GEIST

Future Thinking • Solutions Today

Intelligent Containment Systems

About **Geist**

Geist designs and manufactures industry leading technology and software for powering, monitoring, cooling and managing critical data center infrastructure. We produce affordable, quality products while providing our clients with superior service. Whether it's enhancing customer care services or implementing new technologies, Geist promotes innovation, quality and satisfaction in all aspects of business.

geistglobal.com

Maximize cooling efficiency and easily maintain
a perfectly controlled temperature.

Air Management Systems

Geist Cool solutions offer sophisticated airflow management to data centers of any size and capacity. By containing and directing hot air, the Geist Cool line delivers significant cost savings while improving the long-term reliability of mission-critical IT equipment.

- Maintains a perfectly controlled and consistent IT environment

- Maximizes efficiency while maintaining an ideal temperature throughout data centers

- Contains and evacuates 100 percent of the heat so no hot air mixes with cool air

- Exhausts heat directly from the cabinets, eliminating hot-air bypass

- Maximizes chiller plant efficiency with the highest possible return air temperatures

- Eliminates temporary fixes like vinyl plastic sheeting with expertly manufactured chimneys and rack enclosures

UptimeInstitute
GREEN ENTERPRISE
IT AWARD 2011

Intelligent fan units respond when sensors recognize a fluxuation in demand.

Airflow Assessment Program

Geist's highly trained team of experts conduct a thorough site survey to identify key airflow trouble spots and recommend viable solutions in a customized Airflow Assessment Report. This assessment provides detailed insight into the efficiency of a data center's cooling circuit and summarizes the necessary steps to maximize cooling efficiency.

Assessment ROI

It's estimated that for every watt of power consumed by IT equipment in an average data center, another watt is required to remove the heat generated by that equipment. Based on this principle, significant cost savings can be achieved by implementing all or a portion of the steps prescribed in the Airflow Assessment Report. In addition to targeting airflow problem spots, Geist's assessment clearly calculates the estimated return on investment from the suggested recommendations. Indirect monetary benefits like improved reliability of equipment and upgraded working conditions are also included in the report. Geist's Airflow Assessment Report specifies the many overall benefits of effective airflow management.

Assessment Team

For more details on conducting an Airflow Assessment in your data center, contact one of Geist's cooling experts at 800.432.3219 or sales@geistglobal.com.
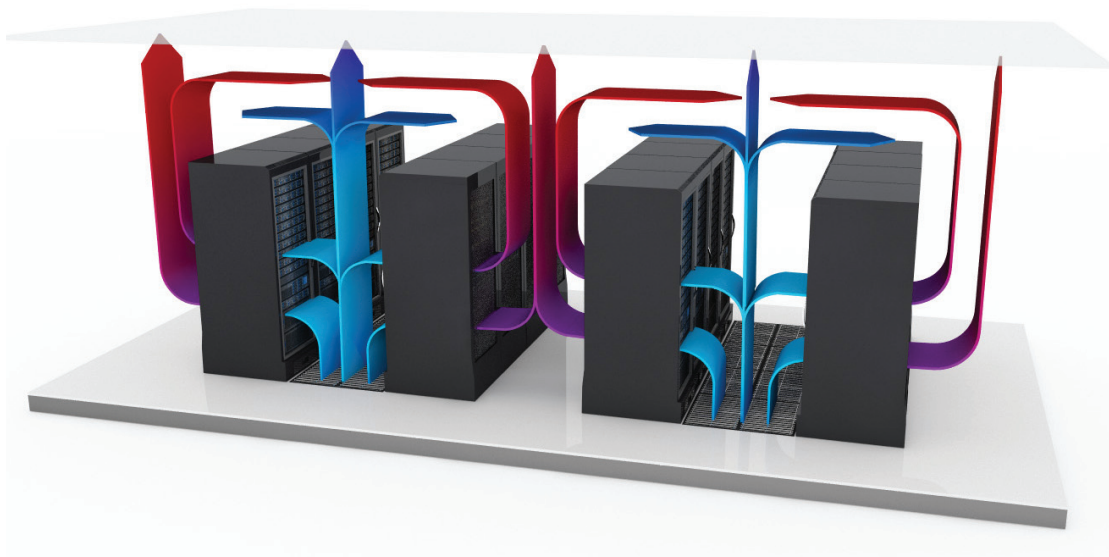
Studies show 250 percent over-cooling is required when hot air is uncontrolled.*

Without heat containment, hot air mixes with cold, leading to gross over-cooling. Geist Cool addresses this problem by focusing on containing hot air to improve cooling efficiency by up to 40 percent.

