VM Backup: Veeam vs. Legacy Backup Tools
Top 10 Reasons to Choose Veeam

Veeam® Backup & Replication™ isn't the only way to back up your Modern Data Center™…but it is the best way.

While many legacy backup tools can now perform image-based backups of virtual machines (VMs), only Veeam fully leverages the virtual environment to reduce the cost and increase the value of backup—not just a little, but a lot.

#1 VM Backup™

Over 120,000 organizations have said, "Enough!" to the shortcomings of legacy backup tools, and have instead switched to Veeam.

It's a wise move. Virtualization isn't going away. In fact, the majority of server workloads are now virtualized. What was once niche is now a fundamental part of the Modern Data Center…and it demands a new approach.

Built for the Modern Data Center

Whether you have thousands of VMs or just a handful, Veeam Backup & Replication is the best choice for your VMware vSphere, Microsoft Hyper-V or mixed-hypervisor virtual environment.

Veeam provides fundamental and far-reaching advantages over legacy backup vendors. The pages that follow will describe these in detail.

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BEST OF
vmworld® **2011**
GOLD AWARD
NEW
TECHNOLOGY

Veeam has won more VMworld awards than any other vendor, and Veeam is the only twotime winner of the VMworld award for New Technology

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Best of WINNER
TechEd
North America **2013**
Product Awards Produced By:
Windows IT Pro

Veeam Backup & Replication v6.5 won Best of TechEd 2013 for Backup and Recovery.

"A major reason that organizations still hit these bumps on the backup and recovery road: They use the same products for both physical and virtual server backup, when we all know that virtualization requires a fundamentally different approach."

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What the competition says about Veeam

Veeam's leadership in VM backup is undisputed. Since bursting onto the scene in 2008, Veeam has shaken up the backup and data protection world with innovation after innovation. So you probably won't hear that Veeam's functionality is lacking, since that would be a difficult argument to make.

Instead, you'll likely hear that Veeam is virtual only and can't back up physical machines.

It's true—Veeam takes full advantage of virtual architecture to do things not possible with physical servers and legacy backup tools. It's how we can do what we do. And because virtualization is a fundamental component of the Modern Data Center, it's exactly the right place to be.

Legacy backup tools were built for the physical world and simply retrofitted for virtualization. Their roots are in the physical world, which constrains what they can do for VMs.

But Veeam is different. Veeam is built for the Modern Data Center and it shows. For example:

Physical backup tools…	Veeam…	
Require agents inside each VM for granular recovery and proper application backup and recovery.	Is completely agentless. Agents are not used to perform or assist with backups, and agents are not used for recovery either.	While others claim to be agentless for certain types of backups and/or restores, only Veeam is agentless in every circumstance.
Make it difficult to find VMs or navigate the virtual infrastructure.	Is intuitive and easy to use. Veeam feels like it was built for virtualization because it was!	As one Veeam customer put it: Our legacy backup tool felt like a bolt-on piece of equipment—like protecting the virtual environment was an afterthought. Veeam feels like it was built specifically to support VMs.
Often take months to provide support for new vSphere and Hyper-V releases—and even then, support is often just basic compatibility.	Provides the best timely, advanced support for new versions of vSphere and Hyper-V.	Since Veeam does not have to carry legacy systems support baggage, Veeam can provide better and deeper hypervisor-specific support much faster than legacy vendors.

Veeam doesn't simply tolerate the virtual environment, we embrace it. By harnessing the disruptive power of virtualization, we provide data protection beyond anything you could have imagined. One Veeam customer calls it "science fiction come true." We call it Virtualization-Powered Data Protection, and it changes what you should expect—and what IT stakeholders and regulators will ultimately demand—from backup.

Of course, we can't take all the credit. It's virtualization that makes what we do possible, like recover a VM in two minutes or less directly from a backup, automatically test the recoverability of every backup and eliminate agents—even for advanced file and application-item recovery.

Look closely

Most backup tools have their roots in the physical world, and some capabilities are not available with image-based VM backups. For example, some legacy backup tools might offer synthetic full backups for traditional file-based backups, but don't have this capability for image-based VM backups. Likewise, OS-level or log-based replication for select applications might be available, but not image-based VM replication. In addition, compression and deduplication might be available, but not recommended for use in vSphere environments or require in-guest agents to be leveraged.

