BACKUP APPLIANCE **SPECIAL REPORT**

The Emergence of the First Enterprise Backup Appliance: The STORServer EBA 3100

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Executive Summary

As organizations of all sizes consolidate and virtualize their infrastructure, a simple, turnkey way to implement and manage data protection in their rapidly evolving infrastructure has eluded them. Enterprise organizations are particularly challenged in responding to these requirements as data protection is only one of the many tasks that they are called upon to perform. Others include:

- ***Big Data.*** More organizations capture, store and retain more types of data for longer periods of time than ever before. This is resulting in them asking their IT staff to protect and recover ever-larger structured and unstructured data stores while having less time to become proficient in the technologies that make this a reality.
- ***Optimize the data center infrastructure.*** IT is under more pressure—and has more responsibility—than ever to place the right data on the right tier of storage while keeping upfront capital and ongoing operational costs under control. Further, they are also tasked with ensuring that corporate data is appropriately protected once stored and managed in such a way that it meets sometimes conflicting application and compliance demands.
- ***Flat to minimal forecasted increases in IT staffing.*** Even as data stores are forecast to increase anywhere from 50 to 75 fold in the next decade, there is no help on the way with IT staffing levels only forecast to increase by a factor of 1.5 during that same period of time.

Backup appliances are one of the key building blocks to helping IT overcome these new hurdles that it faces. Backup appliances are bundled as a single solution, ship as a single SKU and have all necessary hardware and software that an organization needs to theoretically create a "*set it and forget it*" type of backup implementation.

Yet as the recent DCIG 2012 Backup Appliance Buyer's Guide reveals backup appliances differ greatly in their capabilities, features and functionality. These differences span everything from the hardware upon which these appliances are based to the backup software they use to actually do the data protection. These features collectively impact:

- How much data the appliance can protect
- How well the appliance performs during backups and recoveries
- How well data is managed and optimized by the backup appliance after it is protected
- How simple and easy the backup appliance is to initially setup and then manage long term
- How adaptable it is to the different environments that exist within organizations

It is when DCIG took all of these factors into consideration and evaluated backup appliances in light of them that one backup appliance – the STORServer EBA 3100 – stood out from its peers. While many backup appliances were targeted at small and midsized environments, the STORServer EBA 3100 offered all of the attributes that enterprise organizations would expect a backup appliance to possess.

The STORServer EBA 3100 specifically includes the breadth of features that enterprises need to confidently protect the large and varied amounts of data in their environment while still retaining the simplicity of deployment and ease of ongoing management that are the hallmarks of today's backup appliances.

The Characteristics of an Enterprise Backup Appliance

Explaining what an "*enterprise*" backup appliance looks like is easier to illustrate than to explain and no backup appliance shipping today better exemplifies an "enterprise" backup appliance than the STORServer EBA3100. The five characteristics of the STORServer EBA 3100 that make it Enterprise class include:

- ***IBM hardware and software.*** Whether enterprises publicly admit it or not, the name on the box matters to them as it gives them a sense of assurance that they are getting a proven and reliable solution. While "STORServer" itself may not be a household name, IBM certainly is. Knowing that the STORServer EBA 3100 is based on IBM hardware and software and supported by IBM gives enterprises this added degree of confidence that many need to justify moving forward with the EBA 3100.
- ***Hardware availability and scalability.*** Dual Active-Active controllers, 100 TBs of raw storage capacity and up to 300 GBs of solid state storage all equate to a highly available, highly performing and highly scalable backup appliance that is needed to handle enterprise backup workloads.
- ***Data reduction techniques.*** Nearly every backup appliance offers deduplication in some form. In the case of the EBA 3100, deduplication is only where it starts doing data reduction, not where it ends. It offers multiple forms of deduplication that deduplicate data at a very granular level coupled with compression, integration with VMware's VADP and incremental forever backups. Together these combine to assure enterprises that their data is stored in the most efficient way possible.
- ***Advanced, scalable data management capabilities.*** Big Data and compliance requirements are the new reality in enterprises today. Included in the STORServer EBA 3100 is Tivoli Storage Manager (TSM). Using TSM, enterprises can set data retention policies down to the file level and can manage up to eight (8) billion objects or about two (2) PBs of data.
- ***Simplicity.*** The EBA 3100 ships with a lot of functionality but all of this functionality can also mean complexity. To make it simple to use, the STORServer EBA 3100 ships with its own management interface to it. In this way, enterprises can quickly and easily get started with performing and managing backups with the knowledge that if they need these other features they are there on the EBA 3100 waiting to be used.

The Emergence of the First Enterprise Backup Appliance: The STORServer EBA 3100

Impetus Behind the Emergence of Backup Appliances

Rapidly growing data volumes are putting organization on alert. The analyst firm IDC finds that the amount of information managed by enterprise data centers ***will grow by a factor of 50*** over the next decade with the number of files under their management ***growing by an even larger factor of 75***. Yet even as this occurs, the number of IT professionals available to manage this data will only increase by a factor of 1.5.[1]

This combination of data growth and flat IT staffing levels all point to the need for organizations to do more than select the right solution to store all of this data. They also need to put in place a solution to protect the data once it is created. This is the impetus behind the emergence of backup appliances.