* ""Designing Better Data Centers"," *ASHRAE Journal*, 12/07, EPA - Uptime Institute conference material

Provides automated feedback to help cut total fan energy by 40 percent.

Intelligent Cabinet or Row Containment

The Geist Cool ActiveAir System centers on two critical components: 1) containing heat and 2) expelling heat directly to the Computer Room Air Conditioning (CRAC) units. This two-step focus maintains and stabilizes the ideal temperature for data center equipment.

The first step is addressed by Geist Cool's expertly manufactured chimneys and enclosures. The second step relies on sophisticated temperature and pressure sensors to control fan speeds and exhaust hot air through the chimneys at the most efficient rate. The combination of hot air containment and intelligently controlled fan speeds creates a consistent climate-controlled environment in the data center and within the cabinet rows.

Geist Cool is available for virtually every new or existing cabinet model and configuration. Geist has developed a vast library of cabinet-specific installation kits that include cabinet tops, blanking panels and mounting hardware. If a new cabinet or row configuration is required, Geist's team of design engineers will deliver a solution in days.

Fan controller
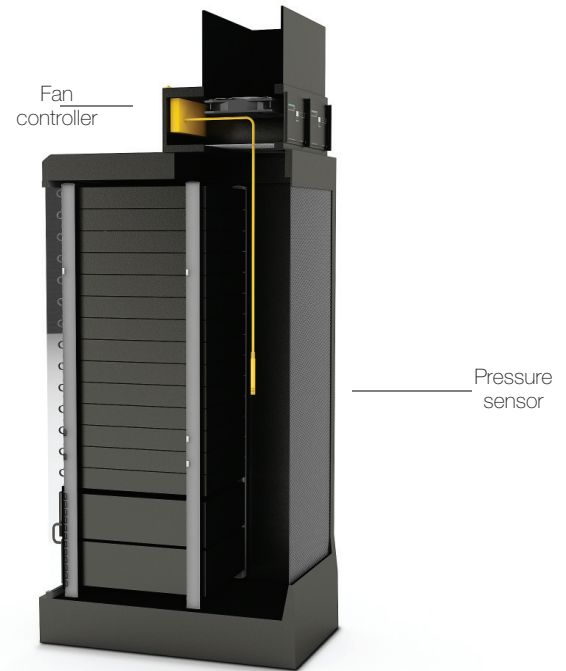
Pressure sensor

Pressure sensor information is fed into the controller, which is then translated into commands that raise or lower fan speeds based on the server load.

Part number	Description (See page 4 for detailed descriptions.)
EC10D SYSTEM	Containment Cooling System includes Chassis, Host Controller with Pressure Sensor and (2) EC10D fan cartridges
EC10R SYSTEM	Row Containment Cooling System includes Chassis, Host Controller with Pressure Sensor and (2) EC10D fan cartridges
EC20D SYSTEM	Containment Cooling System includes Chassis, Host Controller with Pressure Sensor and (2) EC20D fan cartridges
EC20R SYSTEM	Row Containment Cooling System includes Chassis, Host Controller with Pressure Sensor and (2) EC20D fan cartridges
EC1001C	EC Base Chassis, 7.5 inches
EC1001CT	EC Base Chassis tall, 11.5 inches
EC1002-0007X	Duct Extender extends duct an additional 0-7 inches
EC1002-0013X	Duct Extender extends duct an additional 0-13 inches
EC1002-08S	EC System Duct, 8 inches, stackable
EC1002-12S	EC System Duct, 12 inches, stackable
EC1002-24S	EC System Duct, 24 inches, stackable
EC1002-48S	EC System Duct, 48 inches, stackable
EC1001H	EC Host Controller, includes pressure sensor and mounting bracket
EC10D	Fan cartridge for use in EC 10D System

