



TierPoint Case Study

Triad Slotted Airflow Panels

Monitor. Integrate. Alert. Peace of Mind.

Our Customer



TierPoint is a leading national provider of best-in-class IT infrastructure

services. TierPoint offers multi-tenant, private, and hybrid cloud solutions; disaster recovery, business continuity and other managed services; and colocation backed by a commitment to customer service and highly-redundant, carrier-neutral data centers coast to coast. State-of-the-art cooling systems keep TierPoint's data centers optimized for equipment to operate at peak. The prevailing design for TierPoint's data centers is to provide redundant data center cooling and humidity control systems and multiple remotely monitored computer room air conditioning (CRAC) units.

Products Leveraged

Triad Slotted Airflow Panels

- o 65% Top Open Area
- o Heavy steel composition
- o Available in Imperial and Metric sizes
- o Linear grate pattern
- o Powder coat finish
- o Horizontal and vertical levelers

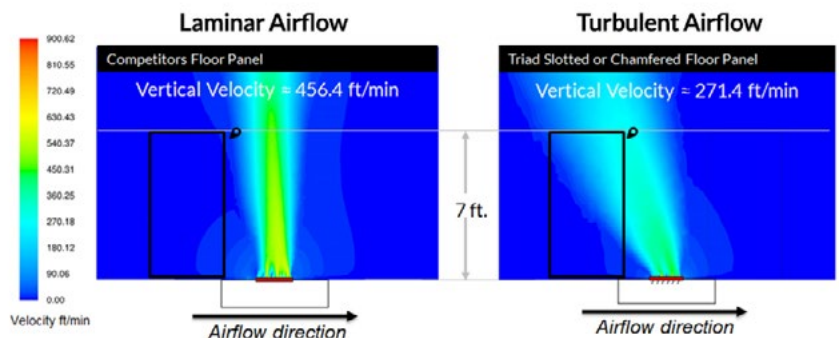
At RLE, we know airflow. It may seem a simple prospect – force cool air into the floor plenum, let it rise in front of the racks, cool the servers and IT equipment. But we've been in hundreds of data centers around the world. We know it's not that simple. And we know data center managers spend endless hours working to improve airflow and rack-specific cooling while minimizing facility cooling costs and energy usage.

Our engineers understand the scientific principles behind data center airflow management, and have worked to create and patent a portfolio of airflow management products that will efficiently maximize your existing airflow. Just ask our satisfied customers at TierPoint.

The Traditional Problem

Facility managers are used to delivering cold air to their computer room through a raised floor supply plenum and standard 25% flat bottom perforated floor panels, and TierPoint is no exception. This approach comes with its own challenges:

- A considerable amount of the laminar air travels past the openings in the perforated panels, which means it does not come into the room to cool the equipment.
- It is very difficult to cool air inlet temperatures higher than three feet above the floor. This is especially an issue when the supply plenum is shallow or the perforated panels have high velocity laminar air traveling beneath them.



High velocity laminar air traveling beneath standard perforated panels is like traveling down the road with an open car window. Some air comes into the car but much of the air passes by the open window. This explains why many of the standard 25% perforated panels in a raised floor data center deliver less-than-optimized airflow to the servers.

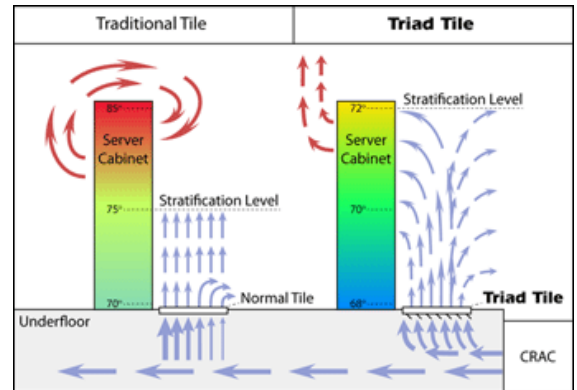
More Air Isn't Necessarily Better

Facilities will often try to solve airflow problems by adding panels with more open space, like 56% open perforated panels. These panels generate considerably better vertical momentum, but **more** air isn't necessarily **better** air. The airflow through these panels emerges as a high velocity laminar jet and travels straight up, failing to penetrate the hot boundary layer along the front surface of the rack. The high velocity on the leading edge of 56% open panel also typically causes recirculation and negative flow over about 20% of the panel surface.

The Modern Solution

To solve TierPoint's airflow problems, we recommended our slotted airflow panels. Why are these panels the right solution?

- Slotted panels feature a patented stratification fin, which is specifically designed to direct cool underfloor air to the server cabinet inlet.
- This creates a direct pathway of air from the supply plenum through the floor panel, and into the server fan. Cool air leaves the CRAC unit, moves through the under floor plenum, and is directed up through the panel and delivered directly into the front of the server. The air cools the server, then returns back to the CRAC unit.
- These airflow improvements are achieved without the need to increase the supply plenum pressure - in most cases the pressure can be reduced, reducing energy costs.



Lou Valentino, TierPoint's Director of Cloud and Data Center Engineering, asked us for a few slotted panels so he could test their performance. The results were impressive - and immediate.

"We performed temperature readings at six points in the front of each cabinet - top left, top right, middle left, middle right, bottom left and bottom right. Using an infrared thermometer, we determined that air entering the server inlets between the three and six foot levels was reduced by eight to ten degrees compared to the traditional panels that we had used previously. We also determined that the slotted airflow panels have no measurable effect on static pressure drop in the system."



Based on these results, Valentino has deployed RLE's slotted panels in 14 data centers across the US. The panels are deployed on a case-by-case basis and used wherever high heat loads are experienced. Infrared temperature measurements are performed on inlet air whenever the slotted panels are installed and they have consistently shown an eight to ten degree reduction for inlets in the three to six foot high range.



Align our patented stratification fin to direct air *exactly* where you need it.

The new tiles have also continued to provide equal static pressure readings compared to the traditional tiles used in the past. "Based on my personal experience, I believe that the slotted tiles provide a fast, easy-to-implement, and economical solution for thermal management in today's state-of-the-art data centers," Valentino concluded.

