

THE VM BACKUP BAKE OFF REPORT

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1 Executive Summary

The purpose of this document is to present tests that have been conducted on several popular VMware virtual machine backup solutions from the 3rd party eco-system to see how they compare with each other. These tests were conducted based on my needs. This could be different for you but could also be helpful. The tests have been conducted in the same environment to minimize discrepancies and are graded in a fair manner. The purpose of the tests was to gage how easy the products are, do they support typical requirements clients need and how cost effective they are. This document will describe each test and how each product performed with each test. At the end there will be a conclusion but should not be taken as gospel to whether a single product is the best solution for your needs.

NOTE: The purpose of this document is NOT to tarnish the reputation of any products mentioned but to demonstrate that where some products maybe better from a feature perspective whilst others maybe more cost effective.

This will be an ongoing project and in future releases more tests maybe included and more solutions maybe tested. If the vendors of tested products are not happy about the results there will be an opportunity to right/enhance the result in the next iteration.

2 Test Environment

The lab used consisted of:

- 3 x physical ESX Hosts where backup and restores occurred – Only 1 host was used
- SSD Disks where the restores occurred
- ISCSI SAN where the same VM was used for the backup tests
- An Exchange 2010 which was used as the backup source
- An instance of vCloud Director on nested ESX hosts only to prove that the solution integrated with vCloud Director

3 The VM Backup Solutions

The backup products used where of versions similar to each other. Namely it had to be the core VMware version of the solution. If the solution required additional options or featured in separate products these were not used as part of this iteration of the tests.

The products included:

- Veeam Backup & Replication Enterprise V7
- Unitrends Virtual Backup V8
- Nakivo Backup & Replication V4.1.2

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- Acronis Backup Advanced V11.5. Post testing it looks like there is a better suited product from Acronis. Acronis Backup for VMware will be used for the next iteration.
- Dell vRanger V7.1.0

4 The Test Results

In this section the test results will be presented in the form of tables with an explanation of the test or task beforehand. Most tests except the performance and costs comparisons were graded between 1 and 5. Scoring 5 is the best result.

4.1 Ease of prerequisites

In this test the products were graded in how much effort was required before the actual install could take place. Do you need to prepare operating systems for example?

Product	Ease of prerequisites	Comment
Veeam	4	Had to build a Windows VM. Would have been nice if it was Virtual Appliance. However the installer installs the rest of the prerequisite components
Unitrends	5	Nothing to prepare upfront.
Nakivo	3	Had to prepare a windows VM as I couldn't get the VA solution working.
Acronis	3	Had to build a Windows VM. Would have been nice if it was Virtual Appliance. I had to review instructions, not intuitive
vRanger	4	Had to build a Windows VM. Would have been nice if it was Virtual Appliance. However the installer installs the rest of the prerequisite components

4.2 Ease of Install

In this test the products were graded in how much effort it took to install.

Product	Ease of Install	Comment
Veeam	5	Next Next very easy install
Unitrends	5	Easy Install of a Virtual Appliance
Nakivo	4	Easy Install of a Virtual Appliance
Acronis	3	I had to review instructions, not intuitive
vRanger	4	Easy install

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4.3 Time to Deploy

Products are graded on how time consuming they are to install. In real world scenarios this may differ depending how you need to distribute the deployment.

Product	Time to Deploy	Comment
Veeam	4	With installing a windows box and the prereqs I do feel that Veeam would be better if it deployed in one go as a virtual appliance
Unitrends	4	I had to review instructions, but once you've done it once you'd be able to speed up follow up deployments
Nakivo	3	Had issues getting it going. In the end I went for a windows install over the virtual appliance version.
Acronis	3	Not as fast as other solutions
vRanger	5	Quick

4.4 Ease of post install config

In this test products are graded on how easy is the product to setup before use.

