

## CASE STUDY

Successful implementation of a virtualised datacentre from Comtec Power

# Comtec delivers Sanctuary Group's Virtualised Datacentre with APC by Schneider Electric

Sanctuary Group is the largest social housing landlord in the UK. Recognising the increasing demands on the organisation's server infrastructure, Sanctuary launched a project for a new, reliable, secure and fully-monitored APC datacentre. Comtec Enterprises won a competitive tender to design the new system which is capable of supporting significant cooling loads created by virtualised servers and high-density applications. This was an integral part of a comprehensive range of energy-efficiency innovations implemented by Sanctuary, all of which were successfully supported by Comtec and APC by Schneider Electric, in partnership with mechanical and electrical consultants JESP Services.



With over 75,000 homes and other properties under its management and 5,700 staff employed, Sanctuary Group is a nationwide, charitable organisation with comprehensive IT requirements. The Group has a number of regional operations and business activities across England and Scotland, each of which are significant and complex in their own rights.

A legacy datacentre for all centralised IT operations had become obsolete because of inadequate cooling facilities and rapidly diminishing available space. Peak loads often necessitated the use of additional temporary air

conditioning, which was inefficient and uneconomical. In terms of space, additional room needed to be found in a spare basement at an adjacent building within the organisation's headquarters.

Sanctuary is a continually evolving organisation with a track record of mergers and acquisitions that add to the size of its business and IT requirements alike, and as such, the legacy datacentre was considered unsustainable.

In the second quarter of 2007, Sanctuary developed a specification for a new datacentre, inclusive of insulated room reconstruction, a water-based cooling system, efficient power and cooling alignment of racks and cabinets, humidification, and full environmental and physical security monitoring. This specification was intended to support Sanctuary's business operations for the foreseeable future, which, in business terms, is an IT infrastructure capable serving nearly double Sanctuary's current needs.

Martyn Lucking is the Computer Services Manager at Sanctuary Group: "Our overall IT requirements include typical corporate applications, communications and storage infrastructure, as well as applications which are specific to the housing association sector. In particular, the housing system application we operate is extremely critical to the running of the entire business."

“Our IT strategy is to move increasingly towards small form-factor systems and virtualisation. We embraced Virtual Desktop Infrastructure (VDI) some time ago, and today we already operate Citrix XenApp and VMWare. We plan to extend this further to include MPLS cloud computing technology. It is essential that any IT environment is entirely stable.

Having been impressed with the performance of APC systems in the past, Sanctuary initiated an open tender process based upon the delivery of an APC-based solution. This led to the engagement of APC Elite Partner Comtec, who were deemed to possess the range of datacentre skills and experience required. Comtec’s fit-out was scaled to accommodate a total of 42 server racks and four data communication racks. Specifically, the design included:

- An insulated building enclosure, using materials that regulate thermal/solar gain from external environmental conditions. The design of the room also minimises the amount of air humidity treatment required, which equates to direct energy savings.
- APC InfraStruXure® Hot-Aisle Containment Solution® (HACS) efficient environment, incorporating 12 APC InRow™ chilled water cooling units to optimise power and cooling. A key component of this architecture is its close-coupled cooling design principle which locates cooling equipment close to the heat source ensuring that heat removal can be more efficient and predictable.
- APC InfraStruXure® Central management platform – allowing for granular management of power distribution, environmental monitoring and physical threats throughout the datacentre.
- APC Managed Rack PDUs; two installed per rack for comprehensive power management/monitoring.
- Full environmental monitoring and management, using strategically located APC NetBotz® sensors to measure temperature, humidity, water etc.
- APC NetBotz® physical threat management cameras located at strategic points and configured with surveillance software capable of generating and communicating alarms etc.

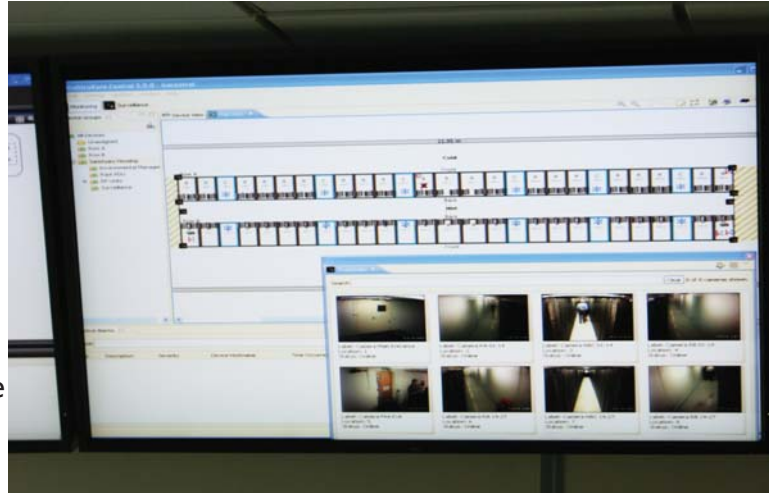
“In our view, specialised datacentre environments and virtualisation go hand in hand. Rather than virtualisation being some sort of stop-gap alternative to upgrading datacentre infrastructure, we wanted to prove that by utilising them both we could ensure the full benefits can be achieved.”



