

## Energy Efficient Directed Airflow™ Cooling

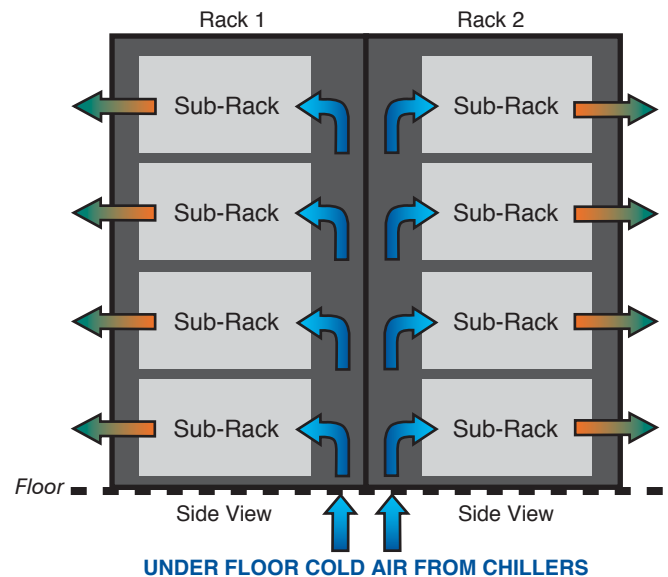
The Xtreme-X2 features a new Directed Airflow™ cooling configuration designed to take cold air from the datacenter AC under floor directly to the equipment for optimum rack cooling efficiency. Warm air is discharged out of the front of the Xtreme-X2 solution. This configuration reduces datacenter floor space while maximizing cooling efficiency and power consumption. This cooling system features front access for maintenance, allowing racks to be mounted back-to-back to take advantage of the under-floor cooling available in most datacenters. Delivering the cold air directly to the equipment to be cooled, eliminates the need for an aisle between the racks. This improves density and saves 30% on floor space. Within the blades themselves, board components are positioned so that processor-heated air flows over the fewest components and is ejected from the blade through the front access panel. More than half of this front panel is perforated to minimize turbulence and reduce pressure.

### Back-to-Back Configuration

- 30% improvement in datacenter space by eliminating hot aisles
- 28% improvement in cooling efficiency compared to front-to-back standard rack configuration

### Directed Airflow™ Cooling

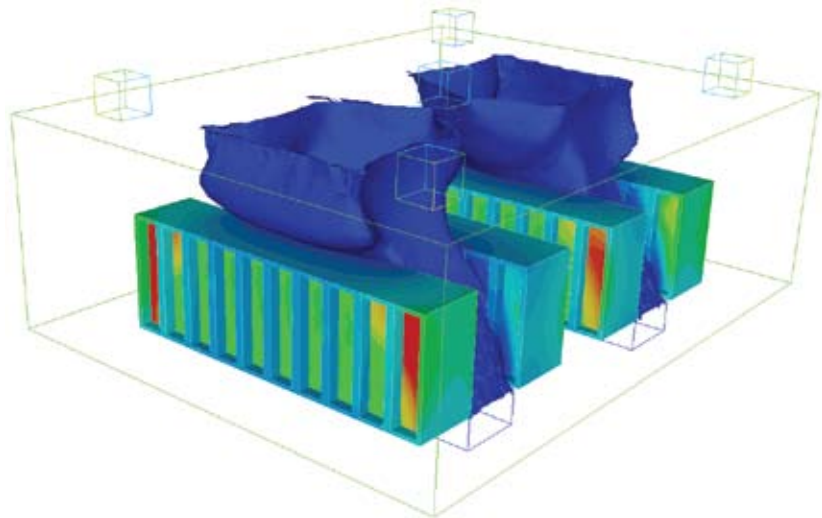
- Delivers cold air from the AC under floor directly to the equipment for optimum rack cooling efficiency
- Delivers comfortable temperature to the room for return to chillers
- Field Replacement Unit (FRU) and maintenance is done in the front side of the rack cabinet



A Compute Fluid Dynamics (CFD) analysis was done to demonstrate the difference between a standard rack cabinet with hot/cold aisle cooling configuration and Appro's Directed Cooling configuration.

### The Standard Rack Cabinet with Hot/Cold Aisle Cooling Configuration

- It takes 28% more airflow to cool the same number of racks for a front-to-back standard rack with hot/cold aisle configuration as compared to the Xtreme-X2 configuration.
- The standard rack cabinet utilizing the standard hot/cold aisle has an inherent flaw of AC flow by passing the servers directly to the exhaust causing an imbalance of cooling between servers and several hot spots.



### The Appro Xtreme-X2 Directed Cooling Configuration

- Appro's direct cooling architecture improves power and cooling efficiency in the datacenter by at least 22% while reducing floor space by up to 30%
- 100% of the AC flow is forced through each server maximizing the reliability of each node while maintaining a uniform temperature across the entire system
- Reduced total cost of ownership and computing capability while keeping the datacenter cool

