

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

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THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

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### Introduction

In the two years since DCIG issued its inaugural 2011 Midrange Deduplicating Backup Appliance Buyer's Guide, much has changed in the data storage industry. New products have been introduced and old ones revamped. New technologies not existing two years ago are now commonplace. Because of all these changes, DCIG has released more targeted versions of its Buyer's Guides to serve an audience with increasingly varied storage needs and budget constraints, resulting in this 2013 Midrange Deduplicating Backup Appliance Buyer's Guide.

Deduplication as a technology continues to become more pervasive in the data storage industry as time passes and the technology further matures. Data deduplication saves disk space by storing only one copy of data when identical data is found. As a result, less storage space is needed for the data backup and the end result means cost savings.

The storage volume necessary for digital media is already at incredibly high levels and the rate of growth is not slowing down. Predictions by Gartner show information managed by enterprise data centers will increase 50 times from 2011 to 2015.<sup>1</sup> A similar statistic issued by IDC estimates that the amount of data reached more than 1.8 zettabytes in 2011 and is more than doubling every two years.<sup>2</sup>

As such, organizations need smarter ways to address the problem of runaway storage volumes. Deduplication technology fills this important gap by providing storage reduction ratios of 10 - 20 times of what can be achieved using standard storage technologies.

Given the ever-growing need for more storage, it should not be surprising that purpose built backup appliances (PBBAs), a category in which deduplicating backup appliances fit, are targeted for large growth.

Recently issued 1QCY13 statistics from IDC show the PBBA market is growing faster than all other areas of the external disk storage and data protection markets. PBBAs are increasing at 17% quarterly year-over-year and shipments have increased by 45% on a year-over-year basis.<sup>3</sup>

Deduplication—maybe more than any other technology—has transformed the backup storage space. Other technologies like thin provisioning, utility computing and virtualization have promised and largely delivered high levels of costs savings and operating efficiency in many environments. However, deduplicating PBBAs often provide these types of results almost immediately in nearly every organization into which they are introduced.

Companies and systems administrators face many challenges when it comes to keeping their backups running smoothly. One of the main challenges in the era of Big Data is to

Kalakota, Ravi. "Big Data Infographic and Gartner 2012 Top 10 Strategic Tech Trends | Business Analytics 3.0."Business Analytics 3.0. http://practicalanalytics.wordpress.com/2011/11/11/big-data-infographic-and-gartner-2012-top-10-strategic-tech-trends/.

Miller, Rich. "'Digital Universe' to Add 1.8 Zettabytes in 2011 » Data Center Knowledge." Data Center Knowledge: Industry News and Analysis About Datacentres. 28 June 2011. http://www.datacenterknowledge.com/archives/2011/06/28/ digital-universe-to-add-1-8-zettabytes-in-2011/.

<sup>3.</sup> IDC Press Release. "Worldwide Purpose-Built Backup Appliance (PBBA) Market Experiences Robust Growth in First Quarter of 2013, According to IDC."

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#### Introduction continued

control and minimize backup data growth. As organizations can realistically expect to cut storage space by 10 to 20 times using deduplicating PBBAs, that goal can be realized. The savings in disk space offered by deduplication can lead to major cost reductions for any business, from small data centers all the way up to those at an enterprise level.

Deduplication may be implemented at the source, the target or both in the backup process, but target deduplicating PBBAs are generally the least disruptive to introduce and may be installed into an existing backup environment. This Buyer's Guide focuses on target deduplicating PBBAs and should be used as a resource for any organization in search of one. When making a decision on purchasing a new backup appliance, organizations face a dizzying array of choices and must research what features are offered by each solution, like in-line vs. post-process deduplication, scalability, packaged software and many other key variables.

This Buyer's Guide does all of that research for organizations. It lists those solutions from which DCIG could reliably obtain information, which features are supported on each product, weights those features and then scores and ranks each target-based deduplicating backup appliance.

This Buyer's Guide takes the place of the heavy lifting that IT organizations normally would have to perform in order to understand the vendor landscape and the scope of available solutions. By using this Buyer's Guide, organizations can immediately understand what features and functions are available so they can move more quickly to making a buying decision.

We hope this Buyer's Guide serves its intended purposes in your environment.

Charley & Jerome

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#### **Executive Summary**

Rapidly growing volumes of data storage have long been a concern of any business, ranging from small and medium sized companies, up to the enterprise. If left unchecked, this data growth inevitably leads to computer storage sprawl as companies spend corporate dollars on the hardware needed to store data and also manage the increasing cooling costs for effective operations of the data center.

Data deduplication is a technology that reduces data stored to disk and may be the technical solution for which many companies are searching. For some time now, companies have been moving to disk at their preferred backup target driven by its disk's lower price, improved performance and higher backup and recovery success rates versus tape. The increase in storage efficiency provided by deduplication processes furthers the cause for using disk in lieu of tape.

Deduplication, when used with disk, reduces the space needed on disk for backup and is able to achieve storage reduction of 10 to 20 times on average, and sometimes even greater numbers are realized. Instead of storing every piece of data, deduplication stores one instance and then provides pointers to one location for exact duplicate copies. As a result of this innovative use of technology, the storage space needed for backup is significantly reduced.

Deduplication may not be the only technology for reducing storage costs, but it is one of the most effective, and deduplication has in many cases replaced tape within companies who are looking to build up their data center cost savings efforts. Aside from helping to decrease administration backup costs, disk-based deduplication also helps to improve the speed and reliability of data protection while facilitating the ability to support multiple backup jobs occuring at the same time.

Deduplication is a technology that crosses industry lines. Organizations in disparate industries ranging from financial services to medical practices can see an improvement to their backup environment through the implementation of a deduplicating backup appliance, though the sum benefit relies heavily on the type of data being stored.<sup>1</sup>

A major feature of deduplicating backup appliances is their ability to handle in-line or postprocess deduplication. Both have benefits, but they handle the removal of duplicate data in very different ways. In-line deduplication deduplicates data at it is ingested by the appliance while post-process deduplication does not deduplicate data until after it is stored by the backup device.

Another notable feature of deduplicating backup appliances is upstream processing. This method divides deduplication between the source and target, so the total time and the work-load associated with deduplicating data are both lessened. While initially offered by Symantec through its OpenStorage Technology API *(OST)* in 2006, this is a key feature that has seen widespread adoption with many deduplicating backup appliance vendors now offering their own version of this technology to complement their support for OST.

Kruschwitz, Paul. "In 2013, deduplication smartens up." Network World. 24 Dec. 2012. http://www.networkworld.com/news/ tech/2012/122412-deduplication-265350.html.

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#### Executive Summary continued

While compiling this Buyer's Guide, DCIG spoke to various end-users to get a sense of how the end-user would weight their needs in various areas. We then evaluated each vendor's capabilities by applying weighting to these features based on our conversations with these end-users.

It is in this context that DCIG presents its 2013 Midrange Deduplicating Backup Appliance Buyer's Guide. As prior Buyer's Guides have done, it puts at the fingertips of organizations a comprehensive list of deduplicating backup solutions and the features they offer in the form of detailed, standardized data sheets that can assist them in this important buying decision.

This Buyer's Guide is the result of a multi-month effort that involved communicating with multiple providers and evaluating over 100 features on 46 different deduplicating backup solutions.

Each provider was given the opportunity to complete a survey with over 85 questions that examined how its solution delivered on features associated with deduplication, management, hardware, scalability and support.

In instances where vendors did not respond, DCIG completed the surveys on the vendor's behalf and then sent the completed survey to the vendor for their review. In every case, every vendor had the opportunity to review and respond to the survey and the information regarding their product displayed on the data sheets included in this Buyer's Guide.

The DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide accomplishes the following objectives:

- Provides an objective, third party evaluation of deduplicating backup appliances that evaluates and scores their features from an end user's perspective.
- Scores and ranks the features of each deduplicating backup appliance based upon the criteria that matter most to end users and then presents these results in an easy to understand table that displays the products' scores and rankings so they can quickly ascertain which deduplicating backup appliance solution is the most appropriate for their needs.
- Provides a standardized data sheet for each of the 46 deduplicating backup appliance solutions from 10 different deduplicating backup appliance providers so users may do quick comparisons of the features that are or are not supported with each product.
- Gives any organization a solid foundation for getting competitive bids from different deduplicating backup appliance providers that are based on "apples-to-apples" comparisons.

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#### How to Use the DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide

The DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide will help IT organizations initiate an informed evaluation of midrange deduplicating backup appliances so they may quickly create a short list of products to consider.

The "Best-In-Class," "Recommended," "Excellent," "Good," and "Basic" rankings included in this Buyer's Guide are a measure of how much functionality and capability each solution has relative to the overall landscape. It should be noted that the five rankings do not determine if the solution is the most appropriate fit for any particular IT organization.

The Buyer's Guide is intended to rank the products in order from those appliances that have the most features and functions to those that have lesser amounts of functionality. However, the Buyer's Guide cannot tell the reader which functions and features are the most appropriate or needed in their particular environment.

Rather, this Buyer's Guide provides IT organizations with much needed guidance and insight as to what midrange deduplicating backup appliances are available. It also helps to assure organizations that if they select a solution that scores highly in this Buyer's Guide, it is more likely to possess all of the features they are likely to need in a backup appliance.

IT organizations should, therefore, use this Buyer's Guide as a handbook to understand:

- Who provides midrange deduplicating backup appliances
- What target-based midrange deduplicating backup appliance solutions are available
- What features and functions are available on each solution

DCIG recommends that one use this DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide to understand each product's strengths and weaknesses around four major categories. Furthermore, IT organizations inevitably have to report back to the business side of the house and there is nothing the business side of the house understands better than a number. To help in this endeavor, each product is scored and ranked so conversations regarding new technology can more quickly shift from a focus on which technology to buy to how the purchase of this technology will help the bottom line.

Lastly, the Appendix of this Buyer's Guide explains and normalizes the jargon specific to target-based deduplicating backup appliances in order to enhance the quality and productivity of the discussions around the technology. The Appendix also provides contact information for each vendor should one wish to reach out to them.

#### **Disclosures**

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

DCIG is no different in that respect as it also receives payment for the different services it performs for technology providers. The services that DCIG provides include blogging, case studies, product reviews, executive white papers, full length white papers and Special Reports.

In the interest of being fully transparent, a number of the technology providers included in this DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide are or have been DCIG clients.

This is not to imply that these technology providers were given preferential treatment in the Buyer's Guide. Instead, it means that DCIG had more knowledge of their target-based midrange deduplicating backup appliance(s) and that DCIG would consider their midrange deduplicating backup appliances for inclusion in this Buyer's Guide—nothing more.

There are a number of important facts to keep in mind when considering the information contained in this DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide and its merit:

- No technology provider paid DCIG any fee to develop this Buyer's Guide
- DCIG did not guarantee any technology provider that its midrange deduplicating backup appliance would be included in this Buyer's Guide
- DCIG did not imply or guarantee that a specific midrange deduplicating backup appliance would receive a good score on this Buyer's Guide

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- All research was based upon publicly available information, information provided by the technology provider, and the expertise of those evaluating the target-based midrange deduplication appliances
- Because of the number of features analyzed, how these features were weighted, and then how these midrange deduplicating backup appliance models were scored and then ranked, there was no way for DCIG to predict at the outset how individual models would end up scoring or ranking when all was said and done
- DCIG wants to emphasize that no technology provider was privy to how DCIG did the scoring and ranking of the deduplicating backup appliance. In every case the technology providers only found out the scores and rankings of their individual midrange deduplicating backup appliance models after the analysis was complete.

### Midrange Deduplicating Backup Appliances Inclusion and Exclusion Criteria

Inclusion of products in the DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide was based primarily upon the following criteria:

- The solution's primary purpose had to be for the deduplication of backup data. There are some storage solutions that offer data deduplication technology (solutions from NetApp, Nimbus Data, Tegile Systems and Whiptail Technologies are such examples.) However, the primary intent of these products is not to deduplicate backup data but primary data so they tend not to function as well when used as a deduplicating backup appliance. This fact was confirmed by conversations that DCIG had both with end users and the technology providers.
- Its primary intent is to do target-based deduplication of backup data. Deduplication may also occur at either the backup client or on the backup media server. However, when deduplication is done in that manner, it is usually delivered and included as part of the backup software. In cases of target-based midrange deduplicating backup appliances, the deduplication technology is delivered and occurs independently of the backup software. However, specific integrations (such as with

*Symantec's OpenStorage API*) may exist between the backup software and the deduplication appliance for enhanced deduplication performance and/or management features.

• It had to offer a network attached storage (NAS) interface and support the CIFS or NFS protocols. DCIG found that most IT organizations looking to deploy target-based midrange deduplication appliances will primarily deploy them using the NAS option. While a number of these solutions offer a virtual tape library (*VTL*) option, this was not viewed as a prerequisite feature for midrange deduplicating backup appliances. In IT organizations where this is a requirement, they should carefully review each product's data sheet.

### The Seven-Step Process Used to Score and Rank Midrange Deduplicating Backup Appliances

To score and rank each midrange deduplicating backup appliance, DCIG went through a seven-step process to come to the most objective conclusion possible.

- 1. DCIG listed out of all of the features available on all of the midrange deduplicating backup appliances. Prior to selecting the features that were included in the final evaluation in the Buyer's Guide, DCIG went through and quantified what features each midrange deduplicating backup appliances model possessed. DCIG then 'normalized' the list of features available on midrange deduplicating backup appliances such that a common name for each feature was established.
- 2. DCIG established which features would be included in the Buyer's Guide. One of the goals of this Buyer's Guide was to try to only include features on each midrange deduplicating backup appliance model that could be objectively and authoritatively analyzed.

For example, *"Maximum Raw Storage Capacity"* was evaluated as a feature instead of "Logical Storage Capacity" which is what vendors often promote. While logical storage capacity is what users ultimately care about and use, a consistent, objective answer cannot be arrived at because of all of the variances in how

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each vendor calculates deduplication ratios. So *"Maximum Raw Storage Capacity"* was selected as the feature to evaluate and score since an answer could be objectively ascertained and supported.

- 3. Each feature had a weighting associated with it. The weightings were used to reflect whether or not a feature was supported and potentially how well it was implemented. For example, "24x7 Support" is more of a "Yes" or "No" type response, whereas "Storage Networking Protocols" could include a number of different protocols. As such, each feature was weighted and scored differently.
- 4. A questionnaire that asked about each of the features scored in this Buyer's Guide was sent to each technology provider. In addition to using the information that was publicly available on each provider's website, each technology provider included in this Buyer's Guide had the opportunity to respond to a questionnaire sent by DCIG. This was done to both verify that the information DCIG found on the provider's website was correct as well as remove any ambiguities that existed regarding how some of the features were implemented.
- 5. All of the features were scored based upon the *information that was gathered.* The weighting and scoring was done by DCIG.
- 6. Broke the features into several categories. The features for target-based midrange deduplicating backup appliances broke down into four larger categories: Deduplication, Hardware, Management, and Scalability & Support.
  - **Deduplication.** How deduplication is done includes what algorithms are used, how it is performed (*concurrent, in-line or post-processing*) and what options are available to manage it.
  - *Hardware*. Hardware components covered include network protocols, network interfaces, controller configurations and storage capacity.
  - *Management*. This category covers what backup software products recognize and manage, the midrange deduplication appliance as well as what replication features the midrange appliance offers.

- Scalability & Support. This category covers how well the midrange deduplication appliance could scale or adjust to specific replication or deduplication demands. It also provides information on what support options are available (phone, email, web) as well as how alerts were generated.
- 7. The midrange deduplicating backup appliances were ranked using standard scoring techniques. The goal of all DCIG Buyer's Guides is to establish clear lines of differentiation between the products included in them. To accomplish this objective, after each product is weighted and score, the mean or average score and standard deviation for all of the products were determined. These were then used as the basis for developing a ranking for each midrange deduplicating backup appliance model:
  - Those midrange deduplicating backup appliances that were .375 or greater standard deviations below the mean were given the rank of "Basic"
  - Those midrange deduplicating backup appliances that were .375± standard deviations above or below the mean were ranked as "Good"
  - Those appliances that were .375 1.125 standard deviations above the mean were ranked as "Excellent"
  - Those appliances that were greater than 1.125 standard deviations above the mean were ranked as "Recommended"
  - The top ranked appliance was given the classification of "Best-In-Class"

Using this scoring and ranking method, DCIG feels confident that all of the appliances included in this report can be reasonably classified as a "*Midrange Deduplicating Backup Appliance*" as all appliances were within two (2) standard deviations of the mean.

### DCIG Comments and Thoughts On... The Cloud

The "cloud" term is being tossed around a lot these days in the technology industry and deduplicating backup appliances are poised to leverage this technology greatly in the very near future. There are two ways in which the cloud

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plays a role in the operation of midrange deduplicating backup appliances.

Once the deduplicating backup appliance has completed deduplicating the backup data, or sometimes even as it is deduplicating the data, an organization may look to move a copy of that data offsite. The cloud is a logical place to send this second copy of the data. Public storage clouds such as those offered by Amazon and others provide an economical and easy way to store this data offsite. This functionality is supported by a number of appliances in this Guide.

The more interesting angle is that once this backup data is in the cloud, organizations may begin to explore recovering their applications offsite, potentially with the hosting provider. This gives them the ability to go the final mile and put in place a viable off-site disaster recovery plan. While achieving this feat is still a bit of stretch based on current technologies, the larger trend is in this direction.

However as organizations look to go down this path, they should also be aware of its limitations. The key limitation is the time it takes to send and retrieve backup data to and from the cloud due to network constraints.

While there are barriers to cloud storage usage, there are also solutions. When uploading and restoring data, cloud providers may send, or seed the upload, or restore using disks sent from the backup location to the cloud, and vice versa. Also, if the restore is going to be lengthy, an organization can wait long periods of time (*potentially days*) for the data to be retrieved from the cloud. For these reasons, cloud storage should only be used in the backup and recovery process after both its benefits and risks are thoroughly understood.

#### Branch Office – Data Center Appliance Applications

Midrange data centers can vary greatly in size and for the purposes of this report, DCIG looked at a specific range of deduplicating backup appliances. Many may classify a data center in the midrange category if it stores from 30 TBs to 100 TBs of data while larger data centers will typically exceed 100 TBs and may potentially scale to house PBs of data. Because of the large range of capacity sizes that may fit under the midrange moniker, DCIG looked at deduplicating backup appliances that start at around 8 TBs and ranging up to ~500 TBs.

Deduplicating backup appliances often do not work singularly in a data center backup environment. The deduplication ratio is largely determined by how the backup appliance is used. Deduplication devices can do "fan-in" replication to a larger appliance, or "fan-out" replication from a large appliance to many smaller ones. Deduplication devices may also be configured in a cascade, where one appliance fans out to several others, and those other appliances then fan out to even more appliances. In these configurations the deduplication ratio will vary depending on the number of hops in the cascade.

It goes without saying that branch offices need less storage space for their backup needs than central data centers. However, a greater deduplication ratio can be achieved when several deduplicating backup appliances are used together. In a *"fan-in"* scenario, branch offices can have a single target 1 TB deduplication appliance at their location, but replicate back to a central target deduplication appliance capable of storing up to 60 TBs of data. In this scenario, the target deduplicating branch office backup appliance is finding redundancies at the branch location. Additionally, with several branch backup appliances going to a central deduplication appliance, the example target device is finding redundancies across the various branch office appliances.

#### Sizing a Midrange Deduplicating Appliance

Various factors need to be considered when sizing a deduplicating backup appliance. Some of the data points that must be looked at include the amount of backup data necessary, compression ratio, and the frequency of incremental and full backups. The type of data to be backed up is also important because some types of data deduplicate better than others. Those with greater redundancies in data will produce the best results in reducing the amount of storage space used.

In simple terms, 10 TBs of backup data is stored with a 2:1 compression ratio when using a deduplicating backup appliance, equates to 5 TBs of backup after the first run. From there, further deduplication results depend on the retention policies of an organization. Some may store data for six (6) weeks. Others may store it for six (6) months. Still others may possibly retain the data even longer.

If a firm does weekly full backups that experience a change rate of 1 percent between backups with each backup retained for six (6) months, the appliance should be storing

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approximately 7 TBs of backup data once deduplication and compression are factored in.

Once the appliance has been up and running, the deduplication ratio can then be calculated by dividing the total amount of data to be backed up by the amount of data stored on the appliance after deduplication. The longer an appliance is used, the greater the deduplication ratio generally gets. In a typical environment, deduplication ratios range from 10:1 to 20:1. If a 20:1 ratio is achieved, then a single appliance with 10 TBs of storage capacity can theoretically store up to 200 TBs of backup data.

Most organizations with which DCIG has spoken find they can achieve a 10:1 deduplication ratio with relatively ease and, with some tuning and attention to detail, achieve a 20:1 deduplication ratio over time. As such, most companies should, as a rule of thumb, use a 1:1 ratio when sizing a deduplicating backup appliance. Using this formula, the usable capacity of the backup appliance should equate to the total amount of data that an organization has to backup in its environment.

