Virtual environment backup gains its importance as business systems get virtualized

Virtualization has permeated to SOHOs, SMEs, and mid- to large-scale enterprises. Software products that enable virtualization have also evolved, making implementation of virtual environment easier over the years. Recently, demand for what is called "P2V" (Physical to Virtual) migration in which existing physical machines are transferred to virtual environments has grown, and systems directly linked with actual business have rapidly been virtualized. When larger systems are virtualized, the size of data processed will proportionally increase.

In case of business systems, the importance of data concerned is unquestionably high. Therefore, both the virtualized environment and important data need to be secured backed up. There are currently many varieties of backup solutions available: from those for general purpose to those specialized in virtual environment. However, it is a matter of fact that few businesses have actually implemented sufficient backup systems.

In this regard, Mr. Shogo Sato, Senior Manager, Sales Division Project Planning, NetJapan, Inc., comments, “Awareness toward backups significantly differ from user to user. The basis of their awareness would be how much loss the user has ever suffered. For example, even small-scale SOHO users realize the importance of backups if they have any experience of losing important data in the past due to hardware crash. However, the backup work itself is lackluster and not directly connected to profits. People tend to delay implementing backup systems as they do not want to spend money on it.”

Yet, once important data is lost, the damage will undoubtedly be enormous. Lost data cannot be restored. If the data lost contained vital sales data or customer information, the matter will be critical. We are living in the age of the Internet and social media. Rumor that the business had not taken backups on vital data will spread and the corporate image can be damaged. In addition to system failures, one has to be ready for unavoidable occurrences such as natural disasters. Especially after the 3.11 Earthquake in Tohoku, disaster awareness has become stronger, and people have started to realize the needs to secure business continuity in one way or another.

What are the requirements for backup solutions in virtual environments?

“In view of the foregoing, what should be considered in regards to backup solutions for virtual environments? While various backup products are available in the market, there are a few issues highly related uniquely with virtual environment, and they are different from those of physical environment. Of course, virtualization solutions typically come with general backup features. However, those features are mostly like free extras as those products are not developed solely for backup purposes, and they are somewhat limited in their functionalities and ease of operations.

With that in view, there are some products available that specialize in virtual machine backups. For example, there are "imaging backup solutions" which apply imaging technology that rapidly backs up individual physical servers into virtual environment. Sato explains, "It has been a while since 'volume shadow copy service (Snapshot)' technology emerged, and database and other applications can now work with Snapshot. In the past, only OS was the target of imaging and the rest was backed up using tapes. That trend has changed nowadays, and the whole data is now being backed up by disk imaging."

Another key point is the speed involved with backup and restore. If backup takes a whole day or even more over the large size of data, it poses too large a burden on administrators. To address that issue, there are products that enable high compression and improves storage usability by "in-line deduplication" technology. When compression rate is higher, data size becomes smaller, which translates into faster processing time. In addition, there are products with high-level virtualization solutions as their basic features. Based on those capabilities, some products provide backup and restore features and focus on on-site ease of use.

Since backups in virtual environment cover wide range of objects, it tends to be difficult to know what should be included in backup and restore operations. An easy-to-use, well thought-out user interface is vital in consideration of daily backups and disaster recovery. Necessary features also include backups of database along with applications and of a whole volume, as well as more detailed file-by-file or folder-by-folder restore and quick configuration of virtual machine to another physical server.

"As a matter of course, ease of operation for everyone is essential. In addition to daily operations, attention has to be given to possible cases of system failure. In actual on-site operations, there will probably be no time to read the documents or source a lot of backup media. Even when technology evolves to be more complicated, use of solution needs to be made simpler all the time" (Sato).

Effective data compression and time reduction possible by unique in-line deduplication compression feature

The preceding part explained the need for outstanding solution which combines functionality with ease of operation in backups for virtual environments. We hereby introduce to you the virtualization backup solution developed by NetJapan, a specialized vendor which sincerely continues its technological development. NetJapan is a forerunner in imaging backup solutions and has a wide range of products.

