Title: Reducing Carbon Footprint in Hybrid Cloud Hosting Services for IT Shared Services

Case Study – Reducing Carbon Footprint in Hybrid Cloud Hosting Services for IT Shared Services at Skills Development Scotland, Scottish Enterprise, Highlands and Islands Enterprise and South of Scotland Enterprise

Background

Enterprise Information Services (EIS) is a shared IT service between Skills Development Scotland and partners Scottish Enterprise, Highlands and Islands Enterprise and South of Scotland Enterprise. EIS conducted a project which moved from on-premises hosting to hybrid cloud-based hosting.

This case study looks at the improvements made in the second iteration of the hybrid cloud-based hosting contract and covers why those changes came about.

The original requirement

EIS previously moved from regular supplier-based data centres to a hybrid cloud-based platform. This platform is capable of supporting future systems they may use and allows them to control costs better, using a ‘pay as you go’ format.

The services can be capped during quiet periods, or completely switched off at certain times, reducing costs and energy demand. Additionally, the service is very adaptable and can be scaled up or down to suit demand.

Updating the requirement

The second iteration of the contract was for continued support of EIS’s existing hybrid cloud environments, with the option to onboard any additional services from traditional data centres to cloud-based hosting. This updated service operates through a smaller provider who offers support services to Hybrid Cloud offerings.

Procurement process

The Prioritisation Test hosted on the Sustainable Procurement Tools platform indicated that procurement of hosting services should involve sustainability outcomes as a priority.

This was embedded into the Procurement Strategy which recommended a call- off from the Crown Commercial Services G-Cloud framework. The G-Cloud process involves shortlisting based on requirements and then scoring offerings which are advertised upfront and allows for a clarification process.

This route facilitated sustainable procurement outcomes and was deemed fit for purpose.

Embedding sustainability requirements

The sustainability test was completed in parallel with the procurement strategy and embedded into the final document.

The following criteria were deemed relevant and influenceable:

- Will the product or service procured, routinely involve consumption of energy (electricity, gas or other fuel) and/or is there an opportunity to minimise energy consumption, including through innovative solutions?
- Are there opportunities to generate employment and training opportunities (particularly for priority groups), develop trade skills in potential suppliers' existing workforce and drive equal opportunities recruitment procedures?
- Are there opportunities to improve fair work practices to ensure the workforce is well motivated, well rewarded and well led?

Award criteria

The strategy was to include 6% weighting (as part of 70% quality weighting) for sustainability within the award criteria, split as follows:

- Detail how you would provide reporting on each individual partners CO_2 usage (2%)
- Detail your roadmap towards net zero and beyond as an organisation. NB: please note this should be as a high level summary rather than copies of policy documents (2%).
- How will your staff training and development ensure that service levels remain high through the duration of the contract (2%)

Requirements

The specification also included the following requirements:

- Requirement to locate data centres in the UK, for security reasons, where practicable - something that can be supported by hybrid cloud hosting providers
- The supplier should provide annual CO_2 emissions consumption data resulting from the use of buyer and partner organisations hybrid cloud services
- Supplier must have the ability to analyse the historical cost including forecasted changes in usage, best practice, security, inventory and utilisation of hybrid cloud services on EIS and partners' environments. All of these will be included in monthly optimisation reports to be reviewed by buyer and supplier
- The supplier to ensure that buyer and partner organisation's resources are sufficient enough to meet its business needs and are also cost-effective

- The supplier must monitor and manage buyer and partner organisation's IT infrastructures to ensure that it is effective and efficient at all times.

The outcome

As part of their response to the G-Cloud clarification process, the successful supplier provided examples of the types of CO_2 reporting from hybrid cloud hosting that they have provided to other clients. Additionally, the supplier proposed working with our IT team to agree how CO_2 will be reported both in terms of report content and frequency.

The supplier also committed to using this reporting to work with IT teams to reduce CO_2 footprint via monthly optimisation meetings. Ideas for optimisation included automatically switching off non-production environments out of hours and re-platforming legacy applications to benefit from hybrid cloud efficiency.

The contract includes a number of obligations on the supplier to meet technical requirements including ISO accreditations, IT security, data protection, GDPR.

The supplier detailed their internal personal development policies in their response, which included structured internal learning with a wide array of training courses, Human Resources policy providing contractual study leave and lessons learned processes should delivery not meet required standards.

The contract management plan highlighted that the contract manager would be responsible for ensuring the supplier's response is delivered. This will include monthly optimisation meetings and reporting. IT and Carbon teams will work with the supplier on delivery of this.

Lessons learned

The key change for the EIS is the ability to have carbon reporting and for monthly contract management meetings to focus on improvements to carbon usage.

For this particular hybrid cloud platform:

- The hybrid cloud provider has committed to ensuring that its data centres will be powered entirely by renewable sources of energy by 2025. Therefore, their already more efficient large data centres will be powered by sustainable means
- When renewable energy is included in calculations carbon emissions from compute (where the servers do calculations to help run applications) are 92–98 percent lower than traditional enterprise data centre deployments of compute equivalents when renewable energy is taken into account (52-79 percent when they are not taken into account)

- carbon emissions from storage are 79–83 percent lower than traditional enterprise data centre deployments of storage equivalents when renewable energy is taken into account (71-79 percent).

Therefore, the focus of this contract is to monitor actual CO_2 usage, seek further improvements and assess the impact of improvements.

One area of interest will be the impact of the hybrid cloud provider moving to renewable sources of energy prior to the end of the contract. SDS are seeking a reporting which demonstrates the impact of their own changes separately from the CO_2 benefit provided from the hosting provider themselves. For example, SDS' changes include switching servers off, throttling, and moving additional services to hybrid cloud from less efficient hosting solutions.

For further examples of the carbon savings that can be brought about by including switch-off options, see the case study Reducing carbon footprint in ICT upgrade at Glasgow Kelvin College, also hosted on the Sustainable Procurement Tools.

Improvements

The information above and CO_2 reduction promises from the hybrid cloud provider mean that substantial CO_2 savings are being made in comparison to the previous hosting model. It should also be noted that there are various substantial promises being made by the small number of hybrid cloud providers so these benefits would likely be achieved by bodies that move to this model regardless of the hybrid cloud solution chosen.

Hybrid cloud hosting has many benefits in terms of cost efficiency and quality benefits such as increased security and improved flexibility in setting up environments.

The inclusion of climate benefit strengthened the overall goals. Rather than state high level average CO_2 savings, actual savings can now be reported on, whilst being able to identify CO_2 savings of further specific improvements. Potentially this could impact future prioritisation – i.e., will hosting still be a high priority for Skills Development Scotland if it is known that CO_2 usage is being kept at a low level?

On reflection

Skills Development Scotland moved to hybrid cloud hosting a few years ago. On reflection, it would have been beneficial to capture carbon usage prior to switching to a hybrid cloud model and then including carbon reporting in the first hybrid cloud contract. This would have demonstrated specific carbon benefit numbers at a time when the greatest level of carbon saving was being realised.

Contribution to National Outcomes

The outcomes provided under this contract support Scotland's Purpose 'To focus on creating a more successful country with opportunities for all of Scotland to flourish through increased wellbeing, and sustainable and inclusive economic growth', and contributes to our national outcomes:

- Environment: We value, enjoy, protect and enhance our environment
- Fair Work and Business: We have thriving and innovative businesses, with quality jobs and fair work for everyone
- Education: We are well educated, skilled and able to contribute to society