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Solving the Storage Challenge Across Platforms: Transparent Compression for Windows Operating Systems

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Dan Sullivan

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The Increasing Importance of Compression in the Enterprise

Over the past decade, the amount of data enterprises gather and store has boomed. Many solutions, such as cloud storage and solid-state drive (SSD) technology, have risen to meet the new challenges brought by large volumes of data. However, these solutions are sometimes dismissed due to security or cost concerns. If such is the case for your enterprise, you still have the option of using one storage solution that continues to stand the test of time: data compression.

Enterprises are facing a number of shifts in how business is conducted and work is performed. These shifts are having a profound impact on the volume of data being generated. Four factors are driving increased demands for data storage:

- Online transactions and mobile devices
- Collaboration
- Compliance and regulation
- Big data

Not all organizations are facing all of these challenges, but many businesses find the need to address one or more.

Online Transactions and Mobile Devices

To manage the ever-increasing volumes of data, it is important to look at where all of this data is coming from. Customer interactions with online applications and mobile applications are an obvious new source of data. As an enterprise, there is a good chance your IT operations have a hand in managing e-commerce, self-service portals, and mobile device-related data (e.g., geolocation data, push notifications). All of these interactions generate large amounts of user data. It is difficult to imagine now, but the level of detail we track via the Web and mobile devices did not exist 20 or even 10 years ago. There is no going back.

Collaboration in the Enterprise

Collaboration is another contributing factor. Within a single enterprise organization, there are likely several collaboration platforms, such as email, social media, and Microsoft SharePoint. These tools enable more efficient workflows. Employees can share information rapidly and at low cost. Although this functionality is a benefit, it also creates the potential for generating large volumes of data. This volume is not necessarily a bad thing, but IT managers need to plan for the appropriate level of storage capacity they will need.

An enterprise planning to store data and metadata using on-premise infrastructure should plan growing volumes of documents, emails, messages, and related metadata. In addition to storing active content, organizations should plan for archived, historical data. This data type is especially a concern for organizations with e-discovery policies that require storing virtually all communications and documentation generated in the course of operations.

Communications between organizations, or an organization and its customers, is yet another factor. Although email archiving fills part of the organization-to-organization storage need, there may be separate collaboration platforms used between separate business entities. In addition, customer content generation, such as for mobile applications or social media sites, may need to be archived.

Compliance and Regulation

It should be pointed out that the main reason for archiving seemingly useless information, such as push notifications from 6 months ago, is industry regulation and compliance. Some industries, such as finance, require organizations to capture and archive all communications. Similarly, the Health Insurance Portability and Accountability Act (HIPAA) privacy and safety regulations require the logging and storage of application use data. Any increase on either side of the equation (i.e., collaboration versus regulation) compounds the storage problem by requiring both an increase in communications content storage as well as metadata about the communications themselves.

Big Data in the Enterprise

Finally, the elephant in the room: Big Data. The capture and analysis of business processes data, such as clickstream data, and customer-generated social data, such as user purchasing habits, can be used in developing proactive and predictive business practices. However, Big Data analytics, although most likely a worthwhile investment, generate an amount of data not previously seen in many businesses.

Part of the demand for data is driven by a new kind of business analyst—the data scientist. Data scientists are constantly experimenting with new ways to analyze data. This approach is prompting organizations to save more data than they have in the past. In some cases, the pendulum has swung from a desire to purge data to avoid information overload to plans to save as much data as possible so that the organization can analyze and mine all the data for business insights.

In addition to increasing volumes of data, enterprises have data spread across more types of devices ranging from mobile phones to network storage arrays.

Complex Storage Ecosystem

Local storage is not limited to onsite racks or storage network devices. Local data is usually spread across both enterprise and personal mobile devices. While tablets and laptops increase in power, so do the applications the devices are used for.

Laptops have become high-performance machines used for complex design and analysis tasks. Once again, this reality makes enterprise storage a compounding problem. Compute-intensive enterprise tasks usually come with the need for data syncing, adding yet another factor to the storage problem. Compression in these areas can be a boon when trying to save storage space.

The increasing efficiency and stability of SSD technology has greatly improved in recent years. The read/write performance and reduced latency offered with SSDs, if you can afford them, is hard to pass up. Compared with hard disk drives (HDDs), SSDs' per gigabyte cost is high. Here lies another advantage of compression: it can increase cost efficiency per gigabyte for SSDs.

However, magnetic disk storage remains tempting, especially when existing HDDs represent sunk business costs. If your enterprise can sacrifice performance for a sizeable increase in local storage capacity, your fleet of existing HDD-equipped devices is worth another look.

An easy answer to the enterprise storage problem is cloud storage. However, the cloud is not always an option. Choosing to store data through a cloud service, although convenient, carries some risks. Information security and privacy concerns are not unfounded. Cloud storage services imply a shared responsibility security model—something that certain organizations might not be ready for.

These security concerns often come down to compliance and regulation. When working in a security-sensitive industry, such as finance or healthcare, organizations need to ensure any third-party storage services meet their respective industry compliance requirements. In addition, any organization in a compliance-heavy industry will have greater need of data backups and archives for cases of litigation or other e-discovery requirements. In the end, compression will allow such organizations some storage breathing room regardless of whether they choose cloud storage.

Compression Addresses Storage Challenges

Data volumes in the enterprise space are growing. It is tempting to think that advances in storage device technology will keep up with demand. For example, with SSD performance and stability, organizations have the potential for high-performance storage but at a substantial cost.

Magnetic disk technology is a lower cost option than SSD. However, magnetic disks operations take longer to complete, leaving operations with longer latencies. There are some cases in which storage needs can be met with a new hard drive, and compression is a preferred alternative.

It is important to keep in mind that not all compression technologies are created equal. Many compression solutions are easy to use and mature but provide relatively inefficient compression rates. Similarly, some newer compression technologies provide better compression rates but are difficult to implement in an enterprise setting.

It cannot be emphasized enough: Businesses must consider the full life-cycle use case when considering compression options. Not only do you want high-compression rates but you should value ease of use as well.

The Need for Cost-Effective Storage Solutions

As the amount of data generated within the enterprise and beyond continues to increase, so does the need for more cost-effective storage solutions. Buying more storage hardware is one option. This approach might work well for centralized, network storage, but cost is still a consideration. When managing a large number of desktops, laptops, and tablets, the ability to increase storage for such devices is more problematic. It can be done in many cases, but it is likely to be cost prohibitive. More businesses are turning to compression solutions. Compression increases the per gigabyte value of new and existing drives, helping address the need for more storage generated by online transactions, mobile devices, and increasing collaboration, compliance, and regulation concerns as well as the increasing use of Big Data.