

Backup Exec™ 2014 Technical White Paper

Deduplication Option

Who should read this paper

Technical White Papers are designed to introduce Symantec partners and end users to key technologies and technical concepts that are associated with the Symantec Backup and Recovery product family. The information within a Technical White Paper will assist partners and end users as they design and implement data protection solutions based on Symantec Backup and Recovery products.

Technical White Papers are authored and maintained by the Symantec Backup and Recovery Technical Services group.



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Introduction

This white paper is intended to assist technical personnel as they design and implement Backup Exec 2014 and the Deduplication Option and make related decisions. The business value of the Deduplication Option will also be considered in this white paper.

This white paper will explore the following topics related to the Backup Exec 2014 deduplication technology:

- Business Value
- Underlying Principles
- Backup Exec Partner Toolkit
- Performance Notes and Recommendations
- General Best Practices

For step-by-step instructions for installing and managing Backup Exec 2014 and the Deduplication Option, please refer to the Backup Exec 2014 Administrator's Guide available here: [TECH205797](#).



Business Value

Modern Data Management and Protection Challenges

Customers of all types and sizes are seeking new and innovative ways to overcome challenges associated with data growth and storage management. While these challenges are not necessarily new, they continue to become more complex and more difficult to overcome due to the following:

- Pace of data growth has accelerated
- Location of data has become more dispersed
- Linkages between data sets have become more complex

Data and storage management challenges are compounded by the need for companies to protect critical data assets against disaster through backup and recovery solutions. In order to maintain backups of critical data assets, additional secondary storage resources are required. This additional layer of backup storage must be implemented wherever backups occur, including central data centers and remote offices.

Storage Efficiencies through Data Deduplication

Backup Exec 2014 includes advanced data deduplication technology that allows companies to dramatically reduce the amount of storage required for backups, and to more efficiently centralize backup data from multiple sites for assured disaster recovery. These data deduplication capabilities are available in the Backup Exec 2014 Deduplication Option.

Backup Exec 2014 Data Deduplication Technology

The data deduplication technology within Backup Exec 2014 breaks down streams of backup data into “blocks.” Each data block is identified as either unique or non-unique, and a tracking database is used to ensure that only a single copy of a data block is saved to storage by that Backup Exec server. For subsequent backups, the tracking database identifies which blocks have been protected and only stores the blocks that are new or unique. For example, if five different client systems are sending backup data to a Backup Exec server and a data block is found in backup streams from all five of those client systems, only a single copy of the data block is actually stored by the Backup Exec server. This process of reducing redundant data blocks that are saved to backup storage leads to significant reduction in storage space needed for backups.

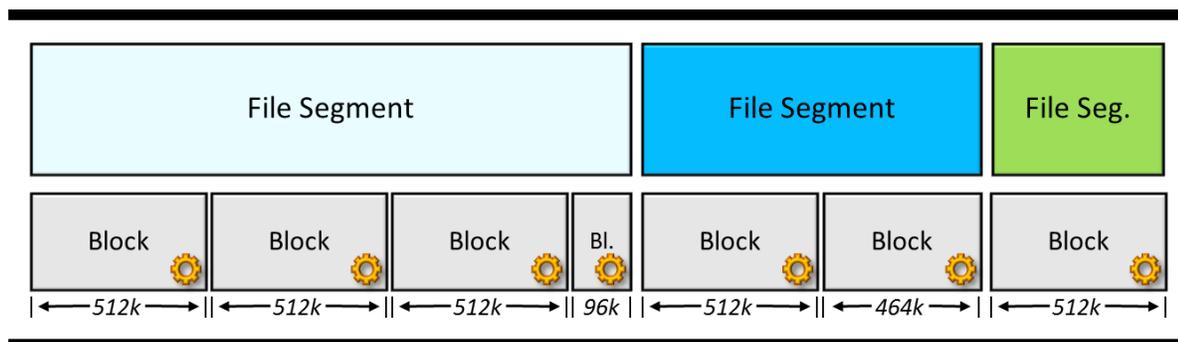


Figure 1: Deduplication Process

The deduplication technology within Backup Exec is applied across all backups managed by a deduplication-enabled Backup Exec server.

Deduplication Methods within Backup Exec 2014



The Backup Exec 2014 Deduplication Option gives administrators the flexibility to choose when and where deduplication calculations take place. Three deduplication methods are supported by Backup Exec 2014. These are as follows:

- **Client Deduplication**

The client deduplication method is a software-driven process. Deduplication takes place at the *source* or protected client, and backup data is sent over the network in deduplicated form to the Backup Exec server. Only unique blocks of backup data are sent to the backup server and saved to backup storage; non-unique blocks are skipped.