Backup appliances eliminate the time consuming process that deploying a backup solution has become. Rather than organizations having to separately buy the backup software, the server hardware, the storage hardware and then assemble and configure the pieces of the backup puzzle themselves, backup appliances come pre-assembled and largely pre-configured.

About the only requirement to get these appliances operations is for organizations to plug them in, connect them to their network and enter site-specific configuration settings (*IP address, firewall settings, etc.*) This turnkey approach to backup serves to reduce the amount of time and effort associated with putting backup into production from days, weeks or months to hours or even minutes.

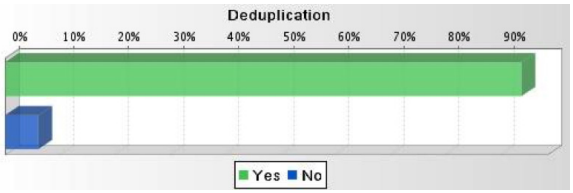
These backup appliances are designed to do much more than simply provide consumer-grade or small business levels of data protection. They are intended for use by the wide range of businesses that exist today ranging from small enterprises that may need to protect only a few hundred GBs of data to those that protect tens or even hundreds of TBs of data.

These backup appliances address the daily backup requirements of various size environments with the ability to hold data for varying fixed lengths of time before archiving it. To achieve this, over 90% of the backup appliances that DCIG evaluated in its recent DCIG 2012 Backup Appliance Buyer's Guide support deduplication as a means to minimize backup data stores.

Four Specific Business Challenges that Backup Appliances Address

Backup appliances are finding a home in organizations of all sizes for a number of reasons. However the four (4) reasons most often cited by organizations for deploying backup appliances include:

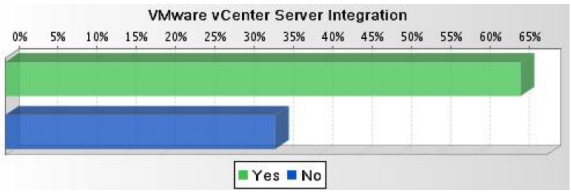
- ***Simplify backup.*** An all-inclusive, ready-to-use backup appliance takes a great deal of complexity out of backup setup and management. Despite the sophisticated, enterprise caliber backup software found on most appliances, many providers have simplified the initial deployment of their appliances down to entering a few site-specific settings into them. Ongoing management is then done with a web-based GUI which is offered by 80 percent of backup appliances.
- ***Accelerate backup.*** Using a preconfigured backup appliance, organizations leave the task of configuring backup software and hardware to the vendor who understands its software and can configure the hardware to work in the most optimal way. In so doing, the backup appliance is ready for quick deployment and optimized for performing faster backups over the long haul.
- ***Quickly and efficiently store backup data.*** Every backup appliance uses hard disk drives (HDDs) which contribute heavily to the fast backup and recovery times that backup appliance deliver. However the vast majority (*over 90 percent*) of backup appliances also use deduplication so their available storage capacity is used efficiently.
- ***Replicate data.*** Completing backups quickly and easily and then efficiently storing the data with deduplication is great. However if data is not moved offsite, organizations are still at risk. 70 percent of backup appliances offer replication software that affords organizations a turnkey method to get their data offsite. Further, 65 percent of backup appliances provide cloud connectivity so they may store backup data in the cloud. These options give companies built-in options for moving data offsite and a great foundation upon which to establish their business continuity and disaster recovery initiatives.



Source: DCIG 2012 Backup Appliance Buyer's Guide

1. Miller, Rich. "Digital Universe to Add 1.8 Zettabytes in 2011." Data Center Knowledge RSS. Data Center Knowledge, 28 June 2011. Web. 18 Nov. 2012. http://www.datacenterknowledge.com/archives/2011/06/28/digital-universe-to-add-1-8-zettabytes-in-2011/.

Backup appliances also take into account the mixed physical-virtual environments that now exist in most organizations. While almost every backup appliance protects the physical servers that exist in most organizations, virtual machine (VM) protection is a close second. 78 percent of backup appliances offer support for the VMware APIs for Data Protection (VADP) and 65 percent integrate with VMware vCenter Server.



Source: DCIG 2012 Backup Appliance Buyer's Guide

Reasons like this explain why all size organizations from small businesses to large enterprises are turning to backup appliances as their first step in creating a comprehensive data protection strategy for their business critical data. The robust set of features on these products coupled with their ease of setup and deployment explains why a recent IDC survey found that 2011 sales of purpose built backup appliances (PBBAs) ***increased by 42.4% over the prior year*** and terms PBBA growth as "***explosive***."[2]

Backup Appliance Landscape

This forecast for increased growth in the use of PBBAs in the years to come is not surprisingly resulting in a corresponding explosion in the number of backup appliances from which they have to choose. The trouble that organizations can run into is they may assume that all appliances are the same or at least comparable.