A. Custom Chimney

Geist Cool chimneys exhaust the cabinet's hot air through the ceiling return plenum or to other desired locations. Chimneys are adjustable to accommodate most ceiling heights. Durable and easy to assemble, each chimney is made of powder-coated steel, matching most data center cabinets.

Adjustable duct extender kits: EC1002-0007X, EC1002-0013X
Fixed length stackable ducts: EC1002-08S, EC1002-12S, EC1002-24S, EC1002-48S

B. Fan Units

Geist Cool fan cartridges evacuate hot air to maintain air flow at the exact rate the IT equipment generates. Each fan unit is manufactured with best-in-class components to ensure maximum run life and unparalleled efficiency.
EC10D, EC20D

C. Intelligent Controller

The intelligent controller is the brains behind Geist's Enterprise Cooling (EC) system. It automatically adjusts fan unit speeds to exhaust exactly the right amount of air from each cabinet. The fan speed is controlled by information from pressure sensors that compare pressure inside cabinets with that in the room. The EC system works to maintain a zero differential between the two environments. The intelligent controller also logs and records valuable temperature and performance data.
EC1001H

A

System
Components

EC20DT System

B

C

Geist Cool conforms to almost any
# environment to deliver intelligent cooling.

Scalable Capacity

- System capacity automatically scales as loads are added or removed
- Automated load sharing returns all heat directly to return air plenum
- High-density loads can be directly coupled for single cabinet isolation
- Load sharing leads to lower cost per deployed kW, allowing all fans to run at energy efficient speeds

Load Sharing

- Multiple systems work together to share cabinet loads
- Operational redundancy increases as systems work in concert
- In the event of utility failure, heat continues to be exhausted by the Geist cooling unit using power provided by its PDU/UPS

Automated Control

- Receive automatic notification of system threshold breach via email or SNMP
- Environmental conditions are monitored and reported automatically
- IT intake air is stabilized within a few degrees of the supply air temperature at all points in the data center
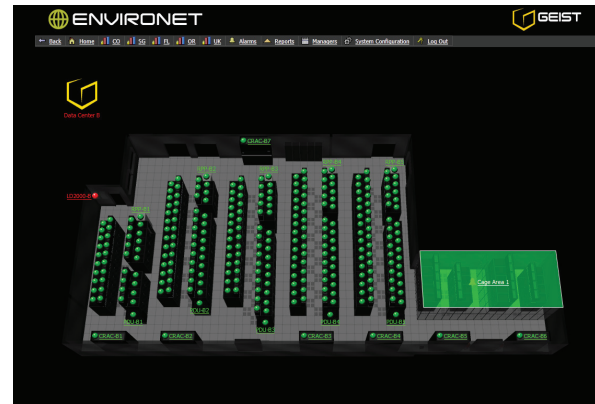
Geist's Environet software aggregates total airflow load and automates the process of defining requirements, allowing for a reduction of supply airflow across the data center.
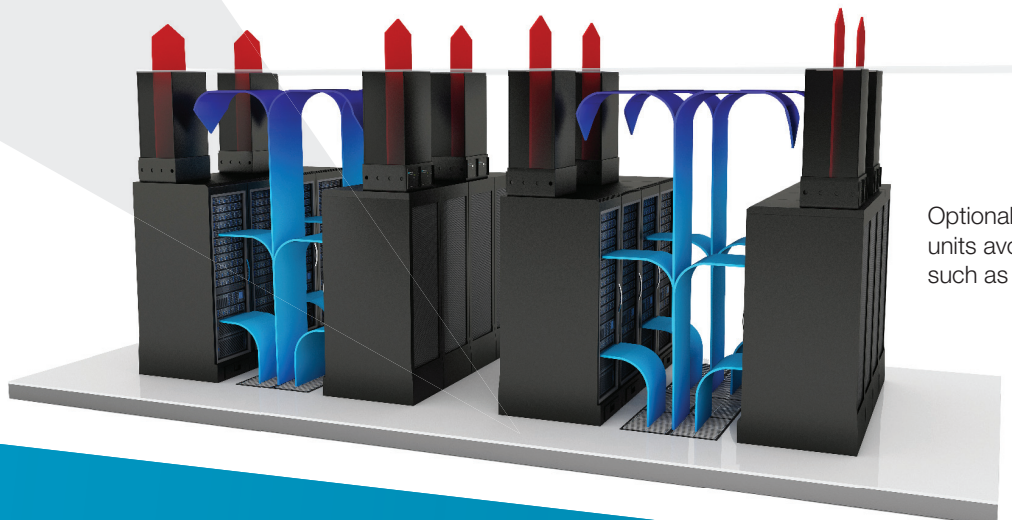
Optional placement of Geist cooling units avoids overhead obstructions such as cable trays.

