



# **esXpress Solution Advantage**

Version 1.0

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# Introduction

## The esXpress Backup Solution Advantage

Although still in its infancy, virtualization has become the de facto standard for many, especially those in the larger enterprise space. However, recent marketing pushes by the virtualization leader VMware, illustrates that small and medium sized businesses can reap the many benefits server, desktop and other types of virtualization bring (see Green Savings of a Virtual Infrastructure White Paper by AM3 Technologies [http://am3tech.com/papers/Green\\_Savings\\_Whitepaper.doc](http://am3tech.com/papers/Green_Savings_Whitepaper.doc)). AM3 Technologies subscribes to the well-founded notion that one day in the nearing future all systems will be virtualized in one way or many. It predicted as much in the Introduction of AM3 Technologies founder's first book, *Virtualization with VMware ESX Server*, published in 2005. Therefore, since virtualization is becoming the industry standard for provisioning traditional IT resources then they need to be managed accordingly. One critical management function is Business Continuity Planning (BCP). One component of any BCP is the design and implementation of a sound backup and recovery process(es).

Enterprise and small businesses alike need to be able to confidently backup and more importantly restore their valuable production data. In the exploding web and digitally-based global economies, recovery of data and solid business continuity planning are fundamental considerations which need to be designed and implemented correctly to ensure business presence and data accuracy. In the last few years virtualization has gained significant momentum and many virtual infrastructures have supplanted their legacy physical counterparts.

In response to this, many vendors have been working on new products to help manage a virtual environment. One company, PHD Technologies and their backup and recovery solution esXpress have helped fill one of the primary needs of virtual environments—the ability to quickly, securely and dependably backup and restore virtual machines and the critical data contained within them.

Founder, Ron McKelvey, has led PHD Technologies and the development of esXpress so that both the product and the company have gained the respect of its growing client base. Because of esXpress's dependability and ease of configuration as well as PHD Technologies corporate culture of listening and responding quickly to their customers' needs and suggestions, the popularity and demand for esXpress has grown as steadily as their market share.



## Early Market Differentiation

esXpress was the first product to introduce the concept of the Delta backup. All backup products for virtual environments claimed they could backup virtual machines, but esXpress was the first product that not only backed up complete virtual machines (or full backups) but also the concept of the Delta. A delta backup captured only the changes of virtual machines at the SCSI block-level. This results in much smaller backups than full backups and thus quicker backup times allowing administrators in many cases to either reduce the time needed to backup their virtual environments or meet the existing SLAs for their backup windows.

As important as the delta backup was to esXpress's early adoption, it was the ability to successfully *restore* its backups that really set PHD Technologies and esXpress apart from their competition. And of course, the restore is the critical success factor for any backup technology. Within the delta backup PHD has very conveniently loaded all the necessary programming needed to restore backups. Restorations can be placed on the ESX host from which the backups were made or they can be restored to just about any platform needed, including a Windows box running CYGWIN. PHD Technologies mantra is that your backups are yours and you shouldn't need their software to recover the data that you need. However, esXpress has a built-in reporting component that notifies administrators and/or management the status of every backup.

With VMware's Virtual Infrastructure 3, esXpress began using Virtual Backup Appliances (VBAs). VBAs are small virtual machines that are configured according to one's requirements and whose sole job is backing up other virtual machines. With the use of VBAs, esXpress moved the processing of backup jobs into the virtualization space, allowing them to minimize the impact that backups had on the ESX service console. Additionally, it allowed esXpress to scale their backup power and flexibility. With multiple VBAs running concurrently on a single host, parallel backup jobs utilized the compute resources that were otherwise not being used. To ensure VBAs do not constrain resources on a hosted virtual machine, PHD Technologies recommends that all VBAs be placed in Resource Pools, so that they can not constrain production virtual machines of needed resources. This backup model not only demonstrates a key understanding that a backup administrator needs, but a highly developed understanding of the power of virtualization. VMware has followed suit by supporting their VCB proxy server as a virtual machine, however VCB's still need a third-party agent and do not scale like VBAs.

