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Avamar Axion



OVERALL RATINGS

Installation		Installation is the weakest part of the system. We'd like to see a wizard added to the product and a client agent deployment "push" capability.
Manageability/Configuration		Once installed, the unit is very easy to use.
Operation/Functionality		We like the combined D2D and CDP functionality.
Recoverability		Recovery point objective is much better than a VTL and most D2D products.
Problem Resolution and Support		Solid documentation and responsive, competent technical support.
Interoperability		Software-based solution that operates on a variety of server platforms.
User Level		Requires a seasoned storage architect to optimize deployment configurations.
List Price as Tested	\$20,000/TB protected	

Scale: 1 flame = poor; 2 flames = fair; 3 flames = satisfactory; 4 flames = very good; 5 flames = excellent

User level: ● = novice; ■ = intermediate; ◆ = advanced; ◆◆ = experts only

PRODUCT SUMMARY

If we offered an award for “most pleasant surprise,” we’d probably select Avamar’s Axion product. However, we don’t offer such an award so we’ll simply say that Axion will be a worthy shortlist candidate for many organizations. Axion, a software solution that operates on a Linux platform, combines attributes of disk-to-disk (D2D) backup and near continuous data protection (CDP)-like functionality. Moreover, Axion contains a number of features not found in comparable products. The only real rough spot that we discovered in our tests was the installation process, which was a bit cumbersome and arcane. A decent wizard would go a long way to solving this problem, and we hope the company adds such a feature in future releases. Avamar recommends professional service assistance during installation, and such an arrangement would shield the IT staff from the installation details.

Data de-duplication is becoming increasingly popular in D2D systems, with almost one-fourth of vendors now offer such a feature; we expect it to become a common attribute by 2008/09. Axion is one of the products that offers de-duplication technology, but does so differently than most other systems. Whereas most de-duplication functionality resides on the D2D server, Axion deploys an agent on each client and performs local de-duplication first using a hashing algorithm. (Avamar calls this de-duplication “at the source.”) If data is determined to be unique on the client, then the hash key is sent to the Axion server. If the hash key reveals duplicate data on the server (i.e. the same data stored for a different client), then a pointer is created and the data is not transmitted from the client. This methodology can save a significant amount of network traffic and will be particularly efficient when clients are widely distributed across a WAN. The downside, however, is that the client software must be individually installed on each client; Avamar does not presently offer a “push” technology. Some organizations will be able to solve this with their own push application software, but we hope that the company adds this to the installation improvement roadmap.

The CDP-like element of the product hinges on a feature the company calls a “Snap-up.” Snap-up operations are a process whereby new and changed data (i.e., new and changed data is detected at

About the Review

Diogenes Analytical Laboratories and SearchStorage.com teamed together to create disk-to-disk buyer’s guidelines that help IT buyers differentiate between products and select the best candidates for their own situation. For this report, we took 13 different products into the lab and ran them through their paces. We compared products based on ease-of-use, manageability, features/functions and technical support systems. Our opinions are based on the experience of more than a decade of implementing and managing data protection systems.

the variable-sized block level) is captured by Axion either via a manually launched job or prescheduled job. Prescheduled jobs can be launched as frequently as every hour, which is presently a common time interval for CDP systems (often referred to as “near CDP”). So, whereas most backup-based VTLs and appliances backup on the same schedule as a tape system would, Axion can be scheduled for a backup on an hourly basis.

For long-term retention or off-site vaulting, backup and recovery (B/R) software can move data independently to tape. However, this is rather resource intensive by transferring the whole data set across the network. Instead, Axion servers can create a read-only virtual file system that facilitates replication between units and backup of an Axion server using traditional

tape. Essentially, Axion builds the physical file system as the B/R software searches the virtual file system looking for files to backup. When the B/R software issues an "open" command on the file to read the data for backup, Axion begins generating the data from its internal structure in real time. This methodology has two key benefits:

1. Physical disk space is not required to house or store the data, thereby saving significant space;
2. The files are backed up in native format so that a restore from tape can be completed with or without an Axion server.

In the event the customer is using raw volumes to store database or other information, Axion still generates a file to be backed up. However, in this case, Axion client software would be required for data restoration.

Fault tolerance in the product is equally well designed. Using several nodes (i.e., servers with CPU, memory and local disk) in a "redundant array of inexpensive nodes" (RAIN) configuration, the meta data (hash keys) are stored along with parity across the nodes. This architecture has three advantages over a clustered configuration:

1. The solution can scale as more data is added simply by increasing the RAIN nodes (up to 30);
2. There is no dependence on a heartbeat between servers to "know when to fail over," which can be triggered by network outages;
3. There is no interruption in service for single node failures. In contrast, a clustered server VTL will experience a brief outage as the second server takes over processing of I/O from the failed server. Most B/R software will see this as an I/O error and will retry before generating an error, but the Axion's RAIN configuration avoids this potential altogether.

With new products, system reporting is often the last element to be added. However, we were very pleased with the reporting available with Axion. The system allows thresholds to be set and monitored, with e-mail, SNMP and Syslog alerts sent to the console. System statistics can be gathered and exported for reporting purposes. These reporting features exceed the capability of other, more mature, systems that we reviewed.

Given the product's complexity and immature installation script, Axion is probably more product than small organizations will want to assume. However, for medium and large scale operations that want a flexible and capable best-in-class level product, Axion should definitely be considered. It would also be a candidate when clients are spread across a wide area. Core functionality is some of the best we've seen, and the fit-and-finish elements should come with time and maturity.

DIFFERENTIATING FEATURES AND FUNCTIONS

FEATURE/FUNCTION	DESCRIPTION
<i>Client-side de-duplication</i>	<i>Data is de-duplicated before being sent over the network to the server. This minimizes network traffic. However, a re-creation of the data takes place on the server to facilitate replication and tape backup.</i>
<i>CDP-like functionality</i>	<i>“Snap-up” functionality allows scheduling of new and changed data at the variable-sized block level to be captured hourly with checkpoints for roll-back.</i>
<i>Flexible recovery options</i>	<i>Disaster recovery options can be entirely separate for integrated into the product. Data can be replicated between units for off-site transfer.</i>
<i>Broad support</i>	<i>Axion supports UNIX and Windows file systems, Exchange, SQL Server, Oracle, DB2 and NDMP systems on a variety of server platforms.</i>
<i>Encryption</i>	<i>Data is encrypted prior to transfer between Axion clients and servers.</i>
<i>Fault Tolerance</i>	<i>The “redundant array of inexpensive nodes” (RAIN) architecture of Axion provides uninterrupted fault tolerance and the ability to rebuild a node on-the-fly.</i>
<i>Virtual file backup to tape</i>	<i>Native format tapes can be created without the overhead of a separate backup operation or the costly replication of data.</i>

BUYER GUIDANCE

Kudos:

The combination of D2D and near CDP-like functionality adds a dimension not available with typical virtual tape libraries. Axion's client-side de-duplication optimizes remote operations and distributes the de-duplication processing; encryption is an added benefit. Configuration flexibility will allow storage architects to customize the solution for their own unique requirements.

Caveat:

Better installation processes would polish the product. However, it is a fundamentally sophisticated product that is best suited to experienced storage architects.

Who should consider this product:

Axion will be a short-list candidate for medium and large enterprises looking to combine D2D, VTL and CDP functionality on a single best-in-class platform.

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