



**TRANE**



UPS  
Power Management  
Remote System Access  
Comfort  
Cooling  
Water  
CCTV  
Access Co  
**Alarms**  
Lighting  
Alternative Energy  
Process Cooling  
Security

*Data Centers  
That Deliver Better Results*

Bring Your Building Together



# Meeting the high demands of your data center...

Meeting the increasing heat loads associated with growing computational needs requires specialized cooling. Hot spots and inadequate cooling cause costly disruptions and continue to be daily concerns for data center operators.

As the modern data center evolves, so do the demands on thermal management, airflow, cooling, and humidity control.

Reliable, efficient, and capable cooling is critical to achieving optimal data center performance.

Thermal management in data centers is increasingly critical as power densities grow dramatically. Server density in existing and newly constructed data centers is increasing to meet surging demand for Internet, e-commerce, cloud computing, globally networked organizations, real-time inventory management, and exploding data-storage requirements. These challenges are further compounded by the trend toward data center consolidation and its increasing heat loads.

## Keep temperatures and costs at an all time low

The Department of Energy estimates that cooling and humidification control accounts for 40% to 60% of a data center's physical operating costs. The combination of consolidation and growth, increasing power densities, and the requirement of uninterrupted operations requires sophisticated, scalable, and reliable heat management strategies. About one-quarter of data centers have experienced expensive downtime caused by overheating.

## Trane intelligence built into every system

A data center requires systems-level expertise to ensure adequate, energy efficient on-demand cooling. Trane knows data centers. We have helped build reliable, cost-effective solutions for every size data center, across all vertical markets.

We understand that every data center is unique and that cooling strategies vary. Our comprehensive approach considers design, installation, commissioning, and ongoing operations that will help you achieve optimum redundancies for today and tomorrow.



# *with greater efficiency and reliability*

Whether you are building a new data center, consolidating centers, or updating an existing installation, talk to Trane. Our experienced sales engineers can make recommendations on the center's physical structure to eliminate causes of cooling inefficiencies, providing energy management tools and guidance along the way. We'll install and optimize the system.

## **Maximize your data center's performance**

Trane global and regional resources will keep your HVAC system running perfectly. Our comprehensive services can maintain, upgrade, restore, and respond to every service need, including 24/7 remote monitoring services. Our solutions include renewal and retrofit-in-place programs to replace worn materials, restore compressor performance, and provide as-new reliability.

Our OEM trained technicians are certified to provide 100% assurance of quality in repairs and restoration. The Trane global footprint includes 260 sales and service locations in over 60 countries.

## **More uptime, greater reliability**

Trane is renowned for reliable products, and we're always finding new ways to increase the reliability of our systems and your data center. Trane understands that when a power loss knocks a data center's chiller offline, every second counts. While other chillers take 4 to 6 minutes at best—some even up to 15 minutes— to restart, a Trane chiller restarts in as little as 43 seconds. Thanks to fast restarts like this, you can substantially minimize the risks of financially devastating data loss and asset damage from overheating.

## **Energy-efficient innovation at work**

Data center cooling offers one of the greatest opportunities for energy-efficiency improvements. Trane is actively involved in the delivery of programs to reduce energy usage, eliminate greenhouse gases, support sustainable growth, and uncover "free" or "reduced cost" cooling options. As a leader in HVAC systems for LEED-certified buildings, and with the industry's largest number of LEED Accredited Professionals, Trane works with industry and construction organizations to advance sustainable green practices and the energy and financial efficiencies associated with them.



Our membership in The Green Grid reflects our commitment to developing and implementing energy efficient and sustainable HVAC options for the data center industry.

LEED-certified buildings demonstrate energy conservation and address concerns for site development, water savings, energy efficiency, material selection, and indoor environment quality. Trane is uniquely qualified to help you achieve LEED-certified data center status through the use of industry-leading, environmentally responsible systems and controls.

# Bring your data center together with confidence

In our connected, networked world, data centers are critical to businesses and individuals. The cost of downtime is enormous, but preventable. Not only are Trane systems renowned for reliability, we can build in the necessary redundancy to ensure no single point of failure disrupts operations. And because our systems are modular and designed for interoperable integration, you can manage your budget today without limiting expandability tomorrow.