- **Backup Exec Server Deduplication**

The Backup Exec server deduplication method is also a software-driven process. Deduplication takes place after backup data has arrived at the Backup Exec server and *just before data is stored to disk* (also known as inline deduplication). Only unique blocks of backup data are stored; non-unique blocks are skipped.

- **Appliance Deduplication**

The appliance deduplication method is a hardware-driven process. Deduplication takes place *on the deduplication appliance* (can be in-line or post-process deduplication, for example, ExaGrid or Quantum). 3rd-party deduplication devices handle all aspects of deduplication.

Administrators can mix and match deduplication methods to fit their unique needs. For example, a single Backup Exec server enabled for deduplication can simultaneously use client deduplication for some jobs, Backup Exec server deduplication for others, and appliance deduplication for yet another set of jobs.

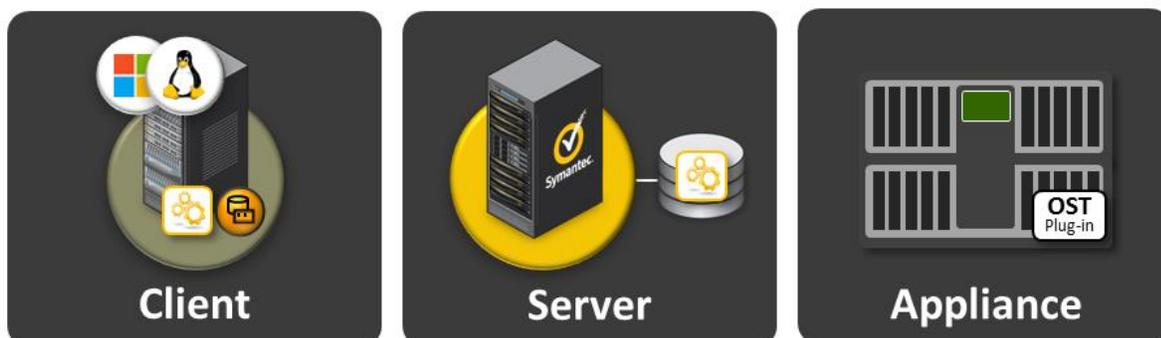


Figure 2: Deduplication Methods

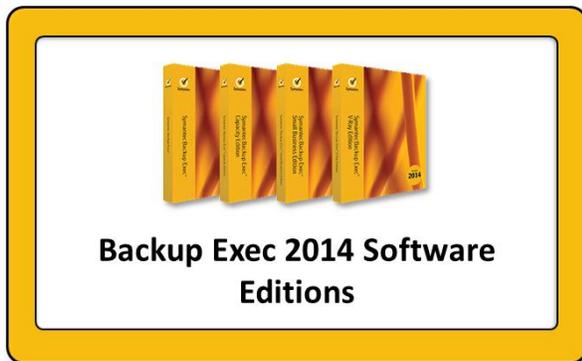
The different deduplication methods supported by Backup Exec 2014 have various configurations for which they are best suited. The benefits of each method, as well as the configurations for which each method is best suited, is detailed in the following sections.

Symantec Backup Exec

Symantec Backup Exec™ delivers powerful, flexible, and easy-to-use backup and recovery to protect your entire infrastructure whether built upon virtual, physical, or a combination of both. Using modern technology, Backup Exec backs up local or remote data to virtually any storage device including tape, disk and cloud. Recovery is fast and efficient. With a few simple clicks, you can quickly search and restore granular file or application objects, applications, VMs, and servers directly from backup storage. Additionally, easily protect more data while reducing storage costs through integrated deduplication and archiving technology.



- **Powerful:** Super charge the performance of your backup with Backup Exec. Get fast and reliable backups that are up to 100% faster than prior releases, comprehensive and innovative virtualization capabilities, and powerful built-in data deduplication and archiving. Avoid lengthy downtime and missing a critical backup window with Backup Exec.
- **Flexible:** Not all backup solutions have the flexibility to protect your environment while also supporting agile recovery. You should be able to recover what you need, when you need it - quickly and easily. Whether you want to recover a single, critical file or an entire server, Backup Exec can quickly search and restore without mounting or staging multiple backup jobs. Backup Exec protects hybrid architectures with a single solution that backs up to virtually any storage device and achieves fast, efficient, versatile recovery.
- **Easy to use:** Traditional, complex and point backup and recovery solutions can be inefficient, time consuming, and expensive to manage. Through intuitive wizards and insightful dashboards, Backup Exec is easy to implement, use and manage, whether you're upgrading from a previous version or switching from an alternative solution.



