VERITAS™
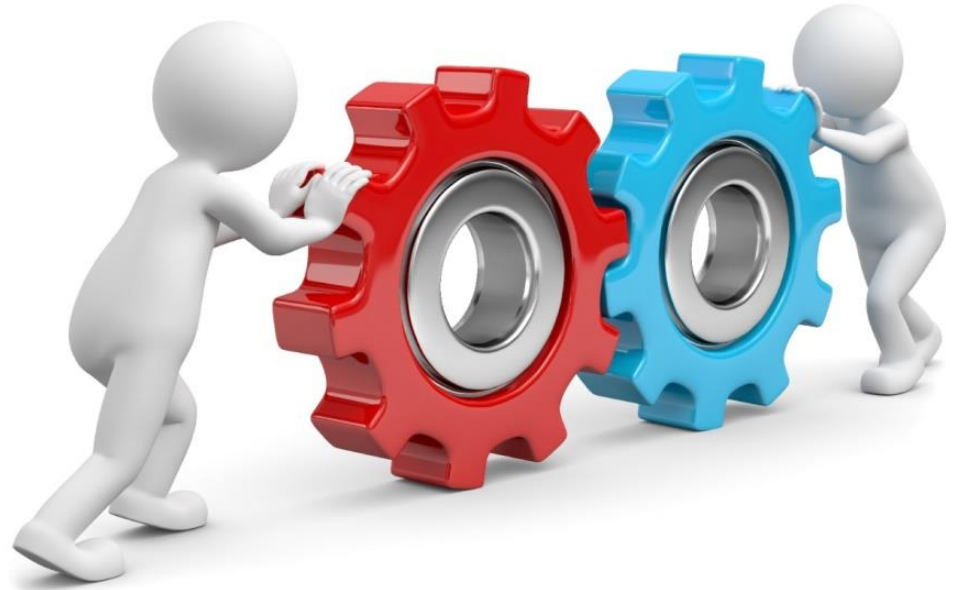
Backup Exec Best Practices

Here's how to get BE running

V 3.1

Backup Exec Best Practice Guide

- Backup Exec Best Practices Guide includes tips and recommendations to help you plan, install, upgrade, protect and backup your environment more effectively.

- Consult any of the following resources if you have questions or difficulties:

  - The *Help and Documentation* menu.

  - Use the Administrator's Guide for comprehensive information about Backup Exec.

  - Use the Backup Exec Help for searchable, topic-based documentation.

- You should always run a full backup job or make a copy before and after upgrading Backup Exec, the operating system, or any applications or files.

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Backup Exec Server Tuning
How to analyze your requirements?

- What?
  - What servers do you have to back up?
  - How much data resides on these servers?
  - What priority do the different servers have?
  - Are all servers in one site or do you need to back up over WAN?

- How?
  - Do you have a restore SLA?
  - Do you need single item restores? (i.e. application servers)
  - What kind of backups do you need to fulfill your SLA?

- Where?
  - How long do you need to retain your backup copies?
    - On site
    - Off site

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Backup Exec Server Hardware Recommendations

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Servers consist of four parts:

- CPU

- Memory

- Network

- Storage

The following slides will give a more detailed look to these components and recommendations on hardware usage for Backup Exec servers.

VERITAS

Backup Server CPU Recomendations

Hardware

Environment

Good to Know

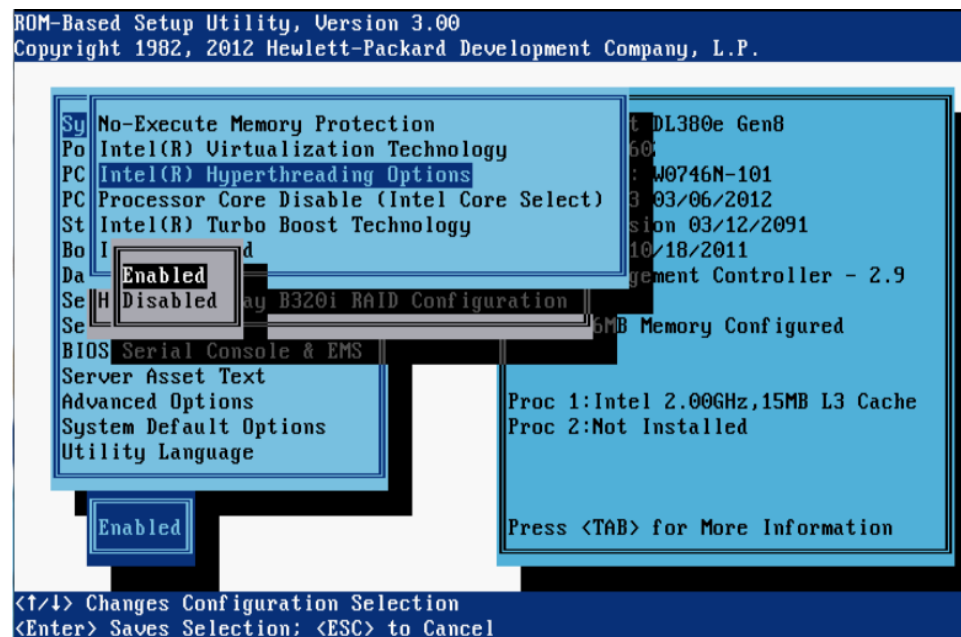Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- As of today, deduplication is not capable of using multiple cores.
- Therefore, better use CPUs with fewer but faster cores than ones with more but slower cores.
- Turn off Hyper Threading in BIOS (to speed up the cores)

```
ROM-Based Setup Utility, Version 3.00
Copyright 1982, 2012 Hewlett-Packard Development Company, L.P.

Sy  No-Execute Memory Protection          t DL380e Gen8
Po  Intel(R) Virtualization Technology      60:
PC  Intel(R) Hyperthreading Options         : W0746N-101
PC  Processor Core Disable (Intel Core Select)  3 03/06/2012
St  Intel(R) Turbo Boost Technology         sion 03/12/2091
Bo  I          d                            10/18/2011
Da     Enabled                             gement Controller - 2.9
Se  H  Disabled   ay B320i RAID Configuration
Se                                          6MB Memory Configured
BIOS  Serial Console & EMS
Server Asset Text
Advanced Options                           Proc 1:Intel 2.00GHz,15MB L3 Cache
System Default Options                      Proc 2:Not Installed
Utility Language

      Enabled
                                           Press <TAB> for More Information

<↑/↓> Changes Configuration Selection
<Enter> Saves Selection; <ESC> to Cancel
```

VERITAS

Backup Server Memory Recommendations

Hardware

Environment

Good to Know

Virtualization

Deduplication

High Availability

Tuning

Backing up

More to know

- Memory is critical for Backup Exec
- For deduplication to work you can calculate the necessary free memory (not used by OS or other applications) as follows:
    - 1,5 GB RAM per TB deduplication storage
    - Add another 8 GB for the operating system
- Example: A backup server has 20 TB of deduplication storage. Therefore it will need 20 x 1,5 + 8 = 38 GB RAM
- Since the size of a deduplication storage in Backup Exec is limited to 64 TB, the maximum RAM needed for Backup Exec servers is 64 x 1,5 + 8 = 104 GB.

