

Article Overview

Cold aisles in data centers are designed to deliver cool air to the front of IT equipment, with recommended widths of at least 1.2 meters and controlled lengths to optimize airflow, safety, and serviceability.

Cold Aisle Layout and Purpose

Cold aisles are formed by arranging server racks so that the front faces of two rows of IT equipment face each other, creating a corridor where chilled air is supplied to the equipment intake . The primary goal is to separate cold supply air from hot exhaust air, preventing mixing and improving cooling efficiency . Cold air is typically delivered through perforated floor tiles in a raised floor system, although some modern designs place racks directly on the floor slab while maintaining the hot aisle/cold aisle orientation .

Recommended Dimensions

- o Aisle Width: Minimum of 1.2 meters, allowing two full floor tiles between rack fronts for optimal airflow and personnel access . Wider aisles may be required if ceiling heights exceed 3.7 meters to accommodate overhead systems such as lighting, fire detection, and suppression equipment .
- o Aisle Length: Maximum 16 meters for continuous rows of cabinets. If one end of the aisle is closed or lacks a personnel exit, the length should be limited to 6 meters for safe access and evacuation .
- o Raised Floor Height: Typically 18-24 inches to create an underfloor plenum for cold air distribution .

Airflow and Containment

Cold aisles rely on directing chilled air to the front of racks, where servers draw it in for cooling. After passing through the equipment, the heated air is expelled into the adjacent hot aisle . Containment strategies, such as cold aisle containment, can further improve efficiency by enclosing the cold aisle to prevent hot air recirculation and reduce energy consumption .

Equipment and Safety Considerations

- o Ensure air inlet and exit areas are unobstructed by cables, paper, or other objects .
- o Maintain inlet air temperatures within manufacturer specifications, typically guided by ASHRAE TC9.9 standards .
- o Plan for serviceability, allowing personnel to access equipment safely without disrupting airflow or cooling performance .

Summary



Cold Aisle Standards for Computer Rooms

Adhering to cold aisle standards enhances cooling efficiency, energy savings, and equipment reliability. Key practices include maintaining proper aisle width and length, using raised floors or alternative air distribution methods, implementing containment where feasible, and following ASHRAE thermal guidelines for inlet temperatures and airflow management .

Hot and cold aisle containment can help you maintain the best air flow, temperature and humidity in the data center to

Air Distribution Diagram of the Isolated Cold Aisle Air Distribution Diagram of the Isolated Hot Aisle 01 Prerequisites for

Hot aisle containment (HAC) and cold aisle containment (CAC) are the most efficient ways of preventing your servers

Learn how to implement hot and cold aisle containment in existing data centers -- HAC vs CAC comparison, PUE

Noticing dramatically different temperatures while walking through a computer room with Cold Aisles/Hot Aisles is a

They house computer systems and associated components such as telecommunications and storage systems.

Overview This standard covers the requirements for the protection of information technology equipment and information technology

By maintaining consistent, predictable temperatures, cold aisle containment minimizes thermal stress and reduces the risk of

In the following figure, racks within the data center are arranged such that there are cold aisles and hot aisles. The cold aisle consists

Training and Awareness The hot and cold aisle strategy is a proven method for improving cooling efficiency and reducing energy

In this guide, we'll break down how hot aisle and cold aisle configurations work, what

strategies orient the IT racks in what is called a hot aisle/cold aisle layout. Cold aisles are formed by the space

between the front faces

Executive Summary of Aisle Containment This article examines cold aisle containment and hot aisle containment (also known as

Equipment layout and air delivery paths The hot-aisle, cold-aisle arrangement that is explained in the ASHRAE publication, "Thermal

The majority of installed computer equipment is placed in racks that are designed to intake cold air from the front and exhaust hot air

As an addition to a conventional precision cooling system, cold aisle containment consistently separates cold and warm areas

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