## Integrated solutions for energy management

Go beyond the traditional siloed approach to managing your data center's infrastructure. Already a recognized leader in data center cooling and building controls, Trane offers an integrated approach to manage and optimize the entire infrastructure—from cooling and power distribution to security, alarms, and safety.

## Increase efficiency through system integration

By automating all the data center systems under a single management system, you can ensure that savings in one system does not increase costs in another system. You gain complete access to real-time information and comprehensive analytics to allow optimum system management. The result is not only reliable uptime of servers and storage, but lower costs through efficient operations.

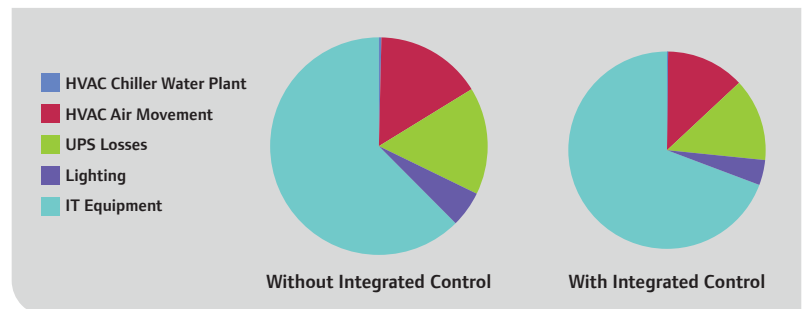
## Tracer™ XT syncs all system data for greater efficiency

Tracer XT combines Trane industry-leading Tracer building controls systems with GE Intelligent Platforms' Proficy Software Platform for visualization, advanced analysis and modeling, remote monitoring and diagnostics. It's scalable to meet evolving needs, from single subsystems to entire data center infrastructures to enterprise-level coverage of multiple sites. From superior collection and storage of data to advanced visualization for faster, better decision

making, Tracer XT gives you more tools and more intelligence to manage your data center efficiently and productively.