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Backup Server Network Recommendations I

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- The backup server's network connection is often the bottleneck in the infrastructure.

- Especially, when doing backups directly to tape, keep the following table in mind:

LAN speed \ Tape speed	LTO 4 (190 MB/s)	LTO 5 (230 MB/s)	LTO 6 (320 MB/s)	LTO 7 (600 MB/s)
100 Mbit (10,5 MB/s)	5,53%	4,57%	3,28%	1,75%
1 Gbit (117 MB/s)	61,58%	50,87%	36,56%	19,5%
2 Gbit (Team) (205 MB/s)	107,89%	89,13%	64,06%	34,17%
4 Gbit (Team) (355 MB/s)	186,84%	154,34%	110,94%	59,17%
10 Gbit (1000 MB/s)	526,32%	434,78%	312,50%	166,67%

(How to run an AppCritical Network Analysis test)

(Troubleshoot advanced network performance)

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Backup Server Network Recommendations II

Hardware

Environment

Good to Know

Virtualization

Deduplication

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More to know

Time to copy 1 TB of data (Hours:Minutes)			
LAN speed	Theoretical	Realistic via LAN	Realistic via SAN (iSCSI/FC)
100 Mbit (10,5 MB/s)	27:45	330:00 (~14 days)	./.
1 Gbit (117 MB/s)	02:30	30:00	06:25
2 Gbit (Team) (205 MB/s)	01:25	17:00	03:40
4 Gbit (Team) (355 MB/s)	00:48	09:45	02:10
10 Gbit (1000 MB/s)	00:20	3:30	00:45

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Backup Server Disk Recommendations

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Apart from minor differences, the rotation speed of hard drives has nearly no impact on the performance of an array
- In order to get significant increases in performance, increase the number of spindles in the array.
- Tests have shown that doubling the amount of spindles in a RAID 5 array (from 6 to 12) tripled the overall performance of the array.
- So better use many small disks than a few larger ones.
- Best for performance and redundancy is RAID 10
- Note: There is a recommendation not to use too many spindles in a single RAID 5, because a high number of spindles (>14) increases the possibility to have more than one drive failing at the same time. For larger arrays rather use RAID 6 than RAID 5.

  (RAID 6 with HP Advanced Data Guarding Technology)

VERITAS

Backup Server Storage Controller Recommendations

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Use storage controllers with as much write cache, as possible (≥2 GB)

  - More cache leads to better performance
    ([HP Smart Array Controller Technology](#))

- Don't use RAID controllers without buffered write cache (either by flash module or battery)

  - Due to safety reasons, most RAID controllers use their cache modules only for read operations, when no battery or flash back module is present, because without such a module, a power loss to the server would almost sure result in an unpredictable data loss.

- Don't use RAID controllers to connect to tape drives, always use HBAs.

VERITAS

Keep an Eye on the Environment

Hardware

Environment

Good to Know

Virtualization

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High Availability

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More to know

- Network Performance (Latency) Considerations

  - Ensure less than one percent (1%) packet loss during transmission.

  - Ensure a destination "round trip" latency of 250ms or better

  - Connection problems can impact job success rates

- Make sure to test the usability of 3rd party WAN optimizer before using them for backup, restore or client site deduplication because these aren't tested configurations and only supported as an alternative configuration.

VERITAS

Keep an Eye on the Environment

Hardware

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More to know

If possible, backup virtual environments via SAN, not LAN

Datastore Location	Backup via NBD	Backup via SAN Transport
Local (non clustered)	Yes	No
NFS Shares	Yes	No
iSCSI LUNs (vmfs)	Yes	Yes
Fiber LUNs (vmfs)	Yes	Yes

Real World Example: ESX connected to storage via 10 GbE

Backup of Test-VM (40 GB) from NFS share: **4.600 MB/min**

Backup of Test-VM (40 GB) from iSCSI LUN: **24.200 MB/min**

VERITAS

Keep an Eye on the Environment – vSphere 6.x

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
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Tuning

Backing up

More to know

New with vSphere 6.x

- Virtual Volumes (vVOL) and Virtual SAN (vSAN) support backups only via NBD and HotAdd (Backup Exec Server virtualized).
- SAN backups/restores do only work for VMware VMFS volumes.
- Going forward, VMware is pushing these new storage types.

VERITAS

Keep an Eye on the Environment

Hardware

Environment

Good to Know

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More to know

Backup Exec can be pretty fast, if configured correctly:
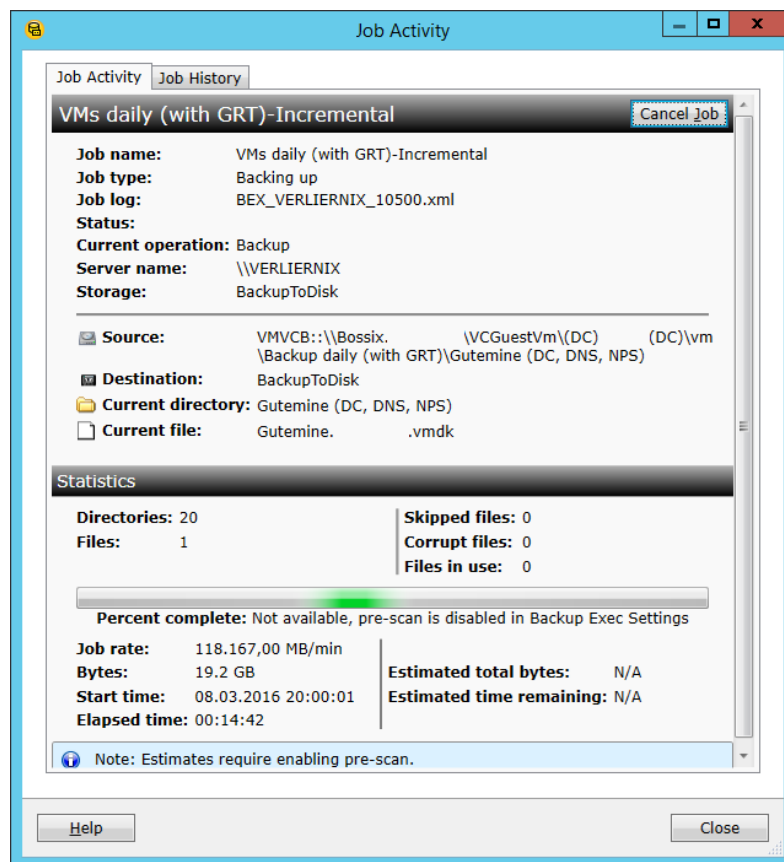
Hardware for BE Server:
- HP DL380e Gen8
- 1x 8-Core Xeon
- 64 GB RAM
- Storage Controller: SmartArray p822 (2GB FBWC)
- Storage Controller for SAN connect: 12 Gb SAS
- 2x 200 GB SSD for OS
- 12x 1 TB HDD for B2D
- 12x 1 TB HDD for Dedup
- 2x 10 GbE NICs (teamed)

Storage for VM:
- 1x HP MSA 2040
- 24x600 GB HDD

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Things to keep in mind I

Hardware

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More to know

- Not all 10 GBE ports are the same
  - In order to use multiple 10 GbE ports on a switch, the switch must not only offer these ports, but also have the backplane capacity to transport the trafic arriving at the ports. Example: Cisco Catalyst 6500 can only transport 2x20 Gbit/sec per line card, so cards with 8x10 GBE are 100% overbooked, cards with 16x10 GBE 200%.
  - Especially when talking about iSCSI, we recommend using deep buffer switches.

