



## Simon Campbell-Whyte DCA Executive Director provides an overview of the recent Data Centre Transformation Conference in Leeds



Simon Campbell-Whyte DCA Executive Director provides an overview of what this means for the industry.

THE 2ND DCA Transformation Conference was held at the University of Leeds on 26th and 27th June. The programme featured talks that covered the past, present and future of data centres in more than just one sense – Examples of the past included a look at innovations from Victorian industrialists that still remain true today and how punch card technology of the 60's and 70's remains a design hang up for many data centres. Data Centre present included the pro's and con's of both PUE and also an insight to the myriad of today's cooling technologies. Whilst data centre future was represented by the development of the liquid cooled data centre and also the progress made by the University's latest graduates.

The first morning featured talks on where the industry is today with insightful discussions on where it's heading. The afternoon looked at standards, networks and security and finished off with a look at improving cooling infrastructures.

The conference closed at 6pm and embarked on a superb dinner held at the Royal Armouries. The second day, continued with a fascinating in depth study on aspects of energy efficiency both from technological and cultural viewpoints. The conference closed with a DCA Q&A session rounding off an extremely informative, thought-provoking and entertaining 2 days.

### Can the industry get PUE under control?

The over-riding message from The University of Leeds Data Centre Transformation Conference was the need to deal with the misuse of the PUE metric. It became clear that the practice of "PUE abuse" does no favours to users, the industry or environmentalists, and that the industry needs to work towards ensuring proper use of the metric. Proposed new ISO standards will help, but the will and acceptance of the industry is absolutely essential and I'm sure the upcoming DCA Certifications programme will provide the mechanism that is needed to begin to rein in PUE mis-representation.

A New Technical Steering group focusing on the growing issue of keeping the data centre free of air borne and people borne particulates has been started by Alan Fisher of Dycem. Although the problem is not new, the use of new ambient air free cooling and passive cooling techniques has polarised the issue.

The group objective is to discuss, advise and recommend practical solutions to the members of the Data Centre Alliance on the control of dust, dirt and contamination. In particular, preventing damage to equipment; loss of data and conservation of energy. To request membership of the group go here <http://www.data-central.org/group/anti-contamination>.

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## Efficient, resilient, modular and low carbon



Louise Fairley reports on the recent visit to Spring Park.

HAVING HAD THE opportunity to attend the tour of Spring Park, Corsham last Month courtesy of Ark Continuity and TalkTalk Business, I can truly say I was highly impressed with this modular super-modern facility; this was a one-time opportunity to see inside one of Europe's most efficient, resilient, modular and low carbon data centres and was not to be missed.

The event was held at Hartham Park, Corsham, a beautiful Georgian Mansion House and head office for Ark. The day started with an

overview presentation from Ark on the P1 facility, a recent finalist in the Uptime Institutes Green Enterprise IT Awards following by a pleasant few minute journey to the park where we were expertly given the expertly guided tour covering cold zone, hot zone, fire suppression, security, building management system and environmental controls. One of the highlights of the tour was to see and understand how the facility is achieving industry leading efficiency, having a green message always feel strange for a Datacentre but its clear that a lot of focus has been given in this area.

The facility uses "Free Cooling" for over 99% of the year and every effort is made to ensure that cooling is directed to exactly where it needs to go with no wastage. It was interesting to see how the facility constantly monitors and reacts to even small changes in load and temperature within the facility, but also to the weather conditions externally to make the most of every single amp of power.

The modular build techniques that are in use combined with the sheer size of the site gave a real feel for the future scalability of this development. Spring Park extends to over 36 acres on the surface and when completed will support approximately 93,000m<sup>2</sup> of high performance data centre and office accommodation. The entire Spring Park site is being specifically developed as a data centre campus. The site is serviced by multiple Tier I carriers, with diverse fibre routes to PoPs in Reading and Bristol providing secure, resilient, high capacity network.