Unified Virtual and Physical Protection in a Single Solution



Underlying Principles

Deduplication Methods

Client Deduplication

With Backup Exec 2014, exciting possibilities for remote office protection are available. The concept of client deduplication – where the remote system is responsible for deduplication calculations and where backup data is sent over the network in its deduplicated form – can make the process of protecting remote offices a much more streamlined experience. Remote offices can be challenging to protect effectively; WAN environments may only utilize a fraction of the bandwidth available to a LAN backup. Backups over the WAN can be a challenge to set up, as well as to complete. Some environments include backup servers that are not as powerful as the application servers they are protecting – often, the SQL server or the Exchange server in the environment is the most powerful machine available in terms of processor speed or disk throughput. Where appropriate, why not leverage some of this remote computing power to achieve faster backups? Both of these situations are problems where client deduplication can offer a comprehensive solution to the data protection challenges brought on by the environment.

Generally, remote office backup strategies have two basic architectures. First, there are remote offices which do not have local storage, and where backup data is sent directly over the LAN or WAN to the central data center for storage. Second, there are remote offices that employ local storage and then “forward” that locally stored backup data to the central data center for protection. Both of these configurations can use the Backup Exec 2014 Deduplication Option to streamline and improve backup and recovery for remote offices.

Client deduplication is the act of skipping redundant data blocks at the backup source before transmitting the backup stream to the Backup Exec server. Data from the source system is refined into smaller deduplication blocks, and only the unique blocks (that is, the data the Backup Exec server doesn't yet contain) are sent to the Backup Exec server's deduplication disk storage device.

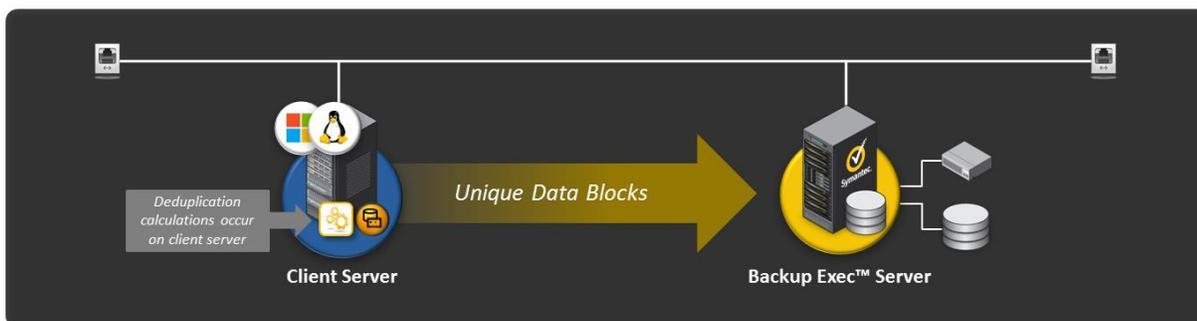


Figure 3: Client Deduplication

A deduplication disk storage device is special type of disk storage configured by Backup Exec where all deduplication data blocks are stored. With the client deduplication method, the majority of the processing necessary for deduplication is done on the remote system rather than as the data arrives at the Backup Exec server. Client deduplication is the default deduplication method Symantec recommends for several reasons:

- **Increased Scalability**
Client deduplication enables greater scalability by spreading processor usage out across all clients running backups, enabling the Backup Exec server to process more concurrent backups.
- **Reduced Network Data Transfers**



Client deduplication minimizes network data transfers as only unique data blocks – not yet stored by the Backup Exec server – are transferred. Most environments – either LAN or WAN environments – can benefit from less data being sent across the network.

Each Backup Exec Agent for Windows and Agent for Linux has the built-in capability to perform client deduplication calculations. Note that all deduplication operations require the Deduplication Option to be licensed on the Backup Exec server.

Backup Exec 2014 Agent	Client Deduplication Support
Agent for Windows	Yes
Agent for Linux	Yes
Agent for Mac	No
Agent for Applications and Databases	Yes
Agent for VMware and Hyper-V (VMware)	No*
Agent for VMware and Hyper-V (Hyper-V)	Yes**

*While it is possible to utilize client deduplication when protecting VMware virtual machines, this configuration requires that backups be processed by locally installed agents within the virtual machines themselves (the Agent for Windows or the Agent for Linux). This configuration bypasses the optimized, image-level backup capabilities of the Agent for VMware and Hyper-V in VMware environments. For these reasons, using client deduplication in VMware environments is generally not recommended. Backup Exec server deduplication is usually optimal.

**Client deduplication can be used when protecting Hyper-V environments using the Agent for VMware and Hyper-V. In this configuration, optimized, image-level backups of virtual machines are captured and deduplicated through the Backup Exec Agent for Windows installed locally to the Hyper-V host. It is not necessary to install an individual agent into each Hyper-V virtual machine in order to realize client deduplication in Hyper-V environments.

