



Frequently Asked Questions

“The key issue (for desktop virtualization) is the impact that desktop virtualization will have on storage capacity and I/O demands...”

-Peter Levine,
SVP Datacenter and
Cloud Division for
Citrix

Who is WhipTail Tech?

WhipTail Tech, a flash-based storage array manufacturer, was founded in 2008 in Summit, NJ. The company is named after the WhipTail Racerunner lizard, an extremely fast species indigenous to the southwestern United States. The XLR8r SSD SAN array was released to “general availability” late 2008.

What is SSD?

A solid-state device or drive (SSD) is the next generation of data storage. The architecture of an SSD does not employ rotating disks at all. A SSD utilizes a memory chip with erasable, writable cells that can hold data even when powered off. Solid-state memory is in popular consumer devices such as iPhones, Blackberries, digital cameras, etc.

What are the advantages of SSD's over traditional magnetic disks?

This is the fun part...

Speed. Clients will see incredible increases in performance up to 30X (60X latency advantage) so that large reports that used to take 24 hours can now take minutes.

Dramatically Lower TCO. XLR8rs can replace a fully populated storage shelf at a 1:30 ratio and eliminate up to 90% power and space, which is huge for Green IT initiatives.

Durability. The underlying architecture allows for more stability and endurance in non-optimal environments (e.g. heat, cold).

What is the XLR8r?

The XLR8r is a patent-pending flash-based storage array. Not a single solid-state drive, but rather an array of drives overlaid with expert software to create a powerful primary storage device that accelerates mission critical data and dramatically expands virtual capacity.

What is the XLR8r?

What is the XLR8r's performance?

250,000 IOPS at 4K size for cryptologically random data

What protocol does the XLR8r support?

Fibre Channel, iSCSI, Infiniband, NFS, & CIFS

What are the optimal application candidates for a XLR8r?

With Intel and AMD breaking new barriers with CPU technology, servers today are being starved for data; the current magnetic spinning disk storage arrays are maxed-out on their speed (15K). The future is solid-state storage, and that future is now.

Examples of those applications which require a higher performing array than magnetic legacy spinning disks can provide are...

- Virtualized Desktops or "VDI"
- Server Virtualization
- Poor Performing Applications (email, ERP, CRM)
- Highly transactional online applications (OLTP)

How does a XLR8r help Scale Virtual Desktops?

No matter which flavor of virtual desktop an enterprise is reviewing (XenDesktop, View, Symantec, Red Hat, etc) one major challenge has become the barrier to entry: the overwhelming storage infrastructure required to support this kind of computing architecture. While the paradigm shift of virtual desktops (hosted desktops, cloud-desktops, etc.) is finally being accepted by the user-community as a concept, it is still in it's infancy in data-center practicality. Common Tier One storage (EMC, NetApp, etc) and their Fiber Channel HDD arrays deliver only 200 IOPS per drive. Depending on how you gauge it, a virtual desktop requires anywhere from 20–40 IOPS per image to run at a satisfactorily level. Thus, a 5,000 user environment would require approximately 250,000 IOPS to minimally perform to user expectations and standards. At 200 IOPS per HDD, you would need 625 drives to meet this performance requirement. (This puts the performance cost at \$8 per I/O operation per second vs. 37 cents with a XLR8r.) The total cost for a 625 drive FC storage array including drives, enclosures, controllers, etc will be over SEVEN-figures up front and consume 60+ units of data center rack space. Thus, between the excessively high initial CAPEX expenditure, the ongoing costs are high (power, cooling, cost for rack space), the ROI is difficult to realize and many VDI projects stall as they simply can not be business justified.

When solid-state drives are offered by the primary Tier One HDD manufacturers, they land in a price-point upwards of \$35,000 per drive that will deliver only 6,000 IOPS each. Due to a lack of mastery in the nuances of SSD's, adding shelf after shelf of these expensive drives will not add to the performance, which normally is maxed out around 60,000 IOPS. At an investment cost of \$350,000 and without seeing the dramatic performance increase, the cost lands around \$6 per I/O operation per second. Another no-go for the majority of enterprises today.

The WhipTail XLR8r offers the best cost per I/O operation on the market. It is sold as a 2 unit appliance in your choice of capacity (1.5 TB, 3.0 TB, 6.0TB, 12.0TB,) with an all inclusive MSRP starting at \$49,000. A game-changing, VDI-enabling cost to our clients of 37 cents per I/O. Welcome to the new world order.

Why does XLR8r work so well with Databases?

