



+7 (495) 925-5519  
info@compuway.ru

---

## Highlights

- Increase usable capacity per rack typically to one petabyte (PB) or more with IBM® Real-time Compression,<sup>1</sup> greatly reducing effective cost per capacity
  - Meet service level agreements (SLA) with consistent, tuning-free high performance and grid architecture-based linear scaling
  - Slash storage administration time with extraordinary simplicity and hyper-scale management of up to 144 frames
  - Maintain business continuity with three-site mirroring, full redundancy, self-healing and fast rebuild speed
  - Deploy on/off-premises disaster recovery (DR) and other solutions in a unified management environment built with IBM Spectrum Accelerate.
- 

# IBM XIV Storage System

*Cost-saving enterprise storage primed for cloud and built with IBM Spectrum Accelerate software*

IBM XIV Storage System is a high-end data storage system built to deliver out-of-the-box performance predictability, high resiliency and management simplicity while offering exceptional data economics, including savings through powerful real-time compression.

## Born for consistent high performance

XIV Storage System delivers hotspot-free, consistent high performance to all applications at all times, tuning-free – even during peak load periods, maintenance and disk recovery – due to several architectural features:

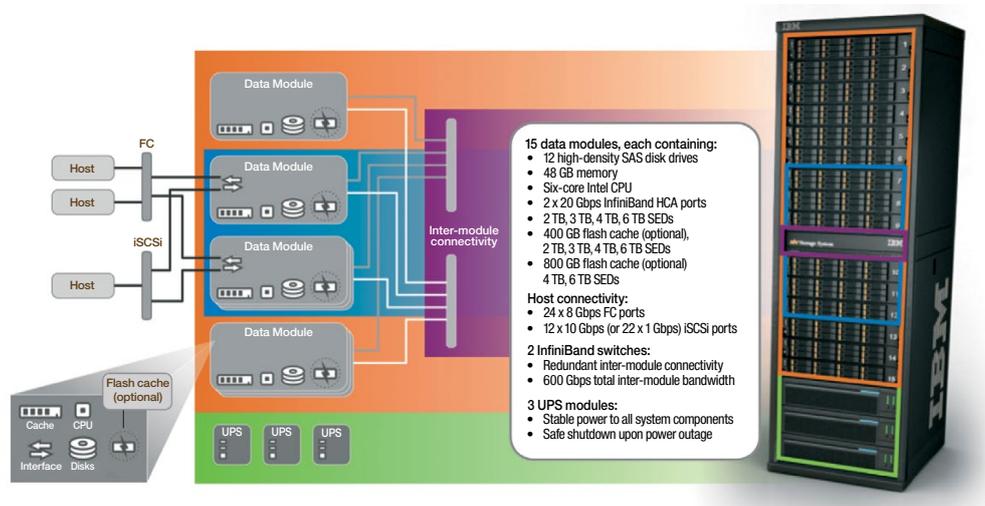
- **Massive parallelism:** XIV uses a distributed design of interconnected modules, each with multi-core Central Processing Unit (CPU), cache, flash caching (optional) and high-density disk drives working in parallel to serve data efficiently
- **Distributed data:** The system stores data by dividing it into 1 Megabyte (MB) partitions, each mirrored to another module; a pseudo-random distribution algorithm spreads the partitions automatically and uniformly across all the disks
- **Distributed cache:** A flexible and powerful cache implementation allows XIV storage to leverage large slots for reads while managing a smaller slot size, resulting in a superb cache hit ratio and better performance



**IBM Systems**  
Data Sheet

- **Flash caching (optional):** XIV deploys flash as a cache across all volumes and without the need to manage tiers. The flash drives cache the most frequently accessed data, boosting performance by up to 4.5 times<sup>2</sup>
- **Smart scaling:** Any capacity increase via added modules provides a corresponding increase in processing power, cache, flash caching (optional) and connectivity, for consistent high performance as the system scales
- **Load balancing:** The system automatically balances application load across all modules uniformly; doing so helps prevent many performance and reliability risks that can plague traditional clustered controller designs

- **Hotspot-free:** Changes to the application or its input/output (I/O) pattern do not affect system performance. As workloads change and evolve, the system stays hotspot-free
- **High bandwidth:** Inter-module communication is over an internal, redundant InfiniBand network equipped with massive bandwidth. Each module has very large CPU-to-memory and disk-to-memory bandwidth
- **Huge resources:** Each module has its own multi-core processor – 90 CPU cores per frame. XIV applies this vast processing power to support small cache slots, ensuring high performance.