Backup Exec Server Deduplication

Do you have VMware ESX or vSphere servers with high average processor utilization? If so, the Backup Exec server deduplication method can be a useful and effective deduplication solution for these environments. This method of deduplication is performed entirely on the Backup Exec server and does not impact source systems any more than a typical backup would.

The Backup Exec server deduplication method performs the deduplication processes against data when it arrives at the Backup Exec server – that is, just before the data is laid down on disk. Data is transmitted in its whole, un-deduplicated form, and then decomposed into deduplication blocks in-line by the Backup Exec server. Only the unique data blocks (that is, the data that the deduplication disk storage device doesn't yet contain) are stored.

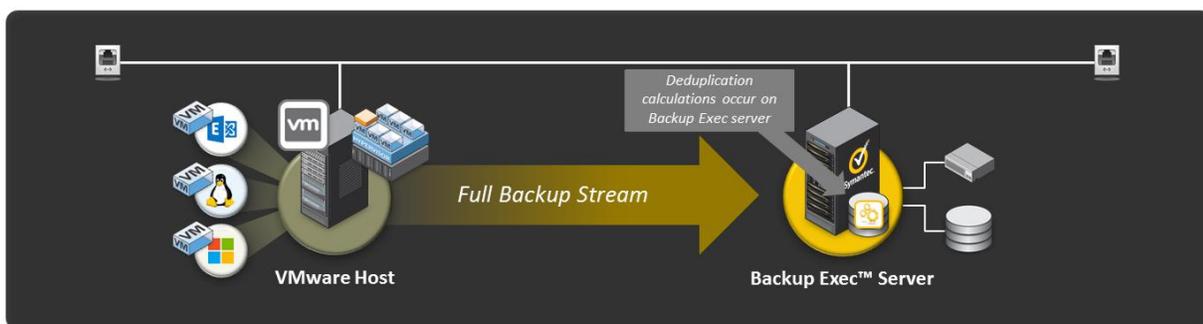


Figure 4: Backup Exec Server Deduplication

The Backup Exec server deduplication method is optimal for situations where:



- **High Processor Utilization on Remote Servers**

If the remote system has no processor cycles to spare for deduplication calculations, Backup Exec server deduplication can take the load and still perform deduplication.

- **VMware Environments**

When using the Agent for VMware and Hyper-V to capture image-level backups of VMware virtual machines, Backup Exec server deduplication must be used.

Backup Exec server deduplication is *not* recommended for the following environments:

- **Remote Office Protection Over a WAN**

With Backup Exec server deduplication, the Backup Exec server receives the entire data set before deduplication takes place. This is not a WAN-friendly method of deduplication. Generally, remote office protection without local storage should use client deduplication.

Any Backup Exec server that has the Deduplication Option licensed can utilize the Backup Exec server deduplication method. Most agents and backup types supported by Backup Exec can take advantage of the space savings inherent with Backup Exec server deduplication.

Backup Exec 2014 Agent	Backup Exec Server Deduplication Support
Agent for Windows	Yes
Agent for Linux	Yes
Agent for Mac	Yes
Agent for Applications and Databases	Yes
Agent for VMware and Hyper-V (VMware)	Yes
Agent for VMware and Hyper-V (Hyper-V)	Yes

Appliance Deduplication

Some Backup Exec customer environments have an existing investment in deduplication-enabled appliances for onsite backup, offsite storage (disaster recovery), and remote office protection. The appliance deduplication method is an excellent fit for these environments.

The appliance deduplication method uses Symantec's OpenStorage (OST) technology in conjunction with both a 3rd-party deduplication appliance and a manufacturer-developed OST plug-in. Together, these components enable the following:

- **Intelligent Replication Tracking**

Many 3rd party deduplication appliances include a replication feature enabling data to be efficiently copied from one device to another downstream device. When backup data is transferred by a Backup Exec server to a deduplication appliance through the OST plug-in, the Backup Exec server is able to track when data is replicated to additional appliances. This allows the Backup Exec server to be able to restore data from both the original deduplication appliance or from any of the additional appliance replication destinations.

Appliance deduplication requires that the Backup Exec server be paired with one or more supported OST-based deduplication appliances. Symantec Backup Exec is committed to expanding the breadth and depth of OST partners certified to work with Backup Exec, so additional OST devices are being certified and supported as they complete Backup Exec's internal qualification processes.

Note: For more information on supported 3rd-party appliances compatible with the OST-based appliance deduplication technology within Backup Exec 2014, please refer to the Backup Exec 2014 Hardware Compatibility List (HCL) available



here: [TECH175582](#).

