



TRINITY'S GREEN DATA CENTRE LEADS THE WAY IN ENERGY EFFICIENCY

A SUSTAINABLE GREEN DATA CENTRE, FACT OR FICTION?

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Over 20,000 students and staff depend on Trinity IT services every day. With PCs, laptops, and smart phones connected to servers 24 hours a day and 7 days a week, it's safe to say that as the need for technology grows in Trinity, so does our carbon footprint. The question then arises: how do we become more energy-efficient while also continuing to grow and change with technology to meet daily business needs? Enter the Green Data Centre.

Trinity's Green Data Centre was opened in March 2013. Since then, IT services have been transferred to this energy-efficient hosting facility and leading edge integrated and unified compute, storage and network platform. Over the coming years, Information Systems Services and partners will continue to work together, operating and

maintaining the data centre and hosting platform so that it continues to deliver reliable, uninterrupted IT to both internal and external customers from one of the most energy efficient, flexible and scalable data centres in the world. The delivery of the Green Data Centre (DC) facility phase allowed IS Services to provision Infrastructure

as a Service (IaaS) and private cloud computing for the College. The Green DC and IaaS provides the College with an energy-efficient foundational hosting platform to support the delivery of local, centralised, sustainable or Green IT¹ services aligned to the College strategic objective² which aims to make Trinity a Green

Campus. The project work behind IaaS has included a public procurement activity followed by the build out and commissioning of new IT infrastructure and a large-scale migration of IT services from old hardware to IaaS in the Green Data Centre and secondary High Performance Research Computing Data Centre.



Dr Geoff Bradley, Senior IT Manager, IS Services in the Green Data Centre

Drivers

- 99.999% uptime, ensuring the facility has no more than 52 minutes down time in the next ten years was a key driver and the facility has been designed to ensure this.
- Cabinet density flexibility; Although today most of the College's data cabinets operate at an average IT load of around 4kW by allowing the system to support up to 25kW IT load per cabinet the College has helped ensure the data centre can support it long in to the future.
- World leading energy efficiency; sustainability and carbon reduction sits at the heart of Trinity College

Dublin's future strategies. It was with this in mind that the College insisted its new facility could be held up as an example of Global energy efficiency excellence.

Challenges

- Energy efficiency; because the data centre was designed to support the College for the next 20 years it has to have a large amount of spare capacity built in. This spare capacity, in most data centres, results in poor energy efficiency during early operation.
- Planning permission; the Trinity College Central Dublin Campus is ranked by Forbes as the sixth most beau-

tiful in the world and is one of Dublin most popular tourist attractions. The combination of architectural styles, and student and staff residences means both visual and noise planning constraints apply.

- Space; the space allocated for the new data centre is compact.
- The Building; the new data centre facility is housed on the ground floor of the Aras an Phiarsaigh building on the College's central Dublin campus and was never intended to house a data centre facility.
- Location; the Aras an Phiarsaigh building is located on Pearse Street, Dublin which is one of the busiest roads in Ireland. Special attention had to be given to crane lifts

to ensure both members of the public and emergency services were not inconvenienced by the works.

• Live services; the construction phase of the project commenced in September. This is the busiest time of the year for both IS Services and the College as a whole. Although there was heavy construction work involved these surrounding areas had to stay live an undisturbed.

Results

The facility at 100% capacity achieves an annualized Power Usage Effectiveness (PUE) of 1.16 and at just 20% IT capacity the

installation achieves an annualised PUE of 1.35. Achieving these figures in a facility that is built to a high availability (TIER 3) specification and housed within an existing building is truly remarkable. This achievement sets the College apart from any other facility currently built and operated in Ireland. This facility provides a bench mark for the design and construction of flexible, energy-efficient, high density data centres.

There is often a misconception in the data centre industry that small facilities such as this cannot obtain high levels of both resilience and

energy efficiency, however the facility at Trinity College does. The initial enabling Green Data Centre facility build project phase was completed on time, within cost and exceeded scope and quality parameters and was shortlisted for a European Data centre Award in 2012.

Trinity's award-winning Green Data Centre was presented a 2014 National Tech Excellence Award. The 'Data Centre of the Year' prize was presented to IS Services in recognition of the data centre's excellence in innovation, operation, awareness of its environmental impact, integrated thinking and how the facility was developed to meet current and future needs. In addition, the project was short-listed as a finalist for the Leadership in the Public Sector category in the EMEA awards for Data Centres in London.

The Green Data Centre was delivered by an inter-department project team consisting of the Director of IS Services, John Murphy (sponsor), the Engineering Services Manager in the Estates and Facilities Department, Kieron McGovern (project manager) and IS Services Networks & Infrastructure Manager, Brian O'Hora (senior user and client project manager).

Brian O'Hora, IS Services Networks & Infrastructure Manager said "The public procurement and contracting approach chosen consisted of a single competition spanning the design, build and maintenance of the facility for a period of five years.



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This approach was particularly successful managing both technical and financial risks across the design and build stages given the complexities of the physical site and also that the tendered performance specification extended to witness testing PUE compliance across low to high load in 25kW increments upon commissioning. The latter in particular ensured that the design was driven by energy efficiency in addition to functionality and availability.”

¹ <http://www.tcd.ie/about/policies/sustainable-development.php>

² <http://isservices.tcd.ie/general/green-it.php>

For a brief information video see: <https://www.youtube.com/watch?v=UwBxYzB9bc>

PROVEN PROTECTION FOR DATA CENTRES

Rittal has updated the DET-AC III product family, comprising the DET-AC III Master fire alarm and extinguisher system, the complementary DET-AC III Slave unit and the EFD III early fire detection solution. All three are available in the form of 19” slide-in racks. Significant enhancements have been made to the DET-AC III Master. The system now features a

CAN bus interface for direct integration with the Rittal CMC (Computer Multi Control) III monitoring solution. This provides administrators with much more detailed information on the status of installations and incoming alerts.

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tions, reset service intervals, or install new firmware from a laptop, without opening the enclosure.

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RITTAL Ltd, Barrowside Business Park, Sleaty Road, Graiguecullen, Carlow. Phone: +353 (0)59 9182100, E-mail: sales@rittal.ie

www.rittal.com