

# TCS Data Center Power Management Framework

Innovation labs



Though availability and reliability of services is critical for data centers, monitoring and minimizing power and energy consumption have now taken on added importance, from an economic and sustainability perspective. While modern data centers are more powerful, they also consume more energy, resulting in increased power costs. Enterprises are now trying to optimize cooling infrastructure and overall power consumption with efficient energy management systems.

Tata Consultancy Services (TCS) brings you a robust data center power management framework that enables you to monitor and manage data center power consumption using a suite of tools and techniques. The benefits of deploying this framework include complete visibility into data center power consumption, reduced cooling costs and the ability to minimize your carbon footprint.

## Overview

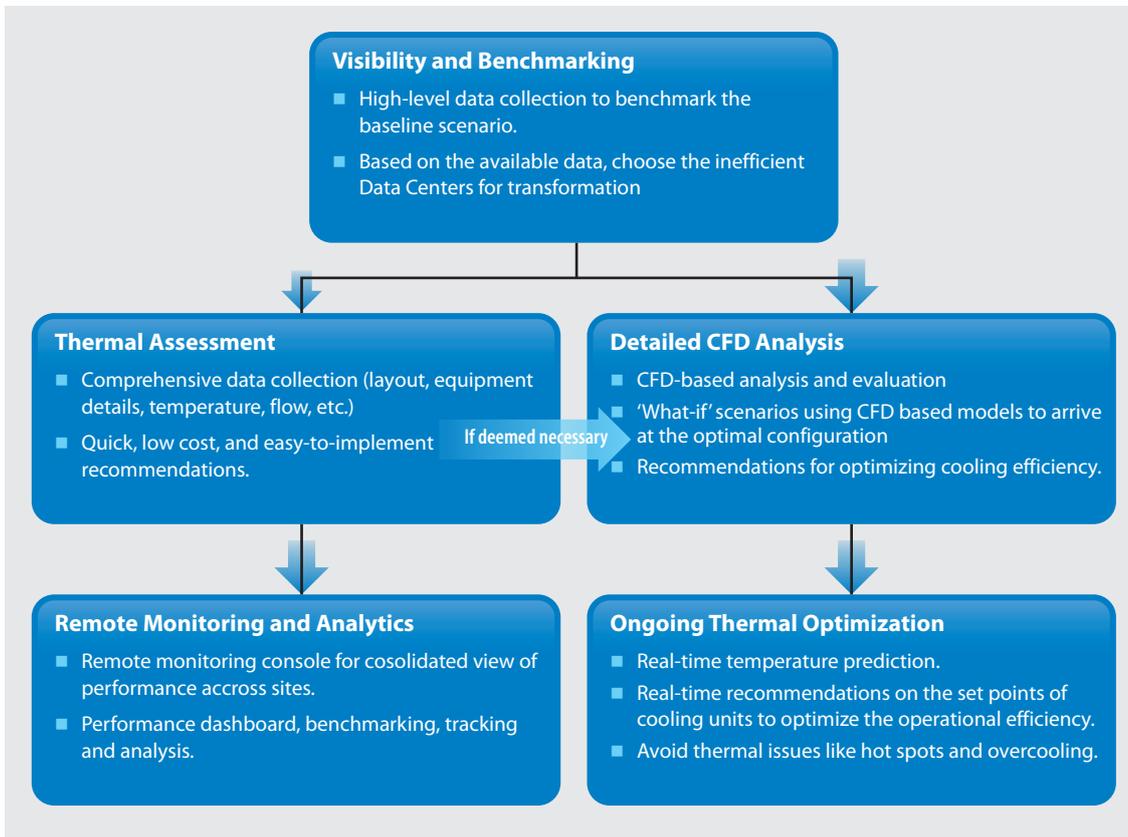
Data center power usage is a major concern for enterprises worldwide, resulting in a need to make them more efficient and cost effective. Rising power costs have also led to the need to monitor and manage power consumption through energy management systems. Additionally, the temperature profile of data centers and thermal issues like hot spots are often overlooked. Opportunities for efficiency improvements are few and far between owing to a lack of knowledge about cooling infrastructure. These challenges also affect greenfield projects, data center ramp-up, and migration activities.

We have developed a Data Center Power Management Framework that comprises a set of tools and techniques to assess, optimize and manage the power consumption of data centers. The solution helps you to assess the 'as-is' scenario of your data centers and devise strategies for efficiency improvement based on their maturity levels. The solution also recommends design and operational level changes using Computational Fluid Dynamics (CFD) based algorithms to optimize the cooling power consumption. In addition, it helps in centralized monitoring, analysis and benchmarking of data centers. As the solution can be customized according to your unique needs, you can significantly reduce overall energy consumption and costs, while also ensuring reliability and availability of your data centers.

