: iso.org/standard/isoiec-27000-family

- Office for National Statistics: 5 Safes: The 'Five Safes' – Data Privacy at ONS | National Statistical

- UK Health Data Research Alliance: TRE Principles and Best Practices: Building Trusted Research Environments - Principles and Best Practices; Towards TRE ecosystems (zenodo.org)

- Design choices for productive, secure, data-intensive research at scale in the cloud: https://arxiv.org/abs/1908.08737

- UK Digital Economy Act includes a framework for sharing personal data in research: Digital Economy Act 2017 (legislation.gov.uk)

- Handbook on Statistical Disclosure Control for Outputs: thf_datareport_aw_web.pdf (ukdataservice.ac.uk)

- Core Trust Seal: standard for Trustworthy Digital Repositories Requirements: About – CoreTrustSeal

Significant resource to support TREs

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2. The TRE: An exemplary part of the research landscape

A range of legislation, governance and guidance: Consolidated

Noting complexity, multiple standards and technical implementations, DAREUK: Home - DARE UK *Standard Architecture for Trusted Research Environments (SATRE)* https://dareuk.org.uk/driver-project-satre/

- Information governance

- Computing technology and information security

- Data management

- Supporting capabilities

An evaluation methodology for TREs

Extending the focus to more disciplines

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2. The TRE: An exemplary part of the research landscape

A range of legislation, governance and guidance:

- The UK Government's National Technical Authority's Trusted Research Guidance for Academia https://www.npsa.gov.uk/trusted-research-academia

- UK Research and Innovation (UKRI): Trusted Research and Innovation Principles UKRI-170821_TrustedResearchandInnovationPrinciples.pdf
  - Assessment of Partner Suitability
  - Managing Information and Knowledge Sharing
  - Commercial Application

Broader trusted research agenda is relevant

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2. The TRE: An exemplary part of the research landscape

Complexity is a concern:

157 of 285 UK universities submitted returns to the Research Excellence Framework (REF) in the UK in 2021

Many operate TREs for personal, commercial or otherwise sensitive research

Many work in collaboration with other universities, research investments, industry, government, the charitable sector and with international partners

"There's potential for a lot of duplication across disciplines because they're developing entirely different technical infrastructures."

"It's just too difficult to get [data]. [Researchers] are just made to jump through too many hoops."

"Making sure things remain safe from things that are more accidental or externally malicious actors, is more a challenge."

TREs increasingly viewed through a sector-wide lens of sustainability

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3. Jisc's role and support to date: Scope, challenges, opportunities

- **Network:** All research undertaken by UK HEIs and in their collaborations with public research organisations, industry and international partners is undertaken over: Janet Network - Jisc

- **Cyber security services:** Jisc Cyber Security Portal

- **Access management:** UK Access Management Federation – Jisc, participation in REFEDs: REFEDS Assurance Framework – REFEDS

- **Licensing:** Software, Cloud services, tools, frameworks, purchasing / procurement

- **Consultancy:**
  - Isambard AI investment with connectivity, security and process
  - Specification of a clearing house for international due diligence

Composing the foundational technologies for open, secure and trusted research

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UKRI Commissioned report: Mapping federation journeys

- Hearing expert voices from the sector

- Helping set out the scope and definitions

- Having many interests represented well

- Extending exemplary approaches

- Establishing innovation potential

- Developing principles and a roadmap

https://www.jisc.ac.uk/reports/mapping-federation-journeys-for-optimising-the-uk-digital-research-infrastructure

Seven themes in the report

Scoping, commissioning & funding

Software, hardware & platforms

People, culture & skills

Trusted & secure research

Data/ output management & workflows

Sustainability, service & capacity

Emerging disciplines & technologies

Trusted research influences and is influenced by the research ecosystem as whole

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🔒 Trusted & secure research

Recommendations

Take a coordinated approach to implementing cyber security across the digital research infrastructure including for future technologies.

sector wide focus on solving AAAI (for secure research production environments) across the disciplinary spectrum as new technologies extend research possibilities:

- Standards and governance models
- Technical coordination of the range of effective approaches and set out the standards framework for licensed applications,
- Potential for national /international AAAI frameworks
- Evaluation of suppliers and solutions.
- Account for future technologies for effective AAAI implementation.

"There is increasing appetite in the less traditional areas for sensitive data research."

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3. Jisc's role and support: Scope, challenges, opportunities

Jisc is being asked to:

- Help more comprehensively

- Bring together technologies to support trusted research across including for international partnerships

- Offer increasing support in a less stable geo-political situation

  - Eg: Support with dual-use research of concern (DURC) in technical applications (*research that is intended to provide a clear benefit, but which could be misapplied to do harm*)

- Develop approaches to support research teams as they increasingly utilise commercial software

- Consider digital and data sovereignty in research infrastructure, process support and reciprocity

Expansion in thinking on the extent of the TRE

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Multi-tenancy hybrid cloud for network connected organisations and institutions

Scale compute, storage, memory, and graphics

Extend data storage facilities

Data Sharing at backplane speed from the hybrid cloud platform

Environments in the heart of the Janet network to support sovereignty

Addressing 'sovereign data' concerns: Hybrid cloud proof of concept

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3. Jisc's role and support: Scope, challenges, opportunities

"Jisc has a crucial role in supporting effective cyber security within and across universities and research establishments in the context of this agenda through awareness raising, effective governance, capacity and resilience building."

Department of Science Innovation and Technology
(DSIT) direction to Jisc's funding body
2024

Strategic impetus and scale

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3. Jisc's role and support: Scope, challenges, opportunities

Placing focus on research security: 4 key areas of activity

1. Improve the security and resilience of international connectivity:
   Enhance external peering edge, support fibre and spectrum consortium

2. Prepare the network and research activity to transition to post quantum research infrastructure
   Support transition of existing encryption mechanisms to quantum resistant algorithms
   Develop provider and supplier capacity to operate quantum with resilience

Situate the TRE space within a broad research security focus

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3. Jisc's role and support: Scope, challenges, opportunities

Placing focus on research security: 4 key areas of activity

3. Address the security need in a complex landscape of trusted research environments

   Facilitate security approaches for trusted research environments at the sector level

4. Develop the unique capability of the network as a secure scientific instrument, supporting new research methods

   Exploit quantum, time precision, experimental network optimisation

   Expansion to new technologies such as biotechnology networks?

Situate the TRE space within a broad research security focus

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4. The NREN role: Scope, challenges, opportunities

Research challenges cluster around trusted research in a range of areas

A complex space – opportunity role for NRENs to support, given the complexity from a macro-level lens

- Help wanted - Need to serve many interests well

- Focus on joint efficiencies, reduced duplication, collective influence?

- Take a sector-wide, NREN-wide and GEANT-wide focus and operate from there

- Extend support where needed most

- Centre on research security (and beyond to teaching and learning) - Crosses all aspects of NREN activity, compute, identity, access, cloud, security, network, data, technology coordination….

TREs as an integrated / integral part of research as a whole

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Thank you