

SEVEN WAYS UNITRENDS OPTIMIZES SERVER VIRTUALIZATION AND SANs

Server virtualization has been one of the most transformative technological trends in the last decade and has been increasingly adopted by small, medium, and large enterprises to decrease IT-related capital expenditure. VMware has had the first-mover advantage in terms of providing comprehensive server consolidation offerings utilizing server virtualization technology - a position that was enhanced when EMC spun VMware into its own corporate entity and assured that the company would continue to pursue a vendor-neutral stance. Nevertheless, VMware has felt the market impact of Microsoft with its Hyper-V server virtualization offering while Citrix's Xen and other smaller competitors are also making inroads into this market. VMware has fought back with its innovative yet closed vSphere 4 which is the successor to the company's VMware Infrastructure 3 platform.

Storage virtualization, or the process of abstracting logical from physical storage, has had less success as a general concept; however, there is one area in which storage virtualization has been able to make great inroads - via SAN offerings. A SAN (Storage Area Network) is an architecture that provides a limited form of storage virtualization for an array of storage devices that appear to be locally attached to a server's operating system. SANs owe their popularity to the support of VMware and other virtualization vendors for SANs as a common storage mechanism for server virtualization. There has been increasing criticism of SANs, perhaps best articulated by Andrew Reichman of Forrester (formerly of EMC) in the report "Do You Really Need a SAN Anymore?" in which Reichman posits that the SAN promise of utilization, simplicity, performance, and availability have been usurped by the SAN reality of cost, complexity, SAN islands, and incompatibility. Nevertheless, SANs are a very real presence in today's marketplace.

Unitrends offers an integrated set of business continuity and disaster recovery appliances which support a diverse set of virtual and physical server and storage options. By using server virtualization, SANs, and Unitrends appliances together, small and medium sized businesses (SMBs) can dramatically increase the effectiveness of virtualization with respect to data protection. The business and technical advantages that Unitrends appliances provide in this environment are these:

1. Seamless support for heterogeneous virtual and physical environments.
2. Seamless support for heterogeneous SAN, NAS, and DAS storage environments.
3. Scalable "future-proof" business continuity and disaster recovery support.
4. Advanced ImmuniLogical data protection¹.
5. An integrated appliance and intuitive user interface that lowers operational expense.
6. Lower WAN costs due to replication using advanced in-flight deduplication.
7. Lower disaster recovery costs because no replicated SAN is required.

Each of these will be examined in more detail in the remainder of this paper.

SEAMLESS SUPPORT FOR HETEROGENEOUS VIRTUAL AND PHYSICAL ENVIRONMENTS

Unitrends is a VMware Technology Alliance Partner. We take our alliance with VMware seriously and are deeply involved with VMware with respect to planning and early product development and testing.