The datacentre is like no other I have experienced before, because of its highly scalable modular design, no detail appears to have been missed in terms of security, efficiency, scalability, temperature environmental control and layout and what struck me in particular (having experience of data centre visits over the years) was the utterly sublime tidy clean design and attention to detail. A truly refreshing experience.

Back at Hartham Park we had the opportunity to see some of the great work successes at Spring Park through presentations from Ark, its industry partners and also from TalkTalk Business who explained their commitment to the project and how the facility is being used to deliver solutions in the Business to Business communications arena. This was then , followed by Q&A, a rather superb lunch and a chance to chat.



### DCA Events Round Up

#### September:

18th-20th: The Green Data Centre Conference

19th-20th: Big Data World Europe

24th-26th: The Data Centre Management Forum

#### October:

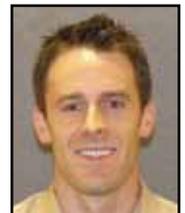
30th: Powering the Cloud

27th-28th: Gartner Data Centre Summit

For further details on all events please visit [www.data-central.org/](http://www.data-central.org/)  
[www.datacentrealliance.org](http://www.datacentrealliance.org)

## Commercial v industrial automation in data centers

Today's data centers have complex mechanical and electrical designs with unique performance and reliability needs. Unique Building Management Systems (BMS) and approaches are required in order to optimize the control, monitoring, and operation of these systems. But what is the best approach? By Sean Graham DLB Associates.



Traditionally, data center automation systems have been comprised of commercial-quality software, hardware and components. However, there are important differences between commercial and industrial automation system hardware, software, and instrumentation that should be considered.

In addition to components, critical facility automation design requires a specialized methodology, which often blends traditional and industrial approaches to fit the facility Owner's Project Requirements (OPR). Ultimately, identifying how various system aspects contribute to performance, reliability, operations, and Total Cost of Ownership (TCO) is the key to delivering a successful data center.

### Hardware

Commercial and industrial control system hardware vary widely in both capabilities and costs. Input / output (I/O) capacity, performance, redundancy, integration options, and vendor support are some of the major considerations when selecting automation hardware for data centers.

Industrial hardware is designed for real-time control. The processors are more powerful, and the logic execution speeds are measured in milliseconds rather than seconds. Additionally, controller input / output resolutions are superior. Commercial controllers have a limited ability to collect and upload data,

typically using a temporary storage buffer or cache. The advantage of using industrial controllers is the ability to integrate data storage with servers in order to provide better trending.

The commercial BMS is becoming more integrated with other facility systems, including power monitoring and Data Center Infrastructure Management (DCIM). Both commercial and industrial systems provide many options for integrating multi-system control and monitoring which can add substantial complexity to a design.

### Software

The features, architecture, and performance of BMS software can vary widely between commercial and industrial systems, and can even be substantially different between vendors. As a result, it is important to understand the capabilities of the system software and ensure that the proposed manufacturer will meet the project requirements.

To maximize data center reliability, it is advantageous to implement a more real-time BMS approach. Commercial systems poll data from field controllers slowly, have slower user interface refresh rates, and can handle less data. These systems can become sluggish when pushed to the limits of managing

data. Industrial automation software is designed to handle substantially more data traffic and is powerful enough to support enhanced data collection / trending. Data centers operate 24 / 7 / 365 and need to maximize uptime. Therefore, providing enhanced monitoring of the cooling process and environment should be considered as a means to forecast and troubleshoot dangerous failures. Enhanced monitoring can be achieved through various means, including additional instruments, more frequent sampling, enhanced trending, and more robust operator displays.

## Instrumentation

In commercial facilities, the focus is generally on comfort control, thus instrument accuracy is not as critical. Accuracy is more crucial in data centers, but the real consideration should be repeatability and quality. Quality instruments provide high confidence in the data and are often the lowest TCO solution when the alternative solution is the potential need for more frequent calibration, increased maintenance labor, frequent replacement, and poorly performing control loops. An enhanced monitoring approach (quality and quantity) can be a valuable tool during implementation and during operations. Greater granularity supports successful approaches to predictive maintenance, energy and performance analysis, optimization, retro-commissioning, historical comparisons and provides confidence in your data.

