

StorageIO Industry Trends and Perspective Solutions Brief
Enabling “Green” and Energy Efficient Storage with Real-time Compression

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For environments looking to address power, cooling, floor space and environmental (PCFE) “Green” footprint issues, a data footprint reduction strategy across different applications and data types including on-line and off-line data should be adopted as part of a PCFE strategy.

Background and Issues

Organizations of all sizes are encountering various power, cooling, floor space and environmental (PCFE) or “green” issues associated with increasing costs while supporting business growth and economic sustainment. In some parts of the world, government legislation has already passed or is being discussed to address emissions associated with energy production and other sources.

A driver for many PCFE green related issues is an increasing demand for and generation of data to be processed and stored for longer periods of time. Continued reliance on information systems and data-centric applications combined with rising energy costs and limits on floor space, power and cooling is another issue (Figure 1).

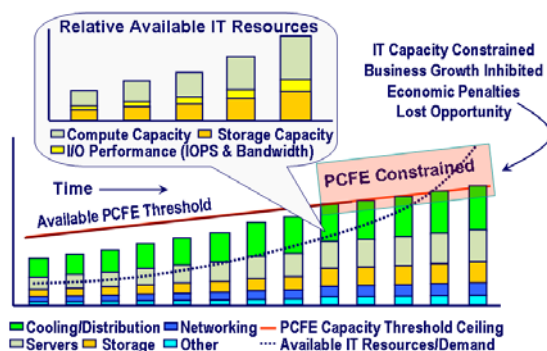


Figure 1 – IT Resource Supply and Demand

Figure 1 shows increasing demand for IT resources with more data being stored resulting in more storage to be powered, cooled and managed within existing constraints.

Value Proposition

The value proposition for addressing PCFE green issues in data centers and across organizations of all sizes is to leverage existing assets while sustaining business growth. Cost avoidance and maximizing current spending can also both be addressed by taking action on PCFE.

What this means is that to support business growth more data will be generated and stored requiring more servers, storage and networks; all of which needs to be managed using available power, cooling and floor space.

Addressing PCFE green issue benefits include:

- Sustain business growth and availability
- Improved asset utilization and ROI
- Lower energy and ownership costs
- Comply with emerging regulations
- Financial and public relations impact
- Cost avoidance or maximize spending
- Boost user and worker productivity
- Do more with what you already have

The Technology

There are several approaches (Figure 2) that can be individually or collectively used to address green issues. Approaches range from leveraging financial incentives and rebates for efficient use of energy from utilities to best practices on how resources are used. Other approaches include moving or masking issues, consolidation, reducing data footprint. The footprint can be reduced using archiving, real-time compression and de-duplication, tiered servers and storage, energy avoidance,

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improved energy efficiency, where more work is accomplished and more data stored per watt of energy, improved cooling capabilities as well as addressing e-waste and related items.

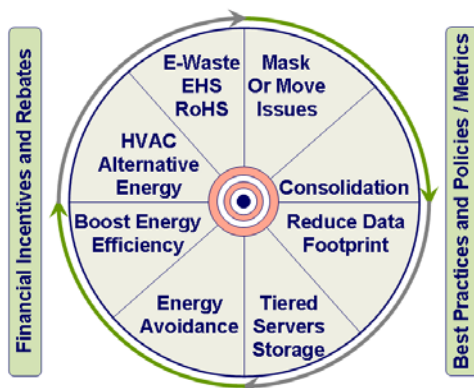


Figure 2 – Approaches to address PCFE Issues

Strategies and Recommendations

With an expanding data footprint as a result of more data being generated, processed, copied and stored in more locations for longer periods of time, data footprint reduction should be part of any overall PCFE green strategy.

Real-time data compression can be used as part of a data footprint reduction approach while also enhancing performance to boost energy efficiency. For example, by compressing on-line and active or changing data, less disk space is required. There is also more efficient use of networks when moving data for backup, business continuance and disaster recovery.

Compressed data is smaller so more data can be held in cache of storage systems. This results in improved read and write performance, boosting efficiency of storage performance while maximizing the amount of data that can be stored in a given footprint.

For performance sensitive applications that require more data to be stored, lower power, higher performing 15.5K RPM SAS and Fibre Channel disk drives can be used in conjunction with real-time compression to boost the effective capacity without incurring performance bottlenecks associated with using fewer slower, yet larger capacity SATA disk drives. For example, compare IOPS, bandwidth, files, transactions or videos per watt of energy when data is compressed for reads and write of active data, or, storing more static data in a given footprint per watt of energy used.

There is confusion about 750GB and 1TByte disk drives using less power than a 15.5K FC or SAS disk drive. The reality is that some newer lower power 146GB and 300GB high performance disks use about the same amount of power as the larger capacity SATA disk drives. What is different between the two types of disk drives is that on a per GByte basis, the larger capacity disk drives have a better GByte of capacity per watt of energy while a higher performing disk drive has a better IOPS per watt.

Closing Comment

Applying the right technology for the task at hand; for example distinguishing between active data versus idle or static data, is an important part of addressing PCFE challenges. For on-line active data including data being changed, real-time compression should be combined along with de-duplication for static and backup data as part of a holistic PCFE Green and data footprint reduction strategy. Additional relevant material including Industry Trends and Perspective white papers and tips can be found at www.storageio.com and www.thegreenandvirtualdatacenter.com.

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