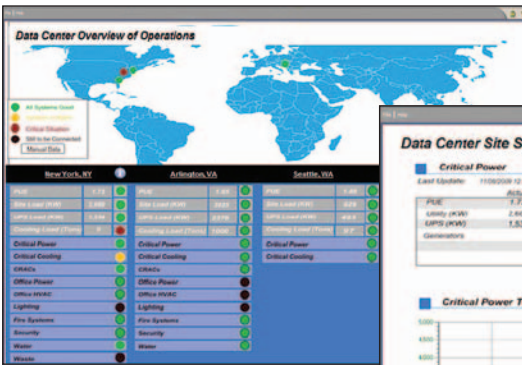
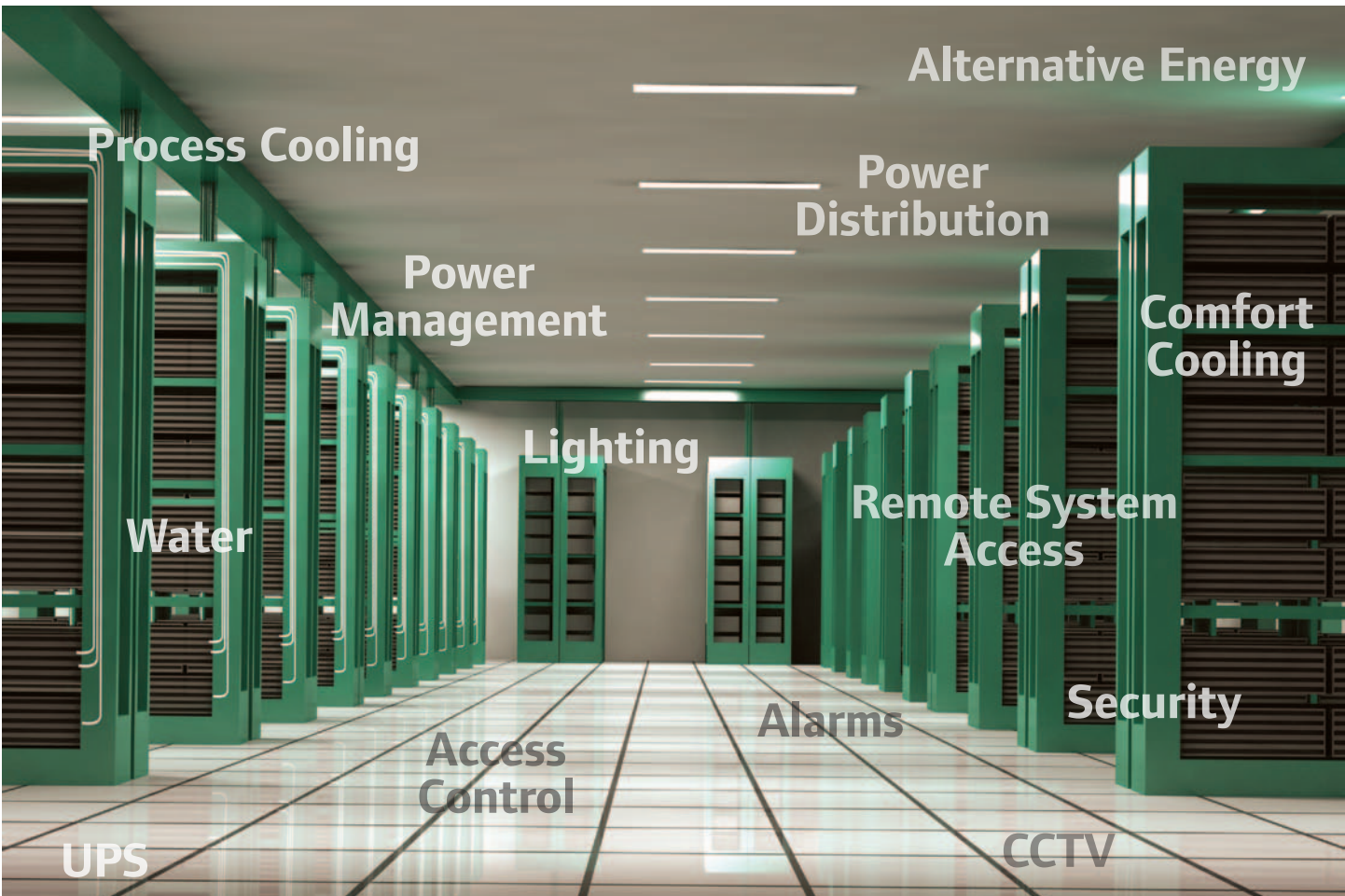
- **Real-time data** for up-to-date information
- **Historical data** for comparing past and current trends to quickly identify and correct system malfunctions
- **Comprehensive analytics** to understand trends and measure long-term goals
- **Intelligent alarms** for actionable information
- **Scheduling** by time of day and by subsystem
- **Powerful data collection** that connects to hundreds of systems and devices with extensive multiprotocol support
- **Change-based execution architecture** to acquire data from field devices, perform database math and logic, archive data, network data and run scripts—all based on change

*A more energy-efficient infrastructure lowers the overall cost of the data center (smaller pie). As energy efficiencies in the infrastructure increase, the power consumed by the servers, storage, and related devices becomes a higher percentage (larger slice) of the overall data center's operating costs.*



