E-Infrastructure Leadership Council

15 October 2014 1400-1600
BIS Conference Centre, 1 Victoria Street, London, SW1H 0ET.

Attendees

Joint Chairs:

Prof Tony Hey	Microsoft

Industry Members:

Paul Best	Industry 42
Ian Dix	AstraZeneca
David Docherty	Digital Television Group
Andy Grant	Bull
Darren Green	GlaxoSmithKline
Andrew Jones	Numerical Algorithms Group
Robert Maskell	Intel

Academic Members:

Prof Peter Coveney	University College London
Prof Richard Kenway	University of Edinburgh
Prof Douglas Kell	University of Manchester
Dr Oz Parchment	University of Southampton
Prof Mike Payne	University of Cambridge

Public Sector Members:

Kevin Baughan	Innovate UK
Dr Cliff Brereton	Hartree Centre (STFC)
Dr Stuart Bell	Met Office
Dr Bob Day	JANET

Secretariat/Observers:

Dr Claire Devereux	BIS (Seconded from STFC)
Dr Martin Ridge	BIS
Dr Jatinder Singh	BIS (Seconded from University of Cambridge)

Guests

Rüdiger Dorn	Microsoft
Carlos Gomes	Microsoft
Iain Gavin	Amazon Web Services
Dr Leigh Lapworth	Rolls-Royce
Dob Todorov	Amazon Web Services
Dr Henner Wapenhans	Rolls-Royce

Apologies

Rt Hon Greg Clark MP	Minister of State for Universities and Science
Dr Anne-Marie Coriat	RCUK
Paul Driver	BIS (Information Economy Council)
Prof Robert Glen	University of Cambridge
Andy Searle	Jaguar Land Rover
Dr Lesley Thompson	EPSRC
Rt Hon Ed Vaizey MP	Minister for Culture and the Digital Economy

1. Welcome, Previous Minutes and Actions

Tony Hey took the Chair, welcoming members and guests to the ninth meeting of the E-infrastructure Leadership Council (ELC).

The Chair explained that Ministerial portfolios have changed with the Cabinet reshuffle, and that more generally, the digital agenda is now spread across departments and Ministers. David Willetts MP no longer holds a Cabinet position; Rt Hon Greg Clark MP now has the portfolio for Universities and Science, as well as for Cities, and Rt Hon Ed Vaizey MP is now responsible for the Digital Economy portfolio (formerly referred to as the "Information Economy"). Greg Clark has chosen to continue and co-chair the ELC.

The Chair gave apologies for both Ministers, noting that this was due to unmovable prior commitments, stressing that both Ministers recognise the importance of the ELC agenda and have committed to attend the next meeting in March 2015.

The Chair also announced that a representative from the Government Office for Science (GO Science) would soon join the Council. GO Science is headed by Sir Mark Walport, the Government's Chief Scientific Advisor and they support the independent Council for Science and Technology that advises No 10.

In line with this, it was mentioned that the Prime Minister recently hosted the Council for Science and Technology where cognitive computing was discussed. The PM has since commissioned a briefing paper on the subject, which will be shared with Council Members for feedback before being passed to the Government's Chief Scientific Advisor, Sir Mark Walport.

Members were then invited to give comments on the actions and minutes from ELC Meeting 08. The Council accepted the minutes, subject to small corrections before public release.

The Chair reiterated the importance of e-infrastructure agenda, and the role of the Council in joining up the political landscape of related initiatives – both within and outside BIS. The importance of this agenda is reflected by the continued Ministerial support. There are many challenges ahead for big data and e-infrastructure. In the news this week were two topical issues highlighting this: the need for disease/pandemic modelling discussed recently by Sir Paul Nurse regarding the Ebola outbreak; and the cross-Atlantic banking crisis simulations commissioned by Mark Carney.

Action 09.01: ELC Secretariat to publish a public version of the minutes from ELC 08 as soon as possible.

Action 09.02: ELC Secretariat circulate a draft of the Cognitive Computing briefing to Council Members; Council Members to provide feedback ASAP.

