

# IBM® XIV® Storage System

IBM answers some of the frequently asked questions about the XIV Storage System



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## Why should I consider IBM's XIV Storage System?

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At IBM, we have changed the value proposition of storage for our customers. For the past 20 years or so, it was considered essential to commit millions of dollars to custom-build a highly reliable enterprise system.

Now IBM has developed an alternative system that uses significantly cheaper industry standard commodity components to create a truly revolutionary grid architecture – the XIV Storage System. While the total cost of storage is substantially reduced, the XIV Storage System is designed to enhance reliability and speed whilst being as feature-rich as traditional high-end machines.

As a high-end open disk system, the XIV Storage System offers a flexible platform. A system less complex, with far fewer overheads, which can be managed with fewer IT staff with lower-level technical skills. As well, it is designed to offer greater back-up functionality through instant snapshot and a range of features such as thin provisioning.

The XIV Storage System is a good choice for the environment<sup>1</sup>, it occupies significantly less floor space per terabyte (TB) and reduces the use and cost of power and cooling.

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## How can cheaper SATA-based technology deliver high performance?

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Traditionally, SATA drives have been thought of as slow compared to Fibre Channel or custom-built systems. However, the XIV Storage System has a vital difference. The system uses a powerful grid architecture, which fully utilises up to 180 disk drives per rack, designed to ensure that there are no hotspots in the system.

Unlike traditional storage systems, the XIV Storage System's architecture is designed to ensure that data is evenly distributed across every disk in the array, so that all drives share the same workload, all of the time, thus ensuring no hotspots. Not only is the system designed to be perfectly load balanced but as it is designed to use all drives all the time, it is extremely fast.

The way the system uses cache also makes a difference. The grid architecture tightly couples the drives, cache and processes together, which allows the system to aggressively serve applications from cache.

By being designed to be able to leverage both the cache and processing power in this way, the XIV Storage System drives higher throughput from the SATA drives, and higher performance as required for tier-1 applications.

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## How can commodity base components deliver enterprise class reliability?

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Some views hold that the adoption of commodity components, such as the SATA drives, are less reliable simply because they cost a fraction of a tier-1 system, which commonly has had millions of dollars invested in customised hardware. How could such a low-cost option possibly compete? It can because the XIV Storage System's grid architecture changes the game.

The XIV Storage System's grid architecture is comprised of interconnected modules, with each incorporating an Intel® Quad processor, cache and 12 disk drives. Each module knows about every other module and piece of data at all times. This means that no individual module can be a single point of failure. If a module, disk or cache fails, for instance, the system is designed to self-heal immediately around the point of failure.

That's the XIV Storage System's point of difference right there. All the components in a grid are identical, so regardless of multiple component failures, the system is designed to ensure that the total system performance is unaffected. At the same time, the XIV Storage System is designed to rebuild itself, returning the system to full availability. An example of this is the XIV Storage System's ability to rebuild a 1TB disk failure in approximately 30 minutes.

By using lots of duplicated small, affordable systems to build a larger system, it is possible to achieve the same outcomes as an equally large customised system – but without the crippling costs. It also means greater flexibility because the smaller systems can be added or removed easily from the grid, which assists in its self-healing, self-tuning process.

The power of the grid architecture isn't unlike the web – it stays up even if a part of it goes down.

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<sup>1</sup> The XIV storage system is designed to use less power than typical tier-1 systems. The XIV system typically consumes 7.7 kW per rack, which holds 180 TB raw capacity. This translates to consumption levels of 43 watts per raw TB (and these are expected to drop by half when 2 TB disks are used). A typical tier-1 system comparable to the XIV system is equipped with 146 GB 15000 RPM FC drives and consumes, on average, 180–380 watts per raw TB.

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## How can a system with 180 disks in constant use be more energy efficient?

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Even though the XIV Storage System offers similar levels of performance and reliability, its power consumption is much lower than typical products equipped with Fibre Channel drives.<sup>2</sup> This is because the 1TB capacity of the SATA drives are more efficient in storing data - the SATA disk spins more slowly and so uses less power to turn the drive.

As a result, it is designed to provide you with more capacity using less power. On average, each SATA drive achieves three times the capacity, using less the power, of a Fibre Channel drive. Again, it is the XIV Storage System's architecture that elevates its disk subsystem above the traditional notion that it is "just a bunch of disks".

The XIV Storage System is designed to offer superior levels of performance and reliability and use less energy than competing SATA-equipped solutions.<sup>3</sup>

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## Where does the XIV Storage System fit into IBM's storage product range and strategy?

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It is not IBM's intention for the XIV Storage System to compete with IBM's traditional storage systems. Rather, the XIV stands alongside IBM's other storage solutions – as another option.

It also sits within IBM's broader marketing strategy to compete aggressively in the open systems enterprise space, particularly when XIV Storage System offers customers an entirely new storage value proposition.

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## As this is new technology, shouldn't I wait until it is field-proven?

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You don't need to - XIV is now installed in large companies all around the world.

In banking & finance, manufacturing, telecommunications and large government departments, all running mission critical applications that are at the core of their business.

We can now connect you to the large and rapidly growing XIV community, talk to customers in similar industries, running similar applications, and you can begin to understand why they made the decision to invest in XIV.

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## Do you think other vendors will attempt to bring out similar architectures?

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Grid architecture has become a bit of a buzzword, like virtualisation, and that has encouraged companies to jump on the bandwagon.

"Grid-like architecture" have begun entering the market, but these technologies tend to be new and, unlike the XIV Storage System, not developed from the ground up, potentially making them more risky. Also they tend to be developed around building clusters rather than an absolute true grid that shares the load, self-heals and has no single point of failure in the entire system.

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## A fresh start

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Enterprise storage users have spent the past decade building resiliency into their systems and processes. Often, in an effort to make their system more useable, available and perform better, these systems have become very complex and increasingly difficult for users to manage.

Developed from the ground up, the XIV Storage System provides a fresh way of thinking about storage. With the XIV Storage System designed to be able to deliver enterprise class reliability and high performance, IBM presents companies with an option to escape the storage jungle that has grown up around them for the past two decades.

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2 The XIV system typically consumes 7.7 kW per rack, which holds 180 TB raw capacity. This translates to consumption levels of 43 watts per raw TB (and these are expected to drop by half when 2 TB disks are used).

A typical tier-1 system comparable to the XIV system is equipped with 146 GB 15000 RPM FC drives and consumes, on average, 180–380 watts per raw TB.

3 The XIV system offers four to nine times improved power consumption, at comparable performance and reliability levels. 'IBM XIV Storage System - Power Consumption Reinvented', Whitepaper, August 2008.



Storage Reinvented

## For more information

To learn more about IBM XIV Storage System, contact your IBM representative or IBM Business Partner, or visit:

[ibm.com/storage/au/xiv](http://ibm.com/storage/au/xiv)

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