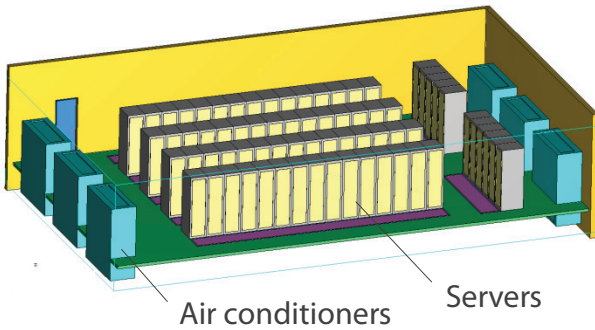


Data Center Planning

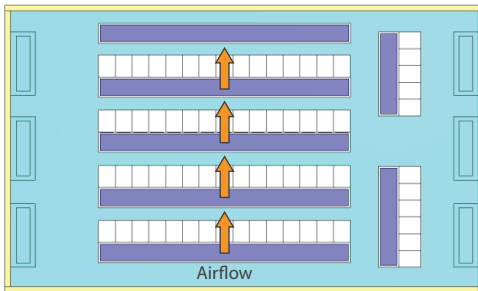
Temperature distribution in a data center is simulated. Two floor plans are compared to find an optimal layout of server racks and cold aisle locations to reduce the temperature profile.

Simulation Model



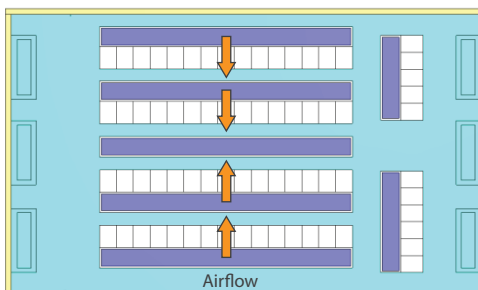
Original floor plan:

Flow direction in/out of the servers are uniform.



Modified floor plans:

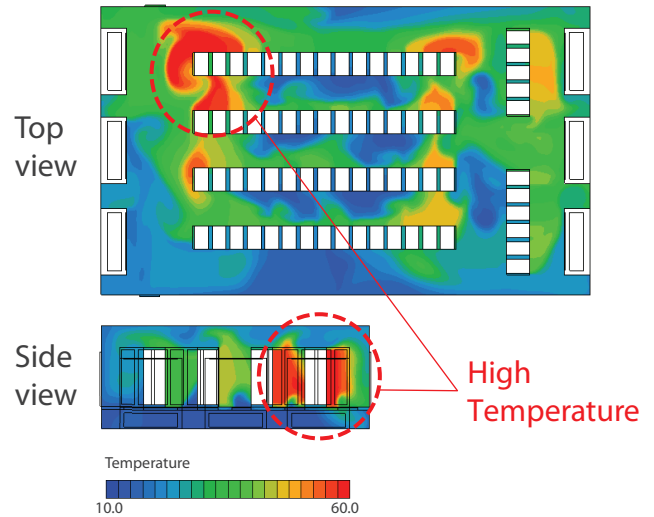
Flow direction in/out of the servers are symmetric about a central cold aisle.



Simulation Results

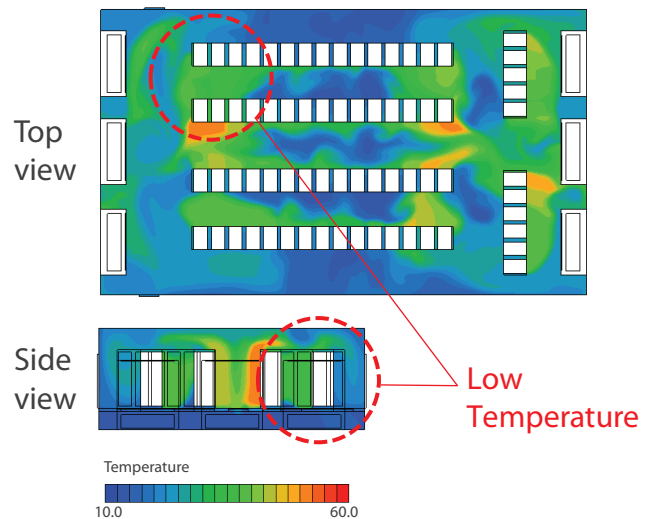
Original floor plan:

Maximum air temperature: 67 °C



Modified floor plans:

Maximum air temperature: 52 °C



Notes

The original floor plan results in a high temperature region due to warmed air from one server entering to the subsequent servers. The modified floor plan avoids such thermal runaway, keeps the room cooler, and allows the servers to operate more efficiently.