## Have more control over your PUE with more information than ever

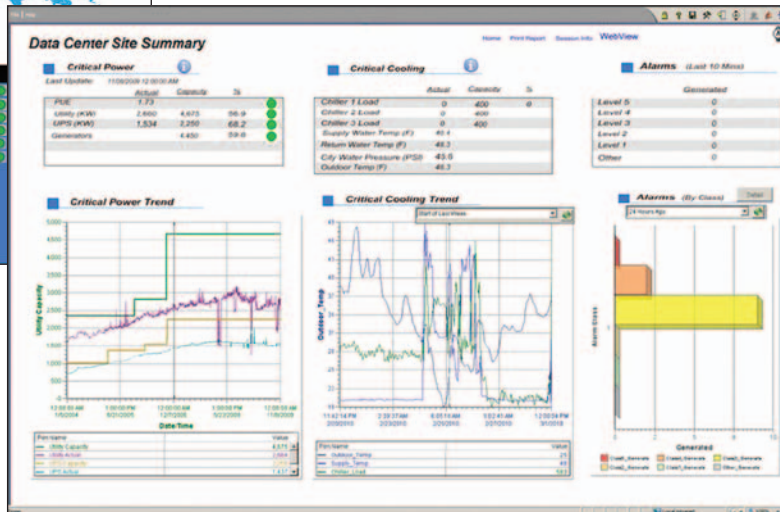
Power Usage Effectiveness is a key metric in evaluating the efficiency of the data center's infrastructure by comparing total power consumed by the data center to that consumed by the IT equipment alone. Trane integrated solutions allow you to devise the best strategies for not only managing your infrastructure, but your IT equipment as well. For example, what is the impact on cooling of running fewer servers at higher loads or more servers at lower loads? Trane intelligent solutions can help you find the "sweet spot" of maximum efficiency.



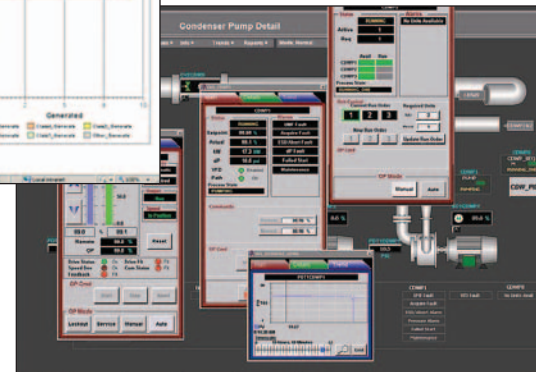
Global View

See your data center's operation in real time with easy-to-use visualization tools, from global operations down to individual components.