#### Software Keys

Deduplicating backup appliance storage expansion can be achieved in two ways: scaling-up and scaling-out. In a scale-up configuration, administrators add storage shelves to an existing appliance in set storage capacities such as through additional disk drives or entire disk shelves.

Scale-out refers to a system where nodes are connected together to grow the backup storage pool linearly. Scaleout systems present a single logical image to the backup software even as compute and/or storage resources are added to it. Each node contains the hardware necessary to grow the storage pool by adding in disk drives, processors, memory, networking for throughput, and controllers.

A third, lesser-used option for storage expansion that deduplicating backup appliance vendors sometimes offer on the lower end of the market is a software key. A software key allows organizations to purchase a storage key to "unlock" additional storage on an appliance, typically doubling the amount accessible. For example, organizations with 4 TBs of initial storage can purchase a software key to access another 4 TBs of storage that is otherwise inaccessible, but already available on the appliance. In this scenario, those with an appliance that begins with 4 TBs of storage can scale-up to larger amounts of capacity without needing to physically install more storage capacity.

At this time, the use of a software key is geared towards the low-end of the midrange deduplicating appliance market, mainly due to the amount of TBs shipped with each appliance. In small segments, a backup appliance vendor may be able to justify including a couple of TBs that can be later accessed by the organization as its backup storage capacity needs grow.

#### Midrange Deduplicating Backup Appliance: Ranking Observations and Recommendations

General observations regarding all of the products covered in the DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide include:

- All appliances compress data after deduplicating the data
- All appliances offer variable length block deduplication as a means to deduplicate data
- All appliances offer at least four (4) Ethernet storage networking ports
- All appliances can deduplicate incoming data while concurrently replicating data
- 98% of the appliances offer at least 12 TBs of raw storage capacity
- 98% of the appliances support hot-swappable drives
- 96% of the appliances support both the CIFS and NFS networking protocols
- 96% of the appliances natively include deduplication software
- 96% of the appliances verify data integrity after deduplicating data
- 93% of the appliances support RAID 6
- 91% of the appliances support Symantec OpenStorage API (OST)
- 87% of the appliances support 10Gb Ethernet ports
- 85% of the appliances support SATA drives
- 76% of the appliances begin deduplicating data before all backup data arrives
- 74% of the appliances support NDMP

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#### **Best-In-Class/Recommended**

#### **Observations**

The products that earned "Best-in-Class" and "Recommended" rankings in the 2013 Midrange Deduplicating Backup Appliance Buyer's Guide generally shared the following features in common:

- · Give organizations two options to encrypt data
- Have starting list prices of over \$250,000
- Scale to at least 100 TBs in raw capacity with the Best-in-Class scaling to over 700 TBs
- Scale to support dozens of concurrent backup streams with no performance degradation
- Scale to support hundreds of GBs of cache

#### Recommendations

NEC HYDRAstor deduplicating backup appliances captured four of the top five spots in the DCIG 2013 Deduplicating Backup Appliance Buyer's Guide with its HS8-4006R model earning the DCIG "Best-In-Class" designation. NEC appliances achieved these high rankings by offering the most scalable hardware among the appliances that DCIG evaluated.

Other features that contributed to NEC earning the high rankings in this Guide included its global deduplication, scale-out architecture, use of dynamic disk pools, large numbers of partitions and storage numbers of storage networking ports and lengthy product warranty (3 years.) However its hardware features contributed most heavily to NEC's high rankings as all of its models scored very well in the Hardware category of this Guide with its NEC HYDRAstor HS8-4006R model also achieving a "Best-in-Class" ranking in this category.

As an example of the scalability this model offers, its raw capacity can scale to over 700 TBs. Yet due to its scaleout architecture, organizations can start out with only as many accelerator (performance) or storage (capacity) nodes as they initially need. They may then non-disruptively add nodes to their existing configuration. In this way, any data center can start off with only as much capacity or performance as they need and then increase capacity or performance in increments as their specific environment requires.

The Quantum DXi8500 was the lone non-NEC model to achieve a Recommended ranking in this Guide. Unlike the

NEC models, the Quantum DXi8500 offers two controllers configured as Active-Active for high availability. While it also delivers high levels of capacity (up to 330 TBs usable) its robust management software contributed the most to its high ranking as the DXi8500 achieved a "Recommended" ranking in the Management category. Its software gives organizations a high level of visibility into the appliance's deduplication activities informing them how well the appliance is performing and deduplicating data as well as giving them flexibility to optimize deduplication due to its integration with multiple backup software products.

#### Excellent

#### **Observations**

The products that achieved an "Excellent" ranking in the 2013 Midrange Deduplicating Backup Appliance Buyer's Guide generally shared the following features in common:

- Can optionally encrypt backup data
- Globally deduplicate data
- Offer a scale-out architecture
- Scale to at least 50TBs of raw capacity

#### Recommendations

It is noteworthy that the majority (80%) of the products achieving an "Excellent" ranking use scale-out architectures. ExaGrid, NEC and Sepaton all use this architecture as they give organizations the flexibility to start with only as much capacity and performance as their environment initially requires and then non-disruptively add more capacity, performance or both.

Of the solutions in this ranking, ExaGrid particularly stands out. All of its products have a starting price point of under \$100,000 with many of them starting out for less than \$50,000. This makes its solutions a compelling option for many small and midsized enterprises as well as remote and branch offices.

Large enterprises should pay special attention to NEC and Sepaton. Due to the capacity and performance that both of these providers offer in their models, they provide enterprise organizations a comprehensive deduplication solution that can satisfy the needs of their central data centers as well as their remote and branch offices.

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

Appliances from Quantum and Symantec round out the Excellent category. Their products are distinguished by the robust management software though in different ways. Quantum is well tuned for environments where multiple backup software solutions may be present while Symantec's appliance is specifically well tuned for environments where NetBackup backup software is in use.

#### Good

#### **Observations**

The products that earned a "Good" ranking in the 2013 Midrange Deduplicating Backup Appliance Buyer's Guide generally shared no specific features in common in this particular Buyer's Guide.

#### **Recommendations**

Only eight (8) products achieved the ranking of "Good" in this Buyer's Guide. While in other Buyer's Guide the characteristics that define a ranking can usually be summarized in 3-5 points, that was not the case in this Guide.

Each of the appliances from ExaGrid, FalconStor Software, NEC, Quantum and Symantec that achieved this ranking had areas of strengths that were offset by other weaknesses. For instance, appliances from ExaGrid and NEC which were both strong in their respective hardware capabilities again offered scale-out capabilities for these appliances in this ranking. However these models did not scale to very high levels of capacity as they used smaller capacity and/or fewer hard drives in their capacity nodes.

In the cases of Quantum and Symantec, their appliance management software drove their products to their respective high rankings in this Guide. That management software still comes into play here though fewer features of their management software are available on their models with the "Good" ranking. As such, the models from all of these providers are generally more suitable for small enterprise and remote and branch offices that have smaller amounts of data to backup. The only exception to this would be the Symantec NetBackup 5030 which does scale to over 300 TBs but which should only be deployed in situations where the backup environment is well understood. FalconStor Software also makes its first showing in this Guide. Making the appearance of its VTL SAM16 notable is that it is one of only a few models that offers a virtual tape library (VTL) interface and supports both Ethernet (NFS/CIFS) and fibre channel (FC) protocols. This would make it appealing to those organizations that need to send backups over multiple interfaces.

#### Basic

#### Observations

The products that achieved a "Basic" ranking in the 2013 Midrange Deduplicating Backup Appliance Buyer's Guide generally shared the following characteristics in common;

- Scale to support less than 35TBs of raw capacity
- Vendors use the same appliance management software as is found on higher ranked/more robust appliance models

#### Recommendation

While organizations still have options with a range of midrange deduplicating backup appliances, the majority of products ranked in the "Basic" category are at the low-end of scalability. A number only offer raw storage capacity in the single TB range and more than 80% do not scale higher than 35 TBs of raw storage capacity.

In spite of the lowered capacity range, the good news is that these appliances still offer the same management capabilities as is found on the larger systems of this size. As a result, organizations will have available to them the levels of backup acceleration, "fan-in" and "fan-out" abilities and related hardware necessary to support their remote and branch office.

Small and midsize businesses may also find these appliances appropriate for use in their environment. In addition to being "right-sized" from a capacity perspective for their size environments, a growing number of these appliances now offer connectivity to public cloud providers which gives them a means to easily store their backup data offsite.

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

# MIDRANGE DEDUPLICATING BACKUP APPLIANCE SCORES AND RANKINGS

The scores and rankings for the deduplicating backup appliances contain the following information:

- A chart that includes the scores and rankings for all of the products
- The mean and the standard deviation that were used to establish how each backup appliance was ranked
- A summary of the primary findings

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

#### **OVERALL SCORES AND RANKINGS**

	Midrange Deduplicating Backup Appliances	Score	Ranking
1.	NEC HYDRAstor HS8-4006R-720	75.78	BEST-IN-CLASS
2.	NEC HYDRAstor HS8-3020R	74.74	Recommended
3.	NEC HYDRAstor HS8-3010R	73.79	Recommended
4.	Quantum DXi8500 Enterprise	72.44	Recommended
5.	NEC HYDRAstor HS8-4002S-192	70.97	Recommended
6.	Quantum DXi6802	69.88	Excellent
7.	NEC HYDRAstor HS8-4002S-96	69.45	Excellent
8.	NEC HYDRAstor HS8-3004S-24-48	68.78	Excellent
9.	NEC HYDRAstor HS8-3004R-24-48	68.68	Excellent
10.	ExaGrid Systems EX13000E	66.92	Excellent
11.	ExaGrid Systems EX10000E	66.69	Excellent
12.	ExaGrid Systems EX7000	66.04	Excellent
13.	ExaGrid Systems EX5000	65.78	Excellent
14.	ExaGrid Systems EX4000	65.64	Excellent
15.	Sepaton S2100-ES3 Series 2925	65.32	Excellent
16.	ExaGrid Systems EX3000	65.14	Excellent
17.	Quantum DXi6700 Series	64.02	Excellent
18.	NEC HYDRAstor HS8-4001S(12-48)	63.03	Excellent
19.	NEC HYDRAstor HS8-3002S(12-24)	62.91	Excellent
20.	Symantec-NetBackup-5230	61.67	Excellent
21.	ExaGrid Systems EX2000	60.54	Good
22.	ExaGrid Systems EX1000	60.34	Good
23.	NEC HYDRAstor HS8-4001S-96	60.11	Good
24.	Symantec NetBackup 5030	57.70	Good
25.	NEC HYDRAstor HS3-410	56.81	Good
26.	NEC HYDRAstor HS3-310	55.51	Good
27.	Quantum DXi4601	55.36	Good
28.	FalconStor Software VTL SAM16	54.15	Good
29.	HP StoreOnce B6200 48TB Backup System	52.21	Basic
30.	FalconStor Software FDS SA623	51.93	Basic

continued on next page

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

#### OVERALL SCORES AND RANKINGS (continued)

	MIDRANGE DEDUPLICATING BACKUP APPLIANCES	SCORE	RANKING
31.	FalconStor Software FDS SA310	51.17	Basic
32.	FalconStor Software FDS SA304	50.73	Basic
33.	EMC Data Domain DD860	50.46	Basic
34.	FalconStor Software VTL SAP16	49.84	Basic
35.	Symantec Backup Exec 3600	49.25	Basic
36.	Dell DR4100	48.71	Basic
37.	EMC Data Domain DD670	48.28	Basic
38.	EMC Data Domain DD640	46.56	Basic
39.	IBM Storage System TS7600 ProtecTIER Deduplication	46.49	Basic
40.	EMC Data Domain DD620	43.36	Basic
41.	FalconStor HDS FS FDS H150	42.74	Basic
42.	FalconStor HDS FS FDS 220S	41.31	Basic
43.	HP StoreOnce 4430 Backup System	32.94	Basic
44.	HP StoreOnce 4220 Backup System	32.52	Basic
45.	HP StoreOnce 4420 Backup System	32.36	Basic
46.	HP StoreOnce 4210 Backup System	32.10	Basic

Total Number of Products

46

		Rankings	
Highest Score	75.78	Recommended	70.42 – 75.78
Lowest Score	32.10	Excellent	61.47 – 70.41
Average (Mean)	56.98	Good	52.51 - 61.46
Standard Deviation	11.94	Basic	32.10 - 52.50

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

#### HARDWARE SCORES AND RANKINGS

	Midrange Deduplicating Backup Appliances	Score	Ranking
1.	NEC HYDRAstor HS8-4006R-720	30.78	BEST-IN-CLASS
2.	NEC HYDRAstor HS8-3020R	29.74	Recommended
3.	NEC HYDRAstor HS8-3010R	28.79	Recommended
4.	NEC HYDRAstor HS8-4002S-192	25.97	Recommended
5.	NEC HYDRAstor HS8-4002S-96	24.45	Recommended
6.	HP StoreOnce B6200 48TB Backup System	23.91	Excellent
7.	NEC HYDRAstor HS8-3004S-24-48	23.68	Excellent
8.	NEC HYDRAstor HS8-3004R-24-48	23.68	Excellent
9.	ExaGrid Systems EX13000E	23.47	Excellent
10.	ExaGrid Systems EX10000E	23.24	Excellent
11.	ExaGrid Systems EX7000	22.59	Excellent
12.	ExaGrid Systems EX5000	22.33	Excellent
13.	ExaGrid-Systems EX4000	22.19	Excellent
14.	ExaGrid Systems EX3000	21.69	Excellent
15.	Sepaton S2100-ES3 Series 2925	21.32	Excellent
16.	NEC HYDRAstor HS8-4001S-96	19.51	Excellent
17.	NEC HYDRAstor HS8-4001S-48	19.03	Excellent
18.	NEC HYDRAstor HS8-3002S	18.91	Excellent
19.	Quantum DXi8500 Enterprise	18.84	Excellent
20.	ExaGrid Systems EX2000	17.09	Good
21.	ExaGrid Systems EX1000	16.89	Good
22.	Quantum DXi6802	16.33	Good
23.	FalconStor Software VTL SAM16	14.45	Good
24.	Symantec NetBackup 5030	14.39	Good
25.	NEC HYDRAstor HS3-410	13.71	Good
26.	Symantec NetBackup 5230	13.51	Good
27.	Quantum DXi6700 Series	12.77	Basic
28.	NEC HYDRAstor HS3-310	12.41	Basic
29.	FalconStor Software VTL SAP16	12.39	Basic
30.	EMC Data Domain DD860	12.05	Basic

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

#### HARDWARE SCORES AND RANKINGS (continued)

	MIDRANGE DEDUPLICATING BACKUP APPLIANCES	SCORE	RANKING
31.	IBM TS7620 ProtecTIER Deduplication ApplianceExpress	10.79	Basic
32.	EMC Dat Domain DD670	10.22	Basic
33.	FalconSor Software FDS SA310	9.92	Basic
34.	Falcontor Software HDS FS FDS H150	9.74	Basic
35.	FalcoStor Software FDS SA623	9.63	Basic
36.	EMCData Domain DD640	8.75	Basic
37.	FalcnStor Software FDS SA304	8.48	Basic
38.	HPStoreOnce 4430 Backup System	7.64	Basic
39.	Dell DR4100	7.46	Basic
40.	HP StoreOnce 4220 Backup	7.22	Basic
41.	HP StoreOnce 4420 Backup	7.16	Basic
42.	HP StoreOnce 4210 Backup	7.10	Basic
43.	EMC Data Domain DD620	7.03	Basic
44.	Quantum DXi4601	6.86	Basic
45.	Symantec Backup Exec 3600 Appliance	4.95	Basic
46.	FalconStor Software HDS FS FDS 220S	4.76	Basic

Total Number of Products

46

		Rankings	
Highest Score	30.78	Recommended	24.04 - 30.78
Lowest Score	4.76	Excellent	18.57 – 24.03
Average (Mean)	15.82	Good	13.09 – 18.56
Standard Deviation	7.30	Basic	4.76 – 13.08

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

# MIDRANGE DEDUPLICATING BACKUP APPLIANCE MODELS

### Dell DR4100

Approximate Starting List Price: \$10,000-\$20,000



108TB\*

8

2

1/10Gb Ethernet

6

 $\otimes$ 

 $\bigotimes$ 

36

 $\mathbf{X}$ 

 $\otimes$ 

 $\otimes$ 

32 GB

 $\otimes$ 

12

1

CIFS, NFS

 $\otimes$ 

32

 $\otimes$ 

Single Controller

 $\otimes$ 

 $\mathbf{X}$ 

Scale-up

RAID 6

#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
48.71	8.00	7.46	23.00	10.25	
BASIC	BASIC	BASIC	GOOD	RECOMMENDED	

32

1

 $\otimes$ 

1

2

1

2

7

0

0

15

2

2

**Max Concurrent** 

**Bundled Software Licenses** 

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** 

**Cloud Providers** 

Natively Hosted (Total #)

**Backup Software Streams** 

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Recognized (Total #)

#### DEDUPLICATION

Compress

**Deduplication Included** 

#### MANAGEMENT

Raw Storage Capacity (Max)	
Ethernet ports (Max)	
FC Ports (Max)	
Storage Networking Interfaces	
Max # Storage Networking Ports	
Hot Swappable Drives	

HARDWARE .

- - -- -

FC Support

**Max HDDs** 

SSDs

FC / SAS HDDS

Cache (Max)

**Erasure Coding** 

**Controllers (Max)** 

**VTL Interface** 

Partitions (Max)

**Processor Cores (Max)** 

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

**Concurrent HDD Mix** 

**Concurrent FC/Ethernet Mix** 

5.4K RPM SATA HDDs (Max)

7.2K RPM SATA HDDs (Max)

Backup Streams		
Encryption Options	<b>S</b>	compress Deduplicated Data
Instant VM Recovery	Variable Length Block, Sliding Scale	Deduplication Level / Type
Encryption EKM	⊗	<b>Bypass Deduplication</b>
Multi-stream Encryption	<b>S</b>	Verify Data Integrity / Rate
Encryption Methods	<b>S</b>	Inline Deduplication
(Total #)	8	Post Process Deduplication
Backup Accelerator Options (Total #)	۲	Inline/Post Process Option
Backup Accelerator Features	~	Deduplication Ratios

 $(\mathbf{X})$ 

1

### **Deduplication Algorithms**

**Deduplication Ratios** 

by Backup Job

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	1
Single Controller Replication	
Single Controller Deduplication	&
Warranty	3 Year
24x7x365	<b>S</b>
Access Methods (Total #)	5
Alerting Options (Total #)	2

Supported		Unsunnorted
Supported	- X.	Unsupported

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DEDUPLICATION

Approximate Starting List Price: \$20,000-\$50,000



#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
43.36	7.50	7.03	22.58	6.25	
BASIC	BASIC	BASIC	GOOD	BASIC	

HARDWARE

#### MANAGEMENT

#### **Deduplication Included Max Concurrent** 7TB/12TB **Raw Storage Capacity (Max)** 30 **Backup Streams** Ethernet ports (Max) 4 **Compress Deduplicated Data Encryption Options** 2 FC Ports (Max) 2 **Deduplication Level / Type** Variable Length Block **Instant VM Recovery** $\times$ **Storage Networking** 1/10Gb Ethernet, $\otimes$ **Bypass Deduplication** Interfaces 4Gb FC **Encryption EKM** 1 Max # Storage Verify Data Integrity / Rate 6 $\propto$ **Multi-stream Encryption Networking Ports Inline Deduplication Hot Swappable Drives Encryption Methods** 2 (Total #) FC Support Ø **Post Process Deduplication** $\mathbf{X}$ **Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 Inline/Post Process Option $\otimes$ (Total #) Max HDDs 12 **Backup Accelerator Features Deduplication Ratios** 5.4K RPM SATA HDDs (Max) $\mathbf{X}$ 2 $(\mathbf{X})$ (Total #) by Backup Job 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses Deduplication Algorithms** 2 2 SSDs $\otimes$ (Total #) FC / SAS HDDS $\otimes$ **Backup Software** 4 Natively Hosted (Total #) **Concurrent HDD Mix** $\otimes$ **SCALABILITY & SUPPORT** Cache (Max) 6GB **Cloud Providers** 0 **Replication Options** 1:1; N:1 (Total #) **Erasure Coding** $\otimes$ **Replication Bandwidth** NDMP **Processor Cores (Max)** Throttling 2 **Data Optimization Options Backup Software Streams Controllers (Max)** 1 10 1 (Total #) Recognized (Total #) **Storage Networking Protocols** CIES, NES **Single Controller Replication** $\otimes$ Native Backup Software Mgt 4 **VTL Interface Single Controller** $\mathbf{X}$ Deduplication Concurrent Partitions (Max) 100 **Deduplication/Replication** Warranty 1 Year **Concurrently Present NAS/VTL** Compress/Encrypt Replicated Data **Controller Configurations** Single Controller 24x7x365 **Replication Status Global Deduplication** $\otimes$ **Access Methods** 2 by Backup Job (Total #) $\mathbf{X}$ **Deduplication HA Alerting Options Replication Types (Total #)** 3 2 **Storage Capacity Expansion** Scale-up (Total #) **Display Real Time** Ø **Battery Backup/UPS RAID Levels** RAID 6

All information on this product is based strictly upon DCIG's own research and information found on the provider's web site. Supported

**Deduplication Ratio** 

Winsupported



DEDUPLICATION

Approximate Starting List Price: \$20,000-\$50,000



### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
46.56	7.50	8.75	24.06	6.25	
BASIC	BASIC	BASIC	GOOD	BASIC	

#### MANAGEMENT

#### HARDWARE

Max Concurrent Backup Streams	90	Raw Storage Capacity (Max)	35TB
Encryption Options	2	Ethernet ports (Max)	8
Lifer yption options	2	FC Ports (Max)	2
Instant VM Recovery	⊗	Storage Networking	1/10Gb Ethernet,
Encryption EKM	1	Interfaces	4Gb FC
Multi-stream Encryption	8	Max # Storage Networking Ports	10
Encryption Methods	2	Hot Swappable Drives	<b>S</b>
(Total #)	-	FC Support	8
Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	<b>S</b>
		Max HDDs	35
Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
		7.2K RPM SATA HDDs (Max)	<b>S</b>
Bundled Software Licenses (Total #)	2	SSDs	8
Backup Software		FC / SAS HDDS	8
Natively Hosted (Total #)	4	Concurrent HDD Mix	8
Cloud Providers (Total #)	0	Cache (Max)	12GB
	•	Erasure Coding	8
NDMP	<b>S</b>	Processor Cores (Max)	4
Backup Software Streams Recognized (Total #)	10	Controllers (Max)	1
Native Backup Software Mgt	2	Storage Networking Protocols	CIFS, NFS
native buokup contware ingt	-	VTL Interface	<b>S</b>
Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	100
		Concurrently Present NAS/VTL	<b>S</b>
Compress/Encrypt Replicated Data	<b>~</b>	Controller Configurations	Single Controller
Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
		Deduplication HA	8
Replication Types (Total #)	3	Storage Capacity Expansion	Scale-up
Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 6

Deduplication Included	<
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	×
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<b>S</b>
Post Process Deduplication	R
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	2

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	1
Single Controller Replication	
Single Controller Deduplication	&
Warranty	1 Year
24x7x365	<b></b>
Access Methods (Total #)	2
Alerting Options (Total #)	2
Battery Backup/UPS	<b>S</b>

All information on this product is based strictly upon DCIG's own research and information found on the provider's web site.