XIV Storage System – components and connectivity

### XIV is ideal for cloud: Infrastructure matters

- **Simplicity:** Autonomic data distribution, tuning-free high performance, easy capacity planning and multi-tenant administration; acquisition flexibility; no hidden costs
  - **Resiliency:** Grid-scale redundancy; fast disk rebuilds; uninterrupted data access; data-at-rest encryption
  - **Predictability:** Grid design that supports SLA through optimal resource sharing and high I/O predictability without logical unit numbers (LUNs) configuration.
- 

### Built for enterprise availability

XIV offers field-proven five-nines availability and is designed for continuous operation without interruption to data access:

- **Redundancy:** Full active-active N+1 redundancy of all key components – disks, modules, switches, host connectivity and uninterruptible power supply (UPS) units; hot-swappable
- **High availability (HA) and DR:** Asynchronous mirroring; synchronous mirroring including offline initialisation; three-site mirroring with concurrent, synchronised copies of data
- **Encryption:** Data-at-rest encryption; self-encrypting hard drives (SEDs); non-disruptive hot-encryption in minutes
- **Extraordinary rebuild speed:** A 6 TB drive rebuilds in less than an hour on average, as XIV uses all disks at once – and even uses spare system resources upon detecting I/O idle time – and rebuilds written data only
- **Preventive health:** Continuous monitoring of components, with self-healing activated as needed; returns to full redundancy without human intervention
- **Smart maintenance and hot upgrades:** Live maintenance to avoid downtime planning; non-disruptive software upgrades; disk/module maintenance when data is fully redundant

- **Reliable backup and recovery:** Host-based application programming interfaces; Microsoft® Windows® Volume Shadow Copy Service support; fast, application-aware backup and restore with IBM Spectrum Control; near-instant space-efficient snapshots with IBM Spectrum Protect.

### Designed for easily managed scalability

The XIV system is designed for simple Tier 1 storage administration, with centralised management, exceptional data mobility, load balancing and over-provisioning across up to 144 XIV arrays. It features a very easy-to-use graphical user interface (GUI), with management tools, hyper-scaling and compression prediction built in. The underlying architecture requires little training or expertise and redistributes data automatically as new modules are added. XIV compression requires no added hardware, enabling a software alternative to hardware-based capacity scaling.

### Exceptional data economics

Real-time compression, use of very high-density drives, space reclamation capabilities, ease of use, ENERGY STAR certification and flexible licensing options help make XIV one of the industry leaders in economics value.

- **Inline compression:** XIV uses field-proven IBM Random Access Compression Engine (RACE) technology, effectively increasing usable capacity per rack to one PB or more<sup>1</sup> without requiring acceleration hardware:
  - Leverages the XIV grid architecture to scale performance and simplify compression management
  - Replicates compressed data faster and while using less bandwidth, freeing up bandwidth for other uses
  - Continuously displays predicted or actual compression ratios for all volumes
  - Converts non-compressed volumes to compressed volumes non-disruptively

- **Extraordinary ease of use:** Time saved is money saved. XIV users provision data by simply sizing volumes. LUN mapping is drag and drop. Workloads are ingested without need for I/O analysis or performance tuning. Snapshots and test environments are differential, created in seconds. Data migration is fast and remote mirroring is easy and across generations. A mobile dashboard offers ‘anywhere, anytime’ real-time notifications and system monitoring
- **Easy acquisition:** XIV system software includes all functionality ready for use – with the exception of compression, which involves a separate license. The XIV Cloud Storage for Service Providers product offers a flexible choice of features. [IBM Advanced System Placement program](#) offers subsequent XIV systems at near-zero upfront-cost, with the balance paid upon reaching a pre-set capacity.

### Effortless integration across host platforms

XIV integrates with leading platforms – at no extra cost.

- **Operating systems (OS):** VMware ESXi, Windows, IBM AIX, Red Hat Enterprise Linux® (RHEL) Server, SUSE Linux Enterprise Server (SLES), Solaris, HP-UX and IBM iSeries (via VIOS)
- **IBM platforms:** VIOS for IBM Power Systems (IBM System i and IBM System p); IBM PowerVM; IBM i5/OS v6R1; AIX (and IBM AIX Multiple Path I/O [MPIO] driver); IBM PowerHA (HACMP); and IBM Spectrum Control
- **Integrated storage solutions:** File-protocol access capabilities with IBM Spectrum Scale, storage virtualisation across heterogeneous systems with IBM Spectrum Virtualise and deduplication archiving with IBM Spectrum Protect and IBM Spectrum Archive
- **Multipath support:** Native OS multipathing solutions, Symantec Veritas Storage Foundation dynamic multipathing (DMP)<sup>3</sup> and EMC PowerPath<sup>3</sup>

