HP Thermal Assessment Services

HP Services

Technical data

As power consumption and heat generation in the data center increase due to the trend toward higher computing densities, facility infrastructures often need to become more efficient. Server blade technologies and other high-density equipment configurations may also increase the complexity of providing adequate power and cooling. The HP Thermal Assessment Services help you gauge your readiness to meet these challenges and provide recommendations to assist you in improving the function and efficiency of your data center facilities.

The HP Thermal Quick Assessment Service provides a base-level assessment of your data center cooling, based on interviews with your staff and HP observations of your data center and cooling environment.

The HP Thermal Comprehensive Assessment Service supplements the HP Thermal Quick Assessment Service with computational fluid dynamics (CFD) modeling, which HP uses to model the probable effects of potential cooling improvements or the addition of new equipment to your facility. Optionally, HP offers Thermal Zone Mapping, an analysis that graphically represents the area influenced by each air-conditioning unit in your facility. This insight may help you more effectively locate mission-critical equipment in locations influenced by multiple air-conditioning units, potentially protecting you from the effects of overheating due to mechanical failures.

HP Assessment Services are based on industry standards such as IEEE Standard 1100-2005, ASHRAE Thermal Guidelines for Data Processing Environments, knowledge and research from HP Labs, HP field assessment experience, and HP's experience designing IT facilities.

HP Technology Services are governed by the HP Single Order Terms for Support or Customer's purchase agreement with HP.

Service benefits

The HP Thermal Assessment Services are designed to:

- Help you determine the potential capacity of your data center environment and plan for adding new equipment to the facility
- Help you gain a better understanding of space, power, and cooling resource requirements
- Help you understand the thermal effect of changes to your environment
- Provide guidance on the placement of IT equipment
- Recommend potential strategies and best practices to help improve the operating efficiency of your facility infrastructure
- Leverage thermal modeling tools and techniques to help you develop effective and efficient cooling strategies for high-density IT equipment

Service feature highlights

- HP Thermal Quick Assessment Service
- HP Thermal Comprehensive Assessment Service

Specifications
Table 1. Service features

Feature	Delivery specifications
HP Thermal Quick Assessment Service: service overview	The HP Thermal Quick Assessment Service provides a base level assessment the effectiveness of the cooling system. Based on interviews with the Customer's staff and HP observations of the Customer's data center environment, the service provides a best practice–based criterion assessment of the cooling physical infrastructure, IT layout, and related operational practices. The service may examine some or all of the following areas, depending on the Customer's specific needs: • The relationship between space, power, and cooling, to determine the cooling capacity of the data center • Cooling load vs. cooling capacity • Airflow management • Heat recirculation • Racking practices • Under-floor and overhead airflow obstructions • Equipment row orientation and placement • Infrastructure management practices
HP Thermal Quick Assessment Service: data collection	An HP service specialist will make observations or collect data in some or all of the following areas, depending on the Customer's specific need: • Maximum capacity of the power and cooling available to the data center • Power consumption measurements from display panels of power distribution units (PDUs) and/or uninterrupted power supplies (UPSs) • Cooling system component specifications • Extraneous heat gains • Total area of the room and the area occupied by the computer equipment • Orientation of computer equipment rows in relation to each other and to air conditioners • Summary view of internal configurations for rack-mount equipment racks • Summary view of internal rack cable management • Ceiling height and raised floor depth (if applicable) • Summary understanding of raised floor perforated panel or overhead diffuser application