Supported 😵 Unsupported

20



DEDUPLICATION

Approximate Starting List Price: \$50,000-\$100,000



#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
48.28	7.75	10.22	24.06	6.25	
BASIC	BASIC	BASIC	GOOD	BASIC	

HARDWARE

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

**VTL Interface** 

Partitions (Max)

#### MANAGEMENT

#### **Deduplication Included Max Concurrent** 76TB **Raw Storage Capacity (Max)** 90 **Backup Streams** Ethernet ports (Max) 10 **Encryption Options** 2 FC Ports (Max) 2 **Instant VM Recovery** $\times$ **Storage Networking** 1/10Gb Ethernet, Interfaces 8Gb FC **Encryption EKM** 1 Max # Storage 12 $\propto$ **Multi-stream Encryption Networking Ports Hot Swappable Drives Encryption Methods** 2 (Total #) FC Support $\otimes$ **Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 (Total #) **Max HDDs** 38 **Backup Accelerator Features** 5.4K RPM SATA HDDs (Max) $\times$ 2 (Total #) 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses** 2 SSDs $\otimes$ (Total #) FC / SAS HDDS $\otimes$ **Backup Software** 4 Natively Hosted (Total #) **Concurrent HDD Mix** $\otimes$ Cache (Max) 36 GB **Cloud Providers** 0 (Total #) **Erasure Coding** $\otimes$ NDMP Processor Cores (Max) 4 **Backup Software Streams Controllers (Max)** 1 10

4

3

Ø

Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	8
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<b></b>
Post Process Deduplication	
Inline/Post Process Option	$\bigotimes$
Deduplication Ratios by Backup Job	<
Deduplication Algorithms	2

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	1
Single Controller Replication	
Single Controller Deduplication	&
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	2
Alerting Options (Total #)	2
Battery Backup/UPS	<b>S</b>

All information on this product is based strictly upon DCIG's own research and information found on the provider's web site.

Recognized (Total #)

Concurrent

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

🗴 Unsupported Supported

CIFS, NFS

100

Ø

Single Controller

 $\otimes$ 

 $\mathbf{X}$ 

Scale-up

RAID 6

21





DEDUPLICATION

Approximate Starting List Price: \$100,000-\$250,000

#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
50.46	7.75	12.05	24.41	6.25	
BASIC	BASIC	BASIC	GOOD	BASIC	

#### MANAGEMENT

#### HARDWARE

Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	90	Raw Storage Capacity (Max)	192TB
Compress Deduplicated Data	$\checkmark$	Encryption Options	2	Ethernet ports (Max)	10
Deduplication Level / Type	Variable Length Block		•	FC Ports (Max)	2
Bypass Deduplication	8	Instant VM Recovery		Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
Marifa Data Internity ( Data	<b>.</b>	Encryption EKM	1	Max # Storage	
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	$\otimes$	Networking Ports	12
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	$\otimes$	(Total #)		FC Support	8
Inline/Post Process Option	8	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	<b>S</b>
	•			Max HDDs	96
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	2	Bundled Software Licenses (Total #)	2	SSDs	8
		Backup Software		FC / SAS HDDS	8
	ODT	Natively Hosted (Total #)	4	Concurrent HDD Mix	$\bigotimes$
SCALABILITY & SUPP Replication Options	1:1; 1:N; N:1; 1:N:N	Cloud Providers (Total #)	0	Cache (Max)	72GB
Replication Bandwidth	•		-	Erasure Coding	8
Throttling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	8
Data Optimization Options (Total #)	1	Backup Software Streams Recognized (Total #)	10	Controllers (Max)	1
Single Controller Replication	⊗	Native Backup Software Mgt	4	Storage Networking Protocols	CIFS, NFS
Single Controller	-		-	VTL Interface	<b>S</b>
Single Controller Deduplication	&	Concurrent	₹	VTL Interface Partitions (Max)	<b>©</b> 100
	X 1 Year	Concurrent Deduplication/Replication	_		-
Deduplication	-	Concurrent	_	Partitions (Max)	100
Deduplication Warranty 24x7x365 Access Methods	1 Year	Concurrent Deduplication/Replication Compress/Encrypt Replicated Data Replication Status	<b>©</b>	Partitions (Max) Concurrently Present NAS/VTL	100
Deduplication Warranty 24x7x365 Access Methods (Total #)	1 Year	Concurrent Deduplication/Replication Compress/Encrypt Replicated Data Replication Status by Backup Job	© ©	Partitions (Max) Concurrently Present NAS/VTL Controller Configurations	100 Single Controller
Deduplication Warranty 24x7x365 Access Methods	1 Year	Concurrent Deduplication/Replication Compress/Encrypt Replicated Data Replication Status	©	Partitions (Max) Concurrently Present NAS/VTL Controller Configurations Global Deduplication	100  Single Controller  Single Controller

All information on this product is based strictly upon DCIG's own research and information found on the provider's web site.

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Approximate Starting List Price: \$10,000-\$20,000



#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
60.34	9.00	16.89	25.95	8.50	
GOOD	GOOD	GOOD	EXCELLENT	GOOD	

**Max Concurrent** 

**Backup Streams** 

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

Backup Software Streams Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Encryption Methods (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

Backup Software Natively Hosted (Total #)

> Cloud Providers (Total #)

**Encryption EKM** 

#### MANAGEMENT

### HARDWARE

200	Raw Storage Capacity (Max)	35TB
	Ethernet ports (Max)	20
	FC Ports (Max)	8
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1Gb Ethernet
<b>S</b>	Max # Storage Networking Ports	20
0	Hot Swappable Drives	<b>S</b>
	FC Support	8
1	Concurrent FC/Ethernet Mix	8
	Max HDDs	70
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	⊗
	FC / SAS HDDS	⊗
20	Concurrent HDD Mix	⊗
1	Cache (Max)	640GB
	Erasure Coding	8
<b>S</b>	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
•	VTL Interface	⊗
<b>S</b>	Partitions (Max)	⊗
	Concurrently Present NAS/VTL	⊗
⊗	Controller Configurations	Scale-Out, Single Controller
$\bigotimes$	<b>Global Deduplication</b>	<b>S</b>
	Deduplication HA	8
3	Storage Capacity Expansion	Scale-out
<	RAID Levels	RAID 6

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<b></b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	<b>S</b>
Verify Data Integrity / Rate	<
Inline Deduplication	$\bigotimes$
Post Process Deduplication	<b>S</b>
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	8
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	8
Data Optimization Options (Total #)	8
Single Controller Replication	<b>S</b>
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

Supported 😵 Unsupported

Supported Supported



Approximate Starting List Price: \$10,000-\$20,000

Variable Length Block

55TB

20

 $\otimes$ 

**1Gb Ethernet** 

20

 $\otimes$ 

 $\bigotimes$ 

120

 $\mathbf{X}$ 

Ø

 $\otimes$ 

 $\otimes$ 

 $\otimes$ 640GB

 $\otimes$ 

4/40

1/10

CIFS, NFS

 $\otimes$ 

 $\otimes$ 

 $\otimes$ 

Scale-Out,

Single Controller

 $\mathbf{X}$ 

Scale-out

RAID 6

SSDs

FC / SAS HDDS

Cache (Max)

**Erasure Coding** 

**Controllers (Max)** 

**VTL Interface** 

Partitions (Max)

**Processor Cores (Max)** 

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

**Concurrent HDD Mix** 

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
60.54	9.00	17.09	25.95	8.50	
GOOD	GOOD	GOOD	EXCELLENT	GOOD	

200

8

20

1

20

9

 $\otimes$ 

 $\otimes$ 

3

NDMP

Concurrent

**Backup Software Streams** 

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Recognized (Total #)

**Max Concurrent** 

**Backup Streams** 

**Encryption Op** 

Instant VM Rec

#### MANAGEMENT

Ethernet ports (Max)	1	ption Options
FC Ports (Max)		P 0 P
Storage Networking	<b>S</b>	VM Recovery
Interfaces	$\otimes$	cryption EKM
Max # Storage Networking Ports	<b>S</b>	m Encryption
Hot Swappable Drives	0	tion Methods
FC Support		(Total #)
Concurrent FC/Ethernet Mix	1	erator Options
Max HDDs		(Total #)
5.4K RPM SATA HDDs (Max)	3	ator Features (Total #)
7.2K RPM SATA HDDs (Max)		(
	8	vare Licenses

HARDWARE

**Raw Storage Capacity (Max)** 

	-
Encryption EKM	<b>~</b>
Multi-stream Encryption	<b>S</b>
Encryption Methods (Total #)	8
Backup Accelerator Options	<b>S</b>
(Total #)	8
Backup Accelerator Features (Total #)	
Bundled Software Licenses (Total #)	3
Backup Software Natively Hosted (Total #)	
Cloud Providers (Total #)	1:1; 1:N: N:1

SCAL	ABILITY	1 & S	UPP	ORT

DEDUPLICATION

**Deduplication Included** 

**Compress Deduplicated Data** 

**Deduplication Level / Type** 

Verify Data Integrity / Rate

Post Process Deduplication

Inline/Post Process Option

**Deduplication Algorithms** 

**Deduplication Ratios** 

by Backup Job

**Bypass Deduplication** 

**Inline Deduplication** 

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	&
Data Optimization Options (Total #)	8
Single Controller Replication	<b>S</b>
Single Controller Deduplication	&
Warranty	1 Year
24x7x365	<b></b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

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Approximate Starting List Price: \$20,000-\$50,000

### 2013 to BUYER'S BUCKUP APPLIANCE

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
65.14	9.00	21.69	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	•••••

Max Concurrent Backup Streams

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

Backup Software Streams Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

Replication Status by Backup Job

Display Real Time Deduplication Ratio

Encryption Methods (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

Backup Software Natively Hosted (Total #)

> Cloud Providers (Total #)

**Encryption EKM** 

#### MANAGEMENT

#### HARDWARE

200	Raw Storage Capacity (Max)	55TB
	Ethernet ports (Max)	60
-	FC Ports (Max)	8
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
<b>S</b>	Max # Storage Networking Ports	60
•	Hot Swappable Drives	<b>S</b>
0	FC Support	8
1	Concurrent FC/Ethernet Mix	8
	Max HDDs	55
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	8
	FC / SAS HDDS	8
20	Concurrent HDD Mix	8
1	Cache (Max)	640GB
	Erasure Coding	
<b>S</b>	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
	VTL Interface	8
<b>S</b>	Partitions (Max)	$\otimes$
_	Concurrently Present NAS/VTL	$\otimes$
8	Controller Configurations	Scale-Out, Single Controller
$\bigotimes$	<b>Global Deduplication</b>	<
	Deduplication HA	⊗
3	Storage Capacity Expansion	Scale-out
<b>S</b>	RAID Levels	RAID 6

DEDOI EIOANON	
Deduplication Included	<b>S</b>
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
<b>Bypass Deduplication</b>	<
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	8
Post Process Deduplication	<
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	8
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	8
Data Optimization Options (Total #)	8
Single Controller Replication	<b>S</b>
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

Supported 🛛 🐼 Unsupported



Approximate Starting List Price: \$20,000-\$50,000



#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
65.64	9.00	22.19	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	

**Max Concurrent Backup Streams** 

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

**Backup Software Streams** Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** by Backup Job

**Display Real Time Deduplication Ratio** 

**Encryption Methods** (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** Natively Hosted (Total #)

> **Cloud Providers** (Total #)

**Encryption EKM** 

#### MANAGEMENT

	HARDWARE	
--	----------	--

200	Raw Storage Capacity (Max)	110TB
1	Ethernet ports (Max)	60
	FC Ports (Max)	8
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
<b>S</b>	Max # Storage Networking Ports	60
•	Hot Swappable Drives	<b>S</b>
0	FC Support	8
1	Concurrent FC/Ethernet Mix	8
	Max HDDs	110
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	8
20	FC / SAS HDDS	8
20	Concurrent HDD Mix	⊗
1	Cache (Max)	640GB
_	Erasure Coding	⊗
	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
	VTL Interface	8
<b>S</b>	Partitions (Max)	⊗
-	Concurrently Present NAS/VTL	⊗
⊗	Controller Configurations	Scale-Out, Single Controller
8	<b>Global Deduplication</b>	<
	Deduplication HA	$\bigotimes$
3	Storage Capacity Expansion	Scale-out
<b>S</b>	RAID Levels	RAID 6

Deduplication Included	<
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
<b>Bypass Deduplication</b>	Ø
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	8
Post Process Deduplication	<b>S</b>
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	&
Data Optimization Options (Total #)	&
Single Controller Replication	<b>S</b>
Single Controller Deduplication	&
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

Supported 🗴 Unsupported



Approximate Starting List Price: \$20,000-\$50,000



#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
65.78	9.00	22.33	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	

Max Concurrent Backup Streams

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

Backup Software Streams Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

Replication Status by Backup Job

Display Real Time Deduplication Ratio

Encryption Methods (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

Backup Software Natively Hosted (Total #)

> Cloud Providers (Total #)

**Encryption EKM** 

#### MANAGEMENT

#### HARDWARE

200	Raw Storage Capacity (Max)	130TB
1	Ethernet ports (Max)	60
	FC Ports (Max)	8
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
<b>S</b>	Max # Storage Networking Ports	60
0	Hot Swappable Drives	<b>S</b>
0	FC Support	$\bigotimes$
1	Concurrent FC/Ethernet Mix	Ø
	Max HDDs	130
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	8
	FC / SAS HDDS	8
20	Concurrent HDD Mix	8
1	Cache (Max)	640GB
_	Erasure Coding	8
<b>S</b>	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
	VTL Interface	
<b>S</b>	Partitions (Max)	⊗
	Concurrently Present NAS/VTL	⊗
&	Controller Configurations	Scale-Out, Single Controller
$\bigotimes$	<b>Global Deduplication</b>	<b>S</b>
	Deduplication HA	\$
3	Storage Capacity Expansion	Scale-out
<	RAID Levels	RAID 6

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	<b>S</b>
Verify Data Integrity / Rate	Ø
Inline Deduplication	
Post Process Deduplication	Ø
Inline/Post Process Option	
Deduplication Ratios by Backup Job	$\bigotimes$
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	8
Data Optimization Options (Total #)	
Single Controller Replication	<b>S</b>
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

Supported 😵 Unsupported

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Approximate Starting List Price: \$20,000-\$50,000

#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
66.04	9.00	22.59	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	

**Max Concurrent Backup Streams** 

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

**Backup Software Streams** Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** by Backup Job

**Display Real Time Deduplication Ratio** 

**Encryption Methods** (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** Natively Hosted (Total #)

> **Cloud Providers** (Total #)

**Encryption EKM** 

#### MANAGEMENT

HARDWARE
----------

200	Raw Storage Capacity (Max)	160TB
1	Ethernet ports (Max)	60
	FC Ports (Max)	×.
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
<	Max # Storage Networking Ports	60
0	Hot Swappable Drives	<b>S</b>
0	FC Support	8
1	Concurrent FC/Ethernet Mix	8
	Max HDDs	130
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	8
20	FC / SAS HDDS	&
20	Concurrent HDD Mix	8
1	Cache (Max)	640GB
	Erasure Coding	$\bigotimes$
<b>S</b>	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
•	VTL Interface	8
<b>S</b>	Partitions (Max)	8
	Concurrently Present NAS/VTL	8
⊗	Controller Configurations	Scale-Out, Single Controller
⊗	<b>Global Deduplication</b>	<b>S</b>
•	Deduplication HA	8
3	Storage Capacity Expansion	Scale-out
<b>I</b>	RAID Levels	RAID 6

Deduplication Included	<
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	<b>S</b>
Verify Data Integrity / Rate	<
Inline Deduplication	$\bigotimes$
Post Process Deduplication	<b>S</b>
Inline/Post Process Option	$\bigotimes$
Deduplication Ratios by Backup Job	
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	&
Data Optimization Options (Total #)	8
Single Controller Replication	<b>S</b>
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

Supported 🗴 Unsupported

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# ExaGrid EX10000E

Approximate Starting List Price: \$20,000-\$50,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
66.69	9.00	23.24	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	••••

3

#### **Deduplication Included Max Concurrent** 200 **Backup Streams Compress Deduplicated Data Encryption Options** 1 **Deduplication Level / Type** Variable Length Block Instant VM Recovery **Bypass Deduplication Encryption EKM** $\otimes$ Verify Data Integrity / Rate **Multi-stream Encryption** $\otimes$ **Inline Deduplication Encryption Methods** 0 (Total #) Post Process Deduplication **Backup Accelerator Options** 1 Inline/Post Process Option $\mathbf{X}$ (Total #) **Backup Accelerator Features Deduplication Ratios** 3 $\mathbf{X}$ (Total #) by Backup Job

**Bundled Software Licenses** 

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** 

**Cloud Providers** 

Natively Hosted (Total #)

**Backup Software Streams** 

Native Backup Software Mgt

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Recognized (Total #)

8

20

1

20

9

 $\otimes$ 

 $\otimes$ 

3

MANAGEMENT

#### **SCALABILITY & SUPPORT**

**Deduplication Algorithms** 

DEDUPLICATION

<b>Replication Options</b>	1:1; 1:N N:1
Replication Bandwidth Throttling	$\bigotimes$
Data Optimization	$\bigotimes$
Single Controller Replication	<
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<b>S</b>

#### HARDWARE

Raw Storage Capacity (Max)	260TB
Ethernet ports (Max)	60
FC Ports (Max)	×.
Storage Networking Interfaces	1/10Gb Ethernet
Max # Storage Networking Ports	60
Hot Swappable Drives	<b>S</b>
FC Support	$\bigotimes$
Concurrent FC/Ethernet Mix	8
Max HDDs	130
5.4K RPM SATA HDDs (Max)	8
7.2K RPM SATA HDDs (Max)	2TB
SSDs	8
FC / SAS HDDS	8
Concurrent HDD Mix	8
Cache (Max)	640 GB
Erasure Coding	$\bigotimes$
Processor Cores (Max)	4/40
Controllers (Max)	1/10
Storage Networking Protocols	CIFS, NFS
VTL Interface	8
Partitions (Max)	$\bigotimes$
Concurrently Present NAS/VTL	8
<b>Controller Configurations</b>	Scale-Out, Single Controller
<b>Global Deduplication</b>	<b>S</b>
Deduplication HA	$\bigotimes$
Storage Capacity Expansion	Scale-out
RAID Levels	RAID 6

Supported 🗴 Unsupported

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Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
66.92	9.00	23.47	25.95	8.50	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	GOOD	••••

**Max Concurrent Backup Streams** 

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

**Backup Software Streams** Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** by Backup Job

**Display Real Time Deduplication Ratio** 

**Encryption Methods** (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** Natively Hosted (Total #)

> **Cloud Providers** (Total #)