Intelligent heat removal and
monitoring solutions.

Unity Cooling

The Geist Cool Unity Cooling solution uses sensors and sophisticated software to integrate its row-based Intelligent Containment System with the data center's CRAC units. By establishing a link to the airflow requirement at the rack-level, Unity Cooling controls the CRAC unit and delivers only the amount of cool air required by the data center. The fully automated system maximizes efficiency by optimizing the amount of power required to maintain the appropriate temperature. The Unity Cooling solution saves up to 40 percent on power consumption. In addition, Unity Cooling gives you the advantage of:

- Scalability to adjust data center airflow to accommodate growth
  of additional servers and load for increased data center efficiency
- Reporting coupled with the element of fan control to reduce fan
  power for better efficiency

IT Row Enclosure

The Geist Cool Row Enclosure system encases an entire row of cabinets to completely contain heat and keep it from mixing with a data center's cold air. The enclosure includes Opengate's intelligent sensors and chimneys to exhaust heat directly to the CRAC. The system can be deployed in a variety of retrofit or new construction configurations to meet your specific data center needs.

Geist's IT Row Enclosure provides:
- Maximum efficiency
- Effective control of thermal environment
- Flexibility to increase load
- Automate cooling supply to match IT load
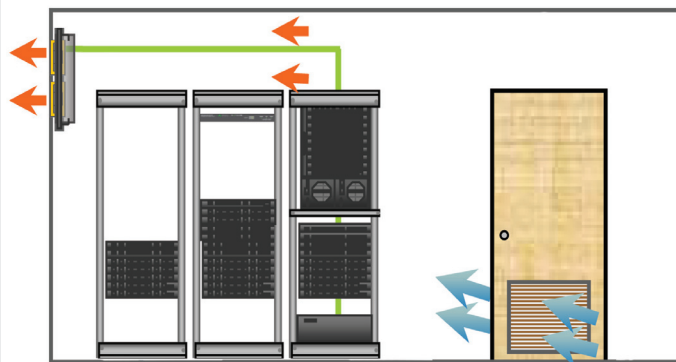
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Small Room Cooling

Geist's RAC10 system evacuates heat from a small space and sends it to the outside corridor or ceiling plenum return. The unit allows the closet to breathe which leads to a perfectly controlled environment for your small computer and network rooms using building air. The unit interfaces with temperature sensors to adjust fan speeds as temperatures rise and fall while providing the needed visibility-to-cooling capacity, environmental information and alarms. Email alerts and the Web interface provide remote alerts and management for superior visibility and control of room environment.

Opengate RAC10

The Geist Cool RAC10 system can be mounted to the wall or the ceiling for automated heat exhaust and critical monitoring and alerts. An optional Duct Kit can be added. The dimensions of the RAC10 fan enclosure are 21" W x 14" L.