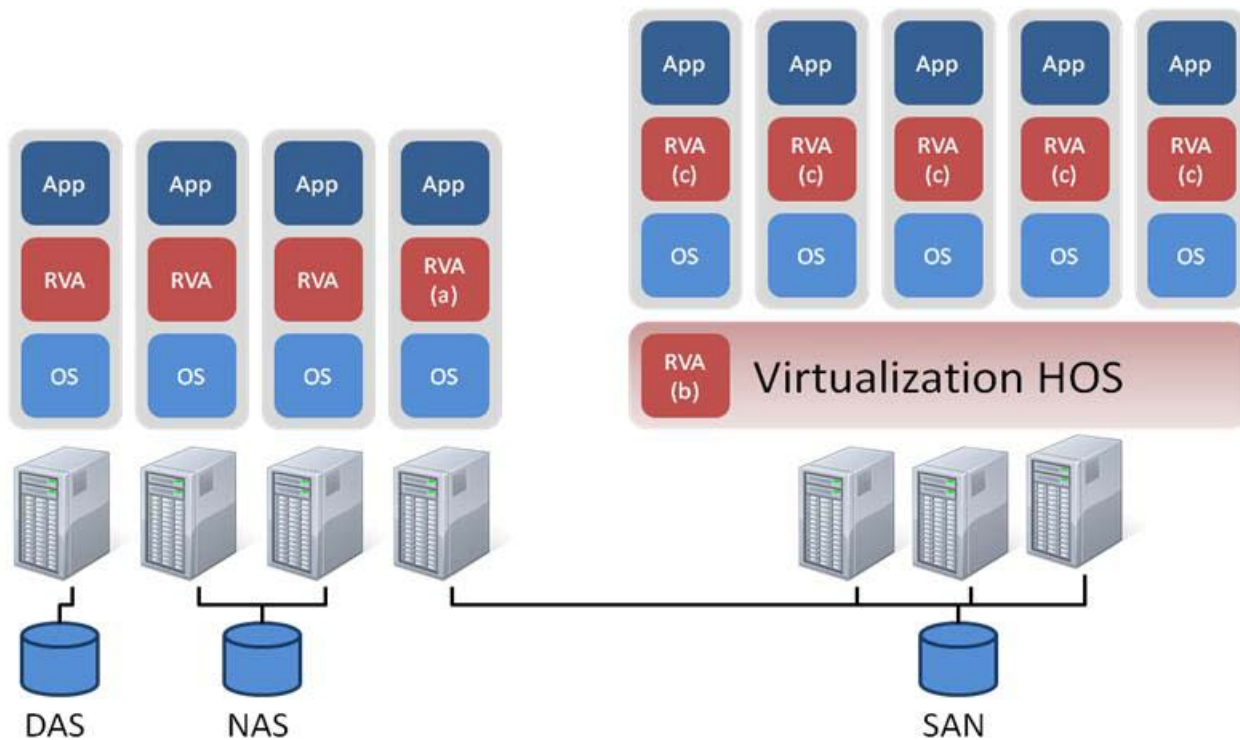
However, we also work with many other server virtualization vendors. We work with many physical server vendors. Our commitment to the SMB market means that we have to be inclusive in terms of different approaches taken by our customers with respect to the design and management of their IT infrastructure.

¹ This approach protects against threats from hackers, malware, viruses and the like that can compromise a SAN's usefulness as a backup and recovery tool.

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Even the most avid proponents of server virtualization tend to have a few physical servers – and a whole lot of PCs and notebook computers – that must be protected. A company that adopts a strict “we’ll protect only the SAN; copy everything to it” philosophy tends to find over time that the requirements for nimble storage provisioning coupled with the drastically decreasing cost of simple SATA-based disk storage defeat the best of intentions.

Unitrends offers an inclusive method of providing data protection that accommodates virtual and physical environments. It features a “single pane of glass” intuitive user interface that doesn’t require the operational expense of learning and maintaining different data protection products. Our method of doing this is via our innovative RVA-based (Retention Virtualization Agent) architecture depicted below.



Note that in this diagram the RVA potentially exists concurrently at the following physical and virtual levels:

- The RVA may exist at the physical level and support DAS or NAS (see the next section); this is depicted above as “RVA.”
- The RVA may exist at the physical level and support SAN (see the next section); this is depicted above as “RVA (a).”
- The RVA may exist at the physical level of the virtualization HOS (Host Operating System); this is depicted above as “RVA (b).”
- The RVA may exist within the virtual level of each virtual machine; this is depicted above as “RVA (c).”

SEAMLESS SUPPORT FOR HETEROGENEOUS SAN, NAS, AND DAS STORAGE ENVIRONMENTS

Just as Unitrends offers seamless support for heterogeneous virtual and physical environments, we offer support for heterogeneous storage environments. This means that we offer support not only for SAN but for NAS (Network Attached Storage) and DAS (Direct Attached Storage.) This was depicted in the last diagram of the previous section.

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Virtualization vendors, led by VMware, initially supported only SANs with their "enterprise-ready" versions of their products (e.g., ESX 3.x.) However, virtualization vendors now also support NASs. DAS support has been slower and has typically been relegated to non-production versions of their product (e.g., VMware Server.)

Unitrends offers seamless support for real-world deployment of SAN, NAS, and DAS. We also offer server-free protection of SAN and NAS as well as offering server-less compression and optional encryption. Thus Unitrends supports direct data protection of DAS, we support direct and server-free methods of supporting NAS at both CIFS and NFS levels, and we support direct and server-free methods of supporting SAN. We do this via an inclusive method of providing data protection that accommodates different storage architectures with a "single pane of glass" intuitive user interface. Users avoid the operational expense of learning and maintaining different data protection techniques and products.