Deduplication Use Case Recommendations

Use Case	Client Deduplication	Backup Exec Server Deduplication	Appliance Deduplication
Remote Windows Servers	✓		
Remote Linux Servers	✓		
Remote Mac Servers		✓	✓
Applications on physical Windows Servers	✓		
Applications on Linux (SAP, Oracle, etc.)	✓		
VMware Virtual Machine backups		✓	
Hyper-V Virtual Machine backups	✓		
Off-Host VMware backups (SAN)		✓	
Remote Office backups - no local storage	✓		
Remote Office backups with local storage	✓*		✓
Investment in deduplication appliance			✓

*It is recommended that client D\deduplication be used to store backups of servers located in a remote office to a Backup Exec server that is also located in the same remote office. Use optimized duplication to copy deduplicated backup data from the remote Backup Exec server to a Backup Exec server at a central office location.

Data Deduplication and Virtual Machine Backups

The Backup Exec 2014 Agent for VMware and Hyper-V enables optimized, image-level backups of both VMware and Hyper-V virtual machines. This is accomplished by capturing backups through communication with the VMware or Hyper-V virtual host. However, deduplication recommendations differ between VMware and Hyper-V environments being protected by Backup Exec 2014.

Deduplication of Image-level VMware Backups

While it is possible to utilize client deduplication when protecting VMware virtual machines, this configuration requires that backups be processed by locally installed agents within the virtual machines themselves (either the Agent for Windows or the Agent for Linux). This configuration bypasses the optimized, image-level backup capabilities of the Agent for VMware and Hyper-V in VMware environments that take advantage of Backup Exec's advanced integration with the VMware vStorage API. For this reason, using client deduplication in VMware environments is generally not recommended. Backup Exec server deduplication is optimal.

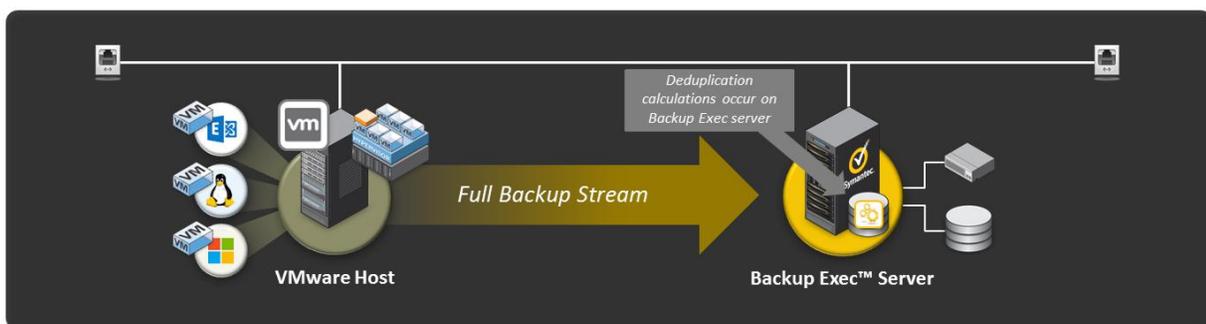


Figure 5: Backup Exec Server Deduplication of VMware Image-level Backups

Deduplication of Image-level Hyper-V Backups



Client deduplication can be used when capturing image-level backups of Hyper-V virtual machines using the Agent for VMware and the Agent for Microsoft Hyper-V. In this configuration, optimized, image-level backups of virtual machines are captured and deduplicated through the Backup Exec Agent for Windows installed locally to the Hyper-V host. It is not necessary to install an individual agent into each Hyper-V virtual machine in order to realize client deduplication in Hyper-V environments.

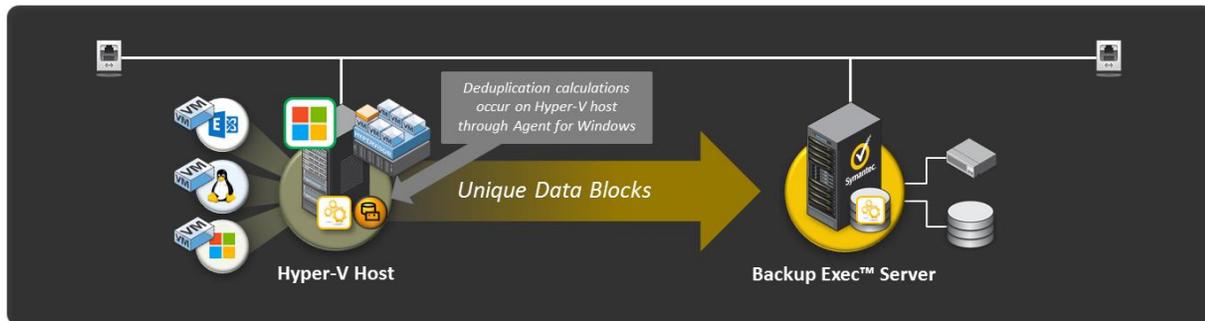


Figure 6: Client Deduplication of Hyper-V Image-level Backups

VMDK and VHD Stream Handlers

Backup Exec 2014 includes stream handler technology designed specifically for image-level backups of VMware and Hyper-V virtual machines captured through the Agent for VMware and Agent for Microsoft Hyper-V. The stream handler technology within Backup Exec operates invisibly, meaning no additional management or configuration adjustments are required on the part of the administrator.

