ExaGrid and Veeam
Straight Disk vs. Appliances

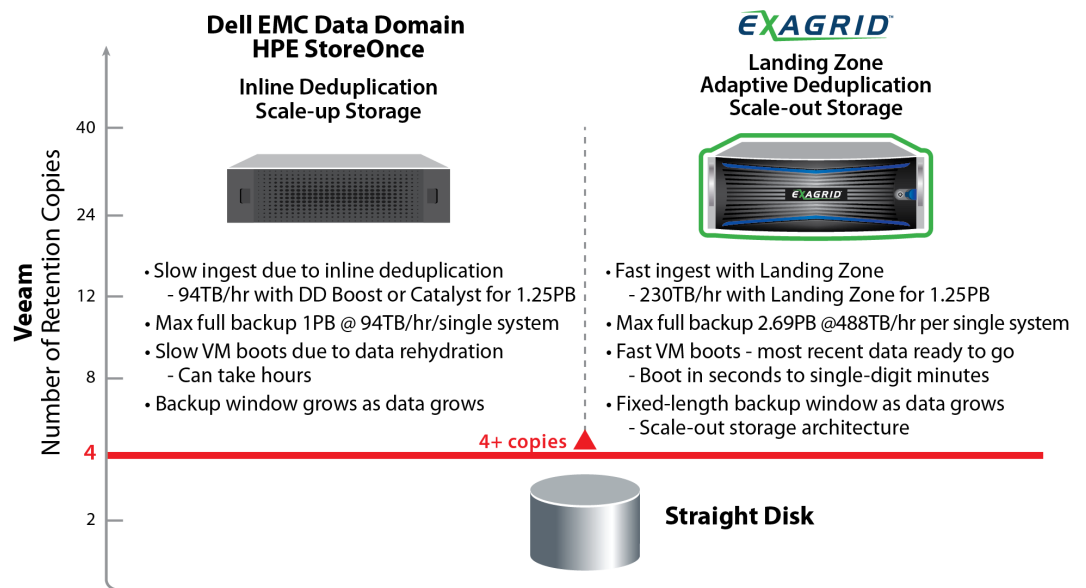**ExaGrid Tiered Backup Storage**

Fastest Backups.

Fastest Recoveries.

Unparalleled, Cost-effective Scale-out.

Veeam backs up to disk and uses changed block tracking, which will achieve a 2:1 deduplication ratio. At lower retention (less than four weeks), straight disk is the least expensive. However, at over four weeks of retention, the amount of straight disk required becomes cost prohibitive. Backup storage appliances provide additional deduplication of up to 10:1 and are far more cost effective at over four weeks of retention.

Dell EMC Data Domain HPE StoreOnce

Inline Deduplication
Scale-up Storage

• Slow ingest due to inline deduplication
 - 94TB/hr with DD Boost or Catalyst for 1.25PB
• Max full backup 1PB @ 94TB/hr/single system
• Slow VM boots due to data rehydration
 - Can take hours
• Backup window grows as data grows

EXAGRID

Landing Zone
Adaptive Deduplication
Scale-out Storage

• Fast ingest with Landing Zone
 - 230TB/hr with Landing Zone for 1.25PB
• Max full backup 2.69PB @488TB/hr per single system
• Fast VM boots - most recent data ready to go
 - Boot in seconds to single-digit minutes
• Fixed-length backup window as data grows
 - Scale-out storage architecture

Veeam
Number of Retention Copies

40 — 24 — 12 — 8 — 4 — 2

4+ copies

Straight Disk

If retention periods onsite or offsite are 6, 9, or 12 weeks – and even months or years – deduplication appliances will cost far less due to greater deduplication ratios. They use far less disk than using straight disk. The role of deduplication is to store only unique bytes or blocks called changed data versus storing all of the data.

With ExaGrid Tiered Backup Storage appliances, backups are written directly to a disk-cache Landing Zone, avoiding inline processing, ensuring the highest possible backup performance resulting in the shortest backup window. Adaptive Deduplication performs deduplication and replication in parallel with backups while providing full system resources to the backups for the shortest backup window.

Virtualized backup applications have many unique features and functions that require the full VM to be available and ready to be booted in seconds to minutes.

- The ability to boot a VM from the backup storage system when the primary VM environment is offline The ability to perform audits or Sure Backups to prove to an internal or external audit team that VMs can be booted or restored in the case of a failure
- The ability to create a synthetic full on a regular basis in order to ensure reliable full backup restores; integration of the Veeam Accelerated Data Mover with ExaGrid's landing zone provides synthetic fulls that are 6X faster
- VM boots on the backup system to test patch, configuration, and other updates before rolling out to the production environment
- Support of Veeam's Scale-Out Backup Repository (SOBR)

Fastest Backups for the Shortest Backup Window

ExaGrid understands that data deduplication is highly compute intensive and should not be performed during the backup window as the deduplication will slow down ingest performance and, as a result, will lengthen the backup window. ExaGrid provides a unique disk-cache Landing Zone in each appliance where backups are written directly to disk so that the compute-intensive data deduplication process doesn't impact ingest. This approach provides the fastest backup ingest rate of any other deduplication solution. ExaGrid uses "adaptive" deduplication to deduplicate and replicate data to the disaster recovery (DR) site during the backup window (in parallel with the backups) but not inline between the backup application and the disk. This unique combination of a Landing Zone with Adaptive Deduplication provides for the fastest backup performance, resulting in the shortest backup window as well as a strong disaster recovery point (RPO).