Table 1. Cisco Catalyst 6500 Series 10 Gigabit Ethernet Modules Primary Features Comparison

Feature	4-Port 10GbE Fiber Module	8-Port 10GbE Fiber Module	16-Port 10GbE Fiber Module	16-Port 10GbE Copper Module
Ports	4	8	16	16
Optics	XENPAK	X2	X2	• No optics • Copper (RJ-45) connectors
Switch fabric connection	40 Gbps (80 Gbps full duplex)	40 Gbps (80 Gbps full duplex)	40 Gbps (80 Gbps full duplex)	40 Gbps (80 Gbps full duplex)
Oversubscription	1:1	2:1	4:1	4:1

VERITAS

Things to keep in mind II

Hardware

Environment

Good to Know

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Backing up

More to know

- Latency and bandwidth isn't the same
    - You can have a broad network line to the internet, but its latency will still lead to "slow" backup rates.
- Verify does not check the content of a file, but only its checksum
    - BE integrated verification does not free you from the need to check, whether the files you backed up are readable.
    - Do random restore tests
    - For 3 stage jobs where last stape is tape use verify only on this last stage

VERITAS

Things to keep in mind III

Hardware

Environment

Good to Know

Virtualization

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High
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Backing up

More to know

- Not all data can be deduplicated well
  - i.e. Exchange log files contain >90% of unique data. Therefore, if the overhead of doing the deduplication is a concern, we recommend targeting incremental Exchange backups to backup-to-disk rather than to a deduplication storage.
    - Just keep in mind of the backps are GRT enabled that full and incremental needs to use the same device!
  - Also the attempt to deduplicate media files (video, pictures and music) will not be very efficient.
- Deduplication is slower than Backup-To-Disk
  - Replacing Backup-To-Disk-To-Tape by Backup-To-Dedup-To-Tape may in some case extend the backup window beyond what is practical
  - Especially the attempt to read from a deduplication storage (i.e. for copying data to tape) at the same time, where backup jobs are writing data to the deduplication storage will dramatically decrease the performance of the storage.
    - Tuning can be done to improve the read performance for duplicate and resore jobs

VERITAS

Backup Exec Server – used Ports

Hardware

Environment

Good to Know

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Backing up

More to know

- By default, Backup Exec uses TCP 10000 for communications between the backup server and the agents installed on source machines.

- If TCP 10000 is already in use by another application, this can be changed per server.

- To do so, following these steps:
    - Connect to the source server
    - Stop the Backup Exec Remote Agent service
    - Open the file C:\Windows\System32\Drivers\Etc\Services with administrative permissions
    - Add the following line at the bottom of the file:
      NDMP   xxxxxx/tcp   #Backup Exec
      Where "xxxxx" is the port number you prefer to use, i.e. 10001.
    - Restart the Backup Exec Remote Agent service.

- Please refer to the Bacup Exec Admin Guide for a complete list of the TCP and UDP ports used by Backup Exec.

VERITAS

Virtualization

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More to know
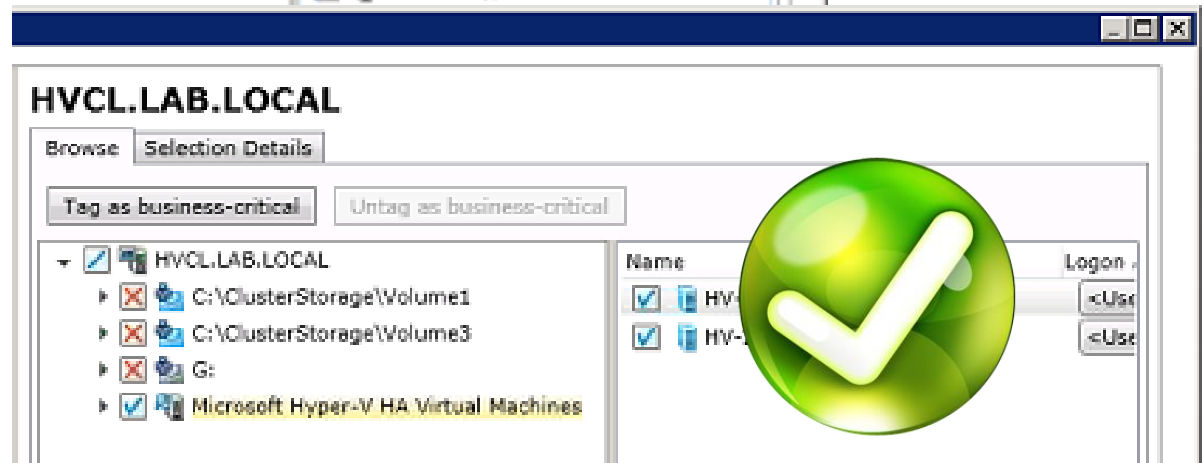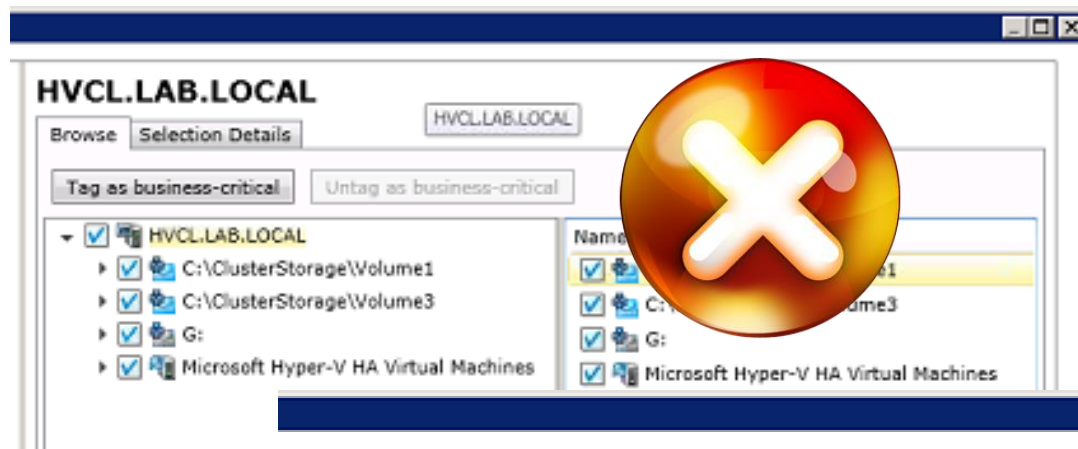
Virtualization best practices

- Create different jobs for different necessities:
    - VMs that shall be backed up daily with GRT enabled
    - VMs that shall be backed up daily without GRT enabled
    - VMs that shall be backed up weekly without GRT enabled
    - VMs that shall be backed up irregularly
- Use GRT only when necessary
    - For most VMs, enabling GRT is not necessary, as single item restore is not needed (i.e. application servers like WSUS etc.)

VERITAS

Virtualization

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More to know

Differences between hypervisors

VMware and Hyper-V support different technologies to do backups and restores.

	VMware	Hyper-V	Agent required
Backup via SAN	Yes	No	No
Restore via SAN	Yes	No	No
Full backup	Yes	Yes	No
Diff./ incr. backup	Yes	Yes	No
GRT for files	Yes	Yes	No
GRT for applications	Yes	Yes	Yes

SAN transport is **not** recommended for thin provisioned disk restore

VERITAS

Virtualization

Hardware

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Good to Know

Virtualization

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Availability

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Backing up

More to know

Hyper-V Best Practices

- Keep Hyper-V Integration Services up to date, as they are a necessary prerequisite for backing up the VM via the host.
  If they are missing, Backup Exec might have to put the machine into a saved state to do the backup.
  Note: This means, the machine is out of service.
  ([Requirements for using the Agent for Microsoft Hyper-V](#))

- Install Backup Exec Remote Agent on the VMs you want to backup with GRT for applications.

- When using Hyper-V 2.0, keep all components of a VM together on one CSV. ([Veritas Community - Using Backup Exec with Hyper-V](#))

- Understand that the backup job rate may be slower when the VM backed up is is on a CSV that is not owned by the cluster owner.

    - [Backups of Hyper-V CSV virtual machines can have a slower throughput when the node owning the virtual machine and CSV is different](#)

VERITAS

Virtualization

Hardware

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More to know

Do not select CSVs and VMs in the same selection list, as this will lead to VSS errors.

VERITAS

Virtualization

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More to know

Hyper-V Best Practices

- Use VHDX over VHD

- Configure VMs by PowerShell, so that Microsoft Incremental Backup Support is enabled (Done automatically with Feature Pack 3)
  Please find the script to configure the VMs on the website mentioned below.
  Note: This technology will use **more storage** due to the creation of dependant differencing VHDs per VM!

- HKLM\Software\Symantec\Backup Exec for Windows\Backup Exec\Engine\Hyper-V Agent

  REG_DWORD "Incremental Backup Style"
  Value:

  > 0 – do not force a change

  > 1 – force VM to have Microsoft Incremental Backup Support enabled

  > 2 – force VM to have Microsoft Incremental Backup Support disabled

  Note: If the key / value is missing, ZERO is assumed

  (How to enable Hyper-V incremental backups)

VERITAS

Virtualization

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More to know

Hyper-V Scenario FAQs

- **Q**: Is it possible and supported to install BE on a standalone Hyper-V host and backup the host itself, as well, as the hosted VMs?
  A: Yes, this is technically supported and working fine, as long, as there's no additional software running on the host, like Exchange Server. Please review the licensing guides from Microsoft and Veritas regarding the needed licenses.

- **Q**: Is it possible and supported to install BE on a clustered Hyper-V host and backup the host itself, as well, as the hosted VMs?
  A: No, this is not supported

- **Q**: Can I install the backup server as a virtual machine and backup other VMs?
  A: Yes, this is possible. However attaching tape devices to virtual machines can be difficult, depending on the hardware. Please check the compatibility lists: (Backup Exec Compatibility Lists).
  Please be also aware of the fact that restores of GRT enabled backups from tape or OST appliances need to be staged to local disks during the restore process.

- **Q:** Is it possible and supported to back up Hyper-V environments directly from the underlying storage (SAN)?
  A: No, this is not supported

VERITAS

Virtualization

Hardware

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Good to Know

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More to know

VMware Best Practices

- Keep VMware Tools up to date, as they are a necessary prerequisite for backing up the VM via the host

- If you want to install the Backup Exec Remote Agent, do not install the VSS Provider included in the VMware tools, as it will conflict with Backup Exec. (VMware VSS Provider has been detected)
  During the initial install of the Remote Agent, we will remove the VMware VSS provider (Remote Agent removes VMware tools)

- Install the Backup Exec Remote Agent on the VMs that you want to backup with GRT for applications. (File servers don't require agents)

- Present the SAN LUNs containing the VMs to the backup server (How to backup ESX(i) using SAN transport)

- Comparison of the VMware editions:
  (Compare VMware vSphere Editions)

VERITAS

Optimized Duplication I

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

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More to know

The term "Optimized Duplication" describes the technology Backup Exec uses to replicate data between two deduplication storages connected to two different backup servers in a way that only those blocks are replicated that do not already exist in the target storage.

To simplify, this means that one backup server does a backup to a dedupe store locally attached to him and afterwards performs a second stage in the backup policy to copy the data to a secondary store that is hosted on a different backup server. That stage is performed somehow similar to a client-side duplication job.

In order for this to work, the environment must have a Enterprise Server Option ("ESO") licensed and a CAS needs to be installed. This may be one of the servers involved in the replication job, but it doesn't have to.

To use a dedicated network just for the Optimised duplicate job between two Backup Exec servers create an entry in hostfiles using the netbios (only) name on each of the servers using the static ip used for each.

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Optimized Duplication II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

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More to know

Optimized Duplication in Detail:

1. The CAS performs a backup job to "his" deduplication storage
2. The CAS connects to the MBES to request access to the deduplication storage connected to the MBES.
3. The CAS copies the chunks to the second deduplication storage that do not exist there and are needed for restores.

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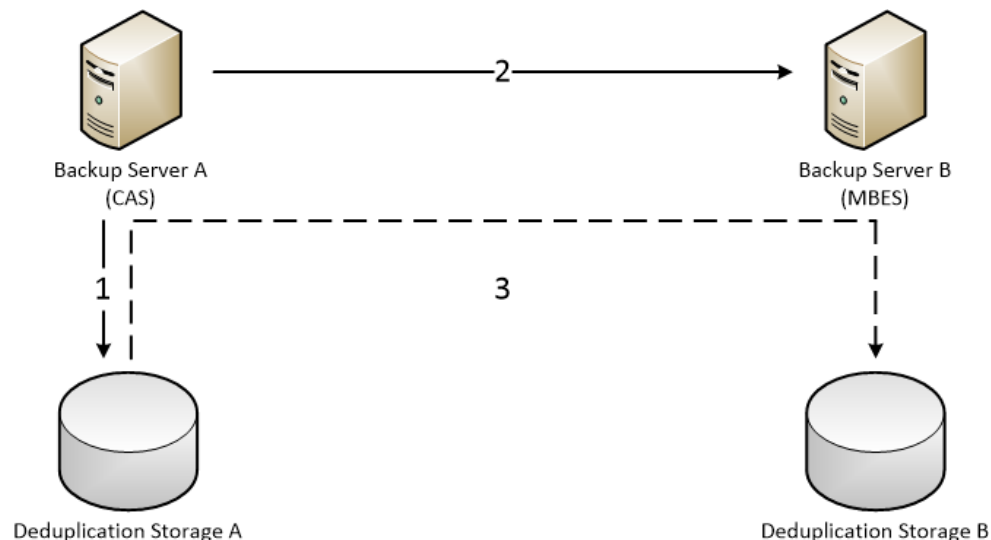
Deduplication with OST Appliances I

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

„Open Storage Technology (OST)" is a software interface that allows Backup Exec to manage external storages in terms of tracking what's happening inside.

In other words, the deduplication process itself is outsourced to the hardware appliance while Backup Exec still gets all information and catalogs needed to do restores.

This outsourcing has many advantages but also disadvantages:

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Deduplication with OST Appliances II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

The bright side:

OST does not only provide a hardware-based deduplication engine that removes the load from the backup server but also application-aware replication.

This leverages the hardware replication capabilities to move data between sites, but it manages the process through policies set in Backup Exec.

Because of the tight integration, Backup Execs access to the replicated data is transparent and allows direct restores from all replicates, wherever they are located.

Since OST appliances have their own storage management, they are not limited to the maximum size of 64 TB, as Backup Exec's internal deduplication storages are as of today.

Because of their specialized hardware and firmware, OST appliances are often better performing than the (Windows-based) internal deduplication storages.

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Deduplication with OST Appliances III

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

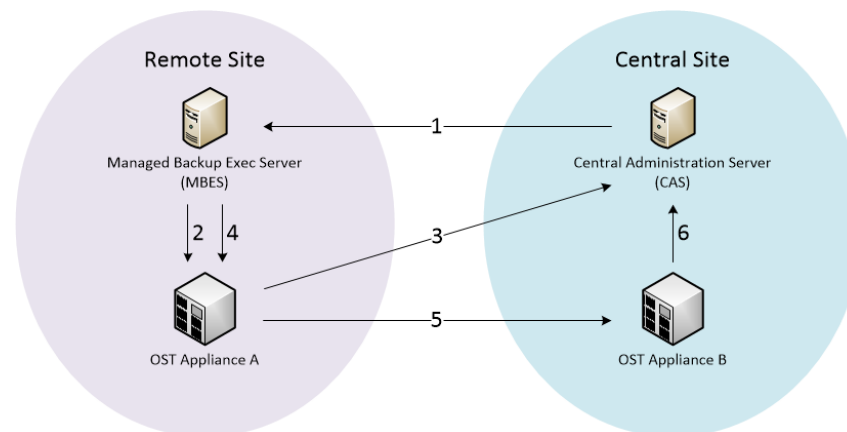Backing up

More to know

The dark side:

Restores from GRT enabled backups need to be staged during the restore process, as it has to be done when restoring from tape.

Therefore an appropriate amount of local storage in the backup server needs to be available during restores (approx. 1.2-1.5 times the size of the largest container backed up [vmdx, edb etc.])

Replication between OST appliances is only supported, if both appliances are from the same vendor and use the same OST plug-in.

The availability and compatibility of client-side deduplication is limited to the capabilities of the OST plug-in provided by the storage vendor.

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Deduplication with OST Appliances IV

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Things to know:

Since replication, or "Optimized Duplication" as Veritas calls it, is managed by Backup Exec but performed at the storage level, the appliances must be able to connect to each other by their replication protocol.
Please refer to the vendors' documentation on which firewall port(s) to open.

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Deduplication with OST Appliances V

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

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Backing up

More to know

Optimized Duplication in Detail:

1. The CAS instructs the MBES to perform a backup job to the OST appliance in the remote site and to duplicate the data afterwards to the OST appliance in the central site.

2. The MBES writes the data to the OST appliance.

3. The OST appliance sends the information needed for cataloging to the CAS.

4. After the backup job is done, the MBES instructs the OST appliance in the remote site to…

5. …replicate the job's data to the appliance in the central site.

6. The OST appliance in the central site sends the data information needed for cataloging to the CAS so that restores can be performed from both OST appliances.

VERITAS™

High Availability I

Hardware

Environment

Good to Know

Virtualization

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High Availability

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Backing up

More to know

- Many applications and databases can be deployed either as a standalone installation or as a highly available instance that is spread over multiple physical or virtual servers.

- When backing up databases and applications on standalone servers, you can decide, whether you want to back up the resources via the virtualization host or via a locally installed agent inside the virtual application server.

- Deploying applications highly available means that the application runs as a sort of virtual instance that can be hosted by any one of the members of the clustered system.

- Since Backup Exec has to bring the application into a consistent state in order to be backed up, it must talk to the virtual instance instead of one of the cluster nodes.

- Those highly available instances will be displayed in Backup Exec as a dedicated resource entry in the "Backup and Restore" pane.

VERITAS

High Availability II

Hardware

Environment

Good to Know

Virtualization

Deduplication

**High
Availability**

Tuning

Backing up

More to know

- To fully protect a database or application cluster, it is necessary to back up the local drives of all cluster nodes in order to restore them in case of a local failure (i.e. an operating system error) and to back up the application in a separate job using its own resource record.

  - Example: When you have a two-node SQL-Cluster, you will have to back up three different objects: Each node with its local hard drive(s) and its system state and the cluster resource itself, which will show you the shared volumes of the cluster and the application resource, in this example the SQL instance(s).

- Therefore, even if the highly available application instance is running on virtual servers, it cannot be backed up using the Agent for VMware an Hyper-V, as this would process the VMs one by one probably not protecting the application at all.

VERITAS

High Availability III

Hardware

Environment

Good to Know

Virtualization

Deduplication

**High
Availability**

Tuning

Backing up

More to know

Only backups of the cluster nodes are usable for SDR

Installing RA on two DAG nodes automatically displays three entries in Backup Exec GUI

Database files are automatically excluded

Only the selection list of the DAG allows to select the Exchange resources

VERITAS

Tuning Backup-To-Disk Storages

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Create all arrays with a stripe size of 64kB.

- Format all volumes in Windows with a block size of 64kB.