## Design Considerations

Implementing a reliable automation system is not solely dependent on the quality of hardware, software, and components used. The engineering and programming approaches have a substantial impact on the system performance, reliability, and ease of use.

Reaching a high state of reliability with commercial systems is possible but generally requires the systems to be "over designed" because the failure rates of commercial components and systems will be greater. Failures should be expected at every level and planned efforts need to be made to ensure that the systems react in the appropriate way to buy valuable time before operator intervention is practical. For applications where redundant or backup systems

are needed, industrial controllers such as Programmable Logic Controllers (PLCs) are easier to implement. Redundancy and backup with commercial hardware can be done but it requires additional programming logic, components and forethought, and even then, it is not a perfect approach. Testing these systems thoroughly takes a larger effort and can add significant complexity and frustration for operators.

## Cost Considerations

It is important to consider TCO when evaluating commercial and industrial BMS solutions. Commercial hardware has a lower first cost which can be substantial depending on the manufacturer. There can also be a large cost differential when looking at software. Commercial systems provide "packaged" software and typically license the software based on users. Industrial systems typically license based on number of points (or tags) which can increase costs for large facilities. An industrial solution is often the best choice when the client's business mission is the key driver. Most clients see the value in spending a little more up front to get a more robust, reliable, usable, and informative system. The costs associated with a downed facility are difficult to quantify but can be enormous.

## Conclusion

Commercial, industrial, and hybrid solutions have all been implemented in mission critical data centers. Some commercial systems can significantly outperform more expensive industrial solutions when a non-traditional, holistic approach is taken. Many data centers with commercial automation systems have multiple points of failure that remain undiscovered by the owner / operator. Selecting the proper hardware, software, and instrumentation are crucial steps for a data center BMS and are rarely given enough attention. Melding the right products with the right design approach can help maximize facility performance and reliability. Ultimately, evaluating various commercial and industrial options against the OPR for all aspects of the BMS, and doing so while looking beyond first costs, will deliver the best total solution.

*This article was written by dlb associates.*

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# Virtualisation and cloud technology – a question of when and how, not if



By Gunter Papenberg, Director Strategic Business at wusys GmbH.

NOW MORE THAN ever, data centres are at the heart of all business activities for companies today. Demands are growing and traditional data centres are reaching their limits of performance and profitability. High cost pressure is forcing many companies to look at promising virtualisation and cloud concepts. Compared to planning for a regular data centre, implementing a virtualisation or cloud concept requires that a company also explore new standards and criteria. Often they will first need to develop new competencies to handle these complex systems, and there is always the question of whether a highly specialised service provider or data centre operator might be a sensible alternative. Partners like this bring a wealth of knowledge to analysis and planning processes, and can get involved from the start to prevent errors and gaps in planning.

## Analysis and planning for new IT concepts

The benefits of virtualisation are efficiency, flexibility, availability and economy. It lays the foundations for demand-compliant IT and also cloud computing. A significant number of major players have already acknowledged this trend and are using very high performance and stable IT structures to their advantage. Direct benefits include savings on servers, footprint and infrastructure. Medium-sized businesses are now starting to follow suit. To fully capture every potential benefit of virtualisation and cloud technologies, there are five steps to consider: 1. Documenting the existing IT environment is the be-all and end-all for optimisation. Non-quantifiable and non-qualifiable environments cannot be usefully restructured and improved. It is also impossible to monitor the level of optimisation achieved without this baseline

data. Some of the main KPIs are: application performance, recovery times, availability and potential cost of downtime, costs for power and space, and auxiliary overheads incurred through cooling and security systems.

