



product spotlight

CFD MODELING: DESIGN•MODEL•DEPLOY

Computational Fluid Dynamics (CFD) modeling uses computer calculations to simulate the interactions of liquids and gases with various surfaces in a defined space. To better understand the role the enclosure plays in the operation of a data center, Great Lakes has acquired the capability to perform CFD analysis with data center specific software. We are now able to help customers better understand what is currently happening in their data center environment to test or plan capacity increases. We can also test and make enclosure recommendations for a data center, room or pod before ever starting a build.

CFD modeling provides a “steady state” view (which is a view of the data center under specific operating conditions that does not change in time):

Data center performance:

- PUE (power usage effectiveness)
- ROI (cost of data center changes/energy cost savings)

Inefficiencies in a data center:

- Over-cooling
- Recirculation
- Obstructions in air delivery

Performance of new design ideas:

- Containment
- Aisle layouts
- IT hardware deployment
- Room expansion
- Floor tile migration/movement

Different scenarios in the data center:

- CRAC unit failures
- Increasing IT load capacity
- Changing aisle layouts
- Increasing temperatures in the data center

Three modeling types can be created with CFD software:

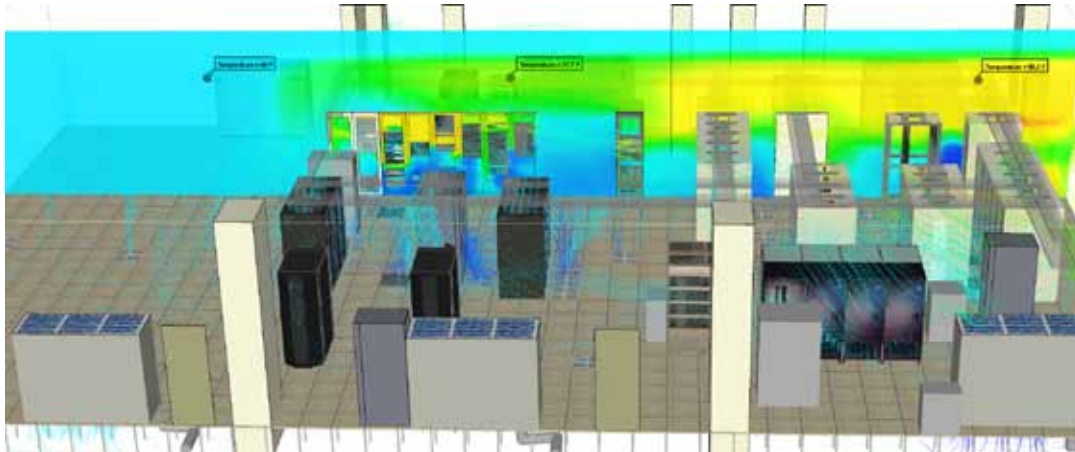
- **Concept Model** – Create a small room with pre-defined criteria to test how a particular layout will perform on a larger scale
- **Virtual Model** – Using customer supplied information (IT assets, CAD model room layouts, plumbing and electrical schematics, etc.) From this information a room model is created. This method reduces model creation time by eliminating site surveys and calibration
- **Baseline Model** – A model is created by using customer supplied information as well as site surveys provided by Great Lakes to measure the real-world room performance and to calibrate the model, providing the most accurate model and scenario.



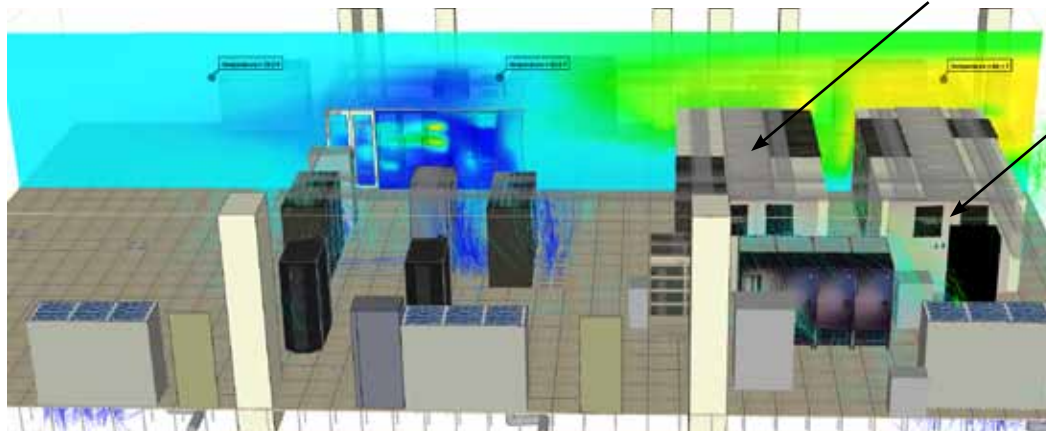
GREAT LAKES CASE & CABINET



Invest in Solid Engineering



Current Data Center



Containment Panels
above the enclosures

Aisle
Containment

Data Center modeled with containment strategy recommendations by Great Lakes

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