One of their most popular solutions is "ActiveImage Protector 3.5 Virtual Edition" (AIP) which enables speedy backups of the whole volume including OS and applications without interrupting Windows/Linux machines currently running. As mentioned earlier, this product is based on server backups, i.e. it is installed on the target server and performs backups on it. For example, this product can be implemented in a VMware ESX (i) environment in which multiple guest OSs are in operation. Backups can be easily performed by anyone by means of simple settings from the wizard, says Sato.
In Consideration of the Best Backup Method for Virtual Environment

ActiveImage Protector 3.5 Virtual Edition / vmGuardian

In-Line Deduplication Compression

Option for virtual appliance-based backups is available for small-scale environments

Another one of major products from NetJapan is "vmGuardian", a virtual appliance-based solution. This solution was developed specifically for VMware-virtualized environments, and can be used without an agent installed on the target virtual machine. The produce brings out the benefit of reduced procedures at initial setup.

In vmGuardian, a Linux-based virtual appliance is started up in ESX (i) environment, and from that local mount, general external devices such as USB devices, HDD, and NAS/SAN can be connected. All operations including those for backup and restore can be done through a web-based user interface easily from anywhere. "This product is intended for small-scale systems for the moment. It is especially suitable for performing simultaneous backups of four or so guest OSs on VMware, for example. Bulk scheduling can also be easily set up through the web-based interface. The product is extremely affordable and is suitable for implementations in small-scale VMware environments," explains Sato.

In vmGuardian, snapshots of multiple virtual machines are simultaneously obtained via vStorage API and are saved in the same image file. Therefore, high deduplication and compression rates can be attained. "However, the specifications depend upon the functionality of VMware. Transaction information cannot be backed up. If database cannot be interrupted even for a moment, AIP is more suitable. Both products have their pros and cons depending upon their usages, backup targets, and management methods. It is recommended that the right product is used for the right application" (Sato).

AIP is designed to suite wide range of applications in small- to large-scale enterprises, health service providers, educational institutions, and government agencies. In addition, since NetJapan is an independent, specialized vendor, it can offer a whole range of minor upgrades and supports. These important factors should not be overlooked. Sato confidently comments, "These are our own products that we ourselves developed. If there is any problem, we can deal with it right away. It is really our strength that we hold the source codes for ourselves. We can instantly make minor fixes or add some functions to them according to the feedbacks from our customers. We never lag behind of anyone in our developments."

Imaging backup will be more essential than ever in virtual environments. While it is true that large foreign-fund vendors usually come to the fore in the field of backup solutions, it is all so true that not many of their products really reflect the needs of users in Japan while new development and user supports also receive low priority. While not as flashy, Japanese vendors like NetJapan remain agile and painstakingly engage in developments impress their strength in the market.

Mr. Shogo Sato  
Senior Manager, Sales Division  
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NetJapan, Inc.

Chart 1: Measurement results of In-Line Deduplication Compression features  
(comparison of data compression rates and backup/restore times)

<table>
<thead>
<tr>
<th>Product</th>
<th>Compression Setting</th>
<th>Original Size</th>
<th>Image Size</th>
<th>Compression Rate</th>
<th>Backup Time</th>
<th>Restore Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>High</td>
<td>1024GB</td>
<td>703GB</td>
<td>68.7%</td>
<td>335 minutes</td>
<td>127 minutes</td>
</tr>
<tr>
<td>A</td>
<td>Highest + Deduplication</td>
<td>1024GB</td>
<td>545GB</td>
<td>53.2%</td>
<td>360 minutes</td>
<td>127 minutes</td>
</tr>
<tr>
<td>B</td>
<td>High</td>
<td>1024GB</td>
<td>705GB</td>
<td>68.8%</td>
<td>352 minutes</td>
<td>129 minutes</td>
</tr>
<tr>
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<td>High</td>
<td>1024GB</td>
<td>729GB</td>
<td>71.2%</td>
<td>122 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>AIP3.5</td>
<td>In-Line Deduplication Compression</td>
<td>1024GB</td>
<td>518GB</td>
<td>50.6%</td>
<td>189 minutes</td>
<td>96 minutes</td>
</tr>
</tbody>
</table>

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