The stream handler technology within Backup Exec applies to both client and Backup Exec server deduplication. The stream handlers enable variable-length segmenting of VMware (VMDK) and Hyper-V (VHD) disk files during deduplication calculations. This aligns deduplication blocks to file extent boundaries within the virtual disk, and data changes over time within virtual disk files result in fewer unique blocks. This translates into better storage savings across both VMware and Hyper-V backups when using the Backup Exec 2014 Agent for VMware and Agent for Microsoft Hyper-V in conjunction with the Backup Exec 2014 Deduplication Option.

Combining the Agent for VMware and the Agent for Microsoft Hyper-V with the Deduplication Option can offer significant storage savings for Backup Exec administrators, allowing them to reduce storage costs by getting the most out of the backup storage resources at their disposal.

Additional information on the Backup Exec 2014 Agent for VMware and the Agent for Microsoft Hyper-V can be found in the Backup Exec 2014 Agent for VMware and Hyper-V white papers, and in the Backup Exec 2014 Administrator's Guide and the Backup Exec 2014 Administrator's Guide Addendum.

Data Deduplication and Storing Backups to Tape

An environment with a disk-to-disk-to-tape architecture is fairly common among customers who are interested in deduplication. It's important to note that all of the Backup Exec 2014 methods of deduplication mentioned here are disk-based; deduplicated data is never stored directly to tape in its deduplicated form. However, the process of migrating deduplicated data to tape is very simple. Customers simply add an additional stage to their backup workflow that sends the data to tape storage.

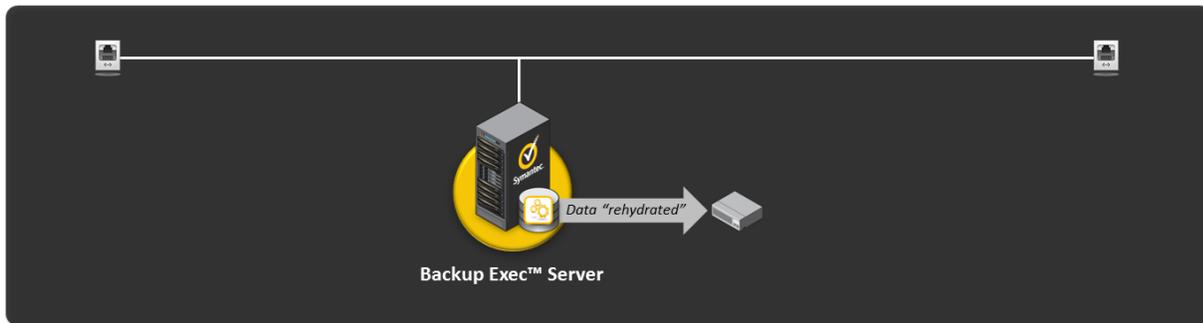


Figure 7: Data Deduplication and Storing Backups to Tape

For data that was backed up using client or Backup Exec server deduplication, the Backup Exec server is responsible for “rehydrating” the deduplicated data – meaning the process of recreating whole files from deduplicated blocks – before transferring the data to tape. There will be some impact to processor and memory usage during the tape stage of the backup workflow due to the rehydration process. While resource consumption varies based on data set, at most the tape stage of the backup workflow will use 100% of one processor core while rehydrating deduplicated data and copying it to tape.

For data that was backed up to a deduplication appliance, the deduplication appliance itself is responsible for “rehydrating” the deduplicated data prior to it being sent to tape.

Data Deduplication and Granular Recovery Technology

Backup data stored on a deduplication disk storage device hosted by a Backup Exec 2014 server or a Backup Exec 3600 Appliance is fully compatible with Backup Exec’s powerful Granular Recovery Technology. This technology enables administrators to recover granular objects, such as files, folders, and granular Exchange, SQL, SharePoint, and Active Directory components quickly and easily.

Note: For more information about Backup Exec 2014’s powerful Granular Recovery Technology, please visit the Backup Exec product page at www.backupexec.com.

Optimized Duplication

In addition to its industry-leading deduplication technology, Backup Exec 2014 allows administrators to make copies of deduplicated backup sets and transfer them to a different Backup Exec 2014 server or Backup Exec 3600 Appliance. The transfer process is optimized, meaning only unique blocks – those not already contained in the deduplication disk storage device of the destination server – are copied. This ability is known as optimized duplication.