Images courtesy of Spa Communications Ltd

“The monitoring systems are particularly useful as they enable us to filter out ‘false negatives’ and identify issues that would ordinarily take a long time to isolate,” commented Lucking.

“The cameras have shown us that around 70% of our issues are caused by people working inside the datacentre. In any event, the team is immediately alerted via any number of configurable alarm systems, such as via SMS and email, and all records can be stored for over a year. The APC InfraStruXure Central console was extremely valuable when we transitioned from Phase 1 of the project into the fully ‘lights-on’ Phase 2, because it enabled us to balance the placement of equipment and application of cooling load via its easily manageable, visual and reliable interface.”



The datacentre is now a significant source of pride for Sanctuary’s IT and facilities teams, and has become a regular feature for new employees as part of their company induction, as well as to important visiting guests to Sanctuaries’ head office. “We often show the datacentre to representatives of other housing associations, as it demonstrates our capabilities for future partnership,” commented Lucking. “Other datacentres take their necessary power load, convert it to heat and throw it away. We reclaim and reuse that utility, making high-yield efficiencies out of what most people would deem ‘low grade’ energy.”

As well as optimising cooling efficiency using APC technology, Comtec’s work was integral to achieving heat extraction from the datacentre, for reuse into the Sanctuary office heating system. This ‘heat reclaim’ capability works in the following way:

- Heat being produced from the IT equipment is contained within the APC Hot Aisle Containment System (HACS) with the heat being removed from the hot aisle via APC InRow cooling units using chilled water as the cooling medium.
- The cooling medium is then passed through a heat reclaim system on the Carrier chillers, where the heat energy is transferred to a heat exchange unit feeding the office and communal areas heating system.
- The heating system in these areas has been designed to work at reduced flow temperatures to accommodate the temperature of the heating medium leaving the heat exchanger.
- This negates the need for the boiler plant to operate whilst the IT equipment is in operation, and reduces the load that the chillers cool from the datacentre. The existing boiler plant has also been replaced with high efficiency condensing units to ensure that if heat is required for the office areas when the IT equipment is in maintenance or standby mode, the boiler plant operates at maximum efficiency to also reduce CO<sup>2</sup> emissions.
- Pumps associated with the system have inverter control to minimise energy usage.
- The chiller water temperature is controlled to suit the heat load within the datacentre and minimise energy usage by the chillers.

The technology developed with JESP, Carrier and Comtec/APC has allowed heat reclaim on the chillers to reduce the cooling load and provide heating for the office areas inside the building. In fact, since project completion in October 2008, heating for all other areas of the 17,474 sq ft 'Enterprise House' building where the datacentre is located has been run off reclaimed heat, saving potentially 400kW. As there is spare capacity within the reclaimed heat system, this capability will soon be extended to two additional buildings being constructed on the same site.

Sanctuary is confident that, while the datacentre has the capacity to manage significant load over and above typical current needs, all operating components within the datacentre power and cooling infrastructure are right sized so that only the appropriate levels of energy are consumed.

"As we are such a large housing association operating in such a heavily regulated sector, we face numerous difficult challenges," said Keith Jackson, Director of Asset Management at Sanctuary Group.

"Having all our IT systems in one place ensures consistency across all our IT operations, as well as driving efficiency of processes and management.

We had problems that could only be overcome by constructing a specialised datacentre environment. Once we'd taken that decision, we were keen to use it as an opportunity to drive further cost efficiencies.

Comtec have proved to be a very valuable partner throughout this process, contributing greatly to the project's overall success. Using their extensive understanding of APC technology, they have demonstrated a real commitment to excellence, and to meeting our IT and sustainability objectives."

"The only true 'unreclaimable' running cost relates to the power drain from the cooling circulation pumps. At around 11kW, or 2.75% of the 400kW total, this represents extraordinary level of overall energy efficiency."

## About Comtec

Comtec Power specialises in the design, build, maintenance and ongoing management of comms rooms, networking closets and datacentres. Our work encompasses new builds as well as the refurbishment and upgrade of live facilities. Our goal is to create technically excellent facilities which are scalable and efficient to meet the power and cooling demands of latest generation IT equipment.

Comtec has a thorough and experienced knowledge of the IT industry and is perfectly positioned to deliver highly resilient solutions for high density IT deployments including blade servers and HPC installations. Our ongoing maintenance and inventory management services help to reduce the threat of downtime, mitigate the risk of thermal shutdown, and keep facilities operating optimally.



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