In reality substantial differences exist between available backup appliance models. The DCIG 2012 Backup Appliance Buyer's Guide helps organizations understand how backup appliances differ by scoring and then ranking these products with higher ranking products generally possessing most or all of the features of lower ranking products.

The backup appliance rankings and the general characteristics of each are as follows:

Different Size Organizations— Different Backup Appliance Needs

The good news from an organizational perspective when looking for backup appliances is that there is a wide range of them from which to choose. That is also the bad news. Having so many choices behooves organizations to first understand their particular needs before selecting a backup appliance.

To do so, they need to look behind just the size of their company (*how many employees they have or what their annual revenue is*) and instead examine the amount of data they have and how fast it is growing. Other factors they need to examine include:

- How much data they need to protect
- What percentages of their environment are physical and virtual
- How quickly they need to backup and recover their data
- What their availability requirements are for the backup appliance
- Do they need to replicate data to another site or to the cloud

Once they have established their requirements, they are then better positioned to identify a backup appliance that aligns with their specific needs.

Basic

Backup appliances ranked as "Basic" by DCIG generally had the following features in common:

- ***Alerting when internal storage is approaching capacity.*** This provides a notification to the administrator that the backup appliance's internal storage is nearing capacity.
- ***Available as a virtual backup appliance (VBA).*** Organizations that are fully virtualized may not want to introduce a new physical appliance into their environment. Using this feature, they can create a VBA in the form of a virtual machine (VM) on an existing VMware server and then use it to backup their VMs.
- ***Concurrent backups and restores.*** Using this option, the backup software can run backup jobs and restore data at the same time.
- ***Data protection for the backup appliance.*** Even backup appliances need their data protected. As the appliance catalogs its backup jobs and indexes data in them, backing itself up permits the backup software to recover to a prior state should its catalog or index become corrupted.

2. IDC. "Worldwide Purpose-Built Backup Appliance 2011-2015 Forecast Update: Explosive Growth in 2011." By IDC in Hardware, Storage, Global. IDC, 21 Dec. 2011. Web. 18 Nov. 2012. http://www.marketresearch.com/IDC-v2477/Worldwide-Purpose-Built-Backup-Appliance-6749896/.

Small Business Backup Appliance Requirements

Small businesses are defined as those that have a couple of TBs or less of data to protect. These organizations will want to start with those backup appliances that supports at least one (1) TB of raw storage capacity. In addition, small businesses should also verify a backup appliance offers:

- ***Cloud connectivity.*** While cloud connectivity may not be a "must-have" Day 1, businesses should verify the backup appliance either offers it now or has a roadmap to provide a cloud connectivity in the years to come as storing data in the cloud is likely to become highly desirable if not an outright business requirement.
- ***Deduplication.*** Deduplication is almost a prerequisite to maximize storage capacity on backup appliances. While over 90 percent of backup appliances support deduplication, those few that do not are found in this Basic range of backup appliances.
- ***Replication.*** A business will want replication if they want to place a backup appliance in another site and replicate data to it for redundancy or if they are a remote office and need to replicate data back to a central office.
- ***VMware support.*** Support for server virtualization with VMware support specifically viewed as a prerequisite. Unless a business definitely knows it is going to remain physical, virtualization is likely in your not-too-distant future as small businesses are among the most likely to fully virtualize their environment in the years to come.
- ***Web GUI.*** Small businesses want "simple and easy management" and a web interface to the backup appliance meets this requirement nicely. The good news is that 80 percent of backup appliances provide this functionality.

- ***File inclusion and exclusion.*** This gives organizations the flexibility to select the specific files and directories on servers that they wish to backup.
- ***Single controller systems.*** These systems offer little in terms of redundancy so if the appliance hardware fails, backups stop until the hardware is repaired or replaced.

Good

In addition to having all of the features that backup appliances ranked as "Basic" by DCIG possessed, backup appliances ranked as "Good" by DCIG also have the following features in common:

- ***Deduplicate data.*** While some backup appliances ranked as "Basic" offer deduplication, on appliances ranked as "Good" deduplication becomes a standard feature.
- ***Hosts a virtual OS.*** Backup appliances with this option give organizations the flexibility to install a hypervisor on the appliance and run the backup software in one of the VMs. The appeal of this option is that organizations may recover an application to a VM running on the backup appliance.
- ***Provide some form of cloud connectivity.*** Some form of cloud connectivity—either to a third party cloud storage provider or a proprietary cloud offered by the backup appliance provider—is generally available as an option on all backup appliances with this ranking or higher.

