Intelligent Data Solutions

Trustworthy Research Environment

January 2026

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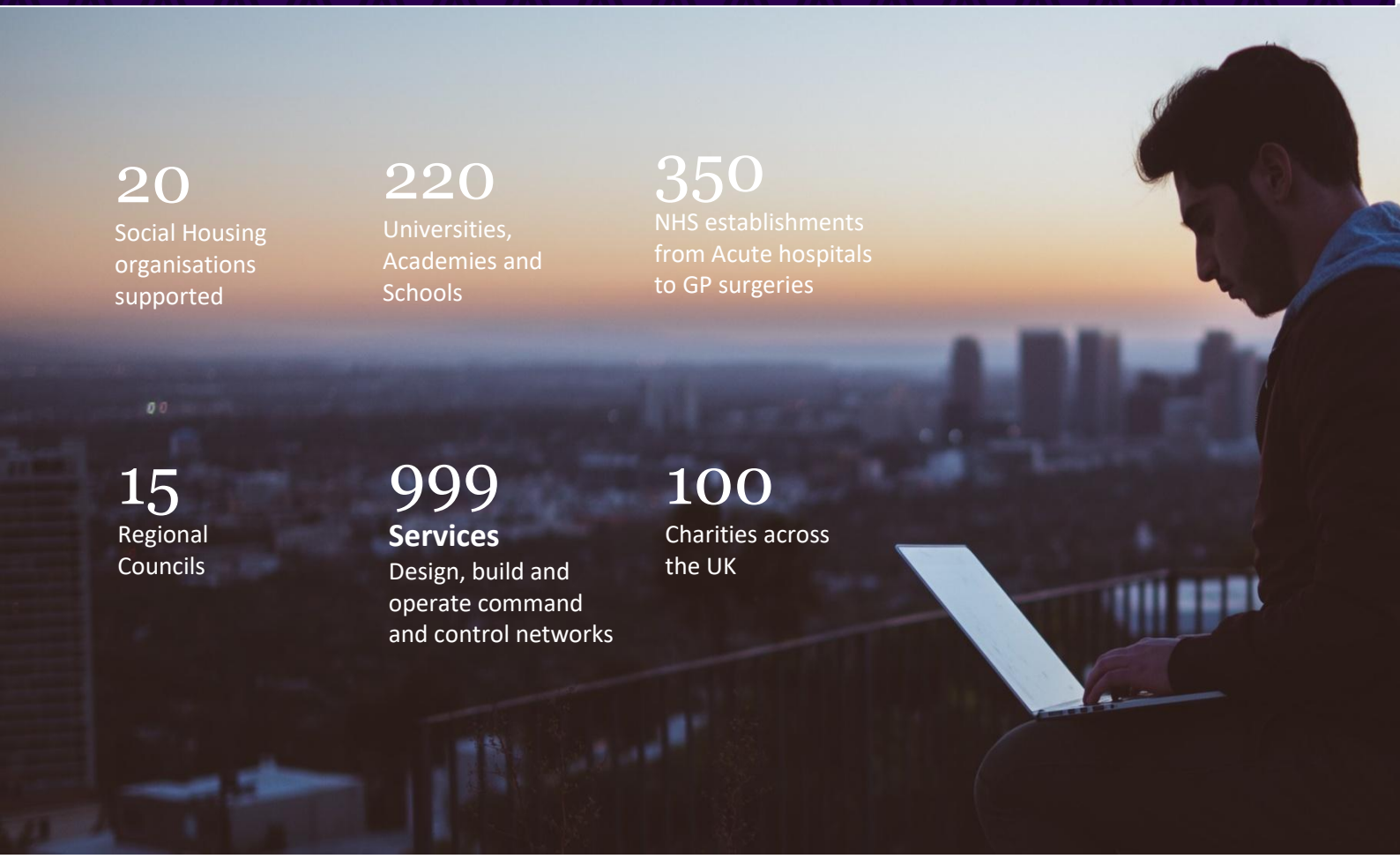

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dca The data centre trade association
CYBER ESSENTIALS PLUS
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HSCN HEALTH & SOCIAL CARE NETWORK COMPLIANT

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1. Trustworthy Research Environment

ARO's Trustworthy Research Environment (TRE) is a secure, software-defined analytics platform designed to support the safe handling and analysis of sensitive healthcare data. The TRE enables approved researchers to work with controlled datasets hosted in an environment accredited with ISO27001, ISO9001, Cyber Essentials Plus, NHS DSP Toolkit Standards Exceeding.

