

# NEWS

Whatever is happening in the world of Data Centre Cooling?  
A MERIT TS Perspective by Lex Pienaar.

Floor space, higher density air conditioning and better power efficiency are all challenges which need urgent attention in data centres. Space-saving is achieved primarily through virtualisation and the installation of a new architectural infrastructure consisting of high density blade servers, high density rack mount servers, high density storage arrays and bladed network equipment.

Gartner predicts that more than 50% of data centres will incorporate High Density Zones in their data centres by 2015. While most of these newer devices are designed with space-saving and power efficiency in mind by virtue of their compact design they generate more heat as a result, so much so that traditional cooling methods simply cannot cope.

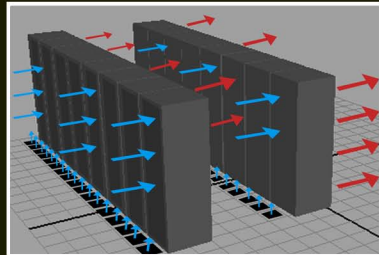
Furthermore, Business Continuity and IT governance regulations (HA and DR), meant that business critical system components inside data centres have been doubled. While this is intended to eliminate single points of failure to better guarantee system availability; more equipment simply means more cooling capacity is needed which means that still more space and electricity is needed.

Additionally, the recent 32% hike in electricity price means that data centres can simply no longer afford not to achieve maximum efficiency.

## CRAC/CRAH alone is no longer sufficient

Traditional CRAC (Computer Room Air Conditioners) CRAH (Computer Room Air Handlers) are either perimeter-based or centralised units that use raised floor plenums for cold air distribution to the equipment through vents or perforated floor tiles.

With CRAC/CRAH at best 3 kW cooling per rack is achievable. For higher densities CRAC/CRAH units prove increasingly inefficient as the biggest disadvantage lies the sheer volumes of air that to be cooled and the distance that air must travel and the considerable fan-power required to reach all corners of the data centre in an effort to prevent hot-spots.



Traditional data center layouts are highly inefficient due to poor airflow management

## In-Row Cooling improves cooling efficiency significantly



The latest data centre designs see air conditioning units placed overhead or in rows amongst the rack enclosures. In-row cooling provides much

higher cold air densities to deal with the heat loads that are generated by fully-populated racks - up to 15kW cooling per rack. In-row cooling devices can meet these phenomenal cooling demands purely because the distance between the cooling devices and the computer equipment has been reduced. Further control is provided by variable fan speed and automated chilled water flow regulation, all of which improves cooling potential.

## Close-Coupled Cooling

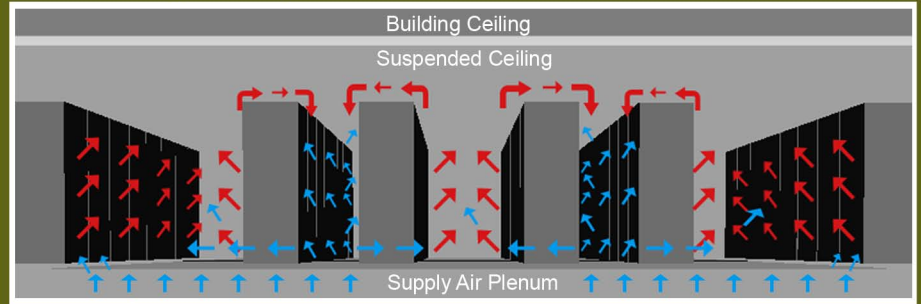
In-row coolers can also be referred to as close-couple cooling units and an added element of efficiency comes in the quicker capture of hot air close to the outlet at its source thereby improving



the net cooling footprint. By delivering cold air close to the origin of heat generation, less fan power is needed to move cold air to the equipment, which also means that the requirement for a pressurized plenum with a traditional air conditioner is eliminated and the set point can be higher.

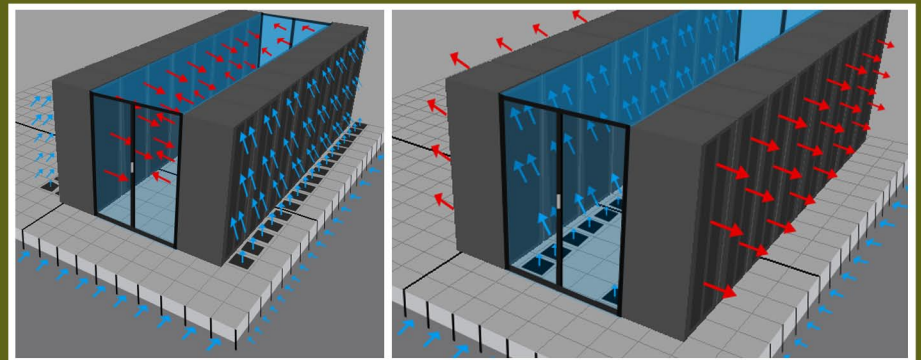
## Hot Aisle/Cold Aisle

The latest recommended approach in data centre deployment is to arrange cabinets into hot aisles and cold aisles configurations. Racks are no longer placed front to back, but rather arranged back to back and front to front, and through aligning cabinets into hot aisle and cold aisle configurations, hot and cold air kept separate, to enhance cooling efficiency.



## Hot Aisle/Cold Aisle Containment

Aisle containment is an ergonomical way to further maximise cooling efficiency that uses barriers between hot and cold air to maximise air flow dynamics. Set-points can be higher in contained environments because Aisle containment focuses on cooling the IT Equipment and not the rest of the room.



## Hot Aisle/Cold Aisle closed loop

For ultimate efficiency hot air must not be permitted to escape from the rack or pod. Solid doors force the air to be recycled and returned immediately into the air conditioning unit to focus on cooling the load and not the room.

The features of in-row cooling mean better airconditioning efficiency, which in turn means better energy efficiency and ultimately higher overall data centre efficiency.

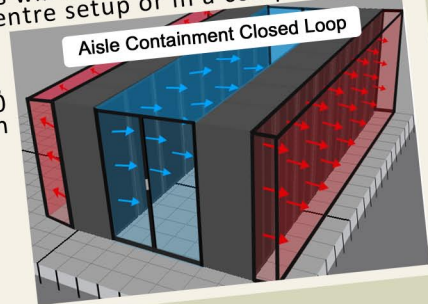
## MERITTS' Data Centre Containment Preferences

What needs to be considered in order to overcome the current limitations of current data centre cooling systems, is that the choice of technology will depend on a host of factors, unique and specific to each data centre.

MERITTS supports both hot aisle and cold aisle containment and advises open-mindedness and flexibility when looking at the future needs of a data centre. For now, conventional CRAC/CRAH units could be complemented by in-row cooling units which could, in turn, contribute to the ease with which containment is made possible, but the only way to efficiently and effectively provide for future computing requirements will be to build high density areas either within a current data centre setup or in a completely new environment.

MERIT TS has been designing data centres for more than 10 years. Please contact us with your questions.

[sales@meritts.co.za](mailto:sales@meritts.co.za)



Address: Unit 6A, Growthpoint Business Park  
Tonetti Road  
1685  
South Africa

Tel: +27 (0) 11 315 9844  
Smart: +27 (0) 86 116 3748 or  
+27 (0) 86 11 MERIT  
Fax: +27 (0) 11 315 9845  
Website: [www.meritts.co.za](http://www.meritts.co.za)