- Don't place more than one backup target on a disk array.

  - Backup Exec 2012 and newer do not support multiple disk targets on a volume and set all but one to read-only.

- If possible, attach multiple arrays to different controllers or buses on the backup server.

- Don't use software RAIDs to combine multiple arrays into one larger one, rather use storage pools inside Backup Exec.

VERITAS

Tuning Deduplication Storage

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Create all arrays with a stripe size of 64kB.
- Format all volumes in Windows with a block size of 64kB.
- If possible, map an array of SSDs into the database folder of the deduplication storage by using a mount point
  - Path: <drive letter>:\BackupExecDeduplicationStorageFolder\databases
  - Warning: Don't underestimate the size of the database!
    (may reach up to 8% of the size of the deduplication storage)
- Assure that your deduplication storage is not running out of disk space, as this can result in a damaged deduplication storage.
  We recommend creating a dummy file on the volume that can be deleted when disk space is running low.
  - Use the following command to create a 100 GB file:
    fsutil file createnew <drive letter>:\dummy.txt 104857600000
  - When volume for deduplication storage was extended, the services need to be restarted in order to recognize the change.

VERITAS

Tuning Deduplication Storage

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Entry in pd.conf	Recommended Value	Default Value
Prefetch_Size	67108864	*33554432*

Entry in contentrouter.cfg	Recommended Value	Default Value
ReadBufferSize	1048576	*65536*
PrefetchThreadNum	8	1
MaxNumCaches	640	64

Do not edit the files with Notepad, as this may result in corrupt files. Rather use WordPad or Notepad++.

Only edit the files in the BE installation folder, not the ones inside the deduplication folder.

VERITAS™

Cleaning up Deduplication Storages

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Backup Exec automatically deletes expired media/backup sets and makes the space available to the Deduplication Folder.

This automated process takes place every twelve hours. Sched_QueueProcess.log (located in DeduplicationFolderPath\Log\Spad) records, when queue processing gets initiated.

The process can also be initiated manually. Please find detailed instructions here:

Manual Space Reclamation for Deduplication Storages in Backup Exec

Please note: The reclamation process needs some temporary space to run. Therefore, if the deduplication storage ran out of disk space, the cleanup process cannot run.

VERITAS

Tuning Network

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Use a dedicated network for backups, if possible
    - Verify correct name resolution or use hosts file to force Backup Exec to use the "private" network link.
- Use NIC teaming
    - Don't overestimate the performance of teamed network links:
      1 Gbit-Link will usually transport around 71 MB/Sec.
      A 2-Gbit team will usually transport around 124 MB/Sec.
      A 4-Gbit team will usually transport around 215 MB/Sec.
      (Four NICs teamed will have around 25% loss of performance due to the teaming process.)
- Turn off offloading (Chimney Offload and Receive Side Scaling)
    - netsh int tcp set global chimney=disabled
    - netsh int tcp set global rss=disabled
    - HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters\EnableT CPA = 0
- Set fixed network speed and duplex on all servers as well as on the switches.