Excellent

In addition to having all of the features of lower ranked backup appliances, backup appliances ranked as "Excellent" by DCIG add the flexibility to do multiple types of system recoveries. Products with lower rankings could generally perform physical-to-physical (P2P) and/or virtual-to-virtual (V2V) recoveries. (*An application that resided on a physical machine and was backed up could only be recovered to a physical machine. Likewise, an application that resided on a VM and was backed up could only be recovered to a VM.*)

Midsized Business Backup Appliance Requirements

Midsized businesses are defined as those that need to protect anywhere from as little as 2 TBs of data to as much as 50TBs though 10 TBs of data to protect is generally how much data midsized business have to protect. In addition to the features that small businesses need to look for on a backup appliance, midsized businesses also need to look for two more features:

- ***Up to 10 TBs or more of storage capacity.*** Deduplication helps but more data to protect usually means a backup appliance needs more storage capacity. To meet this need identify backup appliances that increase storage capacity using either direct accessed storage (DAS) or networked attached storage (NAS). 75 percent of backup appliances support DAS and 77 percent support NAS.
- ***Application integration.*** Midsized businesses are more likely to have mission critical applications such as either Microsoft Exchange or SQL Server running in their environment. While most backup appliances protect these applications (*Exchange–73%; SQL Server–82%*), it behooves businesses to check before they make a buying decision.

Backup appliances rated as "Excellent" add the flexibility to do virtual to physical application recoveries or vice versa. Using these appliances, if an application resides on a physical machine and is backed up, the appliance gives organizations the flexibility to recover the application to either a physical or

Large Business Backup Appliance Requirements

Large businesses are defined as those that need to protect anywhere from as little as 10 TBs of data to 100 TBs or more. However 50 TBs of data is a logical jumping off point for large businesses. These businesses require all backup appliance features available that small and midsized businesses need though large businesses introduce new backup appliance hardware and availability demands.

Robust hardware features define backup appliances intended for use by large businesses. Dual controllers, high levels of cache, and scale out architectures are just some of the features that come into play as these size businesses look to both accelerate backup jobs as well as seamlessly grow the appliance to meet the growing numbers of backup jobs and data volumes in their environment.

a virtual machine. The same principle holds true if recovering an application that resided on a VM in production.

Recommended

In addition to having all of the features of lower ranked backup appliances, the features that backup appliances ranked as "Recommended" by DCIG introduce are as follows:

- ***Enterprise backup software.*** Enterprises typically need backup software that supports both physical and virtual environments in a robust fashion. These backup appliances leverage backup software that has been used for many years in physical environments and have since added many of the features needed to support virtual environments.
- ***FC and Ethernet connectivity.*** These backup appliances frequently go into environments where Fibre Channel (FC) SANs, iSCSI SANs and network attached servers may be present. Supporting multiple network and SAN protocols with the option to have a large number of network ports (*8 or more*) therefore becomes a prerequisite for these backup appliances.
- ***Highly available configurations.*** Downtime for repairs or routine maintenance may not be acceptable in enterprise environments. To minimize these possibilities, these backup appliances offer dual controllers to help ensure continuous availability.
- ***Integration with VMware vCenter Server.*** VMware vCenter integration becomes a de facto standard for appliances with this ranking. These appliances are generally going into organizations that need to protect tens if not hundreds of TBs of data and who will be using vCenter Server to manage their virtual infrastructure.

DCIG's Rationale for Creating a 'New' Enterprise Ranking in the DCIG 2012 Backup Appliance Buyer's Guide

DCIG's first Buyer's Guide was its DCIG 2010 Midrange Array Buyer's Guide. The intent of that Buyer's Guide was to provide guidance to organizations about the different types of storage arrays classified as "Midrange."

As the time it was produced, two forces were in play.

- ***First, the term "Midrange" was loosely applied to many storage arrays.*** The DCIG 2010 Midrange Array Buyer's Guide provided guidance as to how midrange arrays stacked up against one another so organizations could quickly and easily compare midrange arrays from the same and different storage providers.
- ***Second, the storage market as a whole was already a fairly mature space.*** Storage arrays segment into three broad classifications: Enterprise, Midrange and Small Business, with organizations generally understanding which storage arrays fit into each one. For example, products such as the EMC VMAX and HP P10000 are generally understood to be "Enterprise"; the EMC VNX and NetApp FAS3200 series are generally considered "Midrange"; and, Buffalo Technology and Iomega storage systems are generally viewed as "Small Business" arrays.

The backup appliance space is far less mature. Only in recent years have a sufficient number of backup appliances become available to even justify the creation of a Buyer's Guide though few or no attempts were made to break them into different classifications such as existed in the storage array space.

The DCIG 2012 Backup Appliance Buyer's Guide provided that context for which organizations could compare and contrast backup appliances from different providers. But as a first time Buyer's Guide covering a particular space, anomalies can appear.

In preparing its Buyer's Guide, DCIG always tries to include products that fit within a certain range of scores. In the Backup Appliance Buyer's Guide, DCIG normally would ***NOT*** have included the STORServer EBA 3100 as it scored too highly in comparison to the other backup appliances covered in the Guide. The EBA3100's final score more appropriately resulted in it being classified as an 'Enterprise' backup appliance which was beyond this Buyer's Guide's initial scope.