Veeam vs. legacy backup tools

When it comes to VM backup, Veeam provides numerous advantages—both technical and commercial—over physical legacy backup tools. Here are the top 10 advantages according to Veeam customers and partners:

	Veeam Backup & Replication	Legacy backup tools
1. Agentless	✔	✘
2. Built-in advanced replication	✔	✘
3. Instant VM Recovery™	✔ (patented)	✘
4. Instant File-Level Recovery	Any OS and file system	Windows, maybe Linux
5. Instant application-item recovery	Any application and file system	Select applications only
6. Automated recovery verification	✔ (patented)	✘
7. Built-in, source-side compression and deduplication	✔	✘
8. Simple offsite backups	✔	✘
9. Storage agnostic	✔	✘
10. Easy to deploy and configure	15 minutes to self-setup	Weeks of extensive deployment

1.   Agentless

Legacy backup tools rely on agents, and they apply this approach to VM backups as well. Some can do a basic crash-consistent, image-based VM backup without an agent (e.g., using VADP, the vSphere APIs for Data Protection), but they still require agents inside VMs for essential functions like granular recoveries and application-consistent backups.

Even if agent licenses are included "for free," agents add operational cost to backup and recovery. Worse yet, they introduce risk.

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Considerable time is required to deploy, monitor, maintain and upgrade agents in every VM. Backup agents in VMs can also create compatibility issues and complicate troubleshooting for "real" VM workloads.	The time required to maintain agents translates to real costs. Agents also consume host resources, thus reducing server consolidation ratios.	Agents don't protect: • Powered-off VMs • Newly provisioned VMs • VMs with outdated agents or missing prerequisites • VMs whose agents can't communicate with the backup server (e.g., due to network isolation)

Veeam fully embraces virtualization, which eliminates all these issues by eliminating the need for agents:

VADP (for vSphere) and standard Windows APIs (for Hyper-V) eliminate the need for data mover agents inside VMs.	Image-based backups (which capture the entire VM) eliminate the need for application and file system indexing and the agents that perform it.	If properly designed, the remaining guest processing can be done by a lightweight, non-persistent run-time process, eliminating the "agent management hell" and other problems associated with agents.

Veeam performs advanced backup and recovery without the use of agents in VMs. This doesn't mean that Veeam lacks features that legacy backup tools require agents to deliver, such as application-aware backup and recovery, application log truncation, granular application-item recovery, Windows and Linux guest file system indexing, or in-place file restores. Veeam provides all these features and more without agents in VMs.

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2.   Built-in advanced replication

Legacy backup tools often require different tools and separate licenses in order to replicate your VMs off site. With Veeam, you get advanced VM replication built right into the product, allowing you to easily maintain a copy of your backups on offsite secondary storage.

Built-in WAN Acceleration

One way customers often attempt to speed up their offsite backups is through a WAN accelerator. While general purpose WAN accelerators can do an excellent job, by definition they have limited content awareness and are not able to take advantage of all of the traffic reduction capabilities that a content-aware, purpose-built WAN accelerator can.

For this reason, Veeam Backup & Replication includes Built-in WAN Acceleration with functionality specifically tuned for Veeam data transfers across the WAN. What this means is that when you need to either replicate your data or copy your backups to an offsite location, Veeam can determine what data blocks are already there, and as a result, send less data across the WAN connection. Veeam's Built-in WAN Acceleration includes global caching, variable length data fingerprinting, traffic compression, and more. And it's up to 50x faster than a standard file copy. Due to its fully integrated nature, enabling network traffic encryption does not ruin data reduction ratios, as is the case with general-purpose WAN accelerators.

Simple site failover

Once your data is stored at a secondary location, Veeam also provides a built-in orchestration engine, giving you easy 1-Click site failover when needed. An additional "planned failover" capability is also available to facilitate data center migrations with zero data loss.

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3.   Instant VM Recovery

Veeam's vPower® technology runs a VM directly from a compressed and deduplicated backup file on regular backup storage. This patented, groundbreaking technology eliminates the need to extract the backup and copy it to production storage—you simply start the VM from the backup (that's why it's called "instant"). If a VM goes down, you can restart it on any host in a matter of minutes and users can keep working while you troubleshoot the problem.

Back in a snap

In an independent lab test commissioned by Veeam, it took under 1.88 minutes to perform an instant recovery of a 200GB vSphere VM, compared to 2.4 hours for standard VM recovery from an image-based backup on disk using a legacy backup tool. That's 77x faster!