Mission-critical intelligence that enables optimized data center performance



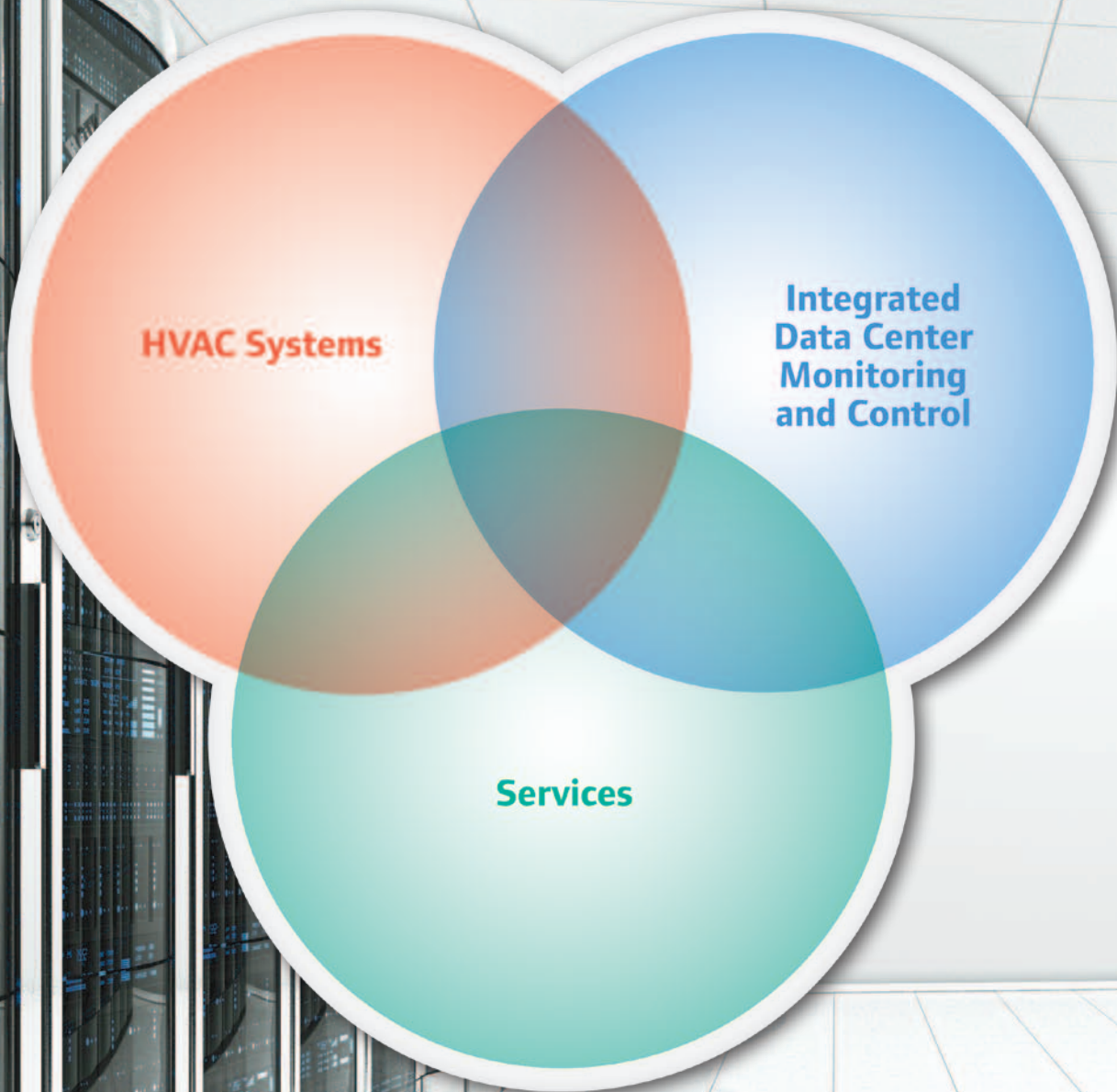
Real-Time Dashboard View



Component View

Trane data center solutions integrate all subsystems into a single integrated monitoring and control system that lowers costs.

## Trane offers comprehensive data center management solutions



### **HVAC systems**

- Scalable systems including chilled water, airside, controls, and hybrid solutions
- Intelligent, self-diagnostic, optimized systems for ultimate control and efficiency
- Advanced controls hardware and strategies for reduced energy consumption
- Environmentally responsible solutions through Trane alternative energy technologies
- Rapid chiller restart—in less than a minute—to protect computing equipment from overheating from a power loss

### **Services**

- 24/7 remote facility monitoring to ensure uninterrupted operations
- Rental and contingency services to keep your facilities on-line
- Scheduled maintenance strategies for maximum uptime
- Extensive trending options and seamless integration capabilities

### **Integrated data center monitoring and control**

- Monitoring of critical subsystems, including HVAC, power, lighting, security, access control
- Real-time visualization
- Trending and historical data
- Alarm management
- Scheduling
- PUE calculations

## The proof is in the savings

Trane and GE worked to improve efficiencies and lower costs at a GE data center that encompassed 30,000 square feet raised floor, 3,800 servers, and 2/5 MVA UPS. The goal was to reduce water and electrical consumption, improve maintainability, and provide better business insight to operations.



## The challenges

- 25-year-old office building repurposed and improved
- Cooling systems were aging and approaching capacity
- Water and electrical consumption needed to be reduced
- Disparate and overlapping building management systems—hardware and software
- Manual reporting and analysis provided no real business insight

## The solution

Refresh the cooling systems to remove failure modes and improve maintainability:

- Replace 3 x 250-ton chillers with 3 x 400-ton Trane chillers, increase cooling system redundancy, optimize cooling and water usage efficiencies plus . . .

Provide simple, holistic view of the entire data center infrastructure with key metrics and insight:

- Replace three BMS with one modern facility management system. A centralized control and visualization platform tied together new and existing GE and non-GE standalone/overlapping systems into a simplified master system—while automating many manual processes.

## The value delivered

- 11% energy savings
- 20% water savings
- 50% chemicals reduction
- Complete facility visualization, insight into prioritized actions
- Automatic PUE and EPA compliance data
- Multiple maintenance contracts eliminated

## Talk to Trane about your data center needs

Trust Trane for the right advice, the right tools, and the right solutions to help achieve the reliability that you require.

If your goal is reliable uptime and lower operating costs, it's time to talk to Trane. To learn more or to find your local Trane representative, visit us online at [www.trane.com/datacenters](http://www.trane.com/datacenters)



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