SCALABLE "FUTURE-PROOF" BUSINESS CONTINUITY AND DISASTER RECOVERY SUPPORT

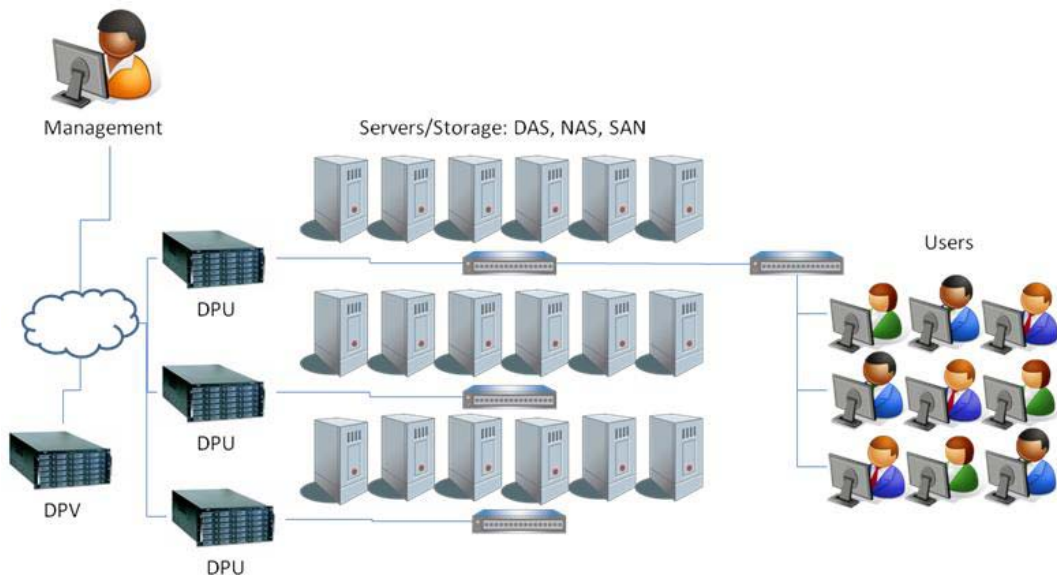


Windows Server® 2008
Hyper-V™

In addition to supporting existing heterogeneity in terms of seamless support of virtual and physical environments as well as seamless support of SAN, NAS, and DAS storage environments, Unitrends supports scalable "future-proof" business continuity and disaster recovery.

We use the term "future-proof" to refer to two aspects of evolving customer growth; the growth in the number of virtual and physical assets and the growth in the number of virtualization environments at both the hypervisor and infrastructure layer.

- We support the growth of customer environments in terms of both virtual and physical computer assets via our scalable data protection appliances. As a customer's environment grows, our data protection appliances offer additional protection both within a single appliance and through the provision of multiple appliances - all of which are managed via a single user interface.



Solutions Benefit Series

- We support multiple and heterogeneous hypervisors and the infrastructure associated with these hypervisors. This means that not only is VMware supported (including VMware ESX, VMware Infrastructure 3, and vSphere 4), but Microsoft Hyper-V is supported as well. In addition, as future hypervisor and infrastructure solutions are available, they will also be supported.

The business strategies of VMware and Microsoft with respect to virtualization are pretty straightforward. VMware is attempting to move up the value chain with first its Infrastructure and now its vSphere offerings. They are powerful and yet closed - you can't use vSphere to manage third-party virtualization products. Microsoft is attempting to compete at the hypervisor level with Hyper-V and has taken an open approach with respect to its System Center offering.

Unitrends' business strategy is equally clear - to enable our customers to avoid the dreaded "lock-in" of these technologies with respect to data protection.

ADVANCED IMMUNOLOGICAL DATA PROTECTION

Disaster recovery tends to receive the lion's share of attention due to the publicity surrounding the horrific effects of major disasters such as Hurricane Katrina or the devastating tsunami that ravaged Thailand. However, a recent survey of IT executives from Infoconomy found that, of the named perceived threats to business continuity, viruses were second only to "internal system failure" as the leading cause of concern. This same survey found that 48% and 32% of these executives, respectively, cited "greater broad awareness of IT risk" and "growing security threat" as the major drivers for increasing IT resilience.