In order to enable optimized duplication, the Backup Exec Deduplication Option must be licensed on each Backup Exec server involved in the transfer process. Copying backup sets from one Backup Exec server to one or more additional Backup Exec servers using optimized duplication makes the same backup data available for recovery at multiple locations, thereby offering a convenient disaster recovery solution. Optimized duplication works just like a duplicate stage from “disk to tape” or “disk to disk to tape”, but the destination is the deduplication disk storage device on another Backup Exec server and is optimized by deduplication technology. Some additional advantages of optimized duplication include the following:

- Avoids rehydration of data while transferring it over the network or WAN
- Copies only unique data blocks not already contained by the destination Backup Exec server
- Transfers backup data significantly faster than traditional or non-optimized copy events



The benefits of optimized duplication can be very dramatic in subsequent backup operations in situations where data change rates are low.



Backup Exec Partner Toolkit

Overview

To assist partners and end users as they implement Backup Exec 2014 and the Backup Exec 3600 Appliance, Symantec has released the Backup Exec Partner Toolkit. The Backup Exec Partner Toolkit demonstrates the power of the Backup Exec data protection portfolio by qualifying the hardware configuration of potential backup servers to ensure they will perform to expectations, by calculating front-end capacity amounts to streamline the Backup Exec licensing process, and by demonstrating the storage optimization benefits of Backup Exec's deduplication technology.

Note: The Backup Exec Partner Toolkit is available to Symantec partners and end users at no charge and can be downloaded from the Symantec Connect portal here: [Backup Exec Partner Toolkit](#).

Business Value

The Backup Exec Partner Toolkit includes three tools designed to help partners and end users perform environmental assessments either before or after installing a Backup Exec solution. These are as follows:

- **Performance Analyzer** - The Performance Analyzer Tool will assess the readiness of one or more server systems to act as a Backup Exec server. Each server's hardware and software configuration is analyzed for performance inhibitors, including any disk and tape backup devices attached to that server.
- **Deduplication Assessment Tool** - The Deduplication Assessment Tool will directly demonstrate the value of Backup Exec's deduplication technology to partners and end users by scanning one or more servers in an environment and offering deduplication ratio and backup storage savings estimates.
- **Front-end Capacity Analyzer** - The Front-end Capacity Analysis Tool will easily and quickly identify the amount of front-end data in an environment and greatly streamlines the process of selling the Backup Exec Capacity Edition, which is licensed against the amount of front-end data in an environment.

Ease of Use

By design, the Backup Exec Partner Toolkit offers a wizard-driven experience that is very easy to use. Simply select the tool to run, identify the servers and associated volumes and application resources to scan, provide associated credentials, and run the selected operation. Upon completion, a results screen is displayed in the form of a report which can be saved to a number of common file formats.

Platform and Application Support

The Backup Exec Partner Toolkit supports Windows 2003, Windows 2008, and Windows 2012 x86 and x64 platforms, including both physical and virtual systems. Front-end capacity analysis is supported for Windows volumes. Deduplication analysis is supported for Windows volumes, Exchange application data, and SQL application data. Performance analysis is supported for any server running Windows 2003, Windows 2008, or Windows 2012 (x86 or x64).



Performance Notes and Recommendations

General Performance Enhancements

The underlying deduplication engine used in Backup Exec 2014 has been updated to a newer version as compared to previous releases. This new version of the deduplication engine includes several enhancements, including improved stability and performance.

Configuring Backup Exec's Deduplication Disk Device

Backup Exec 2014's Deduplication Option allows customers to create a single deduplication disk storage device per Backup Exec server. A deduplication disk storage device is where all deduplication blocks are stored, regardless of whether client or Backup Exec server deduplication was used for a specific backup. A Backup Exec server hosting a deduplication disk storage device can hold up to 64 TB of deduplicated data.



Figure 8: Deduplication disk storage device has 64 TB maximum capacity

Note that the deduplication disk storage device owned by the Backup Exec server is not utilized for backups and restores when appliance deduplication is used. Appliance deduplication stores all backup data on the specific appliance.

Processor Utilization with Client and Server Deduplication

Depending on the type of deduplication used, processor utilization will vary. In general, the deduplication process is not gated or throttled in any way, and is geared towards accomplishing deduplicated backups and restores of deduplicated data as quickly as possible.

Client deduplication performs the bulk of deduplication calculations on the client system. The client deduplication process will consume as much of one (1) core of one processor as it can on that client system during deduplication calculations. While the actual amount of processor utilization will depend on the amount of data to be deduplicated and the speed of the processor, expect to see at least 75% processor utilization for that processor core for the duration of deduplication processing. During catalog operations, CPU utilization on the client is very low.