Wall Mount

Ceiling Mount

Ceiling Mount Wire Hanger Loop

Cable Tie Loop

Wall Stud Mounting Flange

Optional Duct Kit

Temp Sensor Port (4)

Redundant Fans

Internal Temp Sensor

Ethernet RJ45

Power Input
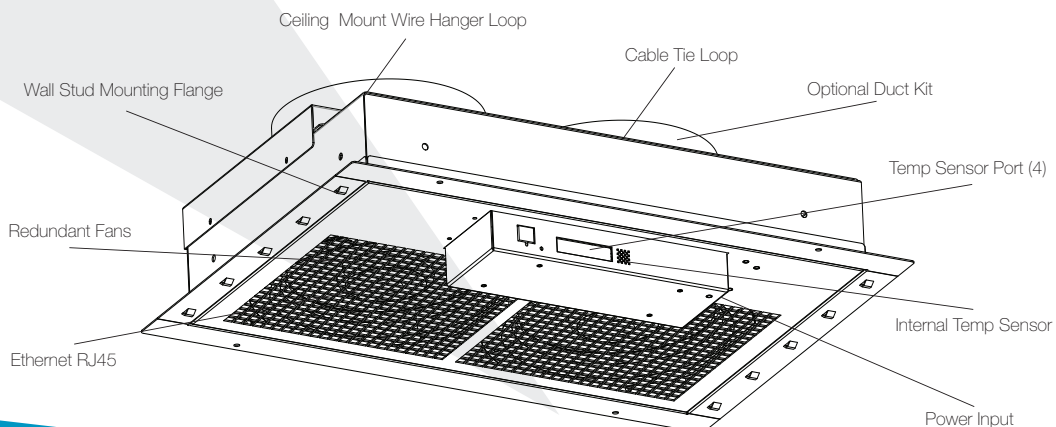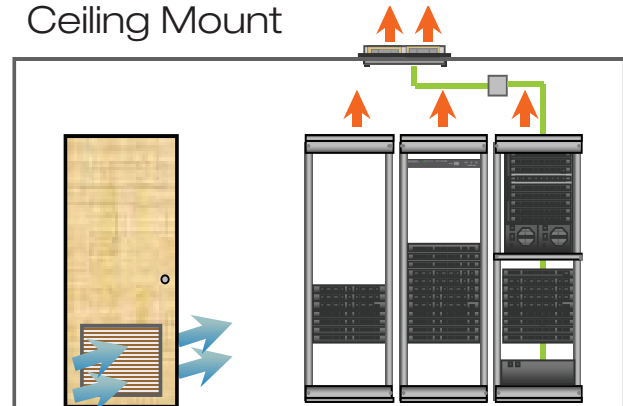
Lower the operating temperature of network switches, load balancers and routers.

Switch Cooling

Network switches, load balancers and routers are often mounted in the back of a cabinet for more convenient cabling connections. Unfortunately, devices installed at the back of cabinets can be critically damaged or may go offline when they are fed pre-heated air from the servers. Geist Cool SwitchAir addresses this issue by delivering cool air to network devices regardless of where they are mounted. Switch Cooling products are available in a wide range of configurations and rack space sizes. Designed to work with 1U to 9U devices and beyond, Geist Cool Device Cooling channels air to every kind of intake/exhaust configuration imaginable.

Network switches mounted at the top and rear of the rack are susceptible to heated air from the servers. This hot air is recirculated, putting stress on the device.
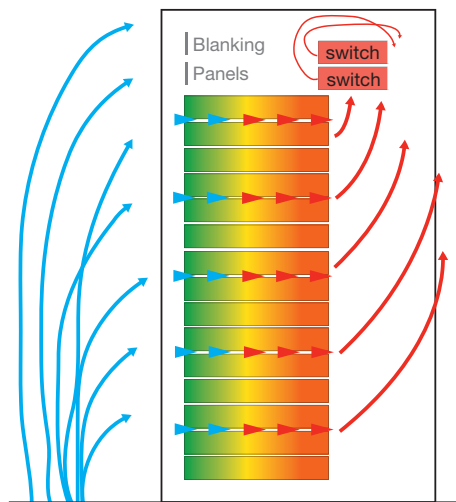
Active

Geist Cool Switch Cooling products are configured to accommodate numerous intake/exhaust configurations.
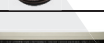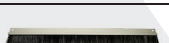
Passive

Geist Cool Switch Cooling guides cool air to network devices mounted in non-ideal locations within the cabinet. In many cases this can be done with a simple passive device. Active fans may be incorported as configuration, size and airflow requirements demand.