2. ELC agenda in the wider landscape

The Chair, in introducing the item, noted that it was three years from the Tildesley report, which led to the establishment of the Council. Since then, the landscape has changed dramatically; for example, data is now firmly on the agenda, and cloud-services have evolved to become a mature component in the e-infrastructure landscape.

Six months ago a "two-year-on report" was planned, to cover progress since the Tildesley report. However, it was felt that e-infrastructure landscape has changed so significantly since then that a fresh evaluation was required. Instead the ELC was invited to reconsider the wider landscape and the drivers for change.

The floor was opened to Members.

A question was raised as to whether the role of the Council was properly understood by Government, given the wide-range of public-sector digital initiatives. It was clarified that position is well-defined. The Digital Economy Council (DEC - formerly the Information Economy Council) looks at a range of sectors and issues (including big data), considering horizontals and verticals; focusing on applications and user-pull. It is clear that ELC's remit is to ensure that sufficient capability exists, both hardware and software, for enabling digital uptake and transformations, and

to account for the fact that many solutions come out the research-base (the DEC does not have a research remit). In short, the DEC considers the wider, more general policy space, while the ELC considers specific, targeted initiatives for impact.

There was some discussion on the horizontal impact of the e-infrastructure agenda, in that it opens up real possibilities in *all sectors* – beyond those considered by the Council so far. It was stressed that a multi-disciplinary approach is required to fully leverage the e-infrastructure. In line with this, it was felt that a major issue is training and skills – not only in the sciences, and those around data, but also those *with sector-specific expertise*, such that they are in a position to best leverage the infrastructure to transform their sector. Although more data scientists are needed, we must also provide the tools, analytics, and training to make big data accessible and usable by knowledge workers. It was noted that the BIS Data Capability Strategy explicitly addresses these issues – the Council needs to ensure it is delivered.

It was generally acknowledged the Tildesley report focused on the issues at the time, and thus particularly on the industrial usage of HPC services. There has been some good progress in this area – for example, as demonstrated by Hartree and ARCHER – which represent a clear Council success. However, two concerns were identified for moving forward: a) from the hardware perspective, issues of power, skills and software to properly leverage the new architectures are crucial; and b) it was felt that issues of data have become increasingly important and we need to do more to deal with data processing and analytics (the proposed Turing Institute being a good first step).

It was suggested that it was time to develop a software strategy, for both HPC and data. There is much effort developing code in academia that is not further hardened for leverage by industry. Issues to consider include fostering stronger collaborations between Independent Software Vendors (ISVs) and academia, considering sectorial software strategies, the comparison of the UK internationally - what are our software strengths/weaknesses, how to deal with issues of legacy code designed for old architectures, and mechanisms to explicitly fund and encourage the transition of codes from academia to industry (including industrial co-design).

This led to discussion on provisioning models, and although there has been talk and interest in enabling cloud-provisioned e-infrastructure – with flexible (PAYG) access models – further consideration is needed into payment mechanisms.

Issues of data management, governance and security in the cloud are of crucial importance. While there is some progress, more needs to be done to address important higher-level concerns such as accreditation, trust, and general management processes. Resolving these concerns offers a real opportunity for the UK to lead, which is important as research is a global business.

The Chair summarised the discussion by noting the on-going issues concerning funding models, which favours capital expenditure where more is needed on skills, software and operations (e.g. cloud). The Council's successes on the hardware agenda were clear, and that although the skills issue remains on-going, this is firmly on the RCUK/DEC agenda (which the Council has an opportunity to influence, e.g. by providing input to the RCUK their e-infrastructure roadmap). Software (both exploitation on novel platforms and hardening for reuse) and data privacy and security in the cloud are two areas that the Council has not yet explored in depth, and thus two task-forces should be created to lead investigations into these areas.

Action 09.03: ELC Secretariat to organise taskforce of Members to consider software sustainability and software for novel platforms.