	• Summary understanding of raised floor cable cutout management • Summary view of perimeter wall penetrations • Summary view of under-floor and overhead obstacles to airflow • Summary of hot spots and heat recirculation • Branch circuit and load documentation, if available • Sample measurements of computer equipment inlet air temperature and humidity • Present infrastructure management practices
HP Thermal Quick Assessment Service: analysis and presentation	HP will create a report detailing the findings of its analysis. The report will cover the following subjects, as appropriate: • Gap between the total power capacity and the present IT power load • Gap between the total cooling capacity and the present IT cooling load • Gap between the total rack floor space capacity and the present space occupied!@Gap analysis comparing the existing environment to recommended cooling practices for high-density equipment • Impact of equipment rack and row configurations • Impact of under-floor or above-floor airflow obstructions • Impact of raised floor perforated panels/grilles or overhead diffuser types, quantities, and locations • Impact of open penetrations in walls, floor, and ceiling • Impact of heat recirculation on inlet air temperature • Impact of infrastructure management practices The report will include technical observations with short and long-term recommendations designed to help improve cooling efficiency in the data center environment and/or project summarized infrastructure growth requirements needed to support future IT equipment installations. HP will e-mail the report to the Customer and then host a one-hour phone call with the Customer to discuss the written report.
HP Thermal Comprehensive Assessment Service: service overview	The HP Thermal Comprehensive Assessment Service couples the criterion-based analysis of the HP Thermal Quick Assessment Service with computational fluid dynamics (CFD) modeling of the designated facility's supply and return air flows. CFD analysis models the 3-dimensional facility space below the floor, above the floor, above the ceiling (where applicable), and around the racks. This provides a view of the thermodynamics throughout the data center, covering the areas where hot air recirculation may affect high-density installations.
HP Thermal Comprehensive Assessment Service: data collection	As a preliminary analysis to the CFD modeling, an HP service specialist will collect the same data as collected in the Thermal Quick Assessment. To create the CFD model, an HP service specialist will collect the following data elements: • Cooling capacity and cooling activity of each computer room air-conditioning unit • Rack inlet temperature measurements • Current and planned power requirements of the equipment in the room • Room measurements, area, shape, walls, openings • Layout and orientation of equipment rack and row configurations and air conditioners • Raised floor perforated panel or overhead diffuser types, quantities and locations • Details of under floor or overhead obstacles to airflow and other airflow influences such as cable cutouts • Pertinent data for extraneous heat gains such as; walls/floor/ceiling transmission, lighting, people, exterior windows, transformers, etc.
HP Thermal Comprehensive Assessment Service: thermal zone mapping	Thermal zone mapping is an optional feature available for an additional fee. Thermal zone mapping further analyzes the data collected to graphically map the areas of the computer room that each air-conditioning unit influences with its cooling capacity. The map visually illustrates which air conditioner influences the cooling of each equipment rack in the facility, which areas (and equipment racks) are controlled by multiple air conditioners, and which areas are outside of the influence of an air conditioner.
HP Thermal Comprehensive Assessment Service: analysis and presentation	Analysis: HP will create a CFD model of the data center as found during onsite data collection. HP will validate the accuracy of this baseline model against the as-is conditions in the data center. After the model has been validated, HP will model up to five alternate scenarios. These scenarios may be useful for determining the effect of changes in the data center, such as:

- The effectiveness of solutions proposed by HP in response to observed or measured thermal issues
- The impact (and potential solutions) of planned equipment additions to the data center
- The thermal effect of the failure of key air-conditioning unit(s)

Presentation of findings: HP will create a report on the findings of its analysis, The report will cover the following topics:

- Executive summary
- Topics covered by Thermal Quick Assessment Service report
- IT hardware layouts
- Observations of conditions and potential issues
- Results of CFD simulations
- Recommendations for improvement

HP will e-mail the report to the Customer and then host a follow-up call to review the findings.

Service eligibility

- HP Thermal Assessment Services are applicable to all data centers, IT rooms, server rooms, and server closets with raised or non-raised floor environments.

Service limitations

- This service does not include any remedial activity related to any data center environmental issues identified. Any corrective measures to mitigate the risks or implement the recommendations identified by this service may be available from HP as part of a separate service scope and for an additional fee.
- Any services not clearly specified in this document or in an associated Statement of Work are excluded from this service.
- For the Thermal Quick Assessment Service, analysis of computer rooms larger than 15,000 square feet may result in additional service fees.
- The fee for the Thermal Comprehensive Assessment Service is based on HP's and the Customer's initial estimate of the size of the facility. Subsequent determination that the facility is larger than estimated may result in additional fees.
- The CFD modeling used in Thermal Comprehensive Assessment Services examines cooling distribution based on the total power load of each equipment rack, not individual components within the racks.
- Services are conducted during HP standard business hours, Monday through Friday excluding HP holidays.

Customer responsibilities

The Customer will:

- Contact an HP service specialist within 90 days of date of purchase to schedule the delivery of the service
- Allow HP full and unrestricted access to all locations where the service is to be performed
- Adhere to licensing terms and conditions regarding the use of any HP service tools used to facilitate the delivery of this service, if applicable

- Provide a suitable work area for delivery of the service, including access to an outside telephone line, power, and any network connections required
- Assign a designated person from the Customer's staff who, on behalf of the Customer, will grant all approvals, provide information, and otherwise be available to assist HP in facilitating the delivery of this service
- Provide an electrician and/or HVAC mechanic to create access to electrical or mechanical equipment, if required by HP
- Provide a ladder and a raised floor tile puller
- Allow HP to enter and exit the site with a laptop computer, used for data collection; test equipment interface; and documentation
- Allow HP to use a digital camera to document infrastructure conditions; all photographs will be available for review prior to leaving the site
- Provide HP with current electrical, mechanical, and architectural design drawings, if available

For more information

For more information on HP Services, contact any of our worldwide sales offices or visit our website at:

HP support services: www.hp.com/hps/support
HP Care Pack services: www.hp.com/hps/carepack

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