Geist Cool Switch Cooling directs cool air to the network switches, significantly lowering operating temperatures.

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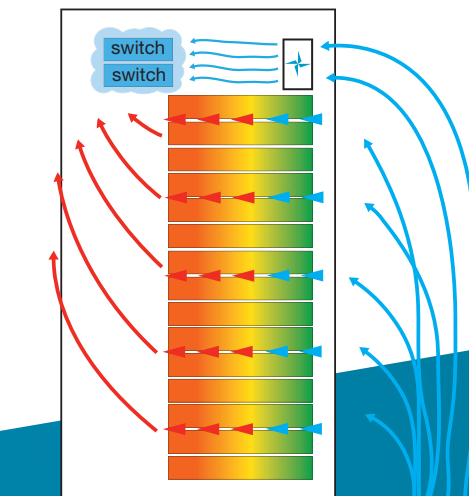
Upsite® Airflow Management Accessories

KOLDLOK® Raised Floor Air Management	Model #	Image	Description
Wave Grommet	20100		Seals openings in new and existing raised floor cutouts prior to the installation of cabling. Wave-shaped thermoplastic elastomer offers the best sealing against bypass airflow.
Wave Cover	20101		Safety cover seals Wave Grommet when cables are not present.
Integral	1010		Install prior to installation of cables.
Split Integral	3030		Split design for easy install without disturbing existing cables.
Surface Mount Original Grommet	2020		Seals a variety of existing raised floor tile cutouts and allows flexibility to remove tiles without capturing cables.
Surface Mount Large Grommet	2030		
Surface Mount Extra Large Grommet	2040		
Mini Grommet	10077		Smaller size 6" x 4" offers flexibility for data centers that have multiple cable opening sizes.
3" Extended Brush	10012		Seals new and existing openings. Simple modification creates the flexibility to seal large and unique openings such as those found under PDUs.
6" Extended Brush	10013		
4" Round Floor Grommet	40001		The split feature allows product installation or removal without disturbing cables. Hybrid brush technology membrane and bristles create extremely effective seal.

HOTLOK® Rack Airflow Management	Model #	Image	Description
1U Blanking Panel	10031		Cantilevered sealing vanes eliminate the gap between adjoining blanking panels or with installed equipment. Tool-free, snap-in installation requires no additional parts or components for installation.
2U Blanking Panel	10033		
1U Temp Strip Blanking Panel	10035		Color-coded temperature ranges indicate potential hot spots by color based on ASHRAE standard. Easy-pull removal for any EIA-310-E standard openings.
2U Temp Strip Blanking Panel	10038		
Round 4" Rack Mount Grommet	40002		Seals 4" cable openings without disturbing the cables in new and existing server rack cutouts.
1U Pass Through Blanking Panel	10112		Provides an effective airflow sealing solution when used in conjunction with pullout KVM switches or servers that may be occasionally extracted. Also provides rack sealing where cables prevent solid blanking panels from being installed.
2U Pass Through Blanking Panel	10113		

AISLELOK® Airflow Management	Model #	Image	Description
Under Rack Panel	10103		25" x 4" x 3" under rack panel seals a variety of openings below the rack on new and existing raised server racks.
.5" Acrycell Tape 1" Acrycell Tape 2" Acrycell Tape 4" Acrycell Tape	10108-001 10108-002 10108-003 10108-004		Seals openings between racks in new and existing data center aisles. Designed to block bypass airflow and maximize cooling system efficiency. Time release expansion ensures a tight seal around cables and other impediments. Customizable tape unrolls, creating one continuous and uniform top-to-bottom seal.

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