Furthermore, the time to do an instant recovery with Veeam remained under 2 minutes, *even as the size of the VM increased*.

An instant recovery of a 16GB Hyper-V VM took just 7 seconds, compared to 9.95 minutes for standard VM recovery from an image-based backup. That's 85x faster! And once again, the time to do an instant recovery remained essentially unchanged even as the size of the VM increased.

Back to normal

Veeam Instant VM Recovery is like a "temporary spare" for your VMs. To complete the recovery, Veeam will migrate the VM running from the backup to production storage for you, using the best method available (VMware Storage vMotion, Microsoft Hyper-V Live Migration, Veeam Quick Migration, etc.). Depending on the method, full recovery can happen in the background, with no interruption in service or impact on users.

Not even close

Legacy backup tools have no equivalent instant recovery capability. They may try to expedite recovery with "live recovery" of data volumes or "CBT restore," but they still operate within the conventional "restore then restart" paradigm. While Veeam too provides a CBT restore option, it is important to keep in mind its limitations, which Instant VM Recovery is free from, such as:

- Doesn't work in most common recovery scenarios, including VM deletion and loss of a complete LUN

- Cannot be relied upon in disasters caused by storage issues or host power loss

- Introduces additional risks due to not restoring blocks that are "known" to vSphere as unmodified, but that might have been corrupted on storage by the incident precipitating the restore

- Doesn't support Microsoft Hyper-V

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4.   Instant File-Level Recovery

Unlike traditional file-based backups, image-based backups allow for quick recovery of an entire VM on any host, without having to rebuild the system from scratch. But recovery of individual guest files can be a challenge.

Given that file-level recoveries are the most common recovery scenario—often occurring on a daily basis—this challenge must be overcome in order for organizations to adopt image-based backups.

First to market

From the very beginning, Veeam has provided file-level recovery from image-based backups. In fact, Veeam invented Instant File-Level Recovery (IFLR), which allows IT admins to restore guest files directly from a compressed and deduplicated image-based backup, without having to restore the entire VM first (that's why it's called "instant").

IFLR was initially available for Windows and then for Linux, Unix, BSD, Novell, Solaris and other file systems using patent-pending Veeam technology based on an IFLR helper appliance.

Extending the lead

With support for 17 different file systems, Veeam already holds a substantial lead over other backup tools. And with vPower, Veeam has extended its lead, with the ability to restore individual files from any guest OS and file system, without restoring or starting up the VM at the desired restore point.

1-Click File Restore

Veeam further extended its lead with 1-Click File Restore, which allows organizations to securely delegate Windows file restores to help desk operators. 1-Click File Restore:

• Leverages guest interaction APIs

• Requires no agents in VMs

• Requires no additional permissions for help desk operators

• Can be limited to direct restores only (so operators never have access to sensitive files)

• Can be limited to specified file types and even specific VMs on per-operator basis

Good enough?

Some legacy backup tools offer file-level recovery for Windows (and in some cases, Linux) VMs, but special indexing of each backup is typically required.

• If you forget to enable the special indexing, file-level recovery is not possible.

• If your environment can't tolerate the additional processing required to index file system of large file servers, file-level recovery is not possible.

• File-level recovery for many OSs and file systems is not possible at all.

• In-place restores, if available, typically require agents in VMs, and direct network connection from a backup server to a target VM.

5. Instant application-item recovery

With Veeam Explorer™ technology for e-discovery and granular recovery, application-item recovery just got a lot faster and easier. Now you can zero in on exactly what you need to recover and restore individual items directly from your backups. There is a Veeam Explorer for the following applications:

Microsoft Exchange: Get instant visibility into Exchange 2010 and 2013 backups, advanced search capabilities, and quick recovery of individual Exchange items (emails, contacts, notes, etc.) and Online Archive mailboxes—even hard-deleted items

Microsoft Active Directory: Search and restore all Active Directory (AD) object types, such as users, groups, computer accounts and contacts—even user and computer passwords

Microsoft SQL Server: Get fast transaction-level recovery of SQL databases, including agentless transaction log backup and replay, so you can restore your SQL databases to a precise point in time and achieve low recovery time and point objectives (RTPO™)

Microsoft SharePoint: Browse SharePoint 2010 and 2013 backups, search for specific SharePoint files and quickly recover items directly to their original SharePoint server or send them as an email attachment

In addition to Veeam Explorer, Veeam also offers its vPower technology, enabling recovery of individual objects from any virtualized application, on any OS, without restoring the entire VM first. For example, you can recover individual rows and tables from an Oracle database running on Solaris, or individual customer records from a Unix-based CRM system.