2. The service level is another critical factor in choosing new, modern IT structures. All analysis focuses on questions of data centre availability and applications that need to be running 24/7. IT is the backbone of any company and needs to be tailored to individual circumstances. It must offer exactly the services that applications and databases need. Once the detailed, comprehensive analysis is complete, the company can align its IT to corporate goals and act flexibly to avoid over- and under-allocations.

3. Following the analysis, various IT strategy models can be considered. The first step is to check whether a data centre is best run internally, externally or as a mixed model. It is vital to review the costs of any components required, which will need to be covered using in-house resources or procured via external specialists. Initial costs are not the sole deciding factor; companies must also look at ongoing operating costs and human resources, and/or developing new competencies for virtualisation projects against deploying external specialists, who generally have far more experience than in-house personnel.

4. Virtualised environments add value through consolidated, more effective infrastructure and the subsequent savings in terms of hardware systems, including power, cooling and footprint. For virtualisation, resource planning needs to be much more accurate than for traditional data centres where servers, storage and network components often only run at 50% utilisation. Furthermore, there is also a question of whether virtualisation should only be expanded internally, or expanded as a cloud in cooperation with a specialist service provider. The various models of private and hybrid cloud give companies outstanding options in reacting very quickly and flexibly to new IT requirements. External specialists are a good option because of their dedicated knowledge, which is unlikely to have developed to the same extent within a company.

5. Another key role of virtualisation involves data security and compliance. Virtualised environments are designed to use the highest possible proportion of existing resources. Data storage concepts, for example, are forced to use much shorter windows for backups, and you need technologies that reliably run backups and snapshots in live systems. Another aspect deals with regulatory directives that require precise compliance depending on the sector in which the company is active. The legislator mandates very high security for sensitive data, which in many cases involves long-term archiving. Right from the start, appropriate solutions must be considered as part of virtualisation concepts.

### Specialists add real value

Promising virtualisation concepts automatically raise the question of whether they should be fully or partly realised in an internal data centre or by specialist service providers. There is a lot to be said for external service providers and data centre operators whose core competency revolves around running data centres.

A data centre service provider – a pure IT professional – is better equipped to maintain components in terms of availability, connections, power supply, security, and free computing and storage resources than an individual company. And all this at much lower cost to the individual user. Outsourcing to an external data centre can save a company between 35% and 55% in energy costs alone, and also



promises greater availability, flexibility and security. Using virtualisation technologies can further increase the potential energy savings.

The ratio of server virtualisation to pure hardware is 6:1. This means that six servers can be replaced by a single virtual instance. In a recent project, data centre operator wusys managed to cut the client's planned acquisition costs by around 80% and reduce some of the budgetary pressure. Outsourcing IT in this project meant that the client's final infrastructure required just 40 virtual servers instead of 233 physical ones. The client calculated that costs would fall by almost 180,000 euros per year compared to the previous year.

Internal costs for administration, power, etc. were cut by another 76,000 euros in the long term. Internal projects can be executed faster, and resources that were previously assigned to standard tasks can now be deployed to new projects.

But aside from creating the technical basis for calculations, it is essential to examine various internal and external organisational aspects as they generally offer the highest value add for companies. Most companies have nothing more than very basic reporting and monitoring tools that provide information about the condition, utilisation and status of an IT infrastructure. A data centre or cloud operator has a range of much more powerful instruments at their fingertips. They need these to illustrate performance for the client and to measure consumption.

Results can be used to expand planning and continue developing the cloud in line with a client's individual requirements. Organisation and optimisation are not just the responsibility of the provider or service provider, but also the client's IT department or management. Close cooperation and partnership is the basis for efficient use of new IT structures. Client management and its IT departments can leverage requirements and reporting information delivered by the provider and service provider to create more accurate plans and take any necessary steps in cooperation with the partner/provider. This gives the company and its personnel a real sense of security in many areas, such as data protection, liability and management, which are rarely manageable with in-house IT.