**Encryption EKM** 

#### MANAGEMENT

#### HARDWARE

200	Raw Storage Capacity (Max)	320TB
1	Ethernet ports (Max)	60
	FC Ports (Max)	8
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
⊘	Max # Storage Networking Ports	60
•	Hot Swappable Drives	<b>S</b>
0	FC Support	⊗
1	Concurrent FC/Ethernet Mix	۲
	Max HDDs	160
3	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
8	SSDs	8
	FC / SAS HDDS	×
20	Concurrent HDD Mix	8
1	Cache (Max)	640GB
	Erasure Coding	8
	Processor Cores (Max)	4/40
20	Controllers (Max)	1/10
9	Storage Networking Protocols	CIFS, NFS
	VTL Interface	
<b>&gt;</b>	Partitions (Max)	R
	Concurrently Present NAS/VTL	8
8	<b>Controller Configurations</b>	Scale-Out, Single Controller
8	<b>Global Deduplication</b>	<b>S</b>
	Deduplication HA	8
3	Storage Capacity Expansion	Scale-out
<b>S</b>	RAID Levels	RAID 6

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	<b>S</b>
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	
Post Process Deduplication	Ø
Inline/Post Process Option	
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	3

DEDUPLICATION

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1
Replication Bandwidth Throttling	8
Data Optimization	8
Single Controller Replication	<
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<
Access Methods (Total #)	4
Alerting Options (Total #)	3
Battery Backup/UPS	<

Supported 🗴 Unsupported



# FalconStor Software FDS SA304



Approximate Starting List Price: \$20,000-\$50,000

#### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
50.73	10.25	8.48	24.75	7.25	
BASIC	RECOMMENDED	BASIC	GOOD	BASIC	

HARDWARE

#### MANAGEMENT

DEDOFEIOATION		MANAGEMENT		HANDWARE	
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	32	Raw Storage Capacity (Max)	4.2TB/60TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	1	Ethernet ports (Max)	10
Deduplication Level / Type	Fixed Block, Variable Length Block			FC Ports (Max)	8
Bypass Deduplication		Instant VM Recovery Encryption EKM	& &	Storage Networking Interfaces	1/10Gb Ethernet
Verify Data Integrity / Rate	<b></b>	Multi-stream Encryption	× ×	Max # Storage Networking Ports	11
Inline Deduplication	$\bigotimes$	Encryption Methods		Hot Swappable Drives	8
Post Process Deduplication		(Total #)	1	FC Support	<b>S</b>
		Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	<b>S</b>
Inline/Post Process Option	$\checkmark$	(Total #)		Max HDDs	54
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	1	5.4K RPM SATA HDDs (Max)	8
				7.2K RPM SATA HDDs (Max)	<b></b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	6	SSDs	8
		Backup Software	_	FC / SAS HDDS	8
CALABILITY & SUPP	OPT	Natively Hosted (Total #)	7	Concurrent HDD Mix	8
Replication Options	1:1; 1:N: N:1; 1:N:N	Cloud Providers (Total #)	0	Cache (Max)	$\bigotimes$
		(10tal #) 		Erasure Coding	8
Replication Bandwidth Throttling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	4
Data Optimization Options (Total #)	1	Backup Software Streams Recognized (Total #)	23	Controllers (Max)	1
Single Controller Replication	⊗	Native Backup Software Mgt		Storage Networking Protocols	CIFS, NFS
Single Controller	-	Native backup Software myt	0	VTL Interface	8
Deduplication	8	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	4,096
Warranty	1 Year			Concurrently Present NAS/VTL	8
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	<b>.</b>	Controller Configurations	Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job		Global Deduplication	&
. ,				Deduplication HA	8
Alerting Options (Total #)	2	Replication Types (Total #)	3	Storage Capacity Expansion	Scale-up
Battery Backun/UPS	<b>X</b>	Display Real Time	<b>S</b>	RAID Levels	RAID 6



**Battery Backup/UPS** 

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**Deduplication Ratio** 

# FalconStor Software FDS SA310



10

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11

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Ø

66

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 $\otimes$ 

 $\otimes$ 

4

1

CIFS, NFS

 $\otimes$ 

4.096

 $\otimes$ 

Single Controller

 $\otimes$ 

 $\mathbf{X}$ 

Scale-up

RAID 6

32

**Concurrent HDD Mix** 

**Processor Cores (Max)** 

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

Cache (Max)

**Erasure Coding** 

**Controllers (Max)** 

**VTL Interface** 

Partitions (Max)

Approximate Starting List Price: \$20,000-\$50,000

#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
51.17	10.25	9.92	23.75	7.25	
BASIC	RECOMMENDED	BASIC	GOOD	BASIC	

#### DEDUPLICATION

#### HARDWARE MANAGEMENT **Max Concurrent Deduplication Included** 54TB **Raw Storage Capacity (Max)** 32 **Backup Streams** Ethernet ports (Max) **Compress Deduplicated Data** 1 **Encryption Options** FC Ports (Max) Fixed Block, **Deduplication Level / Type** Variable Length Block **Instant VM Recovery** $\times$ **Storage Networking** 1/10Gb Ethernet **Bypass Deduplication** Interfaces **Encryption EKM** $\times$ Max # Storage Verify Data Integrity / Rate $\propto$ **Multi-stream Encryption Networking Ports** $\otimes$ **Inline Deduplication Hot Swappable Drives Encryption Methods** 1 (Total #) **FC Support Post Process Deduplication Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 Inline/Post Process Option (Total #) **Max HDDs Backup Accelerator Features Deduplication Ratios** 5.4K RPM SATA HDDs (Max) 1 (Total #) by Backup Job 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses** 3 **Deduplication Algorithms** 6 SSDs (Total #) FC / SAS HDDS

**Backup Software** 

**Cloud Providers** 

(Total #)

NDMP

Concurrent

Natively Hosted (Total #)

**Backup Software Streams** 

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

**Compress/Encrypt** 

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Replicated Data

Recognized (Total #)

7

0

23

8

3

#### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N: N:1; 1:N:N
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	1
Single Controller Replication	⊗
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	2

#### Supported Winsupported



# FalconStor Software FDS SA623



Approximate Starting List Price: \$50,000-\$100,000

#### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
51.93	10.25	9.63	24.80	7.25	
BASIC	RECOMMENDED	BASIC	GOOD	BASIC	•••••

HARDWARE

#### MANAGEMENT

Deduplication Included	<	Max Concurrent Backup Streams	32	Raw Storage Capacity (Max)	112TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	1	Ethernet ports (Max)	10
Deduplication Level / Type	Fixed Block, Variable Length Block			FC Ports (Max)	۲
Bypass Deduplication		Instant VM Recovery Encryption EKM	<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	11
Inline Deduplication	8	Encryption Methods		Hot Swappable Drives	8
Post Process Deduplication	<b></b>	(Total #)		FC Support	<b></b>
	-	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	<b>S</b>
Inline/Post Process Option	<b>~</b>	(Total #)		Max HDDs	72
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	1	5.4K RPM SATA HDDs (Max)	8
-,,		 		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	6	SSDs	8
		Backup Software		FC / SAS HDDS	8
		Natively Hosted (Total #)	7	Concurrent HDD Mix	8
CALABILITY & SUPF		<b>Cloud Providers</b>	0	Cache (Max)	$\bigotimes$
Replication Options	1:1; 1:N: N:1; 1:N:N	(Total #)		Erasure Coding	8
Replication Bandwidth Throttling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	4
Data Optimization	1	Backup Software Streams Recognized (Total #)	24	Controllers (Max)	1
		nooginzou (rotar#)		Storage Networking Protocols	CIFS, NFS
Single Controller Replication	8	Native Backup Software Mgt	8	VTL Interface	⊗
Single Controller Deduplication		Concurrent	<b>S</b>	Partitions (Max)	4,096
Warranty	1 Year	Deduplication/Replication	•	Concurrently Present NAS/VTL	8
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	⊘	Controller Configurations	Single Controller
Access Methods	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
(Total #)		by buokap our		Deduplication HA	8
Alerting Options (Total #)	2	Replication Types (Total #)	3	Storage Capacity Expansion	Scale-up
Battery Backun/UPS		Display Real Time		RAID Levels	RAID 6

33

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**Deduplication Ratio** 



**Battery Backup/UPS** 

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# FalconStor HDS FS FDS H150



Approximate Starting List Price: Not Provided

#### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
42.74	9.25	9.74	17.50	6.25	
BASIC	EXCELLENT	BASIC	BASIC	BASIC	

#### MANAGEMENT

MANAGEMENT		HANDWARE		
<b>S</b>	Max Concurrent Backup Streams	10	Raw Storage Capacity (Max)	135TB*
<b>S</b>	Encryption Options	1	Ethernet ports (Max)	6
Variable Length Block		•	FC Ports (Max)	2
-	Instant VM Recovery	<b>~</b>	Storage Networking	1/10Gb Ethernet,
<b>S</b>	Encryption EKM	$\otimes$	Interfaces	8Gb FC
<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	8
$\mathbf{k}$	Encryption Methods	1	Hot Swappable Drives	<b>S</b>
<b>S</b>	(Total #)		FC Support	<b>S</b>
-	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	•
<b>S</b>	(Total #)		Max HDDs	45
<b>S</b>	Backup Accelerator Features (Total #)	1	5.4K RPM SATA HDDs (Max)	.⊗
	. ,		7.2K RPM SATA HDDs (Max)	⊗
2	Bundled Software Licenses (Total #)	5	SSDs	⊗
	Backup Software		FC / SAS HDDS	<b>S</b>
	Natively Hosted (Total #)	2	Concurrent HDD Mix	⊗
ORT 1:N	Cloud Providers (Total #)	0	Cache (Max)	32GB
			Erasure Coding	8
$\bigotimes$	NDMP	<	Processor Cores (Max)	4
1	Backup Software Streams Recognized (Total #)	10	Controllers (Max)	1
<b>X</b>		•	Storage Networking Protocols	CIFS, NFS
$\bigotimes$	Native Backup Software Mgt	2		

3

Ø

HARDWARE

#### DEDUPLICATION

**Deduplication Included** 

**Compress Deduplicated Data** 

**Deduplication Level / Type** 

Verify Data Integrity / Rate

**Post Process Deduplication** 

Inline/Post Process Option

**Deduplication Algorithms** 

Deduplication Ratios by Backup Job

**Bypass Deduplication** 

**Inline Deduplication** 

#### SCALABILITY & SUPPORT

<b>Replication Options</b>	1:N
Replication Bandwidth Throttling	8
Data Optimization	1
Single Controller Replication	۲
Single Controller Deduplication	&
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	3
	3

Supported 😵 Unsupported

**VTL Interface** 

Partitions (Max)

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

\*Usable



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Concurrent

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

 $\otimes$ 

 $\otimes$ 

 $\otimes$ 

Single Controller

Ø

Scale-up

RAID 6

### FalconStor HDS FS FDS 220S



Approximate Starting List Price: Not Provided

### **DCIG Scores and Rankings**

DEDUPLICATION

**Deduplication Included** 

**Compress Deduplicated Data** 

**Deduplication Level / Type** 

Verify Data Integrity / Rate

**Post Process Deduplication** 

Inline/Post Process Option

**Deduplication Ratios** 

by Backup Job

**Bypass Deduplication** 

**Inline Deduplication** 

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
41.31	9.25	4.76	20.80	6.50	
BASIC	EXCELLENT	BASIC	BASIC	BASIC	

### MANAGEMENT

#### **Max Concurrent** 16TB\* **Raw Storage Capacity (Max)** 10 **Backup Streams** Ethernet ports (Max) 6 **Encryption Options** 1 FC Ports (Max) $\otimes$ Variable Length Block **Instant VM Recovery Storage Networking** 1/10Gb Ethernet Interfaces **Encryption EKM** $\times$ Max # Storage 6 $\propto$ **Multi-stream Encryption Networking Ports** $\otimes$ $\otimes$ **Hot Swappable Drives Encryption Methods** 1 (Total #) **FC Support** $\otimes$ $\bigotimes$ **Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 (Total #) **Max HDDs** 8 **Backup Accelerator Features** 5.4K RPM SATA HDDs (Max) $\mathbf{X}$ 1 (Total #) $\otimes$ 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses** 5 SSDs $\otimes$ (Total #) FC / SAS HDDS **Backup Software** 2 Natively Hosted (Total #) $\otimes$ **Concurrent HDD Mix** $\otimes$ Cache (Max) **Cloud Providers** 0 (Total #)

12

2

3

NDMP

Concurrent

**Backup Software Streams** 

Native Backup Software Mgt

**Deduplication/Replication** 

**Replication Types (Total #)** 

**Compress/Encrypt** 

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Replicated Data

Recognized (Total #)

HARDWARE

	Deduplication Algorithms	2					
sc	SCALABILITY & SUPPORT						
	<b>Replication Options</b>	1:1: N:1					
	Replication Bandwidth Throttling	⊘					
	Data Optimization	8					
S	ingle Controller Replication	<					
	Single Controller Deduplication	8					
	Warranty	1 Year					
	24x7x365	<b></b>					
	Access Methods (Total #)	4					
	Alerting Options (Total #)	2					

Supported

**Erasure Coding** 

**Controllers (Max)** 

**VTL Interface** 

Partitions (Max)

**Processor Cores (Max)** 

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

 $\otimes$ 

4

1

CIFS, NFS

 $\otimes$ 

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 $\otimes$ 

Single Controller

Ø

Scale-up

RAID 6

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Battery Backup/UPS



### FalconStor Software VTL SAM16



Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
54.15	10.25	14.45	22.20	7.25	
GOOD	RECOMMENDED	GOOD	GOOD	BASIC	••••

### MANAGEMENT

BEBOI EIGATION					
Deduplication Included	<	Max Concurrent Backup Streams	32	Raw Storage Capacity (Max)	260TB
Compress Deduplicated Data	<	Encryption Options	1	Ethernet ports (Max)	6
Deduplication Level / Type	Variable Length Block		•	FC Ports (Max)	5
Bypass Deduplication		Instant VM Recovery	<b>S</b>	Storage Networking	1/10Gb Ethernet, 8Gb FC
bypass beaupileation	•	Encryption EKM			
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	11
Inline Deduplication	<b>S</b>	Encryption Methods	1	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	<b>S</b>	(Total #)		FC Support	<b>S</b>
Inline/Post Process Option	<	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	<b>S</b>
	•	(		Max HDDs	130
Deduplication Ratios by Backup Job	$\checkmark$	Backup Accelerator Features (Total #)	1	5.4K RPM SATA HDDs (Max)	⊗
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	2	Bundled Software Licenses (Total #)	6	SSDs	8
		Backup Software	7	FC / SAS HDDS	8
		Natively Hosted (Total #)	7	Concurrent HDD Mix	8
SCALABILITY & SUPP		<b>Cloud Providers</b>	0	Cache (Max)	256GB
Replication Options	N:1	(Total #)		Erasure Coding	<b></b>
Replication Bandwidth Throttling	$\bigotimes$	NDMP	<b></b>	Processor Cores (Max)	4
Data Optimization		Backup Software Streams Recognized (Total #)	23	Controllers (Max)	1
				Storage Networking Protocols	CIFS, FC, NFS
Single Controller Replication	⊗	Native Backup Software Mgt	8	VTL Interface	<b>S</b>
Single Controller Deduplication	$\bigotimes$	Concurrent	<b></b>	Partitions (Max)	255
Warranty	1 Year	Deduplication/Replication	<b>v</b>	Concurrently Present NAS/VTL	⊗
24x7x365		Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
. ,				Deduplication HA	8
Alerting Options (Total #)	2	Replication Types (Total #)	3	Storage Capacity Expansion	Scale-up
Battery Backun/UPS	×	Display Real Time	<b>S</b>	RAID Levels	RAID 5 & 6

### HARDWARE

Supported Support 🗴 Unsupported

**RAID Levels** 

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**Deduplication Ratio** 



**Battery Backup/UPS** 

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36

### FalconStor Software VTL SAP16



Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
49.84	8.25	12.39	21.95	7.25	
BASIC	BASIC	BASIC	GOOD	BASIC	

Max Concurrent Backup Streams

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

Backup Software Streams Recognized (Total #)

Native Backup Software Mgt

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

Replication Status by Backup Job

Display Real Time Deduplication Ratio

Encryption Methods (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

Backup Software Natively Hosted (Total #)

> Cloud Providers (Total #)

**Encryption EKM** 

### MANAGEMENT

### HARDWARE

128	Raw Storage Capacity (Max)	260TB
	Ethernet ports (Max)	6
	FC Ports (Max)	5
<ul> <li>✓</li> <li>✓</li> </ul>	Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
8	Max # Storage Networking Ports	11
1	Hot Swappable Drives	<b>S</b>
	FC Support	<b>S</b>
1	Concurrent FC/Ethernet Mix	<b>S</b>
	Max HDDs	130
2	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	<b>S</b>
5	SSDs	8
•	FC / SAS HDDS	8
2	Concurrent HDD Mix	8
0	Cache (Max)	
	Erasure Coding	8
	Processor Cores (Max)	4
14	Controllers (Max)	1
2	Storage Networking Protocols	CIFS, FC, NFS
-	VTL Interface	<b>S</b>
<b>S</b>	Partitions (Max)	255
	Concurrently Present NAS/VTL	<b>S</b>
<b>S</b>	Controller Configurations	Single Controller
<b>S</b>	<b>Global Deduplication</b>	۲
	Deduplication HA	٨
1	Storage Capacity Expansion	Scale-up
<	RAID Levels	RAID 5 & 6

Deduplication Included	<b>S</b>	
Compress Deduplicated Data	<	
Deduplication Level / Type	Variable Length Block	

Deduplication Level / Type	Variable Length Block
Bypass Deduplication	Ø
Verify Data Integrity / Rate	Ø
Inline Deduplication	<b>S</b>
Post Process Deduplication	Ø
Inline/Post Process Option	<b></b>
Deduplication Ratios by Backup Job	<
Deduplication Algorithms	2

DEDUPLICATION

### SCALABILITY & SUPPORT

<b>Replication Options</b>	N:1
Replication Bandwidth Throttling	
Data Optimization	1
Single Controller Replication	8
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	$\bigotimes$

Supported 😵 Unsupported

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### HP StoreOnce 4210 Backup



Approximate Starting List Price: \$20,000-\$50,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
32.10	7.50	7.10	10.00	7.50	
BASIC	BASIC	BASIC	BASIC	BASIC	

### MANAGEMENT

		MANAGEMENT		HARDWARE	
uded	<b>⊘</b>	Max Concurrent Backup Streams	48	Raw Storage Capacity (Max)	12TB
Data	$\checkmark$	Encryption Options	0	Ethernet ports (Max)	2
Туре	Variable Length Block			FC Ports (Max)	2
tion	⊗	Instant VM Recovery	8	Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
		Encryption EKM	$\mathbf{x}$		
Rate	<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	4
tion	<b>S</b>	Encryption Methods	0	Hot Swappable Drives	<b>S</b>
tion	$\otimes$	(Total #)	0	FC Support	<b>S</b>
	. <b>.</b>	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	<b>S</b>
otion		(10141 #)	(Total #)	Max HDDs	24
atios Job		Backup Accelerator Features (Total #)		5.4K RPM SATA HDDs (Max)	8
				7.2K RPM SATA HDDs (Max)	<b>S</b>
hms	2	Bundled Software Licenses (Total #)	5	SSDs	8
		Backup Software Natively Hosted (Total #)	_	FC / SAS HDDS	8
UPP	OPT		0	Concurrent HDD Mix	<b>\\$</b>
ions	1:1; 1:N; N:1; 1:N:N	Cloud Providers (Total #)	0	Cache (Max)	16GB
/idth	-		•	Erasure Coding	8
tling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	12
ions al #)	0	Backup Software Streams Recognized (Total #)	0	Controllers (Max)	2
tion	$\bigotimes$	Native Backup Software Mgt	9	Storage Networking Protocols	CIFS, FC, iSCSI, NFS
oller		native buokup contware ingt	•	VTL Interface	<b>S</b>
tion		Concurrent Deduplication/Replication	Partitions (Max)	0	
anty	1 Year			Concurrently Present NAS/VTL	<b>S</b>
c365	<b>S</b>	Compress/Encrypt Replicated Data	8	Controller Configurations	Single Controller
nods al #)	4	Replication Status by Backup Job	$\bigotimes$	Global Deduplication	8
al #)			_	Deduplication HA	8
ions al #)	4	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up

Deduplication Included	<
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	8
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<b>S</b>
Post Process Deduplication	8
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	8
Deduplication Algorithms	2

DEDUPLICATION

### **SCALABILITY & SU**

<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	0
Single Controller Replication	$\bigotimes$
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b></b>
Access Methods (Total #)	4
Alerting Options (Total #)	4
Battery Backup/UPS	

Supported Support 🗴 Unsupported

RAID 6

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**RAID Levels** 

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 $\mathbf{X}$ 

**Display Real Time** 

**Deduplication Ratio** 



### HP StoreOnce 4220 Backup



Approximate Starting List Price: \$20,000-\$50,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
32.52	7.50	7.22	10.30	7.50	
BASIC	BASIC	BASIC	BASIC	BASIC	