In advance of VMworld 2008, PHD Technologies announced the release of esXpress 3.5 which includes new features such as data de-duplication and a Global User Interface. These advances, which are discussed below, will greatly enhance the enterprise scalability of esXpress and the value proposition this backup solution has for the SMB and enterprise markets.



### **Data De-duplication**

PHD Technologies has incorporated this hot technology concept within esXpress. Data de-duplication technology enables Virtual Full backups, which captures each unique data block across all virtual machines. Data de-duplication will eventually replace creating separate full and delta backups for each virtual machine. The technology also comes with a new backup target which is created using a virtual SAN appliance and built on the XVS virtual machine.

### **Global user interface**

Further extending their use of virtual appliances, the esXpress Global User Interface is a new web-based centralized management console, which provides enabling hassle free and rapid large scale configuration. The centralized management is integrated into Virtual Center, and can also be accessed through any standard web browser. The interface is provided by a dedicated Virtual Appliance, which provides resilience against hardware failure and eliminates the need for additional Operating System licenses.

### **SMB Market**

Although virtualization has taken a significant hold within the enterprise IT environment, the small and medium-sized businesses (SMB) can also derive considerable benefit from deploying a virtual infrastructure. Consolidating server closets and unmanaged network equipment into a more manageable IT environment can ease the burden on the smaller IT administrative staff who shoulder diverse technical responsibilities that are generally siloed within the enterprise space.

esXpress can allow for simplified but dependable backups at a price point that is attractive and can be accommodated by most SMB budgets.



## Small and Medium Businesses

Below are two reference architectures that provide high level deployment possibilities for SMB.