Product	Ease of post install config	Comment
Veeam	4	Took quite a bit of time to add vCenter in after clicking submit. Everything is guided which is nice. Veeam informs me that this is due to service pack level
Unitrends	4	Straight forward once you get your head around the user interface
Nakivo	3	Took me a bit to configure. Had to setup extra transport server as could not get built in working.
Acronis	3	A little tricky, not intuitive. Acronis Backup for VMware provides simplified, web-based UI with 1-2-3 simple configuration interface.
vRanger	4	Fairly simple. Had to setup a CIFs share. Nice to see they use a virtual appliance for extra processing power.

4.5 Ease to setup job

In this test products are graded on how easy was it to setup a backup job.

Product	Ease to setup job	Comment
Veeam	4	Very easy job setup
Unitrends	4	Very simple setup
Nakivo	5	Very easy
Acronis	4	Easy once post config sorted
vRanger	5	Very simple job setup

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4.6 Backup Job Realization

In this test products were graded on how well they completed a backup of a virtual machine which was running Exchange 2010 server.

Product	Backup Job Realisation	Comment
Veeam	5	Completed Successfully with full reporting
Unitrends	5	No issues
Nakivo	3	Completed successfully after switching to windows version
Acronis	5	Completed no problems
vRanger	5	Completed OK

4.7 Backup Performance

In the below table is the results of the performance of the backup jobs. DO NOT SHOOT THE MESSENGER. These results were reported by the backup products themselves and not fabricated in anyway. No differences in how the virtual machine was backed up so interesting to see variances in the results. Do to legal reasons and breach of a EULA I am unable present all the performance results.

Product	Backup Performance	Time to backup score
Veeam	NA	Response limited by Veeam EULA Agreement
Unitrends	26.7MB/s	32
Nakivo	17.5MB/s	15
Acronis	1.9MB/s	12
vRanger	Unknown	28

4.8 Integrations with CBT

VMware have a feature built into their API for backup that tracks changes in virtual machine usage known as Change Block Tracking or CBT. This allows backup vendors to perform incremental backups at block-level without scanning the virtual machine for changes first.

Integration with CBT		
Veeam	4	CBT backup capable but not CBT restore
Unitrends	5	Has something similar to CBT restore.
Nakivo	4	CBT backup capable but not CBT restore
Acronis	4	CBT backup capable but not CBT restore. In a different product Acronis as something similar to CBT restore.
vRanger	4	CBT backup capable but not CBT restore

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There at least one other product on the market on in this project that has the ability to perform a CBT restore which can restore only changed blocks on the virtual machine thus reducing the restore time dramatically.

4.9 Restore Job Realization

In this test products were graded on how well they completed a restore of a virtual machine which was running Exchange 2010 server.

Product	Restore Job Realisation	Comment
Veeam	4	Failed to restore first time, in fact I had to back up the VM again to get a restore to work. Some kind of glitch. I'm unclear whether it was the VM or the product. Maybe a storage issue. Something was causing that instance to fail. But after that restores happened smoothly.
Unitrends	5	Completed no issues
Nakivo	5	Completed
Acronis	5	Completed no problems
vRanger	3	The restore was not intuitive; I had to hunt down the image from the repository.

4.10 Restore Performance

In the below table is the results of the performance of the restore jobs. DO NOT SHOOT THE MESSENGER. These results were reported by the backup products themselves and not fabricated in anyway. No differences in how the virtual machine was backed up so interesting to see variances in the results. Due to legal reasons and breach of a EULA I am unable present all the performance results.

Product	Restore Performance	Time to restore score
Veeam	NA	Response limited by Veeam EULA Agreement
Unitrends	Unitrends	79.6MB/s
Nakivo	Nakivo	Unknown
Acronis	Acronis	Unknown
vRanger	vRanger	Unknown

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4.11 File-Level Restore

In this test the products were graded based on their ability to perform file-level restores. Typically VM backup solutions are designed to restore full VMs as a single image. Most now have the ability to perform a file restore from an image-level backup.

Product	FLR	Comment
Veeam	5	Windows and Linux FLR capable without rehydration
Unitrends	3	FLR for Windows/Linux but a mount point is created and you have to manually restore files via copy&paste. I'd like to see this directly in the in the UI with a point and click method.
Nakivo	3	For windows only
Acronis	4	Yes works but again not intuitive to where the images is.
vRanger	3	Yes for Windows/Linux but would be nice if Linux FLR could be done without separate virtual appliance.

4.12 Item-Level Restore

In this test the products were graded based on their ability to perform item-level restores like restoring a single email or database entry. Typically VM backup solutions are designed to restore full VMs as a single image. Most now have the ability to perform an item-level restore from an image-level backup.

Product	Item-level restore	Comment
Veeam	5	AD, Exchange and SharePoint. Can also restore from a replica
Unitrends	4	Has AD, Exchange, SQL, SharePoint but through a 3rd party tool. This is antiquated and backup administrators will find this cumbersome. Unitrends should develop this in the main UI.
Nakivo	3	Exchange only
Acronis	3	Only through additional Agents. Acronis Backup for VMware has support for item-level restore for Exchange, SQL, SharePoint with no addition agent installation requirements.
vRanger	3	Separate product

4.13 Space Optimization

In this test the products are graded based on how well they optimize the space required for backups.

Product	Space Optimisation	Comment
Veeam	4	Compression and Deduplication. Support for 3rd party Deduplication
Unitrends	5	Deduplication occurs before the data hits the target
Nakivo	4	Deduplication not sure how well it works
Acronis	5	Built-in Deduplication
vRanger	2	Only compression and support for 3rd party Deduplication

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4.14 Self-service portal

In this section the products are graded on whether they have a self-service portal for users other than the backup administrators to perform their own restores.

Product	Self-service Portal	Comment
Veeam	5	Great self-service portal, I would align it to vCloud organisations too.
Unitrends	3	No self-service portal but users can manage their own VMs from the VI-Client. This could be enhanced
Nakivo	3	This feature is available in the multi-tenant edition of the product
Acronis	3	None but there is a separate product for vCloud Director
vRanger	1	None

4.15 vStorage API Capable

When defining the test it was felt that we should check that the solutions support the VMware APIs to allow backup vendors to backup effectively. This test is kind of redundant because without this capability said backup products wouldn't be able to do things like work with CBT.

Product	vStorage API Capable	Comment
Veeam	5	
Unitrends	5	
Nakivo	5	
Acronis	5	
vRanger	5	

4.16 vCloud Director Capability

In this test products are graded to whether they have functionality to specifically work with VMware vCloud Director. vCloud Director brings new challenges for backup vendors because it further encapsulates VMs in to container called vApps and allows linked clones of these vApps to be used. Backing up this kind of environment can be tricky. That being said the future use case for vCloud Director maybe limited to service providers. So if you are not running as a service provider maybe this feature will not be valuable too you.

Product	vCloud Director Capability	Comment
Veeam	5	Can backup a VM from one vApp and restore to another
Unitrends	2	Can backup in some scenarios but not suited for vCloud
Nakivo	3	No direct integration with vCloud Director, you can back up and replicate VMs that are part of vApps
Acronis	3	In separate product
vRanger	1	None

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4.17 Ability to Backup VSS Apps

In this test products are graded on their ability to backup applications that support Microsoft VSS(Volume Shadow Services) to take an application consistent image-level backup of the application.

Product	Ability to Backup VSS Apps	Comment
Veeam	5	Offers a choice of VMware VSS or Veeam's advanced application-aware process functionality
Unitrends	4	Sufficient
Nakivo	4	Only through VMware tools
Acronis	4	Only with separate agent technology
vRanger	4	Yes but only with VMware Tools

4.18 Ability to back up a transaction consistent non VSS Applications

In this test products are graded on their ability to backup applications that DO NOT support Microsoft VSS(Volume Shadow Services) to take an application consistent image-level backup of the application.