HARDWARE

### MANAGEMENT

BEBOI EIGATION					
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	48	Raw Storage Capacity (Max)	24TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	0	Ethernet ports (Max)	2
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	2
Dunces Deduction	~	Instant VM Recovery	$\bigotimes$	Storage Networking	1/10Gb Ethernet,
Bypass Deduplication	8	Encryption EKM	$\otimes$	Interfaces	8Gb FC
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	4
Inline Deduplication	<b>S</b>	Encryption Methods	0	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	⊗	(Total #)	U	FC Support	<b>S</b>
Inline/Post Process Option	⊗	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	<b>S</b>
		. ,		Max HDDs	24
Deduplication Ratios by Backup Job	$\mathbf{x}$	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	
	•	Bundled Software Licenses		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	2	(Total #)	5	SSDs	
		Backup Software	0	FC / SAS HDDS	
SCALABILITY & SUPP	ORT	Natively Hosted (Total #)	<b>v</b>	Concurrent HDD Mix	8
<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N	Cloud Providers (Total #)	0	Cache (Max)	16GB
Replication Bandwidth		NDMP	<b>R</b>	Erasure Coding	⊗
Throttling	<b>V</b>	NDWF	<b>S</b>	Processor Cores (Max)	12
Data Optimization Options (Total #)	0	Backup Software Streams Recognized (Total #)	0	Controllers (Max)	2
Single Controller Replication	8	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, FC, iSCSI, NFS
Single Controller	⊗			VTL Interface	<b>S</b>
Deduplication	~	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	0
Warranty	1 Year	Compress/Encrypt		Concurrently Present NAS/VTL	<b>S</b>
24x7x365	<	Replicated Data	8	Controller Configurations	Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job	$\otimes$	Global Deduplication	8
Alerting Options		Replication Types (Total #)	1	Deduplication HA	
(Total #)	4		1	Storage Capacity Expansion	Scale-up
Battery Backup/UPS	8	Display Real Time Deduplication Ratio	$\otimes$	RAID Levels	RAID 6

Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	8
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<b>S</b>
Post Process Deduplication	$\bigotimes$
Inline/Post Process Option	
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	2

DEDUPLICATION

### SCALAB

<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	0
Single Controller Replication	8
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	4
Battery Backup/UPS	$\bigotimes$

Supported Support 🗴 Unsupported



### HP StoreOnce 4420 Backup



Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
32.36	7.50	7.16	10.20	7.50	
BASIC	BASIC	BASIC	BASIC	BASIC	

Max Concurrent Backup Streams

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

Backup Software Streams Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

Replication Status by Backup Job

Display Real Time Deduplication Ratio

Encryption Methods (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

Backup Software Natively Hosted (Total #)

> Cloud Providers (Total #)

**Encryption EKM** 

### MANAGEMENT

### HARDWARE

96	Raw Storage Capacity (Max)	48TB
0	Ethernet ports (Max)	4
U	FC Ports (Max)	2
&	Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
8		
$\bigotimes$	Max # Storage Networking Ports	6
0	Hot Swappable Drives	<b>S</b>
U	FC Support	<b>S</b>
1	Concurrent FC/Ethernet Mix	<b>S</b>
	Max HDDs	48
2	5.4K RPM SATA HDDs (Max)	$\bigotimes$
	7.2K RPM SATA HDDs (Max)	8
5	SSDs	×
	FC / SAS HDDS	<b>S</b>
0	Concurrent HDD Mix	8
0	Cache (Max)	16GB
	Erasure Coding	
<b></b>	Processor Cores (Max)	12
0	Controllers (Max)	3
10	Storage Networking Protocols	CIFS, FC, iSCSI, NFS
10	VTL Interface	<b>S</b>
<b>S</b>	Partitions (Max)	0
	Concurrently Present NAS/VTL	<b>S</b>
8	Controller Configurations	Single Controller
$\bigotimes$	<b>Global Deduplication</b>	$\bigotimes$
	Deduplication HA	R
1	Storage Capacity Expansion	Scale-up
	RAID Levels	RAID 6

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<b>S</b>
Post Process Deduplication	8
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	2

DEDUPLICATION

### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	0
Single Controller Replication	8
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<b></b>
Access Methods (Total #)	4
Alerting Options (Total #)	4
Battery Backup/UPS	8

Supported 😵 Unsupported



### HP StoreOnce 4430 Backup



Approximate Starting List Price: \$118,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
32.94	7.50	7.64	10.30	7.50	
BASIC	BASIC	BASIC	BASIC	BASIC	

### MANAGEMENT

#### **Max Concurrent** 96TB **Raw Storage Capacity (Max)** 96 **Backup Streams** Ethernet ports (Max) 4 **Encryption Options** 0 FC Ports (Max) 2 **Instant VM Recovery** $\times$ **Storage Networking** 1/10Gb Ethernet, Interfaces 8Gb FC **Encryption EKM** $\otimes$ Max # Storage 6 $\otimes$ **Multi-stream Encryption Networking Ports** Hot Swappable Drives **Encryption Methods** 0 (Total #) **FC Support** Ø **Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 (Total #) **Max HDDs** 48 **Backup Accelerator Features** 5.4K RPM SATA HDDs (Max) $\times$ 2 (Total #) 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses** 5 SSDs $\otimes$ (Total #) FC / SAS HDDS $\otimes$ **Backup Software** 0 Natively Hosted (Total #) **Concurrent HDD Mix** $\otimes$ Cache (Max) 32GB **Cloud Providers** 0 (Total #)

0

10

 $\otimes$ 

1

 $\mathbf{X}$ 

NDMP

Concurrent

**Backup Software Streams** 

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

Recognized (Total #)

HARDWARE

Compress Deduplicated Data	<b>S</b>		
Deduplication Level / Type	Variable Length Block		
<b>Bypass Deduplication</b>	8		
Verify Data Integrity / Rate	<b>S</b>		
Inline Deduplication	<b>S</b>		
Post Process Deduplication	8		
Inline/Post Process Option	8		
Deduplication Ratios by Backup Job	8		
Deduplication Algorithms	2		
SCALABILITY & SUPPORT			
<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N		

DEDUPLICATION

**Deduplication Included** 

nepileation options	1.1, 1.1, 1.1, 1.1, 1.1,
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	0
Single Controller Replication	
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	Ø
Access Methods (Total #)	4
Alerting Options (Total #)	4
Battery Backup/UPS	$\otimes$

Supported 🗴 Unsupported

**Erasure Coding** 

**Controllers (Max)** 

**VTL Interface** 

Partitions (Max)

**Processor Cores (Max)** 

**Storage Networking Protocols** 

**Concurrently Present NAS/VTL** 

**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 

 $\otimes$ 

12

3

CIFS, FC, iSCSI, NFS

Ø

0

Ø

Single Controller

 $\otimes$ 

 $\mathbf{X}$ 

Scale-up

RAID 6



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### HP StoreOnce B6200 **48TB Backup System**

Approximate Starting List Price: \$100,000-\$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
52.21	7.50	23.91	13.30	7.50	
BASIC	BASIC	EXCELLENT	BASIC	BASIC	

**Max Concurrent Backup Streams** 

**Encryption Options** 

**Instant VM Recovery** 

**Multi-stream Encryption** 

**Backup Accelerator Options** 

**Backup Accelerator Features** 

**Bundled Software Licenses** 

**Backup Software Streams** Recognized (Total #)

**Native Backup Software Mgt** 

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** by Backup Job

**Display Real Time Deduplication Ratio** 

**Encryption Methods** (Total #)

(Total #)

(Total #)

(Total #)

NDMP

Concurrent

**Backup Software** Natively Hosted (Total #)

> **Cloud Providers** (Total #)

> **Encryption EKM**

### MANAGEMENT

### HARDWARE

384	Raw Storage Capacity (Max)	768TB
0	Ethernet ports (Max)	48
U	FC Ports (Max)	16
8	Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
		00010
$\bigotimes$	Max # Storage Networking Ports	64
0	Hot Swappable Drives	<b>S</b>
	FC Support	<b>S</b>
1	Concurrent FC/Ethernet Mix	<b>S</b>
	Max HDDs	384
2	5.4K RPM SATA HDDs (Max)	8
	7.2K RPM SATA HDDs (Max)	8
5	SSDs	⊗
•	FC / SAS HDDS	<b>S</b>
0	Concurrent HDD Mix	8
0	Cache (Max)	16GB
	Erasure Coding	
<b>S</b>	Processor Cores (Max)	96
0	Controllers (Max)	12
10	Storage Networking Protocols	CIFS, FC, iSCSI, NFS
	VTL Interface	<b>S</b>
<b>S</b>	Partitions (Max)	0
	Concurrently Present NAS/VTL	<b>S</b>
&	<b>Controller Configurations</b>	Single Controller
$\bigotimes$	<b>Global Deduplication</b>	8
	Deduplication HA	<b>S</b>
1	Storage Capacity Expansion	Scale-up, Scale-out
8	RAID Levels	RAID 6

DEDUPLICATION	
Deduplication Included	<
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
<b>Bypass Deduplication</b>	$\bigotimes$
Verify Data Integrity / Rate	Ø
Inline Deduplication	Ø
Post Process Deduplication	8
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	2

### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N; N:1; 1:N:N
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	0
Single Controller Replication	8
Single Controller Deduplication	۵
Warranty	1 Year
24x7x365	<b></b>
Access Methods (Total #)	4
Alerting Options (Total #)	4
Battery Backup/UPS	

Supported 🗴 Unsupported

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### IBM TS7620 ProtecTIER **Deduplication Appliance Express**



Approximate Starting List Price: \$20,000-\$50,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
46.49	9.00	10.79	18.20	8.50	
BASIC	GOOD	BASIC	BASIC	GOOD	

HARDWARE

### DEDUPLICATION

### MANAGEMENT

Deduplication Included	<	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	72TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	0	Ethernet ports (Max)	10
Deduplication Level / Type	Fixed Block &			FC Ports (Max)	2
	Variable Length Block	Instant VM Recovery	8	Storage Networking	1/10Gb Ethernet,
Bypass Deduplication	<b>S</b>	Encryption EKM	$\bigotimes$	Interfaces	8Gb FC
Verify Data Integrity / Rate	<	Multi-stream Encryption	8	Max # Storage Networking Ports	6
Inline Deduplication	<b>S</b>	Encryption Methods	•	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	⊗	(Total #)	0	FC Support	<b>S</b>
Inline (Post Process Ontion	~	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
Inline/Post Process Option	8	(10121 #)		Max HDDs	35
Deduplication Ratios by Backup Job	$\mathbf{x}$	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
		D		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	6	SSDs	8
		Backup Software	•	FC / SAS HDDS	<b>S</b>
ALABILITY & SUPF	PORT	Natively Hosted (Total #)	0	Concurrent HDD Mix	<b>S</b>
Replication Options	1:1; 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	$\mathbf{x}$
· · ·		(10141 #)	_	Erasure Coding	8
Replication Bandwidth Throttling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	6
Data Optimization Options (Total #)	0	Backup Software Streams Recognized (Total #)	4	Controllers (Max)	1
Single Controller Replication				Storage Networking Protocols	CIFS, FC, NFS
	•	Native Backup Software Mgt	1	VTL Interface	
Single Controller Deduplication		Concurrent	<	Partitions (Max)	64
Warranty	1 Year	Deduplication/Replication	-	Concurrently Present NAS/VTL	8
24x7x365	<b></b>	Compress/Encrypt Replicated Data		Controller Configurations	Single Controller
Access Methods	5	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b>S</b>
(Total #)		· · ·	_	Deduplication HA	⊗
Alerting Options (Total #)	2	Replication Types (Total #)	2	Storage Capacity Expansion	Scale-up
Battery Backun/IIPS		Display Real Time		RAID Levels	RAID 1 & 5

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**Deduplication Ratio** 

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### NEC HYDRAstor HS3-310



Approximate Starting List Price: \$20,000 to \$50,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
55.51	8.75	12.41	25.10	9.25	
GOOD	GOOD	BASIC	GOOD	EXCELLENT	

HARDWARE

### MANAGEMENT

Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	12TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	6
Deduplication Level / Type	Variable Length Block	Instant VM Recovery	8	FC Ports (Max)	8
Bypass Deduplication	⊗		_	Storage Networking Interfaces	1/10Gb Ethernet
Verify Data Integrity / Rate		Encryption EKM	⊗	Max # Storage	6
		Multi-stream Encryption	<	Networking Ports	-
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b></b>
Post Process Deduplication	$\otimes$	(Total #)		FC Support	$\bigotimes$
Inline/Post Process Option	8	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	⊗
nime/rost riocess option		(10141 #)		Max HDDs	12
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	$\bigotimes$
by Buokup 00b				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	8
		Backup Software		FC / SAS HDDS	$\bigotimes$
		Natively Hosted (Total #)	0	Concurrent HDD Mix	⊗
SCALABILITY & SUPF Replication Options	<b>'ORI</b> 1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	24GB
Replication Bandwidth	•			Erasure Coding	<b>S</b>
Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	8
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	1
Single Controller Replication	$\bigotimes$	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller	-	nutro Buonup Contrato ingr		VTL Interface	$\bigotimes$
Deduplication	⊗	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	250
Warranty	3 Year			Concurrently Present NAS/VTL	⊗
24x7x365	<b></b>	Compress/Encrypt Replicated Data	<b>~</b>	Controller Configurations	Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b>©</b>
· · ·		Deplication Trace (Tet-1 ()		Deduplication HA	<b>S</b>
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up
Battery Backup/UPS	8	Display Real Time Deduplication Ratio	<	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

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### NEC HYDRAstor HS3-410



Approximate Starting List Price: \$20,000-\$50,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
56.81	8.75	13.71	25.10	9.25	
GOOD	GOOD	GOOD	GOOD	EXCELLENT	

### MANAGEMENT

DEDOFEIOATION		MANAGEMENT		HANDWANE	
Deduplication Included	<	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	24TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	6
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	$\otimes$
		Instant VM Recovery	8	Storage Networking	1/10Gb Ethernet
Bypass Deduplication	8	Encryption EKM	$\bigotimes$	Interfaces	
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	6
Inline Deduplication	<b>S</b>	Encryption Methods		Hot Swappable Drives	<b>S</b>
Post Process Deduplication	8	(Total #)	2	FC Support	8
		Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	8
Inline/Post Process Option	⊗	(Total #)		Max HDDs	12
Deduplication Ratios by Backup Job		Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	⊗
ву васкир зов	-	(10411 #)		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	8
		Backup Software		FC / SAS HDDS	$\mathbf{\otimes}$
		Natively Hosted (Total #)	0	Concurrent HDD Mix	$\bigotimes$
SCALABILITY & SUPP Replication Options	<b>'OR I</b> 1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	48GB
Replication Bandwidth	~	. ,	-	Erasure Coding	<b>S</b>
Throttling	<b>S</b>	NDMP	8	Processor Cores (Max)	12
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	1
Single Controller Replication	<b></b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller	_	native backup continuite ingt		VTL Interface	$\otimes$
Deduplication	8	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	250
Warranty	3 Year			Concurrently Present NAS/VTL	$\otimes$
24x7x365	<	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job	<	Global Deduplication	٨
				Deduplication HA	$\bigotimes$
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up
Battery Backup/UPS	8	Display Real Time Deduplication Ratio	<	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

HARDWARE

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Unsupported 🕈

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Deduplication Level / Type	Variable Length Block	Instant VM Recovery	8
Bypass Deduplication	8	Encryption EKM	8
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<b>S</b>
Inline Deduplication	<b></b>	Encryption Methods	2
Post Process Deduplication	8	(Total #)	
Inline/Post Process Option	×	Backup Accelerator Options (Total #)	1
Deduplication Ratios by Backup Job	<	Backup Accelerator Features (Total #)	2
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4
CALABILITY & SUPF		Backup Software Natively Hosted (Total #)	0
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0
Replication Bandwidth Throttling	<	NDMP	٨
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13
Single Controller Replication	<b>S</b>	Native Backup Software Mgt	10
Single Controller Deduplication		Concurrent Deduplication/Replication	<b>S</b>
Warranty	3 Year	Compress/Encrypt Replicated Data	<b></b>
24x7x365	<b>~</b>		-
Access Methods (Total #)	4	Replication Status by Backup Job	<b>S</b>
Alerting Options (Total #)	2	Replication Types (Total #)	1
Rattery Rackun/IIPS		Display Real Time	

### SCAL

DEDUPLICATION

<b></b>	Single Controller Replication
8	Single Controller Deduplication
3 Yea	Warranty
0	24x7x365
4	Access Methods (Total #)
2	Alerting Options (Total #)
×	Battery Backup/UPS

### NEC HYDRAstor HS8-3002S



Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
62.91	8.75	18.91	26.00	9.25	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	

### MANAGEMENT

OPLICATION				HANDWARE	
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	24TB
press Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	6
eduplication Level / Type	Variable Length Block	Instant VM Recovery	⊗	FC Ports (Max)	8
Bypass Deduplication	8	Encryption EKM	× ×	Storage Networking Interfaces	1/10Gb Ethernet
erify Data Integrity / Rate	<	Multi-stream Encryption	<ul> <li>•</li> </ul>	Max # Storage Networking Ports	6
Inline Deduplication	<b>S</b>	Encryption Methods		Hot Swappable Drives	<b>S</b>
st Process Deduplication		(Total #)	2	FC Support	⊗
	-	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	۲
nline/Post Process Option	⊗	(Total #)		Max HDDs	24
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	٨
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	⊗
		Backup Software		FC / SAS HDDS	8
		Natively Hosted (Total #)	0	Concurrent HDD Mix	8
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	60GB
		(10101 "/		Erasure Coding	<b>S</b>
Replication Bandwidth Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	24
)ata Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	1
gle Controller Replication		• • • • • • • • • • • • • • • • • • • •		Storage Networking Protocols	CIFS, NFS
	<b>V</b>	Native Backup Software Mgt	10	VTL Interface	
Single Controller Deduplication	<b>S</b>	Concurrent	<b></b>	Partitions (Max)	250
Warranty	3 Year	Deduplication/Replication	<b>V</b>	Concurrently Present NAS/VTL	⊗
24x7x365		Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	
Access Methods	4	Replication Status	<b>~</b>	Global Deduplication	<b>S</b>
(Total #)		by Backup Job	-	Deduplication HA	
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up, Scale-out
		Display Real Time		RAID Levels	RAID 1, 5, 6 &

HARDWARE

RAID 1, 5, 6 & **Dynamic Disk Pools** 

Supported	$\mathbf{X}$	Unsupported

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Encryption O	<b>.</b>	Compress Deduplicated Data
Instant VM Rec	Variable Length Block	Deduplication Level / Type
Encryption	8	Bypass Deduplication
Multi-stream Encry	<b>S</b>	Verify Data Integrity / Rate
Encryption Me	<b>S</b>	Inline Deduplication
(To	⊗	Post Process Deduplication
Backup Accelerator O (To	8	Inline/Post Process Option
Backup Accelerator Fea (To	<b>S</b>	Deduplication Ratios by Backup Job
Bundled Software Lic (To	3	Deduplication Algorithms
Backup Sof Natively Hosted (To		
Cloud Dro	PORT	SCALABILITY & SUPP
Cloud Pro (To	1:1: 1:N; N:1	<b>Replication Options</b>
	$\checkmark$	Replication Bandwidth Throttling
Backup Software Sti Recognized (To	2	Data Optimization Options (Total #)
Native Backup Softwar	<b>S</b>	Single Controller Replication
Conc Deduplication/Replic	<	Single Controller Deduplication
Deauphoation/ reprin	3 Year	Warranty
Compress/Er Replicated	<b>S</b>	24x7x365
Replication S by Backu	4	Access Methods (Total #)
Replication Types (To	2	Alerting Options

Verify Data Integrity / Rate	⊘
Inline Deduplication	<b>S</b>
Post Process Deduplication	&
Inline/Post Process Option	&
Deduplication Ratios by Backup Job	<
Deduplication Algorithms	3

### SCALABI

DEDUPLICATION

<b>Replication Options</b>	1:1: 1:N; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	2
Single Controller Replication	Ø
Single Controller Deduplication	<
Warranty	3 Year
24x7x365	<b></b>
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	8



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**Deduplication Ratio** 

# NEC HYDRAstor HS8-3004R

HARDWARE

GUID

Approximate Starting List Price: \$100,000 to \$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
68.78	8.75	23.68	27.10	9.25	
EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	•••••