## Our Solution

Our Data Center Power Management Framework comprises four components:

- **Thermal assessment** - This provides quick and low cost recommendations for improving cooling efficiency by identifying thermal inefficiencies like hot spots and overcooled regions.
- **Detailed CFD analysis** - This provides a detailed evaluation by simulating various 'what-if' scenarios using CFD models for further efficiency improvement.
- **Online cooling optimization** - This recommends optimal temperature set points of cooling units in real-time based on current utilization. It eliminates hotspots and cools data centers just-in-time, resulting in significant savings in cooling power.
- **Remote energy monitoring center** - This framework provides a central, integrated view of various metrics like IT power, non-IT power, Power Usage Effectiveness (PUE), and temperature profiles for a large number of data centers. This reduces cost, enhances visibility, tracking and analysis, and enables accurate benchmarking.



**An overview of TCS' Data Center Management Framework**

## Benefits

Our Data Center Power Management Framework brings you benefits such as:

- **Reduced power bills:** Cut costs by achieving improved PUE over the entire lifecycle of the data center
- **Reduced carbon footprint:** Optimize power consumption and consequently reduce your carbon footprint, as a result of enhanced cooling efficiency.
- **Centralized monitoring:** Centrally monitor and analyze metrics such as PUE and the carbon footprint for your portfolio of data centers at the enterprise level.
- **Enhanced regulatory and compliance reporting:** Access real-time information on your carbon footprint and PUE, enabling accurate regulatory and compliance reporting.

## The TCS Advantage

- **Strong research and development foundation:** Our team of qualified research professionals at the TCS Innovation Labs focuses on infrastructure solutions with environmental conservation as a strong research theme. We have also applied for several patents and have presented papers at prestigious international conferences.
- **Domain expertise:** Our platform-agnostic solution is backed by our in-depth knowledge of maintaining large data centers and the expertise gained in deploying green IT projects within our organization. Our solution can be customized to suit diverse requirements.
- **Innovative and cost-effective implementation:** Our solution leverages TCS' modeling capabilities and patent-pending algorithms to reduce the use of sensor hardware and optimize the cooling power consumption of the data centers in a cost effective, non-intrusive manner. The solution is also vendor-agnostic, which makes it possible to work with existing solutions from various vendors.
- **Global recognition:** Our Data Center Energy Management Framework has been recognized by environment and sustainability analyst firm Verdantix in their Green Quadrant: Sustainable Technology Services (Global) report for 2013.

## How we help our customers

### **A leading telecom company achieves energy efficiency**

TCS helped a leading European telecom company reduce the energy consumption and environmental impact of their data centers. We leveraged our CFD capabilities to simulate various 'what-if' scenarios and provided suggestions to improve cooling efficiency. Our recommendations included an improved design of cooling infrastructure, a revised server placement strategy to enable better distribution of heat-load and a cost-effective containment design. In addition, we also suggested many low cost improvements such as tile placements, racking practices and removal of leakages. Our recommendations were estimated to reduce the cooling power by about 30%, with a return on investment of seven months or less.

### **TCS data center optimizes power consumption and boosts power savings**

When our data center managers set about reducing cooling costs, our solution enabled quick data collection to assess the as-is status of the data center and suggest basic, low cost changes. In addition, our CFD based models enabled a detailed analysis of the thermal conditions, which resulted in energy savings of about 20%. Once these design-level optimizations were implemented, our solution continuously monitored various data center metrics like PUE and carbon footprint. It also optimized cooling power in real-time, resulting in ongoing additional savings of about 10%.

## About TCS Innovation Labs

TCS has several disruptive innovations to its credit. It set up its first research lab in 1981 when the IT industry in India was just taking shape. It set up a software tool foundry which has, over the years, produced tools for model driven development, testing, artificial intelligence and re-engineering.

Today, the global network of TCS Innovation Labs works across domains and new technologies to deliver a range of solution frameworks. In the true spirit of collaboration, TCS has created a Co-Innovation Network (TCS COIN™). This connects to several entities in the innovation ecosystem and TCS co-innovates with them, capitalizing on the strengths of each for the benefit of all.

## Contact

To know more about TCS' Data Center Power Management Framework, contact [innovation.info@tcs.com](mailto:innovation.info@tcs.com)

### **About Tata Consultancy Services Ltd (TCS)**

Tata Consultancy Services is an IT services, consulting and business solutions organization that delivers real results to global business, ensuring a level of certainty no other firm can match. TCS offers a consulting-led, integrated portfolio of IT and IT-enabled infrastructure, engineering and assurance services. This is delivered through its unique Global Network Delivery Model™, recognized as the benchmark of excellence in software development. A part of the Tata Group, India's largest industrial conglomerate, TCS has a global footprint and is listed on the National Stock Exchange and Bombay Stock Exchange in India.

For more information, visit us at [www.tcs.com](http://www.tcs.com)

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