The inherent problem with SAN snapshots as a mechanism for data protection is that a SAN snapshot is intrinsically at risk for virus infestation since the snapshot is retained in the same environment in which the virus manifested itself. In addition, even with advanced snapshot technologies allowing hundreds of snapshots there is a tremendous issue with determining when the infestation occurred. Retention is needed, not just in minutes and hours but in days and weeks. Basically, this is akin to the old aphorism "Don't put all your eggs in one basket."

Unitrends takes security threats very seriously. We use a hardened version of a Linux-based operating system, which we call RecoveryOS, as the embedded operating system for our data protection appliances. This operating system is not the typical target of virus writers and hackers. Moreover, we concentrate on longer-lived retention policies than are associated with SANs. We use a differential backup strategy that allows easier isolation of infected files and data structures and recovery of virus-free versions of these. We call all of this the Unitrends advanced Immunological approach to data protection.



INTEGRATED APPLIANCE AND INTUITIVE USER INTERFACE LOWERS OPERATIONAL EXPENSE

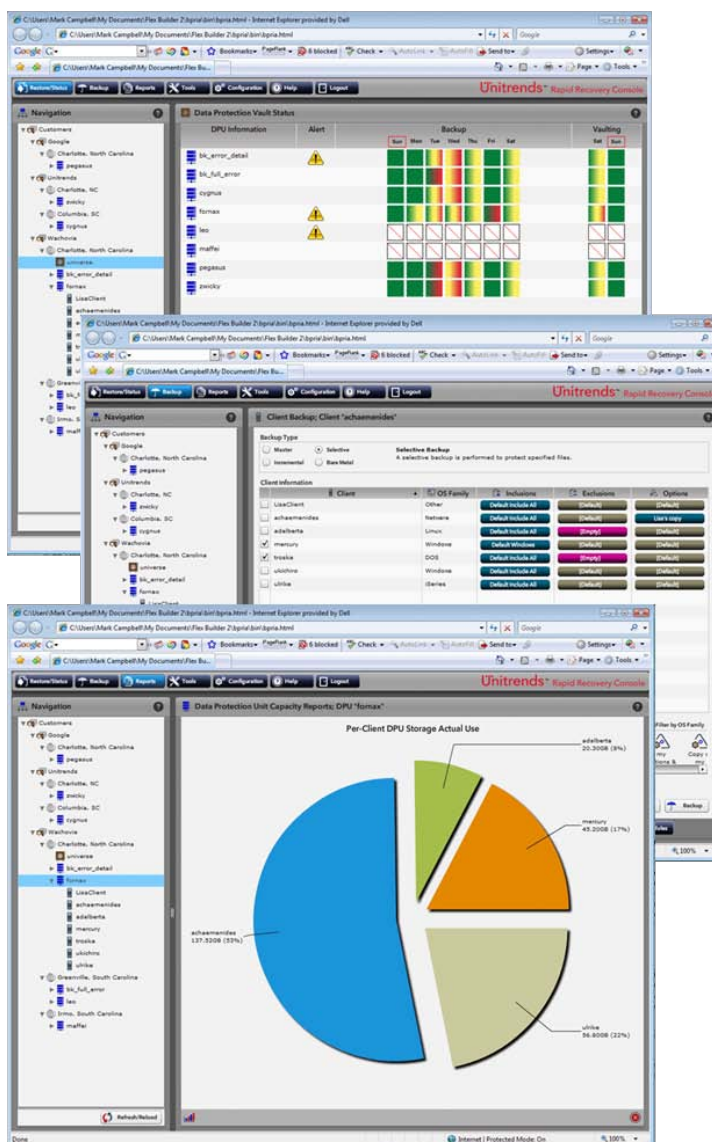
A company purchasing a virtualization solution and a SAN has typically made a decision to make a significant capital expenditure investment. But that same company faces an even greater expense in terms of the operational expense associated with the creation, management, and maintenance of the applications, operating systems, virtualization infrastructure, and physical server and network infrastructure. Attempting to then put together the server, storage, networking, operating system, and application infrastructure for the unique requirements of a set of data protection services is akin to pouring gasoline on the fire of that operational expense.

