IRIS – A Co-Designed Common Distributed e-Infrastructure

Shaun de Witt¹, Peter Clark², Andrew Sansum³, Andrew Lahiff¹
1 United Kingdom Atomic Energy Authority, Culham Science Centre, Abingdon, Oxfordshire, UK. OX14 3DB
2 University of Edinburgh, Old College, South Bridge, Edinburgh, UK. EH8 9YL
3 Science and Technology Facilities Council, Rutherford Appleton Laboratory, Harwell Campus, Didcot, Oxfordshire, UK. OX11 OQX

Background:
STFC Computing Review 2015:
*All STFC programme areas anticipate an order of magnitude increase over the next five years in data volumes, with implications for requirements for computing hardware, storage and network bandwidth. Long-term planning will be critical, as will the scientific disciplines supported by STFC should work more closely together to find ways of sharing computing infrastructure.*

STFC e-Infrastructure Strategy:
*By co-operating across organisational and project boundaries to make UKT0 a reality it will be possible to ensure the consolidation of computing resources and provide HTC access in a cost effective manner.*

Evolution:
Bottom-Up Approach:
- Formed by communities working together
- Not driven by existing einfrastructures or projects
- Interfaces to infrastructure defined by communities
- the infrastructure adapts to the community needs not the other way around
- Share where it makes sense
- scalability, reliability, collaboration are all essential
- Make use of and discover synergies
- Communities better able to share experience with cross fertilisation of ideas

Governance:
- Governed by communities for communities

Resource Scrutiny and Allocation Group
Delivery Board
Technical Working Group
End-User Advisory Board

Deployment:
Commodity HTC + Storage:
- Q2014: 4200 cores + 4PB disk
- Q32015: 7700 cores + 9.6PB disk + tape
- Q42019: 12000 cores + 16PB disk + tape

Specialist:
- Large memory machines (0.5-1.5TB) for radio astronomy & GAIA
- High Performance Storage for CLF and DLS
- Support for large scale astronomical archives (CASU + WAFU)

Software:
- Data Analysis as a Service (DAaaS) for ISIS, DLS, CLF and RSI
- TUX (Tomographic User Experience) for ISIS and DLS
- OCTOPUS Imaging Cluster for CLF
- DITTO high speed object transfer service for CCFE

Usage:

Performance:

Results: