

## IBM IT Facilities Assessment, Design and Construction Services – optimized airflow assessment for cabling



As important as cabling is, however, the expansion of the data center's cabling infrastructure in many cases can be an ad hoc activity. This can lead to unknown cable routing; undocumented cabling; airflow blockages; unpredictable results from moves, additions and changes; and unknown risks with every underfloor activity.

An unstructured cabling infrastructure can result in several issues for business processes and IT systems, including:

- *Data center unavailability*
- *Unexpected costs because of data center downtime*
- *Cooling issues as a result of suboptimal airflow caused by unorganized cable bundles under the raised floor*
- *Unwarranted high energy costs*
- *Inability to manage system growth and upgrades while still maintaining optimal cooling*
- *Difficulty with cable management and administration*
- *System unreliability*
- *Cooling problems in the central patching location (CPL).*

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### Highlights

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- *Offers guidance for increasing data center availability*
- *Proposes a cabling design that can help improve data center airflow for optimized cooling*
- *Recommends steps to facilitate operational efficiency through simplified change management*
- *Suggests changes that may lower the operating cost of managing a data center*

### Understanding the impact of increased cabling in data centers

Data center infrastructures have reached a tipping point. Many major changes have occurred over the past five years that impact data center operations. For one, high-density servers contain more computing capacity per square foot than ever before. While individual servers use less space than traditional servers, the increased number of servers per square foot actually increases the demand for data center connectivity. As a result, the higher density of servers creates denser cabling networks.

The optimized airflow assessment for cabling service includes the following physical inspections:

- *Underfloor environment*
  - *Cables, subfloor boxes, cable paths*
  - *Unused cables*
  - *Unnecessary cable blockage*
- *Cabling infrastructure*
  - *Room planning*
  - *Physical connections and components*
  - *Cables, cabinets and cable paths*
- *Cabling installation*
  - *Installation design*
  - *Storage and protection of installed trunk, jumper and harness cables*
  - *Mechanical requirements and properties*
  - *Density requirements*
  - *Safety aspects*
- *Sample of unused fibers*
  - *Fiber identification*
  - *Decibel loss measurement*

IBM IT Facilities Assessment, Design and Construction Services – optimized airflow assessment for cabling provides a comprehensive evaluation to help you measure your current cabling infrastructure, identify where your cabling infrastructure issues are and determine which improvements to implement.

### **Increasing the availability of your data center**

The IT department spends considerable time and effort supporting data center availability. But availability comes from more than the data center hardware. Backup hardware and mirroring concepts may not pay off if the cabling—often hidden under the raised floor—is not designed with the same quality as the rest of the IT environment. An inadequately designed cabling environment, for example, may not provide the redundancy you need to support prompt problem determination and error recovery.

IBM IT Facilities Assessment, Design and Construction Services – optimized airflow assessment for cabling provides a comprehensive, fact-based analysis that prioritizes tactical plans across your data center to improve system availability through optimizing the underfloor airflow. Underfloor cabling systems are often blocked with dense tangles of cables. These blockages prevent cooling systems from doing their jobs. When

the system overheats, it can go down. Optimizing your cabling infrastructure airflow can protect the system from overheating, which can result in improved system availability and a better service level from your data center.

### **Offering recommendations to optimize data center airflow for improved cooling**

Many IT managers are unaware of the jumble of cables hiding in their under-floor plenum. With unstructured cabling systems, each jumper cable connects one machine port directly to another to form a link. With the huge number and diversity of fiberoptic cables in today's data centers, an underfloor cabling system can soon get out of control and lead to inefficiencies. Cabling blockages can cause inefficient airflow and can ultimately lead to wasteful cooling and increased energy demands.

Another cause of hotspots within data centers is bypass airflow. Unsealed cable openings and open rack spaces can allow hot air within the data center to access the cabinets, leading to additional cooling and energy requirements.

During the optimized airflow assessment for cabling engagement, IBM informs you of the latest technology available for a structured cabling system as well as the potential benefits. Not only can an efficient cabling system lead to

increased data center availability, it can lower cooling and energy requirements as well. With the optimized airflow assessment for cabling service, IBM helps you get the facts to understand your current cabling setup and what the ideal cabling solution is for your environment.

The optimized airflow assessment for cabling service offers advice about:

- *Optimizing your data center's airflow*
- *Marketplace trends*
- *Standards*
- *Technologies*
- *Existing infrastructure.*

#### **Planning for upgrades and changes**

After IBM assesses your current cabling infrastructure and explains the potential benefits that a structured cabling system can provide, we can help you determine what you can do to make changes and upgrades to your data center easier and more affordable.

You may be able to achieve significant benefits by adopting a structured cabling system—principally through the reduction in the number of fiber-optic cables under your raised floor. In a typical underfloor environment, the fiberoptic trunk cables connect the machine ports to the back of patch panels that are located in a series of

cabinets or racks that make up the CPL. The fronts of the patch panels contain individual ports that, in a structured cabling environment, are directly connected to the machine ports. In a structured environment, connections between two machine ports can be made more quickly and easily by running a short jumper cable to connect the two patch panel ports, decreasing the number of cables in the plenum. Fewer cables can simplify documenting the location of cables. And better documentation can make it easier to trace a fiberoptic link when you are problem solving or planning for future growth.

And in a structured cabling system, unlike a discrete jumper cable solution, none of the change activity happens near the active equipment. Future equipment additions and changes can be made in the same manner and should not be affected by the amount of equipment already installed. During the life of your data center, you're likely to add and upgrade storage devices, switches, directors and even servers. The optimized airflow assessment for cabling service can help you understand how a structured fiberoptic cabling system can enable you to plan and implement these critical changes faster and with reduced risk.

#### **Recommending modifications to lower data center operating costs**

IBM Facilities Assessment, Design and Construction – optimized airflow assessment for cabling provides a comprehensive evaluation of the physical infrastructure that supports your IT equipment to identify potential energy cost savings. The assessment can help you understand the potential financial payback that may accompany efficiency improvements. It can provide you with a framework to make future data center cabling infrastructure decisions. And, ultimately, this assessment may help you redirect existing cooling to additional IT equipment.

Recommendations to improve cabling efficiency are tailored to your facility and may include recommendations for upgrades or replacements of inefficient cabling infrastructure or the addition of new technologies. In IBM's experience, cooling systems typically present the greatest opportunity for efficiency improvements, followed by electrical and building systems. Your assessment report will also give you a comprehensive checklist of information gathered during the assessment as well as recommendations and conclusions so you can make improvements to your cabling system.



### **Why IBM?**

IBM is a leading global provider of data center design, construction, relocation and optimization services. We have built more than 30 million square feet of raised-floor data centers for clients worldwide. We currently manage more than 100 IBM data centers of six million square feet. Our structured methodology, intellectual capital and global reach position us to deliver superior, comprehensive data center solutions.

IBM has a strong ecosystem of data center technology alliances, including strategic relationships with major power, cooling and cabling equipment vendors that give us exceptional insight into industry trends and the data center's changing energy needs. And unlike other data center solutions providers, IBM manufactures a full suite of storage and server products and has developed a structured enterprise fiber cabling solution using fiberoptic components known as the IBM fiber transport system. All these factors give us a deep understanding of the infrastructure support needs of your IT equipment.

Beyond the optimized airflow assessment for cabling service, IBM also offers services to implement data center efficiency improvements. We can help ensure that your data centers and facilities support your business needs—and that they are capable of scaling to support business growth. IBM services can cover virtually all aspects of establishing and running data centers, from assessment and strategy to construction and management—virtually anywhere in the world.

### **For more information**

To learn more about IBM IT Facilities Assessment, Design and Construction Services – optimized airflow assessment for cabling, contact your IBM representative or visit:

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