

Ten Symptoms of Data Centre Problems

1. **Floor fans** – a data centre with floor fans is a clear indication of air delivery problems and hot spots. And the bad news is fans only make the situation worse. By increasing air movement you are increasing the cool and hot air mixing, resulting in higher temperature air to the servers and cooler return air to the CRAC (computer room air conditioner) – a major factor of inefficiency.
2. **Random perforated tiles** - perforated tiles in places other than the cold aisle. Data centres are equipment rooms requiring a clean environmentally controlled facility. They are not meeting rooms or storage rooms.
3. **Lack of equipment layout plan** – racks placement is crucial to the delivery of cooled air, the ability to get the hot air back to the A/C unit and the overall efficiency of the A/C units. Racks closest to the A/C units actually receive the least amount of air and in many instances reverse air flow occurs.
4. **Rack configuration** – open spaces between racks and servers, improper distribution of high density servers and poor rack design all impact the level of cooling needed to provide an adequate environment. Research has shown over 30% of the cooled air never gets to the servers due to bypass and servers near the top of racks have higher failure rates.
5. **Floor plenum integrity** – air like water takes the path of least resistance. Holes under racks, around conduit, solid panel rack doors, holes anywhere other than in perforated tiles are a major loss of cooling capacity. Cooled air mixing with warm room air returning to the CRAC decreases the efficiency of the CRAC, resulting in higher energy costs.
6. **Cooling entire data center** – legacy data centre design was based on low heat density equipment and specified cooling the entire data centre to an acceptable range. With the increase in computational capacity of servers and virtualization comes much higher heat densities. Cooling must now be directed to the server, not the room in general, with hot and cold aisle separation being the minimal accepted configuration. Aisle containment solutions are the preferred approach and will dramatically reduce cooling costs.
7. **Conflicting CRAC units** – lack of management of the CRAC units is one of the most common issues within the data center. CRAC units need to be coordinated to avoid conflicting cooling / heating, humidifying / dehumidifying.
8. **Cable chaos** – lack of management of cables creates chaos and impacts the efficiency of the cooling system. Unused cables and wiring under the floor, unmanaged cables within the racks severely impact air delivery resulting in higher operating costs.
9. **Lack of measurement** – not knowing how much power is being consumed by the data center is a major limitation in being able to control operating costs. Power utilization effectiveness (PUE) is the industry standard used to measure the efficiency of data centers.
10. **Lack of real time monitoring** – virtualized servers can rapidly change heat output resulting in hot spots that can affect operation. Room temperature checks, occasional walk abouts or spot checks are not good indicators of what is really happening. Ongoing real time temperature and humidity monitoring at the rack level is key to ensuring problems are identified before they become service affecting issues.