### MANAGEMENT

MANAGEMENT			HANDWANE		
<b></b>	Max Concurrent Backup Streams	128	Raw Storage Capacity (Max)	48TB	
<b>S</b>	Encryption Options	2	Ethernet ports (Max)	12	
ariable Length Block			FC Ports (Max)	8	
⊗	Instant VM Recovery	8	Storage Networking Interfaces	1/10Gb Ethernet	
•	Encryption EKM	8			
<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	12	
	Encryption Methods	2	Hot Swappable Drives	<b>S</b>	
$\otimes$	(Total #)	۷	FC Support	8	
	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	8	
⊗	(Total #)		Max HDDs	48	
<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	⊗	
			7.2K RPM SATA HDDs (Max)	<b>S</b>	
3	Bundled Software Licenses (Total #)	4	SSDs	⊗	
	Backup Software	0	FC / SAS HDDS	⊗	
RT	Natively Hosted (Total #)		Concurrent HDD Mix	8	
1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	120GB	
			Erasure Coding	<b>S</b>	
<b>S</b>	NDMP	8	Processor Cores (Max)	48	
2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	2	
<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS	
-	Native backup Software myt	10	VTL Interface	8	
<b>S</b>	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	500	
3 Year	Comproso /Enormat	_	Concurrently Present NAS/VTL	⊗	
<b>S</b>	Compress/Encrypt Replicated Data	<b>S</b>	<b>Controller Configurations</b>	Scale-out	
4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b>S</b>	
			Deduplication HA	<b>S</b>	

controller configurations		
<b>Global Deduplication</b>	<	Replication Status by Backup Job
Deduplication HA	1	.,,
Storage Capacity Expansion		Replication Types (Total #)
RAID Levels	$\checkmark$	Display Real Time Deduplication Ratio

DEDUPLICATION

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<b>S</b>
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	$\bigotimes$
Verify Data Integrity / Rate	<
Inline Deduplication	<b>S</b>
Post Process Deduplication	$\bigotimes$
Inline/Post Process Option	$\bigotimes$
Deduplication Ratios by Backup Job	<
Deduplication Algorithms	3

### **SCALABILITY & SUPPOR**

<b>Replication Options</b>	1:1: 1:N; N:1
Replication Bandwidth Throttling	<b>S</b>
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	<
Warranty	3 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	$\bigotimes$

Supported 🗴 Unsupported

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Scale-up, Scale-out

RAID 1, 5, 6 &

**Dynamic Disk Pools** 

# GUID

### NEC HYDRAstor HS8-3004S

Approximate Starting List Price: \$100,000 to \$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
68.68	8.75	23.68	27.00	9.25	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	•••••

### MANAGEMENT

	MANAGEMENT		HARDWARE	
<b>S</b>	Max Concurrent Backup Streams	128	Raw Storage Capacity (Max)	48TB
<b>S</b>	Encryption Options	2	Ethernet ports (Max)	12
le Length Block			FC Ports (Max)	$\mathbf{x}$
	Instant VM Recovery	$\bigotimes$	Storage Networking	
⊗	Encryption EKM	⊗	Interfaces	1/10Gb Ethernet
<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	12
<b>S</b>	Encryption Methods	•	Hot Swappable Drives	<b>S</b>
8	(Total #)	2	FC Support	$\bigotimes$
_	Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	8
	(Total #)		Max HDDs	48
	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	$\mathbf{x}$
			7.2K RPM SATA HDDs (Max)	<b></b>
3	Bundled Software Licenses (Total #)	4	SSDs	8
	Backup Software		FC / SAS HDDS	$\mathbf{x}$
	Natively Hosted (Total #)	0	Concurrent HDD Mix	8
: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	120GB
· · · · · · · · · · · · · · · · · · ·	(10101 #)		Erasure Coding	<b>S</b>
	NDMP	8	Processor Cores (Max)	48
2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	2
<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
•			VTL Interface	$\bigotimes$
<b>S</b>	Concurrent Deduplication/Replication	<	Partitions (Max)	500
3 Year			Concurrently Present NAS/VTL	8
<b>S</b>	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Scale-out
4	Replication Status by Backup Job	<	Global Deduplication	<b></b>
			Deduplication HA	<b>S</b>
2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up, Scale-out

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	8
Verify Data Integrity / Rate	<
Inline Deduplication	<b>S</b>
Post Process Deduplication	8
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	<
Deduplication Algorithms	3

DEDUPLICATION

### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1: 1:N; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	<
Warranty	3 Year
24x7x365	<
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	8

Supported Support 🗴 Unsupported

RAID 1, 5, 6 &

**Dynamic Disk Pools** 

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**RAID Levels** 

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**Display Real Time** 

**Deduplication Ratio** 



### NEC HYDRAstor HS8-3010R 120TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
73.79	8.75	28.79	27.00	9.25	
RECOMMENDED	GOOD	RECOMMENDED	EXCELLENT	EXCELLENT	•••••

HARDWARE

### MANAGEMENT

Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	320	Raw Storage Capacity (Max)	120TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	30
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	&
Bypass Deduplication	⊗	Instant VM Recovery	8	Storage Networking	1/10Gb Ethernet
Bypass Deuupiication		Encryption EKM	$\otimes$	Interfaces	
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	30
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	⊗	(Total #)	۷	FC Support	8
Inline/Post Process Option	$\bigotimes$	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	
	~	(		Max HDDs	120
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
-,				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	⊗
		Backup Software	0	FC / SAS HDDS	8
SCALABILITY & SUPP	OPT	Natively Hosted (Total #)	U	Concurrent HDD Mix	8
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	300GB
		(10441 #)		Erasure Coding	<b>S</b>
Replication Bandwidth Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	120
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	5
Single Controller Replication	<b>~</b>		10	Storage Networking Protocols	CIFS, NFS
	•	Native Backup Software Mgt	10	VTL Interface	⊗
Single Controller Deduplication	<b>S</b>	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	1,250
Warranty	3 Year		-	Concurrently Present NAS/VTL	8
24x7x365		Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Scale-out
Access Methods	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b></b>
(Total #)	-	by Backup Job	-	Deduplication HA	<b>S</b>
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up, Scale-out
Battery Backup/UPS	Ø	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

Supported Support 🗴 Unsupported

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### NEC HYDRAstor HS8-3020R 240TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
74.74	8.75	29.74	27.00	9.25	
RECOMMENDED	GOOD	RECOMMENDED	EXCELLENT	EXCELLENT	•••••

HARDWARE

### MANAGEMENT

OF EIGANON				HAILE	
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	640	Raw Storage Capacity (Max)	240TB
press Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	60
eduplication Level / Type	Variable Length Block	Instant VM Recovery	⊗	FC Ports (Max)	8
Bypass Deduplication	8	Encryption EKM	× ×	Storage Networking Interfaces	1/10Gb Ethernet
erify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<u>~</u>	Max # Storage Networking Ports	60
Inline Deduplication	<	Encryption Methods		Hot Swappable Drives	<
st Process Deduplication	8	(Total #)	2	FC Support	8
line/Post Process Ontion	~	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
lline/Post Process Option	⊗	(10tal #)		Max HDDs	240
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	۲
2, 220mp 000				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	۲
		Backup Software	_	FC / SAS HDDS	⊗
LABILITY & SUPF	OPT	Natively Hosted (Total #)	0	Concurrent HDD Mix	⊗
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	600GB
Replication Bandwidth	•			Erasure Coding	<b>S</b>
Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	240
ata Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	10
gle Controller Replication	<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller	<b>S</b>			VTL Interface	
Deduplication	<b>V</b>	Concurrent Deduplication/Replication	<b>~</b>	Partitions (Max)	2,500
Warranty	3 Year	0		Concurrently Present NAS/VTL	8
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Scale-out
Access Methods (Total #)	4	Replication Status by Backup Job	<	Global Deduplication	<b>S</b>
Alerting Options	0	Replication Types (Total #)	1	Deduplication HA	<b>S</b>
(Total #)	2		-	Storage Capacity Expansion	Scale-up, Scale-out
		Display Real Time			RAID 1. 5. 6 &

RAID 1, 5, 6 & **Dynamic Disk Pools** 

Supported Support

🗴 Unsupported

Display Real Time **RAID Levels Deduplication Ratio** 

Compress Deduplicated Data	<b>S</b>			
Deduplication Level / Type	Variable Length Block			
Bypass Deduplication	8			
Verify Data Integrity / Rate	<b>S</b>			
Inline Deduplication	<b>S</b>			
Post Process Deduplication	8			
Inline/Post Process Option	Ø			
Deduplication Ratios by Backup Job	<			
Deduplication Algorithms	3			
SCALABILITY & SUPPORT				

DEDUPLICATION

### SC

<b>Replication Options</b>	1:1: 1:N; N:1
Replication Bandwidth Throttling	⊘
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	⊘
Warranty	3 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	$\otimes$



### NEC HYDRAstor HS8-4001S 12-48TB



Approximate Starting List Price: \$100,000-\$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
63.03	8.75	19.03	26.00	9.25	
EXCELLENT	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	•••••

HARDWARE

### MANAGEMENT

DEDOI EIGANON					
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	48TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	6
Deduplication Level / Type	Variable Length Block	Instant VM Recovery		FC Ports (Max)	⊗
Bypass Deduplication	$\bigotimes$	Encryption EKM	~	Storage Networking Interfaces	1/10Gb Ethernet
Verify Data Integrity / Rate	<b></b>	Multi-stream Encryption		Max # Storage Networking Ports	6
Inline Deduplication	<b>S</b>		•	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	$\bigotimes$	Encryption Methods (Total #)	2	FC Support	$\bigotimes$
Inline/Post Process Option	⊗	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	⊗
	~	(10411 #)		Max HDDs	12
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	⊗
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	⊗
		Backup Software	•	FC / SAS HDDS	8
SCALABILITY & SUPP	OBT	Natively Hosted (Total #)	0	Concurrent HDD Mix	$\mathbf{\otimes}$
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	96GB
		(104111)		Erasure Coding	$\checkmark$
Replication Bandwidth Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	16
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	1
Single Controller Replication		Notive Deckur Coffman Mat	10	Storage Networking Protocols	CIFS, NFS
	-	Native Backup Software Mgt	10	VTL Interface	$\bigotimes$
Single Controller Deduplication	<b>.</b>	Concurrent Deduplication/Replication	<	Partitions (Max)	250
Warranty	3 Year			Concurrently Present NAS/VTL	$\otimes$
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Scale-out, Single Controller
Access Methods (Total #)	4	Replication Status by Backup Job	<	Global Deduplication	Ø
. ,				Deduplication HA	<b>S</b>
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-up, Scale-out
Battery Backup/UPS	8	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

#### Supported 🗴 Unsupported



### NEC HYDRAstor HS8-4001S 96TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
60.11	8.75	19.51	22.60	9.25	
GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	

HARDWARE

### MANAGEMENT

DEDOI LIGATION					
Deduplication Included	<	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	96TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	6
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	$\bigotimes$
Bypass Deduplication	⊗	Instant VM Recovery	8	Storage Networking Interfaces	1/10Gb Ethernet
bypass bedupiication		Encryption EKM			
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	6
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	⊗	(Total #)	2	FC Support	$\otimes$
Inline/Post Process Option	×	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	⊗
		. ,		Max HDDs	24
Deduplication Ratios by Backup Job	$\checkmark$	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	⊗
		Backup Software	0	FC / SAS HDDS	8
SCALABILITY & SUPP	ORT	Natively Hosted (Total #)	0	Concurrent HDD Mix	8
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	192GB
		(10141.1)		Erasure Coding	<b>S</b>
Replication Bandwidth Throttling	<b>S</b>	NDMP	⊗	Processor Cores (Max)	28
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	1
Single Controller Replication			10	Storage Networking Protocols	CIFS, NFS
Cincle Controller	-	Native Backup Software Mgt	10	VTL Interface	⊗
Single Controller Deduplication	<b>S</b>	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	250
Warranty	3 Year			Concurrently Present NAS/VTL	8
24x7x365	<	Compress/Encrypt Replicated Data		Controller Configurations	Scale-out, Single Controller
Access Methods	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
(Total #)			-	Deduplication HA	$\otimes$
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-out
Battery Backup/UPS	&	Display Real Time Deduplication Ratio	<	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

#### Supported 🗴 Unsupported

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### NEC HYDRAstor HS8-4002S 96TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
69.45	8.75	24.45	27.00	9.25	
EXCELLENT	GOOD	RECOMMENDED	GOOD	EXCELLENT	

HARDWARE

### MANAGEMENT

Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	128	Raw Storage Capacity (Max)	96TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	12
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	&
		Instant VM Recovery	8	Storage Networking	1/10Gb Ethernet
Bypass Deduplication	⊗	Encryption EKM	$\mathbf{X}$	Interfaces	
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<	Max # Storage Networking Ports	12
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	8	(Total #)	۷	FC Support	8
Indian (Death Dreason Orthing	~	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
Inline/Post Process Option	8	(10tdi #)		Max HDDs	24
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
		Dundled Coffman Lineares		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	8
		Backup Software	0	FC / SAS HDDS	8
SCALABILITY & SUPP	ORT	Natively Hosted (Total #)	U	Concurrent HDD Mix	8
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	192GB
Replication Bandwidth	<b></b>	NDMP	⊗	Erasure Coding	<b>~</b>
Throttling	<b>V</b>		~~	Processor Cores (Max)	32
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	2
Single Controller Replication	<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller	<b></b>			VTL Interface	<b>&amp;</b>
Deduplication	•	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	500
Warranty	3 Year	Compress/Encrypt	•	Concurrently Present NAS/VTL	⊗
24x7x365	<b></b>	Replicated Data	✓	Controller Configurations	Scale-out
Access Methods (Total #)	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b>S</b>
. ,				Deduplication HA	<
Alerting Options (Total #)	2	Replication Types (Total #)	1	Storage Capacity Expansion	Scale-out
Battery Backup/UPS	8	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

**Dynamic Disk Pools** 

Supported Support 🗴 Unsupported



### NEC HYDRAstor HS8-4002S 192TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
70.97	8.75	25.97	27.00	9.25	
RECOMMENDED	GOOD	RECOMMENDED	EXCELLENT	EXCELLENT	

HARDWARE

### MANAGEMENT

EDG: LIGATION					
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	128	Raw Storage Capacity (Max)	192TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	12
Deduplication Level / Type	Variable Length Block	· · ·		FC Ports (Max)	⊗
		Instant VM Recovery	8	Storage Networking	1/10Gb Ethernet
Bypass Deduplication	8	Encryption EKM	$\bigotimes$	Interfaces	
Verify Data Integrity / Rate	<b>S</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	12
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	8	(Total #)	۷	FC Support	8
Inline/Post Process Option	⊗	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
mille/Fost Flocess option		(10101 #)		Max HDDs	48
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	⊗
Deduction Algorithms	2	Bundled Software Licenses		7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	(Total #)	4	SSDs	⊗
		Backup Software	0	FC / SAS HDDS	8
CALABILITY & SUPP	ORT	Natively Hosted (Total #)	-	Concurrent HDD Mix	8
<b>Replication Options</b>	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	384GB
Replication Bandwidth	•			Erasure Coding	<b>S</b>
Throttling	<b>S</b>	NDMP	8	Processor Cores (Max)	56
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	2
Single Controller Replication	<b></b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller	<b>•</b>			VTL Interface	8
Deduplication	<b>S</b>	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	500
Warranty	3 Year	Compress/Encrypt	~	Concurrently Present NAS/VTL	$\bigotimes$
24x7x365	<b>S</b>	Replicated Data	<b>S</b>	Controller Configurations	Scale-out
Access Methods (Total #)	4	Replication Status by Backup Job	<b>S</b>	Global Deduplication	<b>Ø</b>
Alerting Options	-	Replication Types (Total #)	1	Deduplication HA	<b>S</b>
(Total #)	2			Storage Capacity Expansion	Scale-up, Scale-out
Battery Backup/UPS	$\bigotimes$	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

🗴 Unsupported

Supported Support



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### NEC HYDRAstor HS8-4006R 720TB



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
75.78	8.75	30.78	27.00	9.25	
BEST-IN-CLASS	GOOD	BEST-IN-CLASS	EXCELLENT	EXCELLENT	

HARDWARE

### MANAGEMENT

eduplication Included	<b>S</b>	Max Concurrent Backup Streams	384	Raw Storage Capacity (Max)	720TB
ess Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	36
uplication Level / Type	Variable Length Block	Instant VM Recovery	$\bigotimes$	FC Ports (Max)	8
Bypass Deduplication	8		_	Storage Networking Interfaces	1/10Gb Ethernet
	_	Encryption EKM	⊗	Max # Storage	
y Data Integrity / Rate	<b>V</b>	Multi-stream Encryption	<	Networking Ports	36
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Process Deduplication	⊗	(Total #)	-	FC Support	⊗
e/Post Process Option	⊗	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
	· <b>•</b> ·			Max HDDs	180
Deduplication Ratios by Backup Job	<	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
		Pundled Coffman Licenses		7.2K RPM SATA HDDs (Max)	<b>S</b>
Iuplication Algorithms	3	Bundled Software Licenses (Total #)	4	SSDs	$\bigotimes$
		Backup Software	•	FC / SAS HDDS	8
ABILITY & SUPP	ORT	Natively Hosted (Total #)	0	Concurrent HDD Mix	$\bigotimes$
Replication Options	1:1: 1:N; N:1	Cloud Providers (Total #)	0	Cache (Max)	1,440GB
Replication Bandwidth	<b>—</b> .			Erasure Coding	<b>S</b>
Throttling	<b>~</b>	NDMP	⊗	Processor Cores (Max)	204
a Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	13	Controllers (Max)	6
Controller Replication	<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
Single Controller				VTL Interface	⊗
Deduplication	<b>S</b>	Concurrent Deduplication/Replication		Partitions (Max)	1,500
Warranty	3 Year	Compress/Encrypt	-	Concurrently Present NAS/VTL	$\otimes$
24x7x365	<b>S</b>	Replicated Data	<b>S</b>	Controller Configurations	Scale-out
Access Methods (Total #)	4	Replication Status by Backup Job	<	Global Deduplication	<b>S</b>
Alerting Options		Replication Types (Total #)	1	Deduplication HA	$\checkmark$
(Total #)	2		•	Storage Capacity Expansion	Scale-out
Battery Backup/UPS	$\bigotimes$	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1, 5, 6 & Dynamic Disk Pools

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MANAGEM		DEDUPLICATION		
M Ba	<b>S</b>	Deduplication Included		
Encr	<b>S</b>	Compress Deduplicated Data		
Instan	Variable Length Block	Deduplication Level / Type		
E	8	Bypass Deduplication		
Multi-stre	<	Verify Data Integrity / Rate		
Encry	<	Inline Deduplication		
Packup Accel	8	Post Process Deduplication		
Backup Accel	8	Inline/Post Process Option		
Backup Accele	<	Deduplication Ratios by Backup Job		
Bundled Soft	3	Deduplication Algorithms		
Ba Natively H	SCALABILITY & SUPPORT			
C	1:1: 1:N; N:1	<b>Replication Options</b>		
	<	Replication Bandwidth Throttling		
Backup Sof Recog	2	Data Optimization Options (Total #)		
Native Backup	<b>S</b>	Single Controller Replication		
Deduplicati	<	Single Controller Deduplication		
	••••••••••••••••••			

### SCAL

<b>Replication Options</b>	1:1: 1:N; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	<
Warranty	3 Year
24x7x365	<b>S</b>
Access Methods (Total #)	4
Alerting Options (Total #)	2
Battery Backup/UPS	$\otimes$



### Quantum DXi4601

Approximate Starting List Price: \$20,000-\$50,000

# GUID

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
55.36	9.50	6.86	29.75	9.25	
GOOD	EXCELLENT	BASIC	EXCELLENT	EXCELLENT	••••

HARDWARE

### MANAGEMENT

Included	<b>S</b>	Max Concurrent Backup Streams	32	Raw Storage Capacity (Max)	12TB*
ated Data	<b>S</b>	Encryption Options	1	Ethernet ports (Max)	4
vel / Type	Variable Length Block	Instant VM Recovery	⊗	FC Ports (Max)	0
plication	<b>S</b>	Encryption EKM	8	Storage Networking Interfaces	1Gb Ethernet
ity / Rate	<b>S</b>	Multi-stream Encryption	8	Max # Storage Networking Ports	4
plication	$\checkmark$	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
plication	8	(Total #)	۷	FC Support	8
ss Option	8	Backup Accelerator Options (Total #)	2	Concurrent FC/Ethernet Mix	8
		(10101 #)		Max HDDs	8
on Ratios ckup Job	$\otimes$	Backup Accelerator Features (Total #)	3	5.4K RPM SATA HDDs (Max)	⊗
		Bundled Software Licenses		7.2K RPM SATA HDDs (Max)	<b>S</b>
gorithms	3	(Total #)	6	SSDs	8
		Backup Software		FC / SAS HDDS	8
& SUPP	ORT	Natively Hosted (Total #)	1	Concurrent HDD Mix	8
n Options	1:1; 1:N; N:1	Cloud Providers (Total #)	1	Cache (Max)	32 GB
andwidth	•	· · · ·		Erasure Coding	<b>S</b>
hrottling	<b>~</b>	NDMP .	<b>S</b>	Processor Cores (Max)	8
on Options (Total #)	2	Backup Software Streams Recognized (Total #)	21	Controllers (Max)	1
plication	<b>S</b>	Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, NFS
ontroller				VTL Interface	$\bigotimes$
plication	<b>S</b>	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	0
Warranty	1 Year			Concurrently Present NAS/VTL	8
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	<	Controller Configurations	Single Controller
Methods (Total #)	5	Replication Status by Backup Job	<b>S</b>	Global Deduplication	⊗
g Options		Replication Types (Total #)	3	Deduplication HA	8
(Total #)	4	Replication Types (Total #)	J	Storage Capacity Expansion	Scale-out