The problem with not including the STORServer EBA 3100 was that DCIG was not nor is not aware of any other backup appliance(s) that is as robust as the STORServer EBA 3100. So to leave the STORServer EBA 3100 out of the DCIG 2012 Backup Appliance Buyer's Guide would be as an injustice to those evaluating backup appliances since this general classification of an "Enterprise" backup appliance does not exist.

These factors led DCIG for this release of the Backup Appliance Buyer's Guide to create an Enterprise classification to help raise awareness that a backup appliance such as the STORServer EBA 3100 existed and that an Enterprise class of backup appliances is now available in the market

- ***More replication options.*** Many enterprises have remote or branch offices that contain backup data they needs to be replicated back to the home office. Appliances with this ranking have the flexibility to create fan-in (*many appliances to one*) replication configurations.

- ***Multiple methods in which to do deduplication.*** Products with lower rankings may only deduplicate data on the client, the media server and maybe both. Appliances ranked as "Recommended" almost always perform deduplication in either of these fashions Further, the backup appliance in some cases may even be configured as a backup target (*presents itself as a LUN or CIFS/NFS share*) and then deduplicates data after the data is stored on it.

- ***Scalable hardware configuration.*** Beyond just providing redundant components and controllers, these backup appliances also scale to support more processors, more memory and more storage capacity. Solid state drives (SSDs) are also more readily found in appliances with these rankings as a means to accelerate backup performance. This is done to account for the increased amount of data and number of backup jobs that they are expected to protect and support.

- ***Tape library support.*** Tape is finding new life in enterprise organizations in order for them to cost-effectively store data for long periods of time. While tape library management is less of a concern for lower ranked backup appliances, it becomes a priority for backup appliances going into enterprise organizations.

Enterprise

The Enterprise ranking is a new ranking that DCIG introduced in this Buyer's Guide for the first time. Awarded to the STORServer EBA 3100 backup appliance, this was done to identify it as particularly well suited to meet the rigorous demands that enterprises will place upon backup appliances.

The EBA 3100 particularly shined in the areas of deduplication, general management, hardware (*both its availability and scalability*) and virtualization support. It was when the scores of all of these features were aggregated and compared against competitive backup appliances that DCIG felt that it was the only backup appliance worthy of receiving an "Enterprise" ranking.

The STORServer EBA 3100 Backup Appliance Hardware Differentiators

A large part of what drove the STORServer EBA 3100's Enterprise ranking was its underlying hardware. Three factors specifically impacted its high score in this area.

IBM Hardware Reliability and Support

Unlike other providers that often take a 'white box' approach (*server and storage hardware from various hardware providers or a less well known provider*) when building their backup appliances, STORServer only uses IBM hardware.

The decision to use IBM was driven by two factors: IBM hardware reliability and support. Like other backup appliance providers, STORServer has experimented with using 'white boxes' for its backup appliances. But using IBM hardware it could offer a three (3) year warranty on its backup appliance that is available on less than 50% of backup appliances.

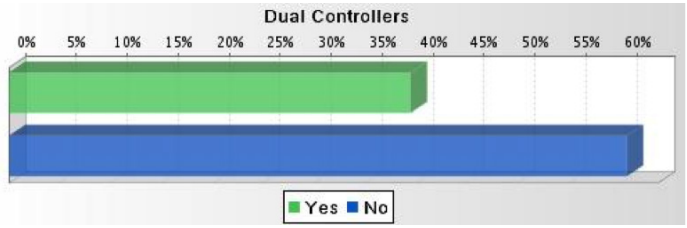
Source: DCIG 2012 Backup Appliance Buyer's Guide

IBM's support further contributed to its decision to exclusively use IBM hardware for its backup appliances. Due to the rapid technology changes that occur in hardware components, using white boxes STORServer had no assurance that replacement parts would be available or, if they were available, that they would work on backup appliances already being used in production.

Using IBM hardware gives organizations the assurance that the backup appliance is supported for as long as it needs it. Further, if a hardware issue does arise that a STORServer engineer cannot support, IBM is available as a third level of support.

Hardware Availability

Using IBM hardware only matters inasmuch as in how it constructed to meet the highly available requirements that some enterprises have for their backup appliances. STORServer inclusion of dual controllers in an "Active-Active" meets these enterprise demands.



Source: DCIG 2012 Backup Appliance Buyer's Guide

While dual controllers are supported by about 40% of backup appliance models, the Active-Active configuration on the STORServer EBA 3100 provides feature function beyond just high availability. Other dual controller configurations are typically configured as "Active-Passive" so the second controller sits idle waiting to take over processing should the primary controller go offline or fail.

The Active-Active configuration on the EBA 3100 permits both controllers to be used at all time. This speeds computer intensive processes such as what is needed for performing deduplication but also facilitates faster backups and restores as well as read and writes.