Backup Exec server deduplication performs the bulk of the deduplication calculations on the Backup Exec server. Similar to client deduplication, the Backup Exec server deduplication process will consume as much of one (1) core of one processor as it can on that Backup Exec server system. While the actual amount of processor utilization will depend on the amount of data to be deduplicated and the speed of the processor, expect to see at least 75% utilization for that processor core for the duration of any Backup Exec server deduplication backup job. For both client and Backup Exec server deduplication, initial backup jobs will be the slowest.



For agents that cannot use client deduplication (Agent for Mac, etc.) there is no change to system requirements as outlined in the Backup Exec 2014 Administrator's Guide. This is also true for Windows and Linux Agents that do not choose to use client deduplication.

Memory Utilization with Client and Backup Exec Server Deduplication

With both client and Backup Exec server deduplication, the majority of memory consumption takes place on the Backup Exec server. This is primarily a performance optimization geared towards fast and accurate calculation of deduplication fingerprints. On the Backup Exec server, deduplication requires 8 GB (gigabytes) of free physical memory for up to 5 TB (terabytes) of deduplicated data stored by the Backup Exec server. For storage requirements that exceed 5 TB of deduplicated data, a formula of $1.5 \times N$, where N is the maximum size of the deduplication disk device in terabytes, is used to calculate free memory requirements. For example, if 8 TB of deduplicated data is stored, the Backup Exec server would require at 1.5×8 , or 12 GB, of free physical memory.

Memory requirements for clients using client deduplication are not very stringent. Symantec requires 1.5 GB of free physical memory on each individual client that uses client deduplication.

Data Deduplication and Incremental/Differential Backups

The data deduplication technology within Backup Exec 2014 can be combined with differential and incremental backup strategies. When doing so, the reported deduplication ratio and reduction percentage may appear to be comparatively low, but this can be attributed to the smaller backup sizes captured by differential and incremental backups.

Additional advantages of combining the data deduplication technology within Backup Exec 2014 and differential or incremental backups include smaller catalog sizes and increased verify job speeds.

Backup Exec Server Hosting a Deduplication Disk Device

Best results are realized when the Backup Exec server hosting a deduplication disk storage device is built for performance and protected against unexpected power loss/interruption events.



General Best Practices

Deduplication Option System Requirements

Backup Exec Server

In order to host a deduplication disk storage device on a Backup Exec server, the following minimum system requirements must be met:

Component	Requirement
Operating System	<ul style="list-style-type: none"> 64-bit version of Windows Windows 2003 x64 (SP2 and later) Windows 2008 x64 (all supported versions) Windows 2008 R2 x64 (all supported versions) Windows 2012 x64 (all supported versions) Windows 2012 R2 x64 (all supported versions)
Physical Memory	<ul style="list-style-type: none"> 8 GB of physical system memory for up to 5 terabytes of deduplicated storage For more than 5 TB of data, use the following: $1.5 \text{ GB} \times N$, where N = the maximum size of the deduplication disk device in TBs Appliance deduplication configurations exempt from this memory requirement
Processor	<ul style="list-style-type: none"> At least one quad-core processor or two dual core processors for the Backup Exec server Two dual-core or one or more quad-core processors are recommended
Disk	<ul style="list-style-type: none"> A dedicated, local volume with at least 5 GB of free space to host the deduplication disk device

Protected Client

For Windows or Linux Agents configured to use Client Deduplication the following minimum system requirements must be met:

Component	Requirement
Physical Memory	<ul style="list-style-type: none"> At least 1.5 GB of physical memory
Processor	<ul style="list-style-type: none"> At least 1 dual-core processor

Note: Protected clients can be either 64-bit or 32-bit versions of the platforms that Backup Exec supports.

Note: The Backup Exec server has other detailed requirements listed in the Backup Exec 2014 Administrator's Guide. Before configuring deduplication disk devices, be sure to refer to the Administrator's Guide available here: [TECH205797](#).



For More Information

Link	Description
http://www.symantec.com/connect/blogs/new-backup-exec-partner-toolkit-v10	Backup Exec Partner Toolkit
www.symantec.com/business/backup-exec-for-windows-servers	BE Family Landing Page
www.symantec.com/business/products/whitepapers.jsp?pcid=pcat_business_cont&pvid=57_1	BE White Papers
www.symantec.com/business/products/datasheets.jsp?pcid=2244&pvid=57_1	BE Datasheets, Feature Briefs
TECH205797	BE Compatibility Docs
www.backupexec.com/configurator	BE Product Configurator
www.backupexec.com/skugenerator	BE SKU Generator and BEST Tool



About Symantec

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