



Posted: Dec 1, 2009 By: Merri Mack

Data centre design is an art

There is no doubt that the once humble data centre is at the zenith of recognition with interest unabated this year. We look at all aspects of design of the data centre right down to finding the best site and why the push for a green data centre is more about conserving power and costs rather than really being green. Merri Mack reports.

Aiden Tudehope, Managing Director, Hosting, Macquarie Telecom, said, “Any business that has not already started to increase data centre capacity or scalability to cope with the demand will face multiple challenges and long-term opportunity loss.

The recent Symantec State of the Data Centre survey showed that the data centre’s focus on ‘being green’ was driven primarily by cost issues in 2008 but that social responsibility as a driver is on the rise. Thirty-seven per cent of those companies surveyed are actively working to reduce their data centre energy costs.

Oracle believes there is a clear need to assist IT teams to raise utilisation levels so that IT hardware does not sit idle consuming power and driving up ventilation and cooling costs. In order to improve the energy efficiency and productivity of a data centre, Robert Gosling, Vice President, Sales for Oracle ANZ, recommends some techniques.

“The first is storage virtualisation and consolidation, which will use less power by operating a centrally managed storage system that uses fewer disks followed by server virtualisation and consolidation.

“It is also important to push consolidation up the stack beyond infrastructure to reduce the footprint of as many business applications as possible,” he says.

Enterprises, both big and small, do not have the skills to run their own data centres in most cases, opting for a hosting data centres service. Because it is a fixed cost and opex rather than capex on the balance sheet, it is even more compelling.

The explosion of data that needs to be stored to meet government and compliance regulations has also accelerated the need for data centres. The catastrophe of 9/11 also brought forward the need for redundant data centre facilities. After 9/11, there was anecdotal evidence that many companies never operated again as they lost all of their data.

Real estate is expensive and we are running out of power for data centres. Queensland is a prime example where organisations in some cases have been forced to run their data centres using generators on the streets but this is only a temporary measure. Queensland and

Brisbane suburbs have attracted data centre investment where the likes of Digital Sense, Polaris and others have been commissioned recently.

The same can be said for Canberra where Canberra Data Centres (CDC) was built on a greenfield site, and is up and running and attracting blue-chip government clients while Canberra Technology City (CTC) is waiting in the wings for its turn.

CTC has invested in a site close to CDC and is in partnership with ActewAGL and Galileo Connect. It will soon start the site development for the 14,000 m² data centre but needs to win some government contracts before it can get the investment finance necessary to proceed further. A bit of a chicken-before-the-egg scenario or a catch 22 situation says Stephen Ellis, a director of Technical Real Estate (TRE), which builds data centres with Galileo.

“Critical criteria in finding a site to build a data centre on include access to power and the site should have access to two separate sub-stations and fibre connectivity, and, depending on the nature of the user, be 15-50 km outside a CBD and not in a flood zone. Neighbourhood risks such as flight paths, oil refineries and service stations should also be avoided,” says Ellis.

Ellis says one of the selling points of its partnership with the ActewAGL is the gas power generation supply to CTC versus the coal power generation/supply conventional data centres in Australia. He believes by running a gas-powered data centre he can reduce the carbon footprint by 77% and the Power Usage Efficiency (PUE) from 2.6 down to 1.3, which will improve the environmental impact and electricity costs to occupants.

Getting a data centre right requires millions of dollars of investment. Andy Goh, Manager, Sjtames Engineering, is a busy electrical engineer, based in Singapore but in demand globally for his expertise in building data centres. He consults to AT&T, which has built more than 500 data centres globally; sourcing data centres sites from 1000 to 10,000 m² of usable area.

Goh is currently working on a data centre project for Tata for its cable landing station in Singapore. This data centre covers three floors and will have 66,000 m² of useable space. It is also futureproofed for the next 60 years with an output capacity of 30 megawatts.

