



CASE STUDY 1



Infrared Thermography Case Study: Financial Data Center

Data collection January 25, 2008

Data Center Details

Corporate data center for a large financial organization. Uptime expectations are "24 x forever". Computer room configuration is Cold and Hot Aisle.

Problem Statement

IT equipment air-intake temperatures exceed the ASHRAE-recommended maximum of 77°F by as much as 13.5°F, putting equipment at risk of premature failure. IT equipment air-intake temperatures of 90.5°F were recorded for the server installed at the base in the IT cabinet enclosure despite cold-aisle containment and installation of grates. Hot exhaust air from the back of the cabinet was recirculating through a 2U opening in the front of the cabinet causing excessively high air-intake temperatures for the two lowest servers in the cabinet.

Cabinet Configuration

The subject cabinet is located in approximately the middle of a row and is full of IT equipment, except for a 2U opening at the bottom of the cabinet. Grates are installed immediately in front of all cabinets in the cold-aisle. The grates are supplying approximately 650 cubic feet per minute (CFM) of conditioned airflow at 53°F. The volume and temperature of conditioned airflow is sufficient to support the installed IT equipment.

Findings

- The primary hot exhaust-air circulation pattern is under the lowest installed server, through the 2U opening.
- A secondary exhaust circulation pattern is around the sides of equipment, through the opening between the sides of the cabinet and rails.
- An insufficient volume of conditioned airflow is not the cause of the high air-intake temperatures.

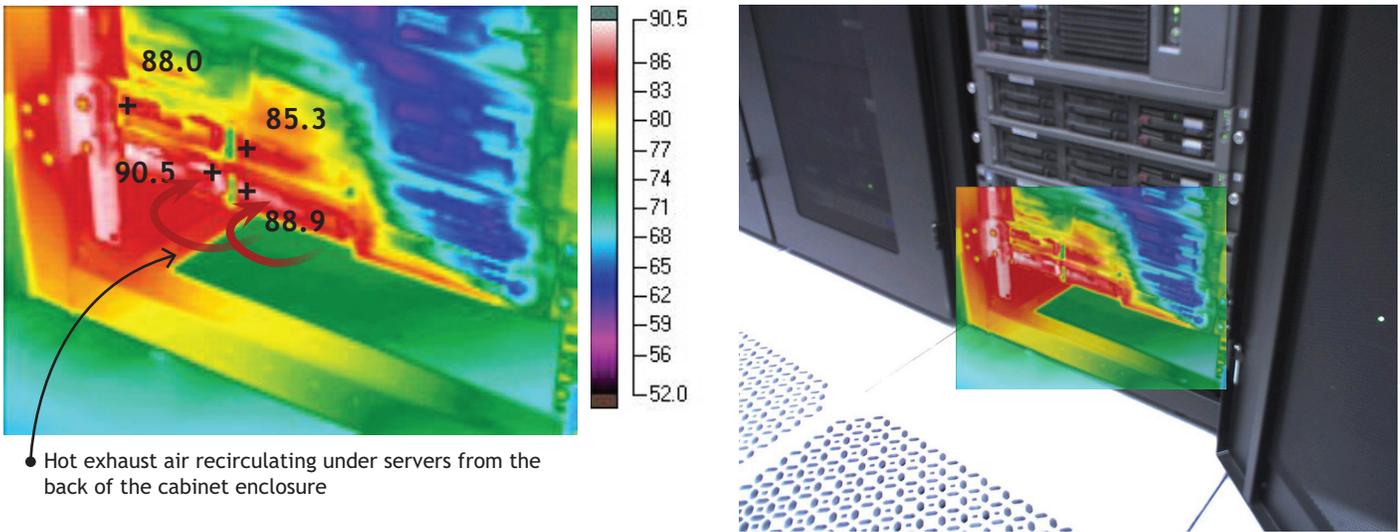
Solution

A 2U HotLok™ Blanking Panel was installed in the opening at the base of the cabinet in less than one minute. IT equipment air-intake temperatures were recorded five minutes after installation of the HotLok Blanking Panel.

Results

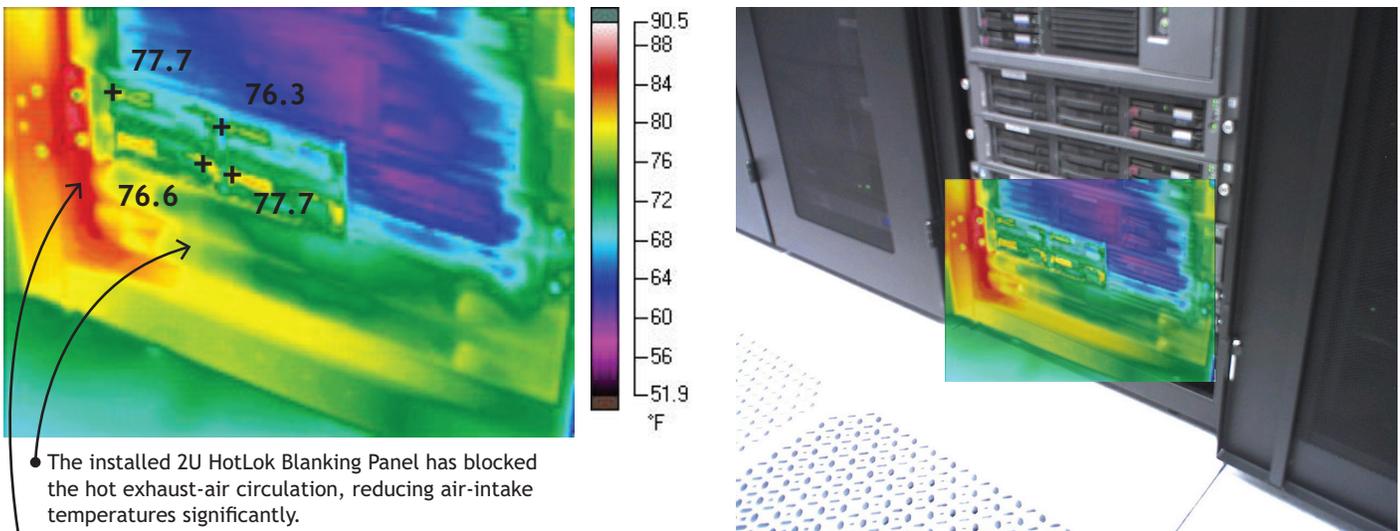
Five minutes after installation of the 2U HotLok Blanking Panel, the air-intake temperature of the four points measured in the server air-intake area dropped by an average of 11.4°F.

Infrared image of cabinet base before installation of the 2U HotLok Blanking Panel



- Hot exhaust air recirculating under servers from the back of the cabinet enclosure

Infrared image of cabinet base five minutes after installation of the 2U HotLok Blanking Panel



- The installed 2U HotLok Blanking Panel has blocked the hot exhaust-air circulation, reducing air-intake temperatures significantly.
- Hot exhaust-air circulation remains around the sides of the servers. If the space between the rails and the side of the cabinet are sealed, the IT equipment air-intake temperatures will decrease further.