The platform delivers IG-compliant security controls, scalable cloud-based processing capacity, and flexible analytical capability for research institutions.

Data ingestion is performed through a secure gateway using multiple approved pathways, including HSCN, encrypted internet channels, and private connections. An integrated processing engine supports direct interoperability with healthcare systems and accepts structured, semi-structured, and unstructured formats.

All data is stored within an isolated secure zone protected from external networks. This zone supports AI, machine learning, and high-performance analytical workloads through cloud-based compute resources. Researchers access approved datasets through managed, software-defined workspaces secured with multi-factor authentication and encrypted sessions.

All research outputs pass through a governed 'Digital Airlock', ensuring sensitive information remains protected while allowing approved results to leave the TRE safely.

2. Interoperability Provisioning Zone (IPZ)

Key Capabilities

- Secure healthcare-data ingestion gateway
- Ingestion support via HSCN and encrypted internet routes
- Multi-format support, including:
  – Structured: SQL, Excel, DICOM
  – Unstructured: PDF, JPEG, PNG
  – Semi-structured: XML, JSON, CSV
- Integration engine supporting automated workflows, including optional anonymisation and pseudonymisation
- Full auditing and activity recording across all ingestion operations

ARO offers flexible ingestion models, ranging from customer-managed workflows to a fully managed data-processing service.

The aim of this zone is to provide a secure healthcare gateway that receives, validates, and prepares all incoming data for use within the TRE.

3. Data Protection Zone (DPZ)

The DPZ forms the core of the TRE, providing secure software defined, long-term storage for sensitive health datasets. This zone is fully isolated from external networks to protect data integrity and confidentiality.

It functions both as an archive for large-scale health datasets and as an active repository for cohort-based research. It supports flexible data-management policies, including multi-format storage, retention controls, compliance requirements, and analytical toolsets.

The DPZ also provides software defined cloud-based processing power for complex analytical workloads, machine-learning tasks, and large-scale data processing—without requiring any customer-owned infrastructure.

4. Researcher Access Zone

This zone provides the secure, software-defined research workspaces used by analysts. Access is delivered via managed virtual research environments that include standard analytic tools such as R, Python, and specialist statistical applications.

Additional tools can be added using a bring-your-own-licence model. GPU-accelerated resources are available for high-demand computational tasks.

Analysts can utilise either persistent (dedicated) research environments. Access is provided through desktop clients or HTML5 interfaces, secured with multi-factor authentication and encrypted channels.

To uphold IG requirements, internet access is restricted, and only pre-approved destinations are whitelisted. A standard whitelist is available upon request.

5. Case Study – Cancer Research UK

The Challenge

Cancer Research UK's Cancer Intelligence team regularly works with highly confidential patient-level datasets from multiple national data providers. Their existing remote-analysis environment met security requirements but lacked adequate computational performance.

The Solution

ARO deployed a TRE-based research environment providing secure storage, controlled dataset access, scalable computing resources, and the ability to whitelist research-related websites for tool expansion. The platform could scale storage and compute resources dynamically as research needs evolved.

The Outcome

The ARO TRE delivered significantly enhanced performance and stability. Analysts saw computation times for large R workloads reduce by approximately 30%, while package-installation tasks became up to 10× faster. The organisation is now expanding the TRE to support additional cancer-research projects.

"We partnered with ARO because they offered the right balance between price, technical specifications and the relevant accreditations and experience."
Simon Parker, Data Liaison Manager, Cancer Research UK

6. Our Accreditations

ARO maintains a range of certifications demonstrating its approach to data security, governance, and compliance. These align with the accreditations referenced within the existing service definition and supporting documentation.

- ISO 27001 Information Security Management System (ISMS)
- ISO/IEC 27017 Code of Practice for information security controls in cloud computing
- ISO/IEC 27018 Code of practice for protecting Personally Identifiable Information (PII) in public clouds.
- Data Security & Protection Toolkit.
- Cyber Essentials Plus.
- Data Centre Alliance Class 3 Facility.
- European Code of Conduct (EUCOC).

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