CISCO NEXUS® 3048 SWITCH

A Vertiv Application Brief

OVERVIEW

The Challenge

A customer installing new servers in a cabinet caused the temperature of a Cisco 3048 switch to reach its maximum operating temperature of 104°F leading to thermal alarms. The switch is mounted in the top rear of the cabinet in a traditional Hot Aisle/Cold Aisle data center configuration. Blanking panels are installed on the unused U space.

What can be done to reduce the operating temperature of the switch?

Learn how the SwitchAir® can be used as a solution to prevent overheating of the Cisco Nexus® 3048 switch.

The Why

Network switches deployed in data centers are often mounted in the top-rear of server rack cabinets. This configuration is convenient for cabling purposes, but it results in the switch intake only having access to hot exhaust air from the servers. This effect is intensified by the arrangement of cabinets into the traditional Hot Aisle/Cold Aisle containment configuration. Blanking panels fill all open rack positions in the front of cabinets and solid side panels are used to prevent mixing of air between the hot and cold aisles. Due to heat rising, the hot exhaust air from the servers and other gear rises to the top of the cabinet where the switch is located. When the server cabinets are lightly loaded, the switch intake temperature remains within its optimal operating temperature range. As additional servers are added, the switch intake temperature begins to rise to undesirable levels. Combined with the heat created by the switch, the temperature could rise above the maximum operating temperature. If the high temperature is not addressed quickly, it could lead to decreased life expectancy of the switch or even switch failure.

The Solutions

There are several solutions to be considered.

- **Remove blanking panels at the top of the cabinet to allow air from the cold aisle into the proximity of the switch intake.** While this option may help, it is not the most effective solution to the problem as it would not significantly reduce the air temperature at the switch intake. The hot exhaust air from the servers in the cabinet will mix with the air from the cold aisle entering the cabinet. Due to the cabinet's slightly positive pressure, it would most likely cause hot air to leak into the cold aisle raising the intake temperature of other equipment in the cabinet.
- **Install a rack mount fan assembly to direct air from the cold aisle into the top of the cabinet.** This option also ends up with significant mixing of hot air with the air from the cold aisle. To get the right air temperature at the switch intake, the fans need a high flow rate which tends to consume a greater volume of air from the cold aisle and starve the other equipment populated in the cabinet. When the fans are directed at the switch intake, it can cause too much positive pressure against the switch's internal fans making them work harder. This can cause early failure of the switch fans. Finally, the rack mount fan assemblies can be costly.

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- **Install a duct/baffle kit to direct airflow from the cold aisle to the air intake of the switch.** This type of solution can significantly improve the intake temperature. It provides an airflow path from the cold aisle to the switch intake and utilizes the internal fans from the switch to move the cool air. The product should be designed and tested for the specific type of switch used. Switches have various airflow patterns, so each switch may require a different duct/baffle kit to ensure a proper path to the air intake. Additionally, the solution should be easy to install without requiring unnecessary downtime and still be cost effective.

The Vertiv™ Geist™ Solution: SwitchAir® Model SA1-01002

The Vertiv Geist SwitchAir SA1-01002 airflow management device is an adjustable duct that creates a channel for air to travel from the cold aisle directly to the rear air intake of the Cisco Nexus 3048 network switch. It is specifically designed to be installed while the switch is in operation, no downtime required. The design prevents hot air from inside the cabinet from reaching the intake of the switch. It is also equipped with brush strips to allow routing of the switch power cords.

A customer who installed the SwitchAir SA1-01002 device in several cabinets saw an average decrease of 18°F at the intake of the switch. After installation, the Cisco Nexus 3048 switches were all well within the preferred operating temperature range, and the SwitchAir proved to be the optimal solution.

Summary

The Vertiv Geist SwitchAir provides airflow management for a wide range of switches to ensure that air from the cold aisle is properly directed to the intake of the switch. To determine the SwitchAir that is right for your device, visit the SwitchAir Finder at www.vertivco.com. Enter your switch make, model, and airflow pattern to find the SwitchAir perfect for your switch.

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