Because AT&T has over 500 data centres around the world with all the equipment specs on a database, Goh was able to draw on this huge resource of information to aid him in designing the Tata data centre. AT&T uses this resource to identify and schedule regular maintenance of infrastructure when needed and before failure.

Goh said, “The most critical facet of a data centre used to be electrical but this is not the case anymore. With density growing so much now in the server racks, cooling is as important as the power because servers shut themselves down if they get too hot. So power and cooling are equally important.

“With the trend for high density of up to 12 kilowatts per rack, there is an increased chance of failure. This is not so in the Asia-Pacific region with density about 5 kilowatts, so data centres can manage with conventional cooling.”

In India, for example, real estate is very expensive so there is a trend to pack a lot into a rack, whereas Australia and New Zealand rate about 5 kilowatts.

Goh says: “What is typically happening now is enterprise data centres are consolidating with virtualisation of servers. Enterprises don’t have the expertise to run these centres and it is not cost effective to have someone run the data centre, so this has given rise to managed hosting of data centres by companies like AT&T and Tata.

Data centres are expanding because of backup and the main data centres have hot stand-by data centres. Banks, for example, have fully redundant data centres, and one bank that Goh knows of even has a bomb-proof data centre. The Singapore government has bought land under a Swiss mountain for a data centre with cooling to be provided by the mountain ice. By buying land under the mountain, the Singapore government overcame the constitutional problem.

When it comes to skills in data centre design and building, Goh says skills can only be gained by experience. Skills can not be taught and courses can only skim over the essentials as they do not give practical experience. There is a huge vacuum of engineering skills. When he did his electrical engineering course, there were 200 in his year and now the course does not exist.

When asked how important are the people you employ to your success and client’s confidence that their data is in good hands, CDC’s Director and Founder, Greg Boorer, said, “CDC is a privately owned organisation put together by four initial partners that have more than 60 years of IT experience between them. Each of these partners brought knowledge and experience of running data centres and working with government to the team. Most of the partners are still involved in the day-to-day running of the operation and work hard to protect their investment by continuing to deliver every day for our government customers.

“Although the core team is very experienced, we also employ junior technicians who are learning the ropes from the senior team. This has proven to be a successful approach to spreading the knowledge through the team,” said Boorer.

Goh says: “Before a new data centre can be commissioned, you have to formulate scenarios for failure and test and test again to make sure everything works seamlessly and that there is concurrent end-to-end system maintainability.

Multiple facility recovery strategy

IBM has opened a new data centre facility in Fortitude Valley, Brisbane, Queensland. The data centre will augment IBM’s existing recovery centre located nearby, to provide risk mitigation for client information and data.

The company claims to be the only vendor in Queensland that offers a multiple facility recovery strategy with hosting and disaster recovery services provided from two separate facilities. This dual centre strategy is designed to mitigate risk and provide high availability services for Australian and international businesses with mission-critical data and information needs.

“The new multi-site capability provides an enhanced portfolio of business continuity services to Queensland. It offers a combination of workplace and crisis management environments, plus IT infrastructure and hosting services, to help organisations achieve their business continuity outcomes. The multi-site strategy specifically delivers greater flexibility and risk

mitigation, providing our clients with optimal peace of mind,” said Andrew Fry, Business Development Executive, Global Technology Services, IBM.

The data centre features a multitude of resilient design elements and provides opportunities to subscribe to shared and/or dedicated IT infrastructure to optimise asset utilisation for clients. The data centre will host local, national and international customers across all industries.

“More than ever before, building, owning and self-maintaining a data centre is one of the most significant real estate decisions a company can make. We are finding that in this economic climate, businesses are looking to adopt a disaster recovery and data centre out-tasking strategy. To go it alone tends to expose organisations to escalating costs and additional business risks, which is what they are trying to avoid,” said Fry.

http://www.voiceanddata.com.au/articles/37559-Data-centre-design-is-an-art-?topic_id=1813