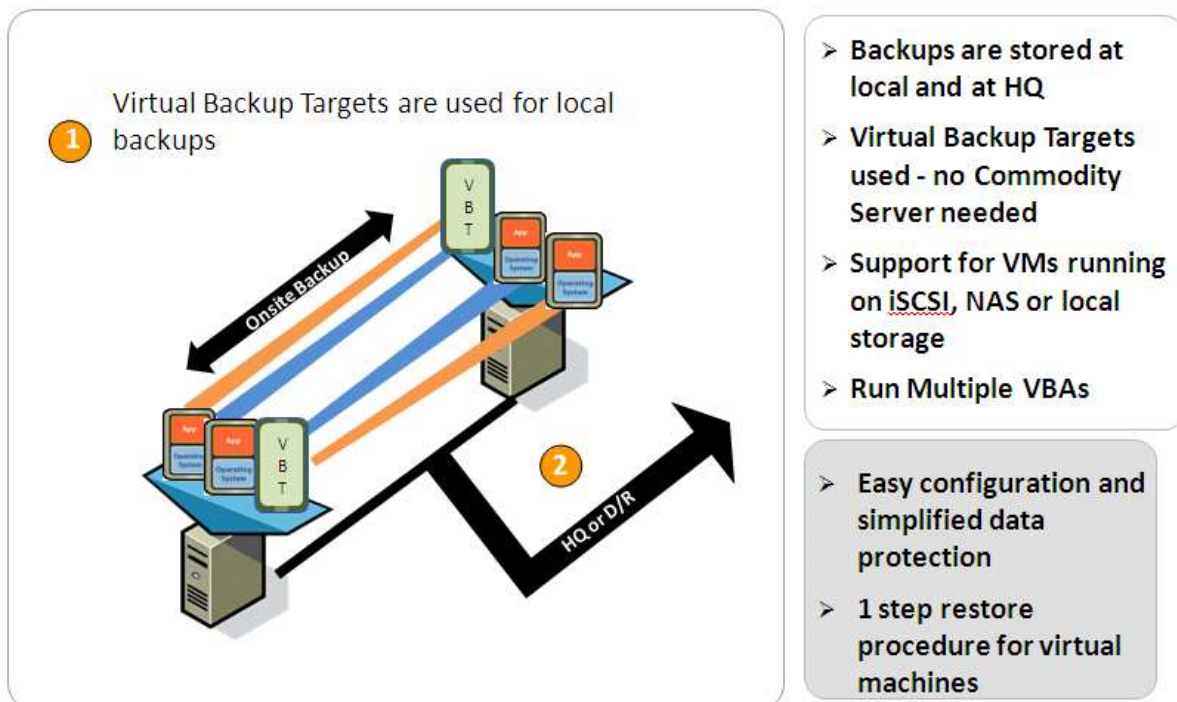


Figure 1 esXpress Reference Architecture 1

In Figure 1 the architecture shows two ESX hosts each of which is running esXpress. Additionally a Virtual Backup Target (VBT) has been created. A VBT is simply a virtual machine that has been provisioned with enough space to house the backups of the other host. The VBT would also be running a service such as FTP or NFS which could be accessed by esXpress. For example, a cost effective VBT could be a Windows XP virtual machine running Filezilla ( a free FTP server). In the example above, each host has a VBT and backs up to it nightly. Additionally, as esXpress can have multiple backup targets, backups can also be piped to corporate headquarters or a disaster recovery site to ensure that in the event of a complete site failure, the backups are kept in a secure location.



In Figure 2 the VBT have been replaced by a commodity server which can be a server that was P2V'd and is now running within the virtual infrastructure. The commodity server model would be used to control environments with limited ESX computing resources. It also leverages legacy hardware that may be re-used to support the virtual infrastructure backup solution. The commodity server in Figure 2 also has a USB drive attached to it. Of course, a multi-drive configuration is possible and with storage prices falling this is also a cost effective solution for SMB budgets.

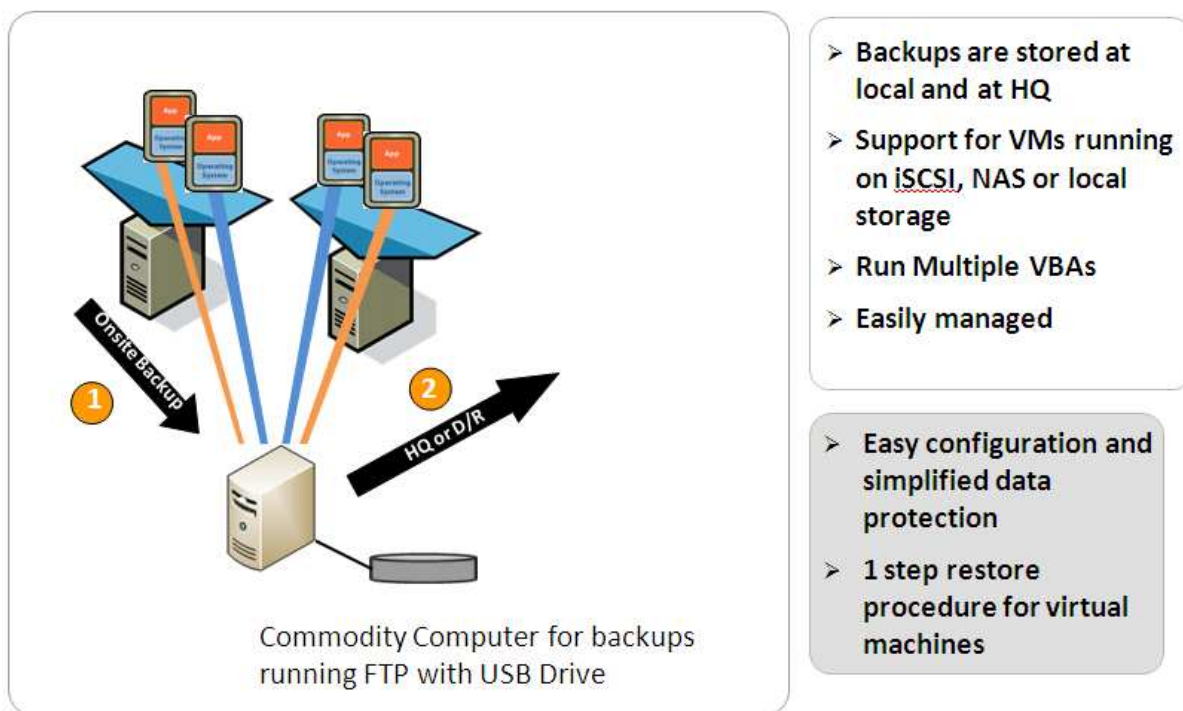


Figure 2 esXpress Reference Architecture 2

There are many advantages to using esXpress if you are an SMB including cost, dependability and ease of use. Like the enterprise environment, the SMB business needs to backup their virtual infrastructure to ensure business continuity in the event of a disaster.