Unitrends provides an integrated set of data protection appliances in order to provide a strategic advantage to its customers in terms of radically decreasing the operational expense associated with data protection. Data protection requires a relatively unique set of activities that challenges even the most advanced administrator with respect to: storage system reliability, performance tuning and fragmentation policy; LAN and WAN monitoring and subsequent management; operating system and application versioning and performance optimization; and many other characteristics.

Even when the required expertise exists to initially set up such a system, the first time a problem occurs the user typically confronts an ugly round of finger pointing as the data protection application, operating system, server, storage, networking, and other vendors all spend time claiming that it's someone else's fault. Everyone has heard many stories of this type of behavior.

Even companies that have existing relationships are far from immune in this behavior - even though EMC at one time owned VMware, you'll find that EMC's myriad of backup products work no better with VMware than any other solution, and the Web is rife with examples of disparate groups blaming each other.

In addition to integrated appliances, Unitrends offers an integrated, simple, and elegant user interface. Its graphical nature and click minimization aspects enable intuitive monitoring and management of all aspects of data protection. The screenshots associated with this section are typical of the type of graphics-rich "monitor and manage at a glance" interface that is offered on all of our appliances.



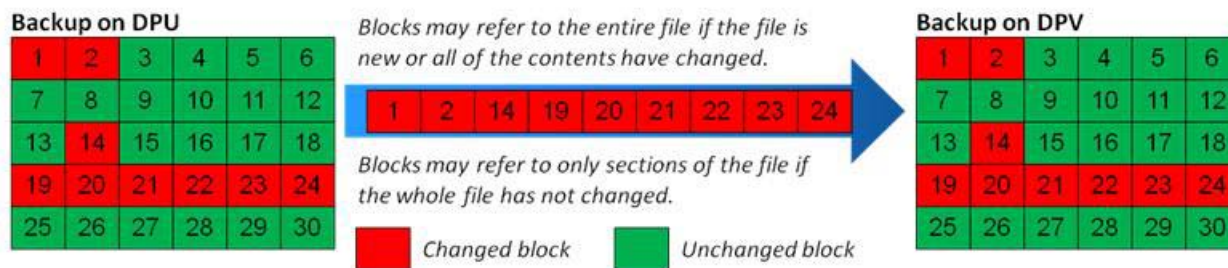
LOWER WAN COSTS DUE TO REPLICATION USING ADVANCED IN-FLIGHT DEDUPLICATION

Of all of the virtualization vendors, VMware is the most advanced in terms of offering disaster recovery services. VMware offers two fundamental disaster recovery mechanisms: host (server) replication and storage array-based replication. Both rely upon the underlying concept of replication. Replication simply means that data is replicated from one storage device to another. Typical mechanisms for replication include SANs and explicit replication software.

There are two categories of replication: asynchronous and synchronous replication. Asynchronous replication is more common and does not have the performance impact on the two (or more) systems being replicated – but it may take from a few minutes to a few hours to switch from the live to the secondary system. Synchronous replication is more rigorous, and has a more severe performance impact due to communication latency, but has the capability of switching from the live to the secondary system in seconds rather than minutes.

If the WAN connection between the replicated systems is of sufficient quality and there is a large amount of bandwidth available, replication works very well. VMware even refers to “dark fiber” in their replication literature – that basically means unused WAN capacity that is seen in some global 1000 companies (e.g., AT&T.) However, for most SMB customers (and even larger enterprises that aren’t yet in the global 1000), WAN bandwidth is an expensive and precious commodity. Optimizing that WAN bandwidth is incredibly important for these companies. Finally, the techniques of asynchronous and synchronous replication tend not only to be expensive in terms of WAN resources, but also very greedy in terms of shared WANs (the most common type, since few companies can devote their entire WAN bandwidth during operating hours for replication – they bought the capacity for the applications they use to operate their business).