Product	Ability to Backup non VSS Apps	Comment
Veeam	3	Can be done using pre-freeze script but lacks agent technology
Unitrends	4	Not with this product but one of their other Unitrends products, even supports AIX/HPUX
Nakivo	3	Can be done using pre-freeze script but lacks agent technology
Acronis	4	With separate agent technology
vRanger	3	Can be done using pre-freeze script but lacks agent technology

4.19 Support for physical server

In this section products are graded on further they can protect physical servers too. The argument is that everything should be virtualized and I agree with it. However in the real world, especially with enterprises clients still have physical servers to protect.

Product	Support for physical server	Comment
Veeam	1	None. Veeam first step into physicals coming soon.
Unitrends	3	Not with this product but one of their other Unitrends products, even supports AIX/HPUX
Nakivo	1	None
Acronis	4	Yes through agent. No AIX etc etc
vRanger	3	Actually has a support for physicals

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4.2 Disaster Recovery capabilities

In this section products are graded based on their ability to provide DR functionality. So what we mean by DR is replication or secondary backup functions.

Product	DR capabilities	Comment
Veeam	5	Offers replication, over the wire backup targets and built in WAN optimisation
Unitrends	4	Has Replication
Nakivo	4	Has Replication
Acronis	2	Not really a replica IMO but more like secondary backup locations
vRanger	4	Replication but not secondary backups

4.3 Data Availability

In this section products are graded based on their ability to provide Data Availability functionality. So what we mean by Data Availability is functionality to reduced RTO by standing up the backup image super quick often without performing a restore.

Product	Data Availability	Comment
Veeam	4	Instant VM recovery is a great feature albeit a tad slow
Unitrends	4	Instant VM recovery option
Nakivo	1	No instant VM recovery
Acronis	1	No instant VM recovery
vRanger	1	No instant VM recovery or similar

4.4 API Functionality

Does the product have a public API that can be used to integrate with your existing management tooling?

Product	API functionality	Comment
Veeam	4	PowerShell API, and REST API for self-service portal.
Unitrends	1	Unable to find anything about an API
Nakivo	3	Separate API SDK
Acronis	3	Unable to find anything about an API. However does have command-line interface.
vRanger	4	VI App

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4.5 Multi-hypervisor support

Does the vendor support other hypervisors like Hyper-V and not just VMware? 1 point for each hypervisor supported.

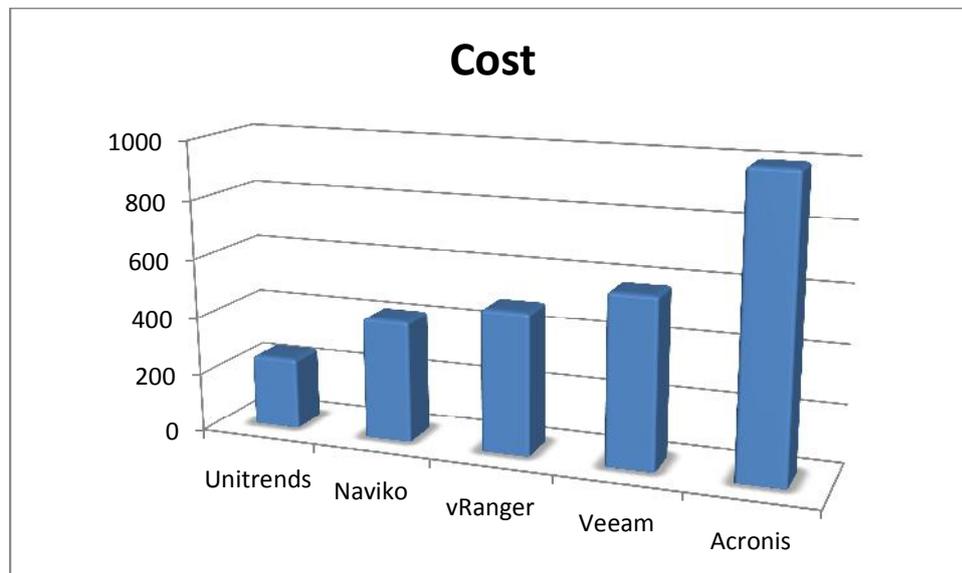
Product	Multi-hypervisor	Hypervisors
Veeam	2	VMware/Hyper-V
Unitrends	3	VMware/Hyper-V/Citrix
Nakivo	1	VMware only
Acronis	5	VMware/Citrix/Hyper-V/KVM/OracleVM
vRanger	2	VMware and Hyper-V