With the dramatic pace of development from chipmakers Intel and AMD, today's enterprise servers are simply being starved for data. Processing speeds have increased exponentially, while the speed at which a disk spins has not changed in over 7 years — a lifetime in the world of computers. This performance delta between the two is only being exacerbated by each release of their respective chips (Nehalem and Shanghai respectively.) The underlying issue is this: database workloads are extremely demanding on traditional spinning disk systems. The majority of the traffic is based on extremely small request sizes and is often random in nature. The mechanical latency is a limiting factor in database performance. Barring a cache "hit" (data already being in a RAM buffer) each request will likely require the movement of the read/write head incurring a 6–9 ms penalty while the head is moved and the data is retrieved. Adding in the speed limitations of traditional disks being 15,000 RPM (unless you like micro-sonic booms in your servers that is), they can perform at a sustained 200 I/O operations per second; it becomes clear that a customer will need to over-invest in a large number of drives just to gain even a moderate performance increase. This vicious circle is one of the largest challenges facing enterprises today, and is directly responsible for the huge % of an enterprise's IT budget being allocated strictly for storage — in many cases over 60%.

The solid-state XLR8r is specifically tuned for low latency high I/O environments. Its horsepower more than accommodates for the demanding requests of today's Nehalem and Shanghai processors with its proven ability to do over 250,000 I/O operations per second at small request sizes (4K) with sub millisecond latency. With its minimal data-center footprint of 2U, and limited power consumption (<200 watts), the XLR8r is a strategic solution in allowing an IT department to get ahead-of-the-curve when deploying new applications and projects.



“WhipTail XLR8r provides significantly higher I/O than any traditional array we've tested, and is a great complement to Xen-Desktop... In our testing WhipTail dramatically outperformed traditional arrays.”

-Citrix Product Management

What is it about Virtualization that is starting to be a major challenge?

Virtualization environments are typically over-subscribed when it comes to disk performance. Everyone is competing for the same pool of resources. This is typically not a problem in an environment where low utilization servers have been virtualized. However, when mid-large organizations try to virtualize Tier One applications (Microsoft Exchange, etc) major disk performance issues often emerge. Oversubscribed disk systems are notoriously hard to identify. CPU and Memory usage is much more “in the face” of administrators. Disk systems require intimate knowledge of the underlying disk infrastructure and the workloads running on them. Virtualization can make this even more challenging as most monitoring and management tools only show you the amount of data being transferred back and forth.

Since many systems are competing for the same disk resource, it can turn a SEQUENTIAL workload into a much more demanding RANDOM workload (RANDOM being the worst possible workload for a mechanical disk). This is because in virtualization, every VM gets a timeslice of every available resource (CPU, MEMORY, DISK, other IO, etc). Thus, a nice sequential file transfer (say a really big ISO image) gets interrupted every so many milliseconds by another file server or an Exchange server, causing the read/write head to be moved to another track, incurring a seek penalty.

Since the XLR8r SAN is completely solid-state in nature, average data access time is sub-millisecond (0.1ms.) Essentially, SEQUENTIAL and RANDOM workloads are no different to a XLR8r.

- While virtualization overhead can be seen as low (6–15%) it is still significant and impacts performance for IO intensive applications. The XLR8r's latency advantage (even with 15% overhead) is 30–60X faster than running without a hypervisor. The XLR8r SAN allows enterprises to finally recognize the value of virtualizing this tier of applications by making the “performance pool” dramatically larger, eliminating the contention.

Isn't flash memory a candidate to wear out quickly?

In almost every scenario, the answer would be yes. However, all versions of the WhipTail XLR8r come embedded with our proprietary software that extends the lifetime of the drives to beyond seven (7) years...and dramatically optimize the potency of the underlying flash architecture. Thus, the XLR8r allows Tier 0 performance to be a realistic option as a primary SAN for enterprises today.

How long does it take to implement the XLR8r?

"LUN & DONE": Plug it into a power source (< 200 watts), attach Network Protocol, assign LUNs. Rinse. Repeat.

Can I procure a XLR8r for an evaluation?

Absolutely. WhipTail has a corporate evaluation program. Simply contact us by phone: (908) 743-1280 or visit the website, www.whiptailtech.com, to submit your information for a 15-day evaluation.

What do clients say about the XLR8r for VDI?

"We assumed we could do it through our original SAN, which was a bad assumption...We couldn't have been successful without this elegant solid-state array."

—Kipp Bertke, Director of IT
The Ohio Department of
Developmental Disabilities

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