We call it U-AIR®, or Universal Application-Item Recovery. It's an innovative, patented solution to the age-old problem of what to do when users accidentally delete important emails or scripts incorrectly update records.

What it means for you

U-AIR addresses the limitations of existing object-level recovery methods. U-AIR is:

- **Inexpensive**: Doesn't require agents, additional backups or additional software tools

- **Universal**: Works with any virtualized application and the application's native management tools and permissions

- **Durable**: Not tied to application internals so it's easy to maintain and works seamlessly with new application patches and releases

The alternative

Some legacy backup tools offer object-level recovery, but:

- Object-level recovery is available for only a few specific applications

- Special agents are required, and in many cases, separately created backups or special metadata collection are also required

- The additional backup processing can be quite resource-intensive and/or slow, so customers often limit their use of object-level backup and recovery (e.g., only do granular backups of executives' mailboxes)

- If the special processing fails for any reason (even if the backup job reports success), you cannot recover application items at all

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6.   Automated recovery verification

Of course, you can't do any sort of recovery—instant or otherwise—if your backups are bad. But how do you know if your backup is unrecoverable? Even if a backup job completes successfully and the backup file passes its integrity check, you might not be able to recover from the backup. For example:

- The system you're backing up may be in an unbootable state (e.g., a critical configuration file or registry key might have been deleted or corrupted)

- There might be installation, update or system reconfiguration tasks pending reboot

- A hot backup might have captured the system or application data in an inconsistent state

The only way to be sure that you can recover from a backup is to do a test restore. All the backup vendors know this. But testing every backup is simply not possible…unless you have Veeam.

SureBackup

Veeam SureBackup® allows you to verify the recoverability of your backups—not just a few selected backups, but every backup, of every VM, every time.

This patented technology:

- Automates the recovery verification process

- Uses available resources in the existing production or test environment

- Does not affect your backup window

During recovery verification, SureBackup:

- Creates a VM in an isolated Virtual Lab (which Veeam automatically creates and manages for you)

- Runs the VM directly from the backup file using vPower

- Starts the VM, boots the OS and confirms that applications inside the VM are running normally

- Can even test a group of dependent VMs (e.g., DNS server, domain controller and Exchange Server)

Virtual Lab for Replicas

Not only can you verify recoverability of your backups with SureBackup, with Virtual Lab for Replicas, Veeam has extended its Virtual Lab capabilities beyond the local backup environment to cover disaster recovery (DR) sites as well. This powerful capability allows you to:

- Perform automated replica verification (test failover) to ensure that your replicas are available if needed

- Create isolated test environments that are exact copies of your production environment, but that use DR site resources—not production resources—so that you can try out software updates, OS patches, or other changes before applying them to your production environment—without any negative impact

How many other backup solutions increase the value of your existing idle resources by putting them to productive work?

Don't settle for less

You no longer have to settle for backups that "might work" or "should work." Instead, you can rest easy knowing that your backups—whether local or remote—actually do work and are available when needed.

7.   Built-in source-side compression and deduplication

While many backup vendors offer various ways to reduce your growing data footprint, most of the time these solutions require agents and/or do not work as well in virtual environments.

Veeam offers built-in source-side compression and deduplication that was specifically designed with virtual servers in mind. With Veeam, you don't have to treat your virtual servers as if they were physical servers by installing an agent in each of them in order to deduplicate your data.

Veeam's multi-pronged approach to reduce the size of backups (as well as network bandwidth consumption) includes the following:

Deduplication	Many VMs have the same OS and/or applications installed, making image-based backups ideal candidates for deduplication. That's why Veeam included deduplication from the beginning. In fact, Veeam was the first vendor to implement deduplication in a VM backup product. Veeam's inline, source-side, block-level deduplication typically results in a 10x reduction in network traffic and backup storage consumption. And it's included at no charge.
Compression	To further reduce backup size, Veeam can also compress backup files.
Whitespace removal	VM disks often contain empty blocks, and Veeam excludes these from backups to save space.
Swap file exclusion	Data contained in swap files isn't necessary when recovering VMs or VM data, so Veeam excludes them from backups.
Single backup	With Veeam, you only ever need one backup regardless of what kind of recovery operation you might need to perform. Full VM recovery, granular, application-item recovery and instant file-level recovery are all available from the same image-based backup for any virtualized application and any guest OS.
"Forever incremental" backups	Synthetic full backups eliminate the need for periodically running and transferring the data of complete full backups by creating new, synthetic, full backups from incremental backups. This "forever incremental" approach to backup is both proven and desirable because it reduces load on the production environment. In fact, forever incremental is the only way to protect very large VMs that would otherwise take the better part of a day—or even longer—to back up (even with the fastest and most efficient backup tool). Likewise, forever incremental is essential when backing up off site over a WAN. Synthetic full backup can also reduce backup storage requirements by 60% or more. For example, say you have a 100GB VM and your organization's policy requires you to keep 30 days of backups on disk. Assuming 5% of the data changes daily, if you were to take weekly full backups and daily incrementals, you would need 655GB of backup storage. But with a single synthetic full backup and incrementals, you need only 250GB of backup storage—a savings of 62%.

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8.   Simple offsite backups

When it comes to protecting your data, many customers struggle with maintaining a proper DR site. Often, it can be costly and time-consuming to get backups off site.

To help mitigate this impact, Veeam Backup & Replication offers some key features to make it faster, easier and more cost-effective to get your backups off site.

Built-in WAN Acceleration

As referenced earlier, Veeam offers a Built-in WAN Acceleration capability that's specifically tuned for Veeam data transfers across the WAN. This is not only useful for replication, but for copying backups off site as well.

Backup Copy jobs

Built-in WAN Acceleration can be used with Veeam's Backup Copy jobs feature. This feature provides an automated way to copy VMs to either local or remote storage locations. It also enables proper backup and retention policies (e.g., grandfather/father/son) to help meet long-term retention requirements. Together, Built-in WAN Acceleration with Backup Copy jobs provide an easier, simpler way to get your backups off site.

Connect to the cloud

To make storing offsite backups even easier, Veeam also offers the ability to seamlessly store your backups in the cloud backup repository hosted by a service provider, with Veeam Cloud Connect. Your backups can be created or copied off site over the Internet securely through an SSL-protected connection. Veeam Cloud Connect enables offsite protection without the need to invest in a second site.

Security

Finally, you might be wondering how safe your data is as it moves from one storage location to another across the WAN. To mitigate these concerns, Veeam offers end-to-end encryption, allowing you to secure your data via AES 256-bit encryption in three different locations:

• *At source* (during backups), before it leaves your network perimeter

• *In flight* as your data is transferred

• *At rest*, which includes hardware and software tape encryption

These three encryption options provide flexibility with regard to when and where you can leverage encryption.

With the combination of Built-in WAN Acceleration, Backup Copy jobs, Veeam Cloud Connect, and end-to-end encryption, along with the ability to send your backups off site to disk, cloud or tape, Veeam Backup & Replication offers a flexible, secure, simple way to more easily and cost effectively get your backups off site.

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9.   Storage agnostic

Veeam is storage-agnostic, so you can use it with any mix of production and backup storage across data centers, remote offices and DR sites. Customers appreciate this flexibility, which:

• Avoids vendor lock-in

• Optimizes storage spend

• Makes it easy to integrate acquired companies

• Allows old production storage to have a new life as backup storage

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10. Easy to deploy and configure

With a product as powerful as Veeam Backup & Replication, it must be expensive and time consuming to install, right? After all, the typical legacy backup solution requires weeks to deploy, even with a team of expensive consultants, and often just to upgrade from one version to the next!

But the power and elegance of Veeam Backup & Replication extends beyond its feature set such that installation and deployment can occur in a fraction of the time and expense. With Veeam Backup & Replication v7, individual IT administrators reported 60 minutes to download, install, configure and complete a full backup of 25 VMs!

Compare that to legacy, agent-based legacy backup solutions, which normally require weeks of professional services to be deployed.

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Summary

Legacy backup tools are typically considered for VM backup by organizations already using those tools. While it might be convenient to back up everything—both physical and virtual—with one tool, what is the cost of doing so? What do you lose by choosing a single legacy solution over one specifically built for the Modern Data Center?

As this document illustrates, you lose a lot.

The Modern Data Center—including virtualization—offers the opportunity to significantly enhance data protection and reduce costs, but you need the right tool to turn opportunity into reality. Already, Veeam has made this a reality for over 120,000 customers. Isn't it time you made Veeam part of your Modern Data Center?