VERITAS

Tuning Backup Exec I

Hardware

Environment

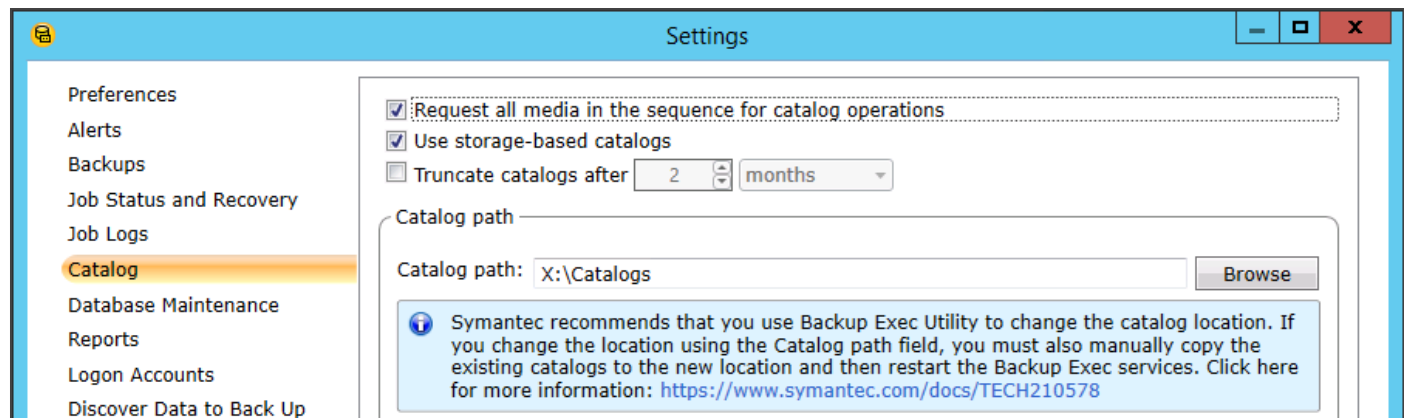Good to Know

Virtualization

Deduplication

High
Availability
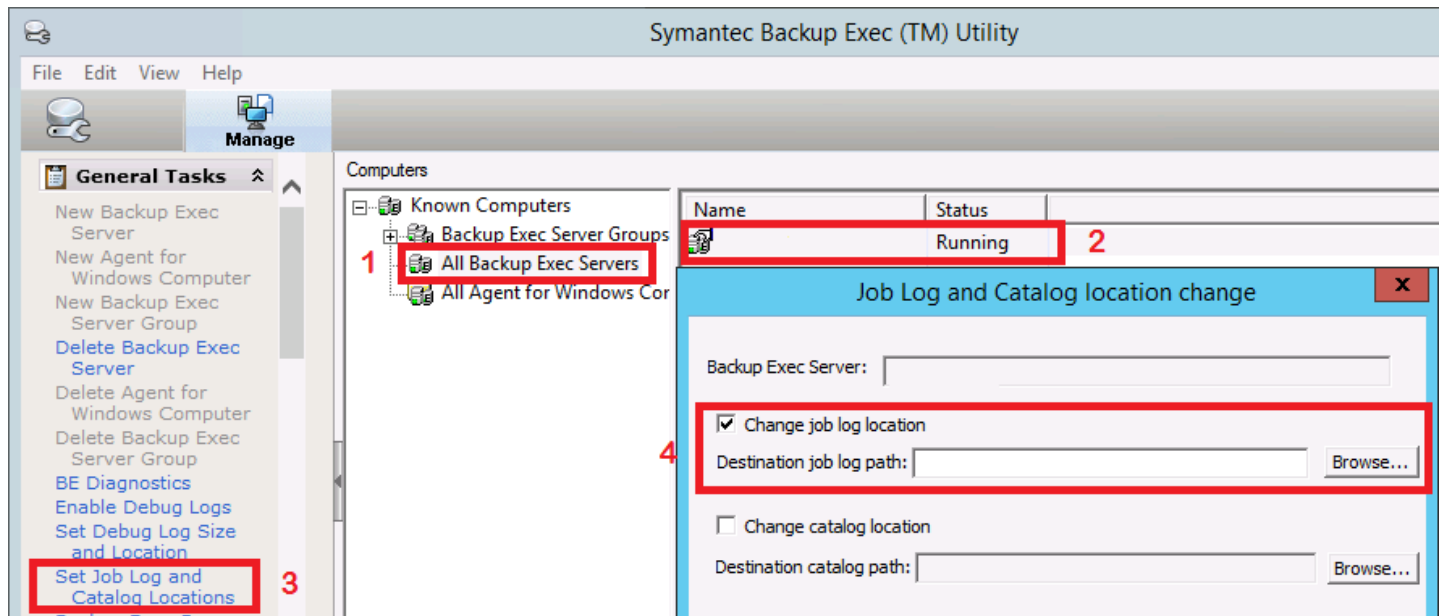
Tuning

Backing up

More to know

- Move Catalogs (using BE GUI)
  Move the "Catalogs" folder to a performant volume (i.e. the Backup-To-Disk storage or another dedicated fast IO storage)
  Note: If you change the catalog location this way, you'll have to move the files from the old location to the new one afterwards manually, as this is not done automatically.

Tuning Backup Exec II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High Availability

Tuning

Backing up

More to know

- Move Log Files (using BE Utility)
  Move the "Logs" folder to a performant volume (i.e. the Backup-To-Disk storage.
  Note: The target folder must exist. Else the move will fail.

VERITAS

Tuning Backup Exec III

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Configure the database settings in Backup Exec:

☑ Enable Backup Exec database maintenance

Last time maintenance was performed: 08.03.2016 19:00:00

Perform database maintenance daily at: 19:00:00

Delete aged data
☑ Delete aged data

Job History:
○ Keep job history for data on media that have current overwrite protection periods
○ Keep job history for specified number of days: 90

Number of days to keep data before deleting it from the Backup Exec database:

Job logs: 30
Alert history: 7
Reports: 14
Audit logs: 30

☑ Perform database consistency check
☑ Save contents of database to the Backup Exec data directory
☑ Optimize database size

Backup Exec Database Encryption Key Management

The database encryption key is required to migrate or recover the Backup Exec server.

Path: [   ] Export

☐ Remember the export path. By clicking this check box, you consent to let Backup Exec retain and display the export path during import operations.

VERITAS

Tuning Backup Exec IV

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Export the database encryption key

- Define a path to where you want to export the key.
- You can tick the checkmark that Backup Exec keeps record of the export path, if you want.

Note: You must have the key, whenever you want to import the database into a Backup Exec environment.

Backup Exec Database Encryption Key Management

The database encryption key is required to migrate or recover the Backup Exec server.

Path: [   ] Export

☐ Remember the export path. By clicking this check box, you consent to let Backup Exec retain and display the export path during import operations.

⚠ You must export the database encryption key to ensure that you can migrate or recover the Backup Exec server later. Export the key to:
• Either a physical volume that is assigned to a drive letter or a network share that is specified as a UNC path
• A drive other than the drive on which Backup Exec is installed
• A secure location so that an unauthorized user cannot use the key to access the database

VERITAS™

Tuning Backup Exec V

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Turn off Antivirus/Malware software
  At least exclude the following folders from any type of virus protection
  (real time and scheduled scans):
    - Catalogs folder
    - Logs folder
    - Data\Database folder
    - All backup-to-disk folders
    - The deduplication storage
- Use Delayed Cataloging (Configure Delayed Cataloging)
    - When using GRT, set the cataloging for the job to delayed in order to
      complete the backup job itself as fast, as possible note: This is only
      possible, when backing up to disk or deduplication storages, not to
   tape, OST or VTL.

VERITAS

Tuning VMware Backups I

Hardware	• Buffer Tuning
Environment	• HKLM/Software/Symantec/Backup Exec for Windows/Backup Exec/Engine/VMware Agent/…
Good to Know	(http://www.veritas.com/docs/000085311)
Virtualization	
Deduplication	• Examples default / (recommended)
High Availability	• Enable Buffered Reads 1 / (1)
Tuning	• Enable Buffered Writes 1 / (1)
Backing up	• Numbers of Read Buffers 10 / (16)
More to know	• Numbers of Write Buffers 10 / (16)
	• Size of Read Buffers 1024 / (8192)
	• Size of Write Buffers 1024 / (8192)
	• Write Thread Priority 1 / (1)
	• Read Thread Priority 1 / (1)

VERITAS™

Tuning VMware Backups II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Configuration tool (including readme) available at
PingUs Download Site
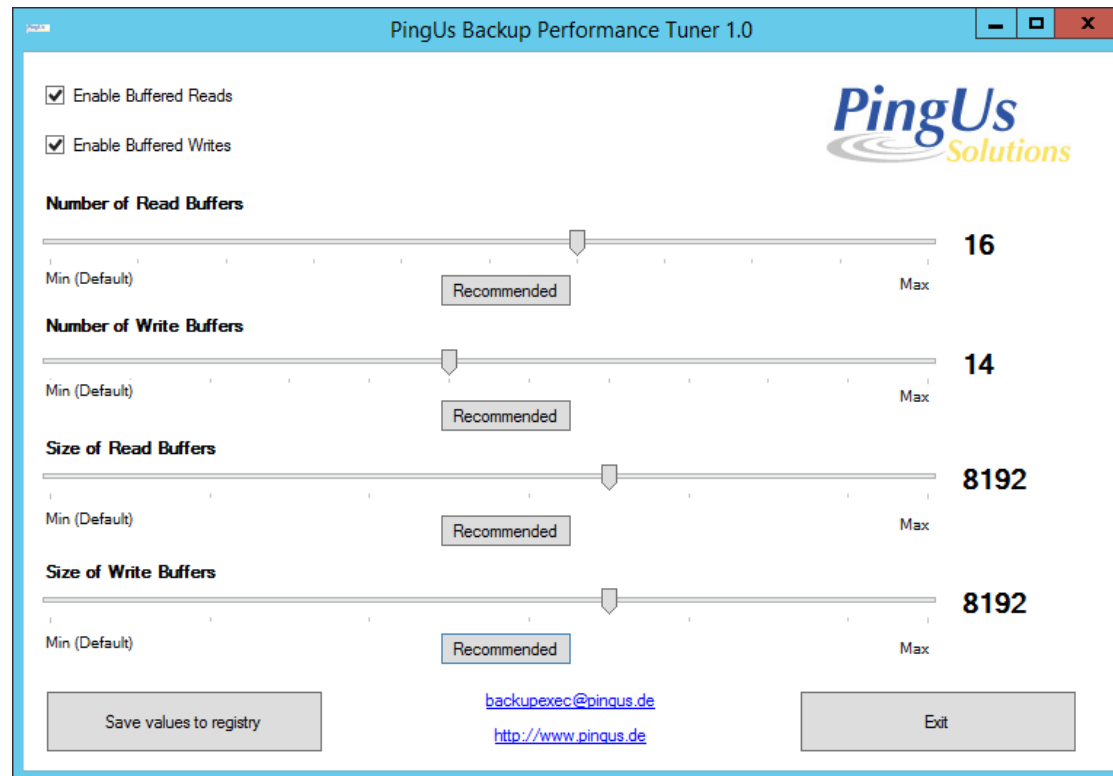
Backing up Database Servers I