Hardware Scalability

The other major way in which the STORServer EBA 3100 leverages IBM hardware is to scale it to meet the capacity and processing demands that it is likely to encounter in enterprise backup environments.

To meet these demands, the EBA 3100 scales up to:

- ***3 GBs of memory.*** This serves to expedite writes to disk, accelerate deduplication and handle multiple workloads such as performing concurrent backup and restore jobs or replicating data even as backup occurs.
- ***Eight (8) storage networking ports.*** The EBA 3100 supports either 8Gb FC and 10GbE with the option to have up to eight (8) FC ports. These give it the flexibility to connect to a variety of backup devices (*virtual tape libraries, tape libraries*) as well as do SAN-based backups that are still routinely done in enterprise IT shops.
- ***100 TBs of raw capacity.*** Assuming even a rather conservative 10:1 deduplication ratio, a single EBA 3100 can protect up to 1 PB of data which meets or exceeds the amount of data found in many enterprises.
- ***300 GBs of solid state drives (SSDs).*** Solid state drives are becoming a prerequisite to handle the expedite deduplication in enterprise environments. Scaling to 300 GBs of SSD gives the EBA 3100 the ability to satisfy the high end deduplication demands placed on it by enterprise shops. The EBA 3100's backup software, Tivoli Storage Manager (TSM), also leverages SSDs to first expedite the reading and writing of VM backups and then expedite their deduplication of their data.

DCIG 2012 Backup Appliance Hardware Scores and Rankings

	Backup Appliance Models	Score	Ranking
1.	STORServer EBA 3100	20.20	ENTERPRISE
2.	STORServer IR Series of Backup Appliances	19.20	Recommended
3.	STORServer EBA 2100	17.40	Recommended
4.	STORServer EBA 1100	16.70	Recommended
5.	STORServer EBA 800	16.60	Recommended
6.	RackTop EBR-FE	14.50	Excellent
7.	Everysync 9500	14.00	Excellent
8.	STORServer BA851	13.70	Excellent
9.	Symantec NetBackup 5220 Backup Appliance	13.61	Excellent
10.	Eversync 4500	13.40	Excellent
11.	Dell PowerVault Backup to Disk DL2200	13.00	Excellent
12.	Unitrends Recovery-833	13.00	Excellent
13.	EVault Express Recovery Appliance (ERA)	12.74	Excellent
14.	EVault Plug-and-Protect Appliance PNP1200XV	12.74	Excellent
15.	Unitrends Recovery-823	12.30	Excellent
16.	Eversync 2500	12.00	Excellent
17.	EVault Plug-and-Protect Appliance PNP1200XE	11.90	Excellent
18.	Unitrends Recovery-822	11.90	Excellent
19.	Arkeia R620 Backup Appliance	11.58	Excellent
20.	Unitrends Recovery-813	11.45	Excellent

Note: Only the Top 20 backup appliance hardware scores are displayed here. To view all backup appliances and their respective hardware scores please download the entire DCIG 2012 Backup Appliance Buyer's Guide at this link.

The STORServer EBA 3100 Backup Appliance Software Differentiators

STORServer's use of IBM TSM as its backup and management software gives organizations access to much more than simply backup software. The EBA 3100 also offers hierarchical storage management (HSM), archive management and data reduction. This presence of these technologies and how the EBA 3100 leverages them separates the EBA 3100 from almost every other backup appliance in ways that the DCIG 2012 Backup Appliance Buyer's Guide does not fully illustrate.

Deduplication

Over 90% of backup appliances deduplicate data with the STORServer EBA 3100 included in that statistic. But where STORServer differentiates itself from competitive models is in ***how*** it deduplicates data and the options it gives organizations to protect the data it deduplication.

For instance, STORServer hardens its deduplicated data by giving organizations the flexibility to store the data on multiple devices. In this way should a specific device ever go down or become inaccessible, STORServer may simply go to another device to retrieve the data.

STORServer also give organizations the flexibility to include and exclude specific files from being deduplicated. In this way, files that do not deduplicate well (image files, video files, etc.) or where legal questions may exist about the state of the data may be excluded from the deduplication process.

When it comes to actually deduplicating the data, STORServer offers both inline and post process deduplication techniques to give organizations the flexibility to choose the best method for each application in their environment as there are performance and bandwidth trade-offs with each one.

Inline deduplication minimizes the amount of data sent over the network but can chew up valuable processing cycles on the host. This approach is recommended for those servers with low data change rates (2% or less) which generally represents the majority of servers in most environments.

Post processing occurs after the data has already been backed up to move the overhead associated with deduplication from the host to the client. This approach is generally recommended for those applications that have high data change rates and/or do not have sufficient processing power on the host to deduplicate the data.

A final step that STORServer takes is globally deduplicating across its entire backup data store. This feature particularly comes into play when an enterprise is using multiple STORServer backup appliances or a single STORServer backup appliance is using multiple different storage devices to store its data. Using STORServer, an organization may store just one copy of the data across all of these locations.