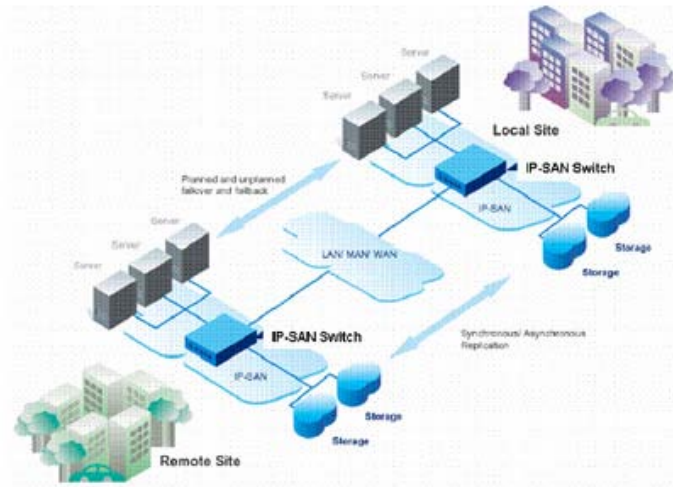
Unitrends is different. Our replication software is domain-specific. What that means is that our replication software was built from the ground up to understand data protection and to transfer only the minimum amount of information necessary for disaster recovery. We have advanced throttling algorithms and techniques to optimally handle sharing of precious WAN bandwidth with other applications. We optimize every available bit of bandwidth.



LOWER DISASTER RECOVERY COSTS BECAUSE NO REPLICATED SAN IS REQUIRED

In addition to providing lower operational expense due to optimizing the WAN bandwidth required for disaster recovery, Unitrends optimizes capital expenditures when compared to either asynchronous or synchronous SAN replication, since those techniques require a SAN mirror to exist at a separate geographic site. And while there exists some management software that supports SAN replication, most notably VMware's SRM (Site Recovery Manager, which was part of VMware's Infrastructure 3, now superseded by vSphere 4), the process is not only expensive but complicated as well.

In addition, a replicated SAN by its very nature protects only another SAN. As noted previously, this does not tend to bode well for real-world scenarios of protecting NAS and DAS, nor does it protect well separate physical servers, PCs, and notebook computers.



Unitrends replaces the concept of a specialized SAN mirror with the concept of a general data protection and disaster recovery "vault;" this is a data protection-specific appliance that exists solely for disaster recovery purposes. It is simple to manage and configure, and because it is implemented as an integrated appliance and is managed as part of an overall system of appliances, it is much less expensive on both a capital and operational expenditure basis. This means that you can more efficiently protect not only your SAN and your virtualized servers, but also your DAS, NAS, physical servers, PCs, and notebook computers – all using a single integrated offering.

CONCLUSION

We've identified seven important ways that Unitrends optimizes server virtualization and SANs while protecting past investments, providing data protection flexibility in the future, and protecting against "vendor lock-in" of both virtualization as well as storage technologies. To recap, these seven key advantages are:

1. Seamless support for heterogeneous virtual and physical environments. Unitrends protects both your virtual and your physical computing assets without forcing you to restructure your entire environment.
2. Seamless support for heterogeneous SAN, NAS, and DAS storage environments. Unitrends protects your SAN, NAS, and DAS storage without forcing you to redesign your entire IT infrastructure. Storage provisioning can occur in an agile and nimble fashion based on application needs as well as the latest developments in storage technology and pricing.
3. Scalable "future-proof" business continuity and disaster recovery support. Unitrends protects multiple hypervisors and virtual infrastructures, and supports scalable appliances that can be added as the customer's business grows.
4. Advanced ImmuniLogical data protection. Unitrends is less likely to replicate viruses, and we don't protect data on the same systems that are the targets of viruses and hackers.
5. Unitrends provides an integrated appliance and intuitive user interface to drastically lower capital and operational expenses.

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6. Lower WAN costs due to replication using advanced in-flight deduplication. Unitrends optimizes every last bit of precious WAN bandwidth through domain-specific in-flight data deduplication technology, and allows optimal interaction with other applications sharing the WAN.
7. Lower disaster recovery costs because no replicated SAN is required. Unitrends offers disaster recovery for your SAN, NAS, DAS, virtual servers, physical servers, PCs, and notebooks via its integrated vault appliance.

For more information, please contact us at [800.648.2827](tel:800.648.2827) or sales@unitrends.com.