Deduplication Included	<b>S</b>
Compress Deduplicated Data	<
Deduplication Level / Type	Variable Length Block
Bypass Deduplication	⊘
Verify Data Integrity / Rate	<b>S</b>
Inline Deduplication	<
Post Process Deduplication	8
Inline/Post Process Option	8
Deduplication Ratios by Backup Job	&
Deduplication Algorithms	3

DEDUPLICATION

### **SCALABILITY &**

<b>Replication Options</b>	1:1; 1:N; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	<
Warranty	1 Year
24x7x365	<
Access Methods (Total #)	5
Alerting Options (Total #)	4
Battery Backup/UPS	<b>S</b>

Supported Support 🗴 Unsupported

**RAID Levels** 

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**Display Real Time** 

**Deduplication Ratio** 

RAID 6

### Quantum DXi6700 Series



Approximate Starting List Price: \$50,000-\$100,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
64.02	9.50	12.77	32.25	9.50	
EXCELLENT	EXCELLENT	BASIC	RECOMMENDED	EXCELLENT	

Concurrent

**Deduplication/Replication** 

**Replication Types (Total #)** 

Compress/Encrypt Replicated Data

**Replication Status** 

**Display Real Time** 

**Deduplication Ratio** 

by Backup Job

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3

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### MANAGEMENT

)	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	80TB
)	Encryption Options	2	Ethernet ports (Max)	8
gth Block			FC Ports (Max)	4
	Instant VM Recovery	⊗	Storage Networking	1/10Gb Ethernet,
)	Encryption EKM	$\otimes$	Interfaces	8Gb FC
)	Multi-stream Encryption	<b></b>	Max # Storage Networking Ports	12
)	Encryption Methods		Hot Swappable Drives	<b>S</b>
	(Total #)	2	FC Support	<b>S</b>
	Backup Accelerator Options	2	Concurrent FC/Ethernet Mix	<b></b>
	(Total #)		Max HDDs	124
	Backup Accelerator Features (Total #)	3	5.4K RPM SATA HDDs (Max)	8
	. ,		7.2K RPM SATA HDDs (Max)	<b>S</b>
	Bundled Software Licenses (Total #)	8	SSDs	<b>S</b>
	Backup Software		FC / SAS HDDS	&
	Natively Hosted (Total #)	1	Concurrent HDD Mix	<b>S</b>
; N:1	Cloud Providers (Total #)	1	Cache (Max)	64GB
	. ,		Erasure Coding	<b>S</b>
)	NDMP	<b>~</b>	Processor Cores (Max)	8
	Backup Software Streams Recognized (Total #)	21	Controllers (Max)	4
)	Native Backup Software Mgt		Storage Networking Protocols	CIFS, FC, NFS
	Native backup Software Mgt		VTL Interface	<b>S</b>

HARDWARE

<b>S</b>
Variable Length Block
<b>S</b>
<b>S</b>
<b></b>
$\bigotimes$
$\bigotimes$
&
3

DEDUPLICATION

**Deduplication Included** 

### **SCALABILITY & SUPPORT**

<b>Replication Options</b>	1:1; 1:N; N:1
Replication Bandwidth Throttling	<
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	<
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	5
Alerting Options (Total #)	4
Battery Backup/UPS	<

Supported 🛛 🐼 Unsupported

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Partitions (Max)

**Concurrently Present NAS/VTL** 

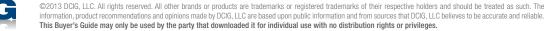
**Controller Configurations** 

**Storage Capacity Expansion** 

**Global Deduplication** 

**Deduplication HA** 

**RAID Levels** 





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128

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Single Controller

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Scale-out

RAID 1 & 6

### Quantum DXi6802

Approximate Starting List Price: \$100,000-\$250,000

### **DCIG Scores and Rankings**

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
69.88	9.50	16.33	34.55	9.50	
EXCELLENT	EXCELLENT	GOOD	RECOMMENDED	EXCELLENT	

### MANAGEMENT

DEDUPLICATION				NARDWARE	
Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	64	Raw Storage Capacity (Max)	156TB*
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	9
Deduplication Level / Type	Variable Length Block		⊗	FC Ports (Max)	6
Bypass Deduplication	<b>S</b>	Instant VM Recovery Encryption EKM	~	Storage Networking Interfaces	1/10Gb Ethernet, 8Gb FC
Verify Data Integrity / Rate	<	Multi-stream Encryption		Max # Storage Networking Ports	15
Inline Deduplication	<b></b>	Encryption Methods		Hot Swappable Drives	<b>S</b>
Post Process Deduplication	⊗	(Total #)	2	FC Support	<b></b>
		Backup Accelerator Options (Total #)	2	Concurrent FC/Ethernet Mix	<b>S</b>
Inline/Post Process Option	⊗	(10tdi #)		Max HDDs	84
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	4	5.4K RPM SATA HDDs (Max)	⊗
Deduplication Algorithms	3	Bundled Software Licenses		7.2K RPM SATA HDDs (Max)	8
Deaupheaton Aigorianna	0	(Total #)	8	SSDs	8
		Backup Software	1	FC / SAS HDDS	<b>S</b>
CALABILITY & SUPP	ORT	Natively Hosted (Total #)		Concurrent HDD Mix	<b>S</b>
<b>Replication Options</b>	1:1; 1:N; N:1	Cloud Providers (Total #)	1	Cache (Max)	128 GB
Replication Bandwidth	<b>.</b>			Erasure Coding	<b>S</b>
Throttling	<b>.</b>	NDMP 	<b>.</b>	Processor Cores (Max)	16
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	21	Controllers (Max)	1
Single Controller Replication		Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, FC, NFS
Single Controller	-	native backup Software myt		VTL Interface	<b>S</b>
Deduplication	8	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	128
Warranty	1 Year			Concurrently Present NAS/VTL	<b>S</b>
24x7x365	<	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Single Controller
Access Methods (Total #)	5	Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
. ,				Deduplication HA	
Alerting Options	4	Replication Types (Total #)	3	Storage Capacity Expansion	Scale-out

HARDWARE

### DEDUPLICATION

<b>Replication Options</b>	1:1; 1:N; N:1
Replication Bandwidth Throttling	<b>S</b>
Data Optimization Options (Total #)	2
Single Controller Replication	<b>S</b>
Single Controller Deduplication	8
Warranty	1 Year
24x7x365	<b>S</b>
Access Methods (Total #)	5
Alerting Options (Total #)	4
Battery Backup/UPS	<b>S</b>

\*Usable

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**Storage Capacity Expansion** 

**RAID Levels** 



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**Display Real Time** 

**Deduplication Ratio** 

Scale-out

**Dynamic Disk Pool** 

### Quantum DXi8500 Enterprise



Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
72.44	9.50	18.84	34.85	9.25	
RECOMMENDED	EXCELLENT	EXCELLENT	RECOMMENDED	EXCELLENT	

HARDWARE

### MANAGEMENT

Deduplication Included	<	Max Concurrent Backup Streams	256	Raw Storage Capacity (Max)	330TB*
Compress Deduplicated Data	$\checkmark$	Encryption Options	2	Ethernet ports (Max)	10
Deduplication Level / Type	Variable Length Block			FC Ports (Max)	4
		Instant VM Recovery	⊗	Storage Networking	1/10Gb Ethernet,
Bypass Deduplication	<b>S</b>	Encryption EKM	$\otimes$	Interfaces	8Gb FC
Verify Data Integrity / Rate	<b>~</b>	Multi-stream Encryption	<b>S</b>	Max # Storage Networking Ports	14
Inline Deduplication	<b>S</b>	Encryption Methods	2	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	۲	(Total #)	L	FC Support	<b>S</b>
Inline/Post Process Option	⊗	Backup Accelerator Options (Total #)	2	Concurrent FC/Ethernet Mix	<b>S</b>
	<b>*</b>			Max HDDs	183
Deduplication Ratios by Backup Job	$\bigotimes$	Backup Accelerator Features (Total #)	4	5.4K RPM SATA HDDs (Max)	8
				7.2K RPM SATA HDDs (Max)	<b>S</b>
Deduplication Algorithms	3	Bundled Software Licenses (Total #)	8	SSDs	×
		Backup Software	4	FC / SAS HDDS	<b>S</b>
ALABILITY & SUPP	PORT	Natively Hosted (Total #)	1	Concurrent HDD Mix	<b>S</b>
Replication Options	1:1; 1:N; N:1	Cloud Providers (Total #)	1	Cache (Max)	256GB
Replication Bandwidth	•		•	Erasure Coding	<b>S</b>
Throttling	<b>S</b>	NDMP	<b></b>	Processor Cores (Max)	12
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	21	Controllers (Max)	5
Single Controller Replication		Native Backup Software Mgt	10	Storage Networking Protocols	CIFS, FC, NFS
Single Controller	_	Native Backup Software mgr	10	VTL Interface	<b>S</b>
Deduplication	8	Concurrent Deduplication/Replication	$\checkmark$	Partitions (Max)	128
Warranty	1 Year			Concurrently Present NAS/VTL	<b>S</b>
24x7x365	<b></b>	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Active-Active
Access Methods (Total #)	5	Replication Status by Backup Job	<b>S</b>	Global Deduplication	8
. ,				Deduplication HA	$\bigotimes$
Alerting Options (Total #)	4	Replication Types (Total #)	3	Storage Capacity Expansion	Scale-out
Battery Backun/UPS		Display Real Time	<b>~</b>	RAID Levels	RAID 1 & 6

### \*Usable

Supported Support 🗴 Unsupported

**RAID Levels** 

**Battery Backup/UPS** 



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**Deduplication Ratio** 



### Sepaton S2100-ES Series 2925

Approximate Starting List Price: Over \$250,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
65.32	8.25	21.32	26.25	9.50	
EXCELLENT	BASIC	EXCELLENT	EXCELLENT	EXCELLENT	

HARDWARE

### MANAGEMENT

#### **Max Concurrent Deduplication Included** 2.59PB **Raw Storage Capacity (Max)** 512 **Backup Streams** Ethernet ports (Max) 6 **Compress Deduplicated Data Encryption Options** 1 FC Ports (Max) 4 Fixed Block, Variable **Deduplication Level / Type** Length Block, Sliding Scale Instant VM Recovery $\times$ **Storage Networking** 1/10Gb Ethernet, **Bypass Deduplication** Interfaces 8GB FC **Encryption EKM** 3 Max # Storage $\otimes$ Verify Data Integrity / Rate 10 **Multi-stream Encryption Networking Ports Inline Deduplication** $\otimes$ **Hot Swappable Drives** Ø **Encryption Methods** 1 (Total #) **FC Support** Ø **Post Process Deduplication Concurrent FC/Ethernet Mix Backup Accelerator Options** 1 Inline/Post Process Option $\mathbf{X}$ (Total #) Max HDDs 1,296 **Backup Accelerator Features Deduplication Ratios** 5.4K RPM SATA HDDs (Max) $\mathbf{X}$ 3 (Total #) by Backup Job $\otimes$ 7.2K RPM SATA HDDs (Max) **Bundled Software Licenses Deduplication Algorithms** 1 5 SSDs $\otimes$ (Total #) FC / SAS HDDS **Backup Software** 0 Natively Hosted (Total #) **Concurrent HDD Mix SCALABILITY & SUPPORT** Cache (Max) 128GB **Cloud Providers** 0 **Replication Options** 1:1; 1:N; N:1: 1:N:N (Total #) **Erasure Coding Replication Bandwidth** NDMP **Processor Cores (Max)** Throttling 128 **Data Optimization Options Backup Software Streams Controllers (Max)** 8 2 4 (Total #) Recognized (Total #) **Storage Networking Protocols** CIFS, FC, NFS **Single Controller Replication** Native Backup Software Mgt 5 **VTL Interface** Single Controller Deduplication Concurrent Partitions (Max) 108 **Deduplication/Replication** $\otimes$ Warranty 1 Year **Concurrently Present NAS/VTL Compress/Encrypt** Replicated Data **Controller Configurations** Scale-Out 24x7x365 **Replication Status Global Deduplication** Ø **Access Methods** 5 by Backup Job (Total #) **Deduplication HA Alerting Options Replication Types (Total #)** 1 5 **Storage Capacity Expansion** Scale-up, Scale-out (Total #) **Display Real Time Battery Backup/UPS RAID Levels** RAID 6 **Deduplication Ratio**

#### Supported 🐼 Unsupported



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## Symantec Backup Exec 3600 Appliance

Approximate Starting List Price: \$10,000 to \$20,000



### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
49.25	9.25	4.95	24.55	10.50	
GOOD	EXCELLENT	BASIC	GOOD	RECOMENDED	

HARDWARE

### MANAGEMENT

Deduplication Included	<b>S</b>	Max Concurrent Backup Streams	32	Raw Storage Capacity (Max)	8ТВ
Compress Deduplicated Data	$\checkmark$	Encryption Options	2	Ethernet ports (Max)	5
Deduplication Level / Type	Fixed Block, Variable Length Block	Instant VM Recovery		FC Ports (Max)	0
Bypass Deduplication	<b>S</b>		× ×	Storage Networking Interfaces	1/10Gb Ethernet, 6Gbps SAS
Verify Data Integrity / Rate		Encryption EKM	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Max # Storage Networking Ports	6
Inline Deduplication	<b>~</b>	Multi-stream Encryption	<b>v</b>	Hot Swappable Drives	<b>S</b>
	~	Encryption Methods (Total #)	2	FC Support	
Post Process Deduplication	⊗				-
Inline/Post Process Option	⊗	Backup Accelerator Options (Total #)	1	Concurrent FC/Ethernet Mix	8
Bud officially Ballie		Pookun Appolorator Footuroo		Max HDDs	6
Deduplication Ratios by Backup Job	<b>S</b>	Backup Accelerator Features (Total #)	2	5.4K RPM SATA HDDs (Max)	8
Deduplication Algorithms	1	Bundled Software Licenses	_	7.2K RPM SATA HDDs (Max)	8
		(Total #)	8	SSDs	80GB
		Backup Software	1	FC / SAS HDDS	<b></b>
ALABILITY & SUPP	ORT	Natively Hosted (Total #)	•	Concurrent HDD Mix	<b>S</b>
Replication Options	1:1; 1:N; N:1; 1:N:N	Cloud Providers (Total #)	1	Cache (Max)	128MB
Replication Bandwidth	-		-	Erasure Coding	8
Throttling	⊗	NDMP	<b>~</b>	Processor Cores (Max)	4
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	6	Controllers (Max)	1
Single Controller Replication	8	Native Backup Software Mgt	1	Storage Networking Protocols	CIFS, NFS
Single Controller	•		- 	VTL Interface	$\otimes$
Deduplication	⊗	Concurrent Deduplication/Replication	<b>S</b>	Partitions (Max)	8
Warranty	3 Year			Concurrently Present NAS/VTL	8
24x7x365	<b>S</b>	Compress/Encrypt Replicated Data	<b>S</b>	Controller Configurations	Single Controller
Access Methods	4	Replication Status by Backup Job	<	Global Deduplication	8
(Total #)	•	by backup JOD	-	Deduplication HA	8
Alerting Options (Total #)	5	Replication Types (Total #)	1	Storage Capacity Expansion	8
Battery Backup/UPS	<b>S</b>	Display Real Time Deduplication Ratio	<b>S</b>	RAID Levels	RAID 1 & 6

Supported

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### Symantec NetBackup 5030



Approximate Starting List Price: \$50,000 to \$100,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
57.70	7.75	14.39	25.06	10.50	
GOOD	BASIC	GOOD	GOOD	RECOMMENDED	

HARDWARE

### MANAGEMENT

Deduplication IncludedNax Concurrent Backup Streams100+Raw Storage Capacity (Max)3007Compress Deduplication Level / TypeImage: Compress DeduplicationImage: Compress Ded	thernet, FC
Deduplication Level / Type       Fixed Block, Variable Length Block, Silding Scale       Instant VM Recovery       Image: Constant of the second se	thernet, FC
Deduplication Level / Type       Length Block, Sliding Scale       Instant VM Recovery       Image: Constant of the stant of the	FC
Bypass Deduplication       Interfaces       Storage Networking Interfaces       1/106b Ef 868 Interfaces         Verify Data Integrity / Rate       Image: Storage Networking Ports       Max # Storage Networking Ports       10         Inline Deduplication       Image: Storage Networking Ports       Max # Storage Networking Ports       10         Post Process Deduplication       Image: Storage Networking Ports       2       FC Support       Image: Storage Networking Ports       Image: Storage Networking Ports       Image: Storage Networking Ports       Image: Storage Networking Ports       10         Post Process Deduplication       Image: Storage Networking Ports       Image: Storage: Storage: Storage: Storage: Storage: Storage: Storage: Storag	FC
Verify Data Integrity / Rate       Image: Construct of the second s	
Inline Deduplication       Image: Constraint of the straint of the stra	
Post Process Deduplication       Image: Construct of the sector of the sec	
Inline/Post Process Option       Image: Concurrent FC/Ethernet Mix (Total #)       Concurrent FC/Ethernet Mix (Total #)         Deduplication Ratios by Backup Job       Image: Concurrent FC/Ethernet Mix (Total #)       Max HDDs       18         Deduplication Ratios by Backup Job       Image: Concurrent FC/Ethernet Mix (Total #)       4       5.4K RPM SATA HDDs (Max)       18         Deduplication Algorithms       1       Bundled Software (Total #)       0       7.2K RPM SATA HDDs (Max)       Image: Concurrent FC/Ethernet Mix (Total #)         Deduplication Algorithms       1       Bundled Software (Total #)       0       SSDs       Image: Concurrent HDD Mix (Total #)         CALABILITY & SUPPORT       Cloud Providers       0       Cache (Max)       Image: Concurrent HDD Mix (Total #)	
Inline/Post Process Option       Image: Constraint of the sector of the se	•
by Backup Job     Image: Concurrent HDDS (Max)       Deduplication Algorithms     1       Bundled Software (Total #)     0       FC / SAS HDDS     Image: Concurrent HDD Mix       CALABILITY & SUPPORT     Cloud Providers       Detune of the total #)     0	
Deduplication Algorithms     1     Bundled Software Licenses (Total #)     0     7.2K RPM SATA HDDs (Max)       Backup Software Natively Hosted (Total #)     0     SSDs     Image: Concurrent HDD Mix       CALABILITY & SUPPORT     Cloud Providers     0     Cache (Max)	
CALABILITY & SUPPORT     Cloud Providers     0     SSDs       Cloud Providers     0     Cache (Max)     3.150	
CALABILITY & SUPPORT Cloud Providers Cloud Providers Cache (Max) 3.150	7
CALABILITY & SUPPORT Cloud Providers Cloud Pro	•
Cloud Providers 0 Cache (Max) 3.150	ð
	GB
Replication Bandwidth	<b>)</b>
Replication Banaviating     NDMP     Processor Cores (Max)     12	1
Data Optimization Options (Total #)     2     Backup Software Streams Recognized (Total #)     3     Controllers (Max)     2	
Single Controller Replication	CoE, NFS
VTL Interface	
Single Controller Deduplication Concurrent Deduplication/Replication Partitions (Max) 2	
Warranty 3 Year Concurrently Present NAS/VTL	)
24x7x365 Single Compress/Encrypt Replicated Data	ntroller
Access Methods 4 Beplication Status Signature Global Deduplication	<b>)</b>
(10tal #) Deduplication HA	¢
Alerting Options (Total #) 3 Replication Types (Total #) 2 Storage Capacity Expansion Scale-up, S	scale-out
Battery Backup/UPS Section Ratio Display Real Time RAID Levels RAID 1	

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### Symantec NetBackup 5230



Approximate Starting List Price: \$20,000 to \$50,000

### **DCIG Scores and Rankings**

DEDUPLICATION

OVERALL Score	Deduplication	Hardware	Management	Scalability & Support	
61.67	8.75	13.51	28.91	10.50	
EXCELLENT	GOOD	GOOD	EXCELLENT	RECOMMENDED	