Hardware

Environment

Good to Know

Deduplication

Virtualization

High
Availability

Tuning

Backing up

More to know

When backing up (agent-based) database servers like Exchange, SharePoint, SQL, Oracle, Enterprise Vault or Active Directory, keep the following topics in mind:

- For each server create (at least) two job policies:
    - One for the operating system and system state for SDR purposes
        - Weekly or less
    - One for the database and its related resources
        - Daily or more
- Schedule the policies in a way that they don't run in parallel, as this will lead to VSS issues and failed jobs.

VERITAS

Backing up Database Servers II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

When backing up (host based) SQL servers and you have applications on other servers that use databases on the (remote) SQL, consider the following:

- When doing host-based backups, the smallest instance you can select, is the VM. In other words, you cannot unselect any of the items inside a VM during host-based backups.

- Since SQL is a VSS aware application, all databases are flagged as backed up during the host-based, too.

- This may lead to inconsistent backups of the application running on the other VM, because "someone else" backed up "its" SQL database (and maybe even truncated the log files) without informing the application.

If you are running such applications, you should exclude the SQL server from all host-based backups and protect it via an agent-based backup policy only.

VERITAS

Backing up Database Servers III

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- Exchange DAG – Preferred Node for Backups

    - New with BE15 FP3

    - Allows for choosing one DAG node to do all backups from, passive or active copies, of the mailbox databases in the DAG

    - Can drastically reduce the time it takes to do a backup of a widely distributed DAG when the node nearest and/or most performant for the Backup Exec server is set as preferred

VERITAS

Backing up Oracle (on Windows) I

Hardware	When backing up Oracle database servers keep the following topics in mind:
Environment	
Good to Know	• Install the Backup Exec Remote Agent on the Oracle server.
Virtualization	• Open the Backup Exec Agent Utility on the Backup Exec Server.
Deduplication	• Click on "Change Settings".
High Availability	• On the "Oracle" tab click "new".
	• Select the instance(s) you want to protect and enter a username and password with SYSDBA rights on that instance.
Tuning	
Backing up	• On the "Database Access" tab enable the "Enable the Backup Exec Server…" checkbox.
More to know	• Specify a username and password for a user that has administrative permissions on this server. Note: You can use the Backup Exec System Account (BESA) here.

VERITAS

Backing up Oracle (on Windows) II

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

- If necessary, change the IP port used to access the Oracle installation.
- On the backup server click the Backup Exec button, select "Configuration and Settings" and the click "Backup Exec Settings".
- In the left pane, click "Oracle".
- Enter the name of the Oracle server on which the instance is installed.
  Note: specify the name exactly, as it is shown in the "Backup and Restore" tab. Else Backup Exec might not be able to match the two entries.
- Click "Add".
- Enter the username and password you entered in the "Database Access" tab on the Oracle server before.
- Create a job policy for backing up the Oracle instances.

VERITAS

Backing up the Backup Server

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

In case of a disaster restore the most important machine to recover will be your backup server. In order to prepare for this scenario, you should do the following:

- Create a SDR backup of all components of the backup server and exclude only the volumes that contain B2D- and deduplication storages. (How to backup your deduplication folder will be shown later)

- Configure the alternate storage path for SDR files in the Backup Exec settings to point to a network share.

- Let the backup run either to a B2D device located outside the backup server (USB drive or network share) or (better) to a tape device.

- Create a SDR boot medium including all necessary device drivers for your backup server's hardware.

- Note: Restores from deduplication storages are not possible, as the deduplication database is not available in the SDR environment.

VERITAS

Backing up the Deduplication Storage

Hardware

Environment

Good to Know

Virtualization

Deduplication

High Availability

Tuning

Backing up

More to know

In order to back up your deduplication storage to tape, do the following:

- Create a new backup policy.

- Give it a clear name (i.e. "<server name> Dedup").

- Unselect all items in the selection list by removing the checkmark on the server name level.

- Include the "Shadow Copy Components" resource by clicking on its checkmark.

- Select a tape device as the target for the job.

VERITAS
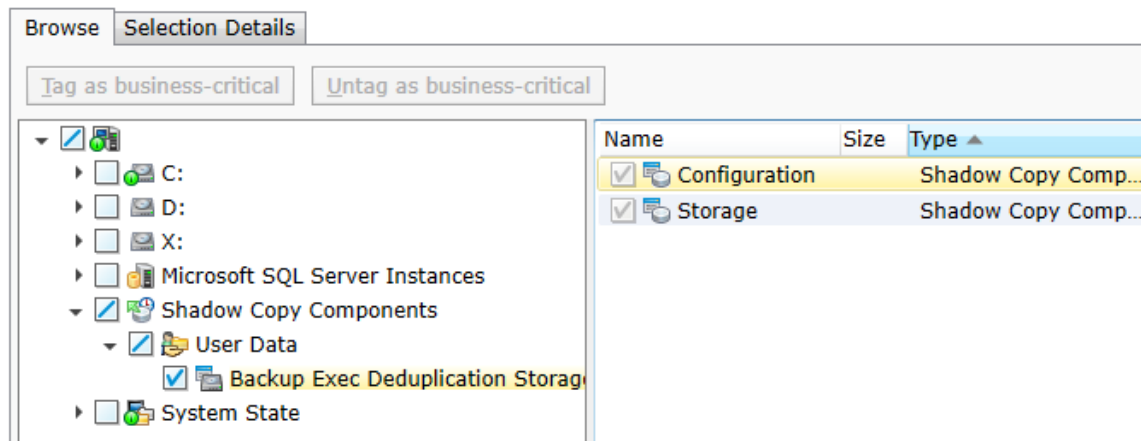
Where to find more information

Hardware

Environment

Good to Know

Virtualization

Deduplication

High
Availability

Tuning

Backing up

More to know

Backup Exec Administrator's Guide
http://www.veritas.com/docs/000004565

Backup Exec Software Compatibility List
Backup Exc SCL

Backup Exec Hardware Compatibility List:
Backup Exec HCL

Backup Exec License Guide:
http://www.veritas.com/docs/000024885

Download trialware:
Trial Version of Backup Exec

Backup Exec Support
https://www.veritas.com/content/support/en_US/15047.html

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Thank you!

Klaus Kresnik

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