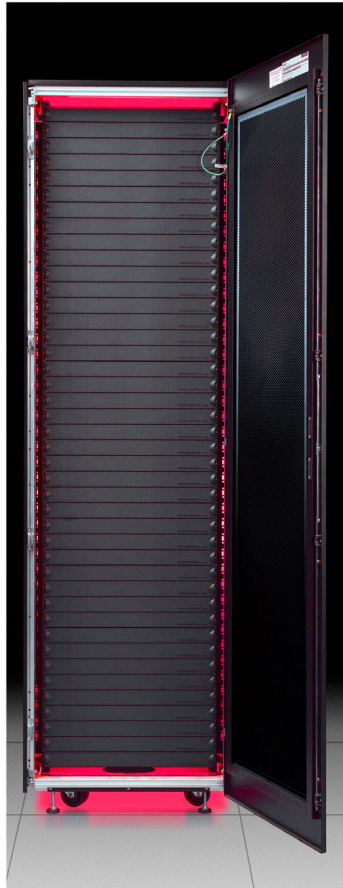


Five Airflow Fault Areas

Though the industry has learned the benefits of blanking panel best practices for the data center, this is only one airflow containment measure within the Rack Hygiene approach. There are as many as five additional rack-related areas requiring containment that are overlooked when one discusses rack-based airflow management faults. These fault areas can drive true performance gains in a front-to-back cooled world. The areas, known as the Five Airflow Fault Areas (Figure 2), include:

1. Under the rack (external to rack)
2. Left side of front-left 19" vertical mounting rail (internal to rack)
3. Right side of the front-right 19" vertical mounting rail (internal to rack)
4. Below the bottom rack-mount space (internal to rack)
5. Above the top rack-mount space (internal to rack)



Fault Area #2 & #3: Left and Right Side of Front 19" Vertical Rails

Because of customer demand for adjustable front rails and cable pass-thru capability, the areas to the left and right of the front rails on most 19" racks are potential leakage points. The space between the side of the vertical rail and the side of the rack frame or side panel is typically wide open. It is a potential leakage area into which hot air can penetrate or by which cold air can pass. This rack environment can severely compromise a robust blanking panel strategy.

Today's wider racks (i.e. 30") have an additional three inches on each side of the 19" rails to provide space for cooling side-to-side switches or space for managing a high volume of network cables. To get out to the side or up to the top, cables are passed through openings that are typically unsealed. These openings should be covered with a material that provides a seal around the cables to minimize air leakage.



Fault Area #1: Under the Rack

The area under the rack to the floor deck can be difficult to manage because the height is a variable based on the size of rack levelers or casters and will vary from one rack manufacturer to another. This space can contain a substantial amount of uncontrolled air in an enterprise data center with multiple rows of server racks. Therefore, this is an area that can yield a large benefit, if sealed appropriately.

Typically, there is no solid panel under the rack due to the requirement for power and network connectivity. This is a potential leakage area because hot air can come across from below the rack, and cold air from perforated floor tiles can bypass the rack in this space.



Fault Areas #4 & #5: Above and Below the Vertical Rack-mount Space

Areas above the top U space and below the bottom U space are also regions of suspicious leakage. Typically, some amount of space exists in these areas and varies per rack manufacturer. However, it is not unusual for this space to equal that of a missing blanking panel.

Not only is this area susceptible to hot-air recirculation, but it is also more likely to allow bypass of the cool supply air supply from CRACs.