HARDWARE

### MANAGEMENT

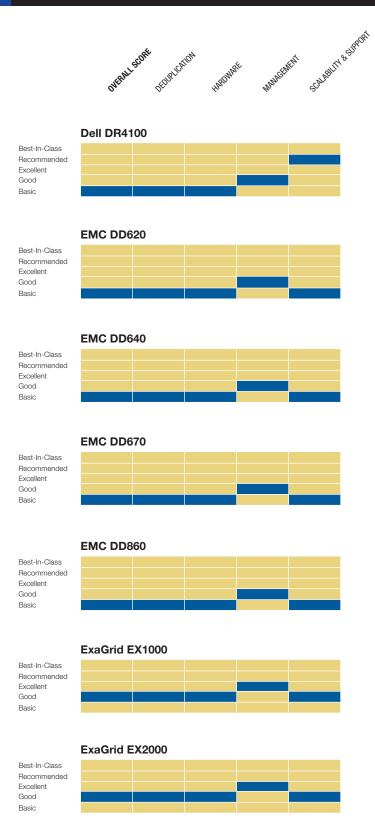
Deduplication Included	8	Max Concurrent Backup Streams	100+	Raw Storage Capacity (Max)	106TB
Compress Deduplicated Data	<b>S</b>	Encryption Options	2	Ethernet ports (Max)	8
Deduplication Level / Type	Fixed Block, Variable Length Block, Sliding Scale		-	FC Ports (Max)	10
		Instant VM Recovery	<	Storage Networking	1/10Gb Ethernet,
Bypass Deduplication	<b>S</b>	Encryption EKM	$\bigotimes$	Interfaces	8GB FC
Verify Data Integrity / Rate	<	Multi-stream Encryption	<	Max # Storage Networking Ports	16
Inline Deduplication	<b>S</b>	Encryption Methods	•	Hot Swappable Drives	<b>S</b>
Post Process Deduplication	<b></b>	(Total #)	2	FC Support	<b>S</b>
		Backup Accelerator Options	1	Concurrent FC/Ethernet Mix	<b>S</b>
Inline/Post Process Option	<b>S</b>	(Total #)		Max HDDs	42
Deduplication Ratios by Backup Job	<	Backup Accelerator Features (Total #)	4	5.4K RPM SATA HDDs (Max)	×
by backup obb	_			7.2K RPM SATA HDDs (Max)	8
Deduplication Algorithms	1	Bundled Software Licenses (Total #)	0	SSDs	⊗
		Backup Software Natively Hosted (Total #)	1	FC / SAS HDDS	<b>S</b>
				Concurrent HDD Mix	8
SCALABILITY & SUPF Replication Options	<b>20R1</b> 1:1; 1:N; N:1; 1:N:N	Cloud Providers	4	Cache (Max)	5.69GB
		(Total #)		Erasure Coding	<b>S</b>
Replication Bandwidth Throttling	<b>S</b>	NDMP	<b>S</b>	Processor Cores (Max)	12
Data Optimization Options (Total #)	2	Backup Software Streams Recognized (Total #)	6	Controllers (Max)	2
Single Controller Replication	⊗			Storage Networking Protocols	CIFS, FC, FCoE, NFS
		Native Backup Software Mgt	1	VTL Interface	$\bigotimes$
Single Controller Deduplication		Concurrent Deduplication/Replication		Partitions (Max)	4+
Warranty	3 Year		-	Concurrently Present NAS/VTL	<b>S</b>
24x7x365	<b></b>	Compress/Encrypt Replicated Data	✓	Controller Configurations	Single Controller
Access Methods	Access Methods 4		<b>S</b>	Global Deduplication	8
(Total #)	-	by Backup Job		Deduplication HA	8
Alerting Options (Total #)	3	Replication Types (Total #)	2	Storage Capacity Expansion	Scale-up
Battery Backup/UPS	<	Display Real Time Deduplication Ratio	<	RAID Levels	RAID 1 & 6

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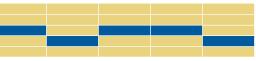
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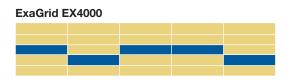
### Product Rankings Dashboard



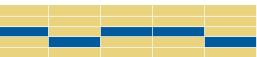


ExaGrid EX3000

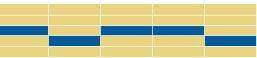




### ExaGrid EX5000



### ExaGrid EX70000



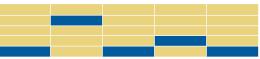
### ExaGrid EX10000E



### ExaGrid EX13000

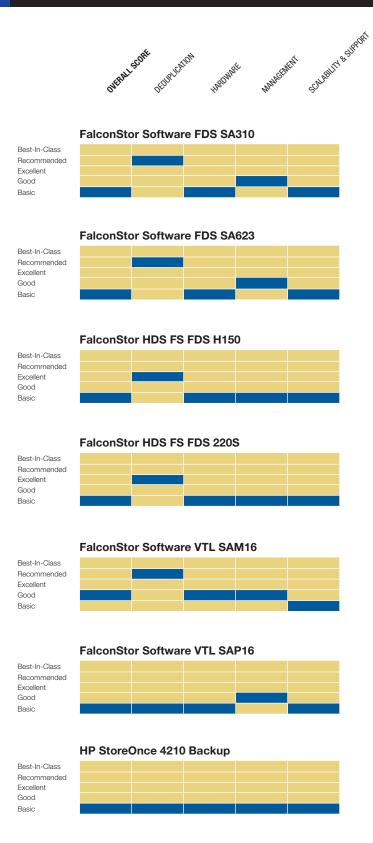


#### FalconStor Software FDS SA304



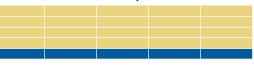
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### Product Rankings Dashboard (continued)

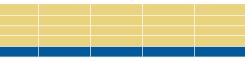




HP StoreOnce 4220 Backup



HP StoreOnce 4420 Backup



HP StoreOnce 4430 Backup



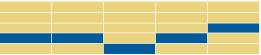
### HP StoreOnce B6200 48TB Backup System



IBM TS7620 ProtecTIER



### NEC HYDRAstor HS3-310



### **NEC HYDRAstor HS3-410**



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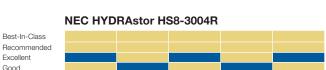
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### Product Rankings Dashboard (continued)



NEC HYDRAstor HS8-3002S

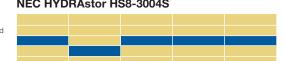
Best-In-Class Recommended Excellent Good Basic



NEC HYDRAstor HS8-3004S

Best-In-Class Recommended Excellent Good Basic

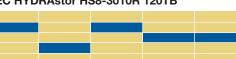
Basic



### NEC HYDRAstor HS8-3010R 120TB

Best-In-Class Recommended Excellent Good Basic

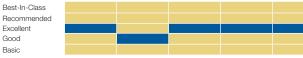
Good Basic

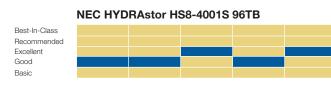


NEC HYDRAstor HS8-3020R 240TB

Best-In-Class			
Recommended			
Excellent			
Good			
Basic			
	1	1	1

NEC HYDRAstor HS8-4001S 12-48TB



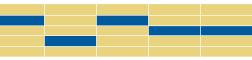


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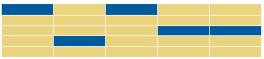
NEC HYDRAstor HS8-4002S 96TB



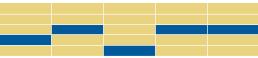
NEC HYDRAstor HS8-4002S 192TB



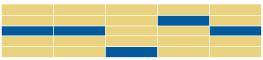
### NEC HYDRAstor HS8-4006R 720TB



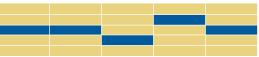
### Quantum DXi4601



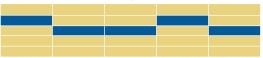
### Quantum DXi6700 Series



### Quantum DXi6802



### Quantum DXi8500 Enterprise



THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

### Product Rankings Dashboard (continued)



Sepaton S2100-ES Series 2925

Best-In-Class			
Recommended			
Excellent			
Good			
Basic			

Symantec Backup Exec 3600 Appliance



### Symantec NetBackup 5030

Best-In-Class	
Recommended	
Excellent	
Good	
Basic	

### Symantec NetBackup 5230

Best-In-Class			
Recommended			
Excellent			
Good			
Basic			

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

## **APPENDIX**

Appendix A: Definitions, Explanations and Terminology Appendix B: Provider Contact Information Appendix C: Author Contact Information

THE INSIDER'S GUIDE TO EVALUATING MIDRANGE DEDUPLICATING BACKUP APPLIANCES

### Appendix A—Definitions, Explanations and Terminology

### **Definitions, Explanations and Terminology**

This section contains brief definitions and/or explanations of the terms used when developing the data sheets found in the DCIG 2013 Midrange Deduplicating Backup Appliance Buyer's Guide.

### **Deduplication**

### **Deduplication Included**

Deduplicating backup appliances may or may not include deduplication software as part of their backup appliance; this indicates that deduplication software is part of the offering.

### **Compress Deduplicated Data**

Data deduplication does not eliminate spaces or leading zeros that may be found in a backup job. It is only after data is deduplicated that it is compressed. This typically adds by a factor of 2-3X the total amount of data that can be stored on the appliance.

### **Deduplication Level/Type**

This reflects the level of granularity of deduplication provided by the appliance. All deduplication appliances deduplicate data at the block level which breaks the backup data stream into blocks (called chunking). Some use variable length blocks which break the backup data stream at various points while some use fixed block which breakup the backup data stream based upon preset parameters.

### **Bypass Deduplication**

Some data does not deduplicate well (videos, images, etc.) If this feature is supported and turned on, ingested data will bypass the deduplication process and be stored in its native format.

### Verify Data Integrity/Rate

After the data is stored, an algorithm is run against the stored data to verify that the data written is what was supposed to be written. The stored data is also checked periodically to verify it is still readable and the media on which it resides has not become corrupted or degraded such that the data is unreadable or inaccessible.

### **Inline Deduplication**

Data is deduplicated as it is ingested into the deduplicating backup appliance and before it is stored to disk.

### **Post Process Deduplication**

Data is first stored to disk on the deduplicating backup appliance in its native or raw format and then deduplicated.

### **Inline/Post Process Option**

The appliance may be configured to either deduplicate data using the inline or post process technique.

### **Deduplication Ratios by Backup Job**

Deduplication Ratios by Backup Job allows administrators to see how successful deduplication is by the backup job being carried out.

### **Deduplication Algorithms**

These are the various deduplication algorithms used by the deduplicating backup appliance. Options include hashing, delta differencing, variable length block, fixed length block and sub-file. The total number of algorithms supported is listed here. For a detailed list of exactly which algorithms are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### **Scalability & Support**

### **Replication Options**

If replication is supported, this indicates what options the midrange deduplicating backup appliance offers to configure data replication. (1:1, 1:N, N:1, or N:N)

### **Replication Bandwidth Throttling**

If replication is supported, this indicates if the midrange deduplicating backup appliance can control or throttle data as it is replicated.

### **Data Optimization**

If replication is supported, this indicates if the midrange deduplicating backup appliance optimizes data as it is replicated.

### **Single Controller Replication**

If replication is supported, this indicates if the midrange deduplicating backup appliance can dedicate a single controller to data replication.

### **Single Controller Deduplication**

This indicates if the midrange deduplicating backup appliance can dedicate a single controller to data deduplication.

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### Appendix A—Definitions, Explanations and Terminology (continued)

### Warranty

This indicates the standard warranty that is offered with the deduplication appliance.

### 24x7x365

This indicates if phone support is available 24x7x365.

### Access Methods (Total #)

This lists all of the methods in which IT organizations can access support from the provider. The total number of access methods is listed here. For a detailed list of exactly which access methods are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### Alerting Options (Total #)

This lists all of the methods which the midrange deduplicating backup appliance provides alerts as to its conditions. The total number of access options is listed here. For a detailed list of exactly which access methods are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### **Battery Backup/UPS**

This indicates if the midrange deduplicating backup appliance natively provides a battery backup and/or UPS (uninterruptible power supply) for availability in the event of a power outage.

### Management

### Max Concurrent Backup Streams

The maximum number of backup streams that a target-based midrange deduplicating backup appliance can ingest at one time. For example, if the maximum number is 32, that means that 32 backup jobs can be executing on backup clients and concurrently sending data to the target.

### **Encryption Options**

The total number of encryption options is listed here. The two available options are in-transit and at-rest encryption and both provide a level of security. In-transit encryption encrypts data as it is sent from the source to the target and at-rest encryption encrypts data where it resides on disk. For additional details on supported access encryption options, please access the DCIG Interactive Buyer's Guide (IBG).

### Instant VM Recovery

If a Deduplicating Backup Appliance offers the ability to recover a virtual machine, this indicates the speed at which recovery is possible.

### **Encryption EKM**

Extensible Key Management (EKM) is generally used in a tape environment where a key is required to transfer data between users. EKMs may also be encrypted to provide an additional level of security.

### **Multi-stream Encryption**

Deduplicating Backup Appliances may be able to encrypt data streams sent to a second location for replication. While most use encryption for this purpose, some may not be able to function in a multi-stream replication environment.

### Encryption Methods (Total #)

The total number of encryption options is listed here, with possible options being AES-128 and/or AES-256 bit. These are security algorithms initially introduced by the U.S. Government. For additional details on supported access encryption methods, please access the DCIG Interactive Buyer's Guide (IBG).

### Backup Accelerator Options (Total #)

Indicates if the midrange deduplicating backup appliance offers any software or option to accelerate the performance of backup software when doing backups. The total number of backup acceleration options is listed here. For a detailed list of exactly which backup accelerator options are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### Backup Accelerator Features (Total #)

Lists the number of backup accelerator features speeding the deduplication process. For example, Symantec's OST offers three accelerator features: optimized duplication, path to tape, and also optimized synthetics, a way of creating backup representations through a combination of full and incremental backups. For a detailed list of exactly which backup accelerator features are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### Bundled Software Licenses (Total #)

This lists what software licenses are bundled with the midrange deduplicating backup appliance when it is purchased. The total number of backup acceleration options is listed here. For a detailed list of exactly which backup accelerator options are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### Backup Software Natively Hosted (Total #)

This indicates whether or not backup software is hosted on the appliance. Backup software can be hosted on the

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### Appendix A—Definitions, Explanations and Terminology (continued)

appliance or accessed through the appliance and hosted elsewhere. The total number of backup software products natively hosted is listed here. For a detailed list of exactly which backup software products are natively hosted, please access the DCIG Interactive Buyer's Guide (IBG).

### Cloud Providers (Total #)

Indicates if the deduplicating backup appliance provides direct access to cloud storage and which cloud providers are offered as available options. The total number of cloud providers supported is listed here. For a detailed list of exactly which cloud providers are supported, please access the DCIG Interactive Buyer's Guide (IBG).

### NDMP

Network Data Management Protocol (NDMP) is a protocol for moving data to a backup appliance without going through the backup server, in turn providing a direct path to backup. Network Data Management Protocol expedites the backup process.

### Backup Software Streams Recognized (Total #)

Deduplicating backup appliances integrate with various backup software products. The number of backup streams recognized indicates how many backup streams the appliance recognizes from the backup software; a higher number means it can duplicate its backup stream in a more optimal manner. For a detailed list of exactly which backup software streams the appliance recognizes, please access the DCIG Interactive Buyer's Guide (IBG).

### Native Backup Software Mgt (Management)

This lists the various backup software products which can manage the deduplicating backup appliance. The total number of backup software products that can natively manage the appliance is listed here. For a detailed list of exactly which backup software products can natively manage the appliance, please access the DCIG Interactive Buyer's Guide (IBG).

### **Concurrent Deduplication/Replication**

Indicates whether the Deduplicating Backup Appliance can deduplicate incoming data as it replicates or it must send the data to a second location for storage.

### **Compress/Encrypt Replicated Data**

If supported, deduplication devices are able to encrypt or compress data as it is replicating, in turn providing an additional layer of security.

### **Replication Status by Backup Job**

This indicates if the deduplicating backup appliance supports the replication of data associated with specific backup jobs.

### Replication Types (Total #)

Indicates the maximum number of replication options supported by the midrange deduplicating backup appliance. The total number of replication types is listed here. For a detailed list of exactly which replication types are supported by the appliance, please access the DCIG Interactive Buyer's Guide (IBG).

### **Display Real Time Deduplication Ratio**

Indicates if the midrange deduplicating backup appliance displays the deduplication ratio it is achieving in real time.

### Hardware

### **Raw Storage Capacity (Max)**

Lists the maximum number of raw storage capacity supported by the midrange deduplicating backup appliance.

### **Ethernet Ports (Max)**

The maximum number of Ethernet ports (1 or 10 Gb) supported by the midrange deduplicating backup appliance.

### FC Ports (Max)

The maximum number of FC (Fibre Channel) ports supported by the midrange deduplicating backup appliance.

### **Storage Networking Interfaces**

Lists all of the storage networking interfaces supported by the midrange deduplicating backup appliance. Examples include 1/10 Gb Ethernet and FC.

### Max # Storage Networking Ports

Regardless of the type of ports offered (1/10GbE or 4/8Gb FC) this shows the total number of ports supported by the deduplicating backup appliance.

### **Hot Swappable Drives**

If hot swappable drives are available, the appliance does not need to be taken offline while a drive is changed out on the fly should one drive fail.

### FC Support

Fibre Channel is used as a storage networking protocol to transmit data between computer devices, such as a server and a storage appliance.

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### Appendix A—Definitions, Explanations and Terminology (continued)

### **Concurrent FC/Ethernet Mix**

Indicates if the midrange deduplicating backup appliance supports a concurrent mix of Ethernet and FC ports.

### Max HDDs

The maximum number of internal hard disk drives (HDDs) that the midrange deduplicating backup appliance supports.

### 5.4K RPM SATA HDDs (Max)

This lists the largest capacity 5.4K RPM SATA HDD it supports.

### 7.2K RPM SATA HDDs (Max)

7.2K RPM SATA internal HDDs are offered on all midrange deduplicating backup appliances. This lists the largest capacity it supports.

### SSDs

Indicates whether Solid State Drives (SSDs) are offered or if the Deduplicating Backup Appliances uses the more standard SATA disk drive. SSDs provide performance than SATA drives and use less power because they have no moving parts.

### FC/SAS HDDs

Indicates that the deduplicating backup appliance uses either FC or SAS disk drives. Other options include SATA and Solid State Drives (SSDs), which are noted elsewhere on the data sheet. The types differ in their connection used. For example, SAS drives use the Serial Attached SCSI (SAS) serial protocol, as opposed to the Serial Advance Technology Attachment (SATA).

### **Concurrent HDD Mix**

Indicates if the midrange deduplicating backup appliance supports a mix of different HDD types.

### Cache (Max)

Indicates the maximum capacity of the midrange deduplicating backup appliance's cache storage.

### Erasure Coding

Erasure coding offers data protection by breaking data into fragments. The fragmented data is then expanded and encoded with redundant data and stored across multiple disks or other storage locations.

### **Processor Cores (Max)**

The number of processor cores offered by deduplicating backup appliances play a role in their processing speed.

The backup appliances in this report may contain dual or quad core processors and may have a number of each. This lists the maximum number of processor cores supported by the appliance.

### Controllers (Max)

Lists the maximum number of controllers supported by the midrange deduplicating backup appliance.

### **Storage Networking Protocols**

Lists the storage networking interfaces supported by the midrange deduplicating backup appliance. Examples include CIFS, FC, NFS, and OST.

### **VTL Interface**

Indicates if the midrange deduplicating backup appliance offers a Virtual Tape Library (VTL) interface.

### Partitions (Max)

Indicates if the midrange deduplicating backup appliance can be partitioned either logically or physically so each partition can operate as its own independent midrange deduplicating backup appliance with its own administrators. If supported, the maximum number of partitions is listed.

### **Concurrently Present NAS/VTL**

Indicates if the midrange deduplicating backup appliance supports a concurrent mix of NAS and VTL interfaces.

### **Controller Configurations**

Lists what controller configurations the midrange deduplicating backup appliance offers.

### **Global Deduplication**

Global Deduplication is a way of configuring a multicontroller system so one controller does the deduplication and spreads the deduplicated data across multiple nodes.

### **Deduplication HA**

High availability deduplication addresses a scale-out multi-node environment and guarantees an operational level of uptime.

### Storage Capacity Expansion

Indicates if the midrange deduplicating backup appliance supports the addition of external storage capacity.

### **RAID Levels**

Indicates what RAID options the midrange deduplicating backup appliance supports.

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### Appendix B—Technology Provider Contact Information

### **Technology Provider Contact Information**

#### Dell, Inc.

1 Dell Way Round Rock, TX 78682 +1.800.671.3355 http://www.dell.com

#### **EMC Corporation**

176 South Street Hopkinton, MA 01748 info@isilon.com +1.866.438.3622 http://www.emc.com

#### ExaGrid Systems, Inc.

2000 West Park Drive Westborough, MA 01581 info@exagrid.com +1.800.868.6985 http://www.exagrid.com

#### FalconStor Software, Inc.

2 Huntington Quadrangle, 2S01 Melville, NY 11747 +1 631.777.5188 http://www.falconstor.com

#### **Hewlett-Packard Corporation**

3000 Hanover Street Palo Alto, CA 94304 +1.866.625.0242 http://www.hp.com

#### **IBM Corporation**

1 New Orchard Rd Armonk, NY 10504-1722 callserv@ca.ibm.com +1.800.426.4968 http://www.ibm.com/storage

#### **NEC Corporation of America**

2880 Scott Blvd Santa Clara, CA 95050 +1.408.844.1475 http://www.necam.com

#### **Quantum Corporation**

1650 Technology Drive, Suite 700 San Jose , CA 95110-1382 +1.408-944-4000 http://www.guantum.com

#### Sepaton, Inc.

400 Nickerson Rd. Marlborough, MA 01752-4658 +1.866.737.2866 http://www.sepaton.com

#### **Symantec Corporation**

350 Ellis Street Mountain View, CA 94043 +1.650.527.8000 http://www.symantec.com

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### Appendix C—Author Contact Information

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