## Enterprise

In the enterprise environment agent-based backups have ruled this space for years. Each of these agents has a significant price point and the solution in general requires a fully dedicated team to manage. If bare-metal backups are required extra costs may be incurred. In this legacy backup model, similar or exact server hardware is required for full-metal restores which can easily double costs. However, testing this type of solution is known to be laborious, time-intensive and generally results in a large percentage of failures. This is a contributing factor to why many organizations do not regularly test their BCP strategy if they have one at all.

esXpress can help introduce efficiencies of cost, scalability and dependability for the enterprise backup model. Every backup done can be considered a bare-metal backup as the virtual machine being backed up is a file. Virtualized workloads are basically hardware independent and so restoring virtual machines does not require the same server class or specification.

Below are two reference architectures that represent the scalability and flexibility of esXpress in an enterprise environment.

In Figure 3 there are three ESX hosts running esXpress which point to two VBTs on the management virtual infrastructure. VMware has recently begun supporting and even recommending VirtualCenter be placed in a virtual machine.

**Note:** With the explosion of virtual appliances many of which can assist in supporting and managing virtual infrastructure enterprise deployments, you may want to consider designing a management virtual infrastructure which will be used exclusively for appliances such as VBTs, management virtual appliances and VirtualCenter.

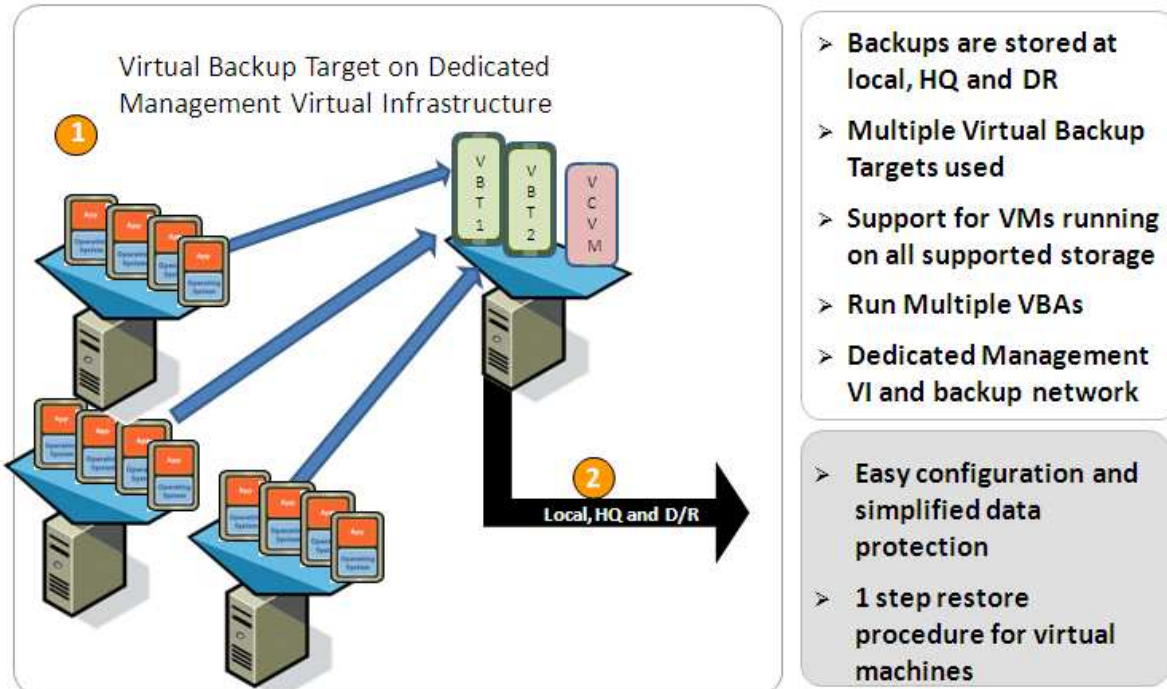


Figure 3 esXpress Enterprise Reference Architecture 1

Figure 3 shows a very high level architecture that can be scaled based on the needs of the enterprise. The introduction of a management virtual infrastructure allows an easily scalable model which can support the deployment of multiple VBTs and can share storage or present disparate storage targets for backups.

Figure 4 illustrates how esXpress can utilize the virtual infrastructure as well as the legacy backup solution to ensure redundancy and replication of the virtual infrastructure.

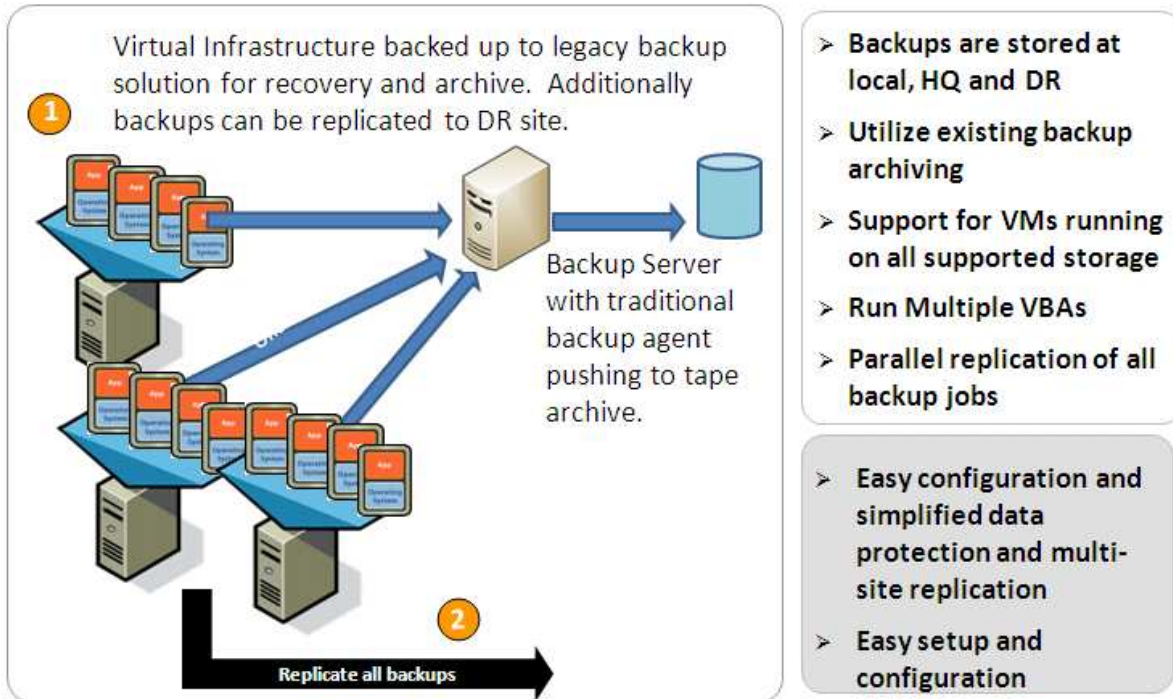


Figure 4 esXpress Enterprise Reference Architecture 2

If regulatory compliance is a consideration when designing your backup solution and long term tape archive is a requirement within your organization, esXpress in conjunction with an agent-based archive solution can be easily architected. However, esXpress significantly reduces the number of agents needed which minimizes the cost of the solution.

esXpress can be easily adopted within both the SMB and enterprise environments providing cost reductions and management and configurations efficiencies. The flexibilities that the esXpress solutions provides allows backup administrators to easily design a backup strategy that can meet business, technical and compliance requirements.