Action 09.04: ELC Secretariat to arrange a taskforce of Members to consider data privacy and security concerns with respect to cloud computing.

3. Industrial access to e-infrastructure facilities

The Chair opened the item by inviting guests from Amazon Web Services (AWS) and Microsoft to

present the current state of commercial cloud offerings, in the context that the cloud offers much promise for the provision of e-infrastructure. AWS emphasised the cost and efficiency benefits of cloud computing, in terms of economies of scale, platform breadth (across platforms, geographies, power-requirements etc.), agility to react to changes in workloads, new technology (upgrade cycles), etc., and importantly, in terms of flexible pricing models. The key point was that this works to promote innovation by lowering the barrier for entry and reducing risk – thus benefiting SMEs and larger firms. Microsoft echoed the cloud benefits, but also focused on governance, noting that many companies are unwilling to have sensitive data transferred to the public cloud. Microsoft presented the concept of 'hybrid-cloud' solutions, which provides for seamless integration between a private cloud (i.e. company hosted/managed) and the public cloud, such that the public cloud can be leveraged when/where necessary, while enabling particularly sensitive data to remain local.

The following discussion centred around three aspects: 1) general issues of security and governance – these are crucial for cloud adoption; 2) that Government tends to support a capital vs. operational expenditure model, ruling out the purchase of cloud resource; and 3) what e-infrastructure services are amenable to cloud provisioning – mid-range HPC, data storage/analytics, appear suitable, but high-end HPC would not. The Chair summarised by saying the cloud is mature and being used by industry, and offers much potential as a component of the UK e-infrastructure.

Rolls-Royce (RR) was invited to present from the perspective of an industrial e-infrastructure user. RR argued the need for a national e-infrastructure (including software, skills and HPC), beyond that available today, that is accessible by both academia and *by industry at low cost*. Although simulation and modelling are crucial for their future business and innovation, the scale of the e-infrastructure required makes it unviable for industry to do this alone. The ability to design in cyberspace is crucial for the UK's international competitiveness. Further, competitors overseas have free access to publicly funded facilities giving a competitive advantage. RR noted a preference for its pre-competitive research to be undertaken in the UK due to the need for data security, supporting their suggestion for access to a publicly-funded national supercomputer. The timescales are presented as tight, in that waiting for an industrial consensus on general needs would arguably be too late.

Questions were asked about industrial uptake of existing infrastructure, given that facilities such as ARCHER, Hartree, etc., already offer some industrial access. It was said these tended to be directly funded engagements, but there is no current strategy with respect to low-cost industrial usage. With regards to security and governance, RR indicated that they would not put product data on shared infrastructure, but rather use the infrastructure for pre-competitive research requiring large machine capacity and performance.

Claire Devereux presented on behalf of RCUK (who sent apologies) outlining a pilot project for RR having access to ARCHER to undertake six months of precompetitive work at no charge. The undertaking represents an experiment to indicate any hurdles and processes that may need to be taken if national facilities are opened for more industrial uptake – particularly for *pre-competitive activities*. The key issues concern: a) how to balance industrial and academic usage (peer-review is essential); b) security and data governance; and, c) state-aid issues.

4. On-ramp business cases progress

Martin Ridge provided an update on the on-ramp business cases for the Autumn Statement. There were half a dozen sectorial proposals, but internal BIS processes had required a prioritisation on the two sectors with the greatest customer pull: construction and finance. Though these proposals did not make it through the BIS Investment Gateway, it is still possible for the proposals to be picked up for the Autumn statement. Each sector has significant customer requests for their proposal outputs (e.g. construction's BIM3 is essential for the delivery of HS2). Regardless, all

proposals will be up for reconsideration in future funding rounds, e.g. Budget 2015.

5. Next meetings

24 March 2015
13:30 arrival and lunch, meeting 14:30-16:30
BIS Conference Centre, 1 Victoria St, London

Meeting close 16.30hrs

Provisional dates to be confirmed post-election:
8 July 2015, 4 November 2015