Data Reduction

Deduplication helps minimize backup data stores but it can only do so much to control data growth and it does not by default place backup data on the most cost-effective storage media. The EBA 3100 provides these additional needed levels of data reduction and optimization with its incremental forever, co-location, and compression features that complement its deduplication feature and VMware integration.

TSM minimizes how much data is backed up using two different techniques. Using its incremental forever feature, it only backs up new data on physical servers. TSM takes a similar approach with VMs by integrating with the VMware APIs for Data Protection (VADP) and then leveraging its Change Block Tracking (CBT) feature to only backup data that has changed on a VM since its last backup.

Together these two features do more than minimize the amount of data that actually needs to be protected. They also serve to speed up the entire backup process to shorten backup windows.

Once these two processes have completed their respective backup tasks, TSM's compression and deduplication technologies take over to further reduce the amount of data that needs to be stored. Then TSM goes the final mile and optimizes the placement of its deduplicated data stores by placing aging backup data to the most cost-effective storage tiers, such as tape and the cloud, as it treats all storage media as a single logical storage pool across which it can globally deduplicate data.

Creating Virtual Storage Pools (VSPs), TSM can move data from one medium to another whether that is from disk to disk, disk to tape or even disk to tape to the cloud. Regardless of what media is used, TSM can catalog, track

and move data across any and all of the media types in the VSPs without impacting the performance of the EBA 3100 based on the policies associated with the backup data to lower storage costs as well as meet growing concerns that businesses have about compliance.

Data and Policy Management

Compliance is the new reality for ALL businesses regardless of their size with almost no limits as to how far it reaches into their business. How they account for assets, how long they retain employee information and even how well they respond to litigation holds are just some of the new realities of doing business in today's world. However ensuring appropriate access to that data and making sure it is only retained for the correct length of time is a task that rightly and wrongly falls to the backup software.

Using the STORServer EBA 3100's TSM software, compliance comes as a standard features thanks in large part to its policy management functionality. Administrators may set data management and retention policies as granularly as at the individual file level up to and including the entire machine or entire environment. For example, whether it is a file, virtual machine or the entire environment, the item in question may be kept for seven (7) days, seven (7) months or seven (7) years (or whatever) with the flexibility to set different policies for each item individually or apply policies to them collectively.

Equally important to enforcing an effective policy management scheme is the ability for the backup software to catalog and index all of the data under its management. To accomplish this STORServer uses IBM's DB2 relational database that is included with TSM to catalog and index the data in the environment.

One of the main benefits of IBM's relational database is its object level processing. Most other backup software products used database software that is based on a flat file system. While that may be adequate for small environments, it does not provide the flexibility, versatility and power of an object database.

DB2's ability to handle four (4) billion objects now (*which roughly equates to about one (1) PB of data*) and scaling to eight (8) billion objects in the near future gives the STORServer EBA 3100 access to the underlying database engine it needs to effectively manage the growing amount of data that more enterprises routinely encounter.

It is this combination of both hardware and software in a single backup appliance that gives the STORServer EBA 3100 to do with a single appliance what might require multiple other backup appliances from another provider to require. Further, using the STORServer EBA 3100,

STORServer's "Support"ing Arguments

In DCIG's conversations with end users in organizations, service and support continually emerge as top factors that influence a buying decision. In those same conversations, organizations also acknowledge that measuring service and support is subjective at best and very difficult to do objectively. In the face of these challenges, STORServer provides some concrete examples as to how its service and support may be of measured objectively.

- ***STORServer appliances consist entirely of IBM hardware.*** By only using IBM hardware, STORServer removes any questions as to if its internal hardware components are compatible with one another either initially or later on when upgrades and/or maintenance is performance. All hardware and the firmware on them are tested to ensure compatibility to prevent the scenario where customer sites become testing grounds for backup appliances.

  Using STORServer appliances, this is a real possibility. STORServer shares that a number of its appliances are still used in production eight (8) years after their deployment which are still supported by STORServer and for which parts are still available.

- ***STORServer backup software is IBM Tivoli Storage Manager (TSM).*** STORServer uses a proven and established enterprise backup software product to power its backup appliance that is used in tens of thousands enterprise accounts throughout the world to protect both physical and virtual machines. More importantly, STORServer includes a software overlay. This overlay presents the main features that organizations need to quickly install it and make it easy to manage long term. However it leaves all of TSM's flexibility should an organization need them later on to perform archiving, storage tiering and/or apply policies to specific files or data.

- ***Behind the scenes IBM support.*** Initial support calls are placed to STORServer who handles first and second lines of support. But in enterprise environments complex problems can emerge especially when it comes to backup. In those cases, STORServer has the flexibility to escalate these support issues to IBM who can help troubleshoot hardware issues or even TSM coding.

organizations are already positioned for their next generation of data management requirements such as archiving and compliance as well as managing other storage media without the need to acquire another appliance or a different set of software to satisfy these concerns.