4.6 Cost comparison

Each of the products is licensed per CPU socket which makes them comparable. Please DO NOT take this as gospel! These were the RRP prices I could find for each product. Actually pricing WILL differ based on your relationship with the partner you buy from.

Note: Both Unitrends and Veeam quote their Essentials prices but still valid for these tests.

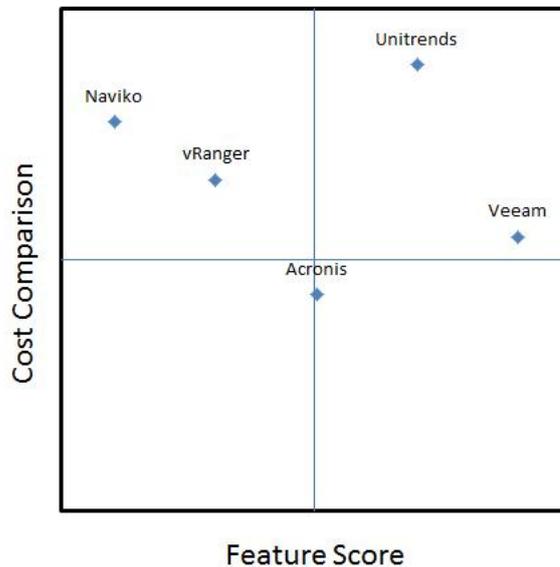
Product	Cost
Veeam	£580
Unitrends	£246
Nakivo	£419
Acronis	£999
vRanger	£488



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4.7 Ricky's Magic 4 boxes

Based on the data just presented the below table maps cost vs feature score in a magic quadrant style view. You can see now that features impact the cost somewhat. I know that is an obvious statement but there in front of you are the facts.



5 Conclusion

For me there are no surprises. There is a market leader in this space and coincidentally they scored highest. But the best advice is not to jump straight in and go for the most obvious solution. The best solution may not be the cheapest solution. Evaluate your requirements first. Maybe most of the features provided by one solution are not needed and therefor going for a cheaper solution is best. Maybe you want a lot of functionality but with a lower price tag. So going for one of the better solutions that is slightly cheaper is best for you. Maybe you want a specific feature that only 1 solution can meet, and then you know to pick that product over the rest. The purpose of this document is not to bad mouth any vendor; it's about demonstrating you have options..

Keep watching www.virtualizeplanet.com because I have a feeling this will be an on-going project.

6 About the Author

Ricky El-Qasem - Cloud and EUC expert with over 21 years of Microsoft, Citrix, VMware, Storage, Networking and Wintel experience. His years of experience, mixed knowledge and a plethora of certifications make Ricky knowledgeable to such matters. In his spare time Ricky webmasters his own virtualization blog site which has been running since 2005 <http://www.virtualizeplanet.com> and has been known to write his own VDI and Virtualization Automation tools. Well acquainted in the virtualization/cloud industry. In 2010, 2011, 2012, 2013 and 2014 Ricky was awarded vExpert status by VMware which is only awarded to 500+ people globally. Currently Ricky is a Chief Technologist at Canopy Cloud but previously worked for Veeam Software. Be reassured although Ricky is X Veeam he conducted these tests without biased and as fairly as possible.