Fastest Restores, VM Boots, and Offsite Tape Copies

Ninety-five percent or more of the total volume of restores, VM boots, and offsite tape copies come from the most recent backup, so keeping the most the most recent backup in only deduplicated form will require a compute-intensive, time-consuming data "rehydration" process that will slow down restore requests. VM boots can take hours from deduplicated data.

Since ExaGrid writes directly to the disk-cache Landing Zone, the most recent backups are kept in their full undeduplicated, native form. All restores, VM boots, and offsite tape copies are fast as the overhead of the data rehydration process is avoided. As an example, ExaGrid can provide the data for a VM boot in seconds to single-digit minutes versus hours for inline data deduplication backup storage appliances that only store deduplicated data. ExaGrid maintains all long-term retention (weeks, months, years) in a deduplicated format for storage efficiency.

ExaGrid provides the best of both worlds – writing to ExaGrid's disk-cache Landing Zone delivers the fast ingest and restore performance of straight disk while also leveraging the cost savings gained with long-term deduplicated storage. ExaGrid is the only solution with these combined benefits in a single product.

Fixed-Length Backup Window

Since data deduplication uses a lot of processor and memory resources, as data grows, the amount of data deduplication to be performed grows as well. The first generation of deduplication storage appliances utilize a "scale-up" storage approach with a fixed resource front-end controller and disk shelves. As data grows, they only add storage capacity. Because the compute, processor, and memory are all fixed, as data grows, so does the time it takes to deduplicate the growing data until the backup window is so long that the front-end controller has to be upgraded (called a "forklift" upgrade) to a larger/faster controller which is disruptive and costly. ExaGrid provides full appliances in a scale-out system. Each appliance has Landing Zone storage, deduplicated repository storage, processor, memory, and network ports. As data volumes double, triple, etc., ExaGrid doubles, triples, etc. all required resources to maintain a fixed-length backup window. If the backups are six hours at 100TB, they are six hours at 300TB, 500TB, 800TB, etc. Expensive forklift upgrades are avoided, and the aggravation of chasing a growing backup window is eliminated.

Disk-Based Backup with Data Deduplication Comparison

Feature	ExaGrid **Adaptive Deduplication** **Scale-out architecture** **Landing Zone**	Dell EMC Data Domain, HPE, Quantum **Inline deduplication** **Scale-up architecture**
Backup Performance	**FASTEST** Data writes direct to disk; as data grows, additional storage and bandwidth are added.	**ADEQUATE** Deduplication is compute intensive and occurs during the backup, resulting in slower backups.
Fixed-Length Backup Window	**YES** As data grows, additional processor, memory, and bandwidth are added.	**NO** Uses a fixed resource front-end controller and only disk is added as data grows.
Fast Restores	**YES** Most recent data resides in full, undeduplicated format in the Landing Zone for fast restores.	**NO** All data is deduplicated and has to be rehydrated before a restore can be performed.
Fast Offsite Tape Copies	**YES** Most recent data resides in a full, undeduplicated format in Landing Zone for fast offsite tape copies.	**NO** All data is deduplicated and has to be rehydrated before an offsite tape copy can be made.
Instant VM Recoveries vMotion into Production	**YES** Most recent VMs are in a complete, undeduplicated format in the Landing Zone and can be immediately booted and used while migrated to production storage.	**NO** All data is deduplicated and has to be rehydrated both during VM booting, which can take hours for production-sized VMs, and completely rehydrated during migration to production storage.
Accelerated Synthetic Full	**YES** ExaGrid-Veeam Accelerated Data Mover allows the entire synthetic full operation to occur on the ExaGrid appliance. Most recent VMs are stored in a complete, undeduplicated format in the landing zone and the Veeam Data Mover can easily reconstitute a synthetic full in the ExaGrid Landing Zone.	**NO** The Veeam Data Mover does not run on inline deduplication appliances.
Veeam vPower features such as - SureBackup - Virtual Lab - U-AIR	**YES** Most recent VMs are in a complete, undeduplicated format in the Landing Zone and can be immediately booted and used for Veeam vPower operations.	**NO** All data is deduplicated and has to be rehydrated both during VM booting (which can take hours for production-sized VMs) and completely rehydrated during all Veeam vPower operations.
Low Cost Scalability as Data Grows	**YES** Scale-out architecture; full server appliances are added into a single system as data grows, adding compute with capacity.	**NO** As data grows, the front-end controller falls behind and must be replaced with a bigger/faster front-end controller.
Rack Space	Average 2U per appliance	Average 3U per appliance
Power and Cooling	Average - Uses more disk but cooler, lower clock speed processors	Average - Uses less disk but very hot, higher clock speed processors
Price	Market leading	Depends on the vendor – some are market leading and some are overpriced