Simplicity

All of these software features found on the STORServer EBA 3100 sound appealing except for one small item: Lots of flexibility usually means lots of complexity. If that occurs, that undermines the very purpose of acquiring a backup appliance in the first place. The intent of backup appliances is to simplify backup and recovery, not make it more difficult.

To deliver on this fundamental goal of backup appliances, STORServer includes a software overlay that abstracts away much of the underlying complexity of its TSM software. Rather than users being presenting with all of TSM's capabilities, they are just presented with the features they need to accelerate its initial deployment and ongoing management as easy as possible.

The upside is that if and when an organization needs to manage multiple storage tiers, set policies for data retention, scale to manage hundreds of TBS of data, protect billions of objects or globally deduplicate data, they already have solution with all of the flexibility and sophistication that they need.

STORServer EBA 3100 Stands Alone as First Enterprise Backup Appliance

DCIG's recent independent evaluation and side-by-side comparison of over 50 backup appliances and 100+ features revealed that they are not created equal. Significant differences between them exist in terms of capabilities, features and functionality that impact their availability, capacity optimization, performance, reliability, and service and support.

Yet when all of these factors were taken into consideration and the individual backup appliance models scored and ranked, the STORServer EBA 3100 emerged as the clear winner. But what made its score and ranking so unique in the inaugural DCIG 2012 Backup Appliance Buyer's Guide was by how much higher it scored in comparison to other backup appliances.

In what can still be defined as an emerging though rapidly growing class of data protection appliances, the STORServer EBA 3100 possessed attributes that far exceeded every other backup appliance that DCIG evaluated. Its hardware features were without equal and those features when coupled with its enterprise TSM backup software left DCIG with no other choice but to create a new "Enterprise" designation that should signal to the industry and end-users organizations alike that there are backup appliances and then there is the STORServer EBA 3100. ■

Appendix A

Backup Appliance Overall Scores and Rankings

	Backup Appliance Models	Score	Ranking
1.	STORServer EBA 3100	91.70	ENTERPRISE
2.	Symantec NetBackup 5220 Backup Appliance	87.11	Recommended
3.	STORServer EBA 2100	86.90	Recommended
4.	STORServer EBA 1100	85.70	Recommended
5.	STORServer EBA 800	85.60	Recommended
6.	Symantec Backup Exec 3600 Appliance	78.83	Excellent
7.	Unitrends Recovery-823	76.55	Excellent
8.	RackTop EBR-FE	76.50	Excellent
9.	Unitrends Recovery-833	76.25	Excellent
10.	Unitrends Recovery-822	76.15	Excellent
11.	Unitrends Recovery-712	75.49	Excellent
12.	Unitrends Recovery-612	75.37	Excellent
13.	Unitrends Recovery-212	75.30	Excellent
14.	Unitrends Recovery-813	74.70	Excellent
15.	Unitrends Recovery-713	74.57	Excellent
16.	Unitrends Recovery-312	74.35	Excellent
17.	EVault Plug-and-Protect Appliance PNP1200XV	72.74	Excellent
18.	EVault Plug-and-Protect Appliance PNP1200XE	71.90	Excellent
19.	EVault Express Recovery Appliance (ERA)	71.74	Excellent
20.	EVault Plug-and-Protect Appliance PNP600XE	71.30	Excellent

Note: Only the Top 20 backup appliances and their respective overall scores and rankings are displayed here. To view all backup appliances and their respective overall scores and rankings please download the entire DCIG 2012 Backup Appliance Buyer's Guide at this link.

Appendix B

DCIG Disclosures

Over the last few years the general trend in the US has been for large and boutique analyst firms alike to receive some or all of their revenue from storage vendors.

DCIG is no different in that respect. It also receives payment for services it performs for storage vendors. The services that DCIG provides include blogging, case studies, product reviews, executive white papers and full length white papers.

A number of the products that DCIG evaluated are produced by providers that are or have been DCIG clients. This is not to imply they were given preferential treatment. All it meant was that DCIG had more knowledge of their backup appliances and that they would be considered for inclusion in this report.

In that vein, there are a number of facts to keep in mind when considering the information contained in this Special Report and its merit.

- No provider paid DCIG any fee to do the original research of the DCIG 2012 Backup Appliance Buyer's Guide to "ensure" its product(s) scored well.
- DCIG did not guarantee any provider that its backup appliance would be included the DCIG 2012 Backup Appliance Buyer's Guide.
- DCIG did not at any time imply that a specific backup appliance would score or be ranked well the DCIG 2012 Backup Appliance Buyer's Guide.
- All research was based upon publicly available information, information provided by the storage provider and the expertise of those evaluating the backup appliances.

Because of the number of features analyzed, how these features were weighted and then how these backup appliance models were scored and then ranked, there was no way for DCIG to know or could predict at the outset how individual backup appliances or its features would end up scoring or ranking when completing the evaluation.