---

### IBM Spectrum Accelerate

IBM XIV Storage System is built using IBM Spectrum Accelerate, a software-defined storage solution that delivers proven enterprise-class capabilities including performance predictability, ease of use and an advanced management toolset. IBM Spectrum Accelerate offers rapid deployment, extreme agility and cost effectiveness for addressing application workload demands and can reduce procurement needs and enable standardisation of storage operations and services. Use cases include flexible deployment of on- and/or off-premises storage solutions such as hybrid clouds, DR for remote branch offices and on-demand test/development environments. IBM Spectrum Accelerate software is available pre-installed in IBM XIV Storage System, or for deployment on hardware of choice or in the IBM SoftLayer<sup>4</sup> cloud.

---

### Enterprise-proven features and solutions

XIV integrates with leading platforms – at no extra cost.

- **Advanced features:** XIV offers enterprise-class features with the system software at no extra cost, including mirroring, advanced snapshot management and multi-tenancy. For a full list, go to [ibm.com/xiv](http://ibm.com/xiv).
- **Cloud and virtualisation:** OpenStack Cinder for automation; RESTful API for customisation; XIV storage self-provisioning via IBM Cloud Storage Access and via PowerVC for IBM Power environments; deep integration with VMware and Microsoft management systems and hypervisors; full compliance with other virtualisation environments, including Citrix XenServer, IBM z/VM and VIOS for Power Systems

**IBM Systems**  
Data Sheet

- **Broad, hotspot-free VMware solutions set:** Using IBM Spectrum Control and a VMware vSphere Web Client plug-in: high-end virtual machine (VM)-granular storage with VMware vSphere Virtual Volumes (VVOL)<sup>5</sup>; storage control with vSphere APIs for Storage Awareness (VASA); cloud automation/monitoring with VMware vRealise Suite; optimisation and space reclamation with vStorage APIs for Array Integration (VAAD); IBM-native storage visibility and self-service provisioning. XIV supports certified DR with VMware Site Recovery Manager (SRM) and backup/restore of vSphere VM using IBM Spectrum Protect and vStorage APIs for Data Protection (VADP)
- **Efficient, hotspot-free Microsoft solutions:** Automation of clouds and virtualised environments using Hyper-V and Microsoft System Centre Virtual Machine Manager (SCVMM) with certified Storage Management Initiative Specification (SMI-S) support; seamless replication orchestration with SCVMM and Microsoft Azure Site Recovery; XIV monitoring with IBM Storage Management for Microsoft System Centre Operations Manager (SCOM); Windows Server 2012 R2 and Windows Server 2012 certification and space reclamation; Microsoft Windows VSS provider; Microsoft Failover Clustering agent
- **Business applications:** Consistent high performance for IBM Notes, Microsoft Exchange, Solaris, SAP, serial attached SCSI (SAS) and healthcare applications such as Epic
- **Extended storage management:** IBM Spectrum Control, SCVMM, HP Storage Essentials and Symantec Veritas Storage Foundation
- **Data protection and business continuity:** Backup solutions with IBM Spectrum Control, IBM Spectrum Protect, Symantec NetBackup and CommVault Simpana IntelliSnap; DR solutions with PowerHA, Symantec Veritas Cluster Server (VCS), VMware SRM, Microsoft Azure Site Recovery and Microsoft Failover Clustering

**IBM XIV Storage System (Model 2810/2812-214) – capacity and connectivity**

Number of frames/modules	Number of disks	Usable capacity (TB, decimal) 1 TB*/2 TB/3 TB/4 TB/6 TB	Fibre Channel (FC) ports 8 Gigabits per second (Gbps)	Internet small computer system interface (iSCSI) ports 1 or 10 Gbps
1/6	72	28/55/84/112/169	8	6 or 4
1/9	108	44/88/132/177/267	16	14 or 8
1/10	120	51/102/154/207/311	16	14 or 8
1/11	132	56/111/168/225/338	20	18 or 10
1/12	144	63/125/190/254/382	20	18 or 10
1/13	156	67/134/203/272/409	24	22 or 12
1/14	168	75/149/225/301/453	24	22 or 12
1/15	180	80/161/243/325/485	24	22 or 12
144 <sup>†</sup> / 2,160	25,920	69,840	3,456	3,168 or 1,728

**IBM XIV Storage System (Model 2810/2812-214) – number of CPUs and memory**

Number of frames/modules	Number of disks	Number of CPUs	XIV memory (GB) 24 GB / 48 GB per module	Flash caching (TB) (optional)	
				1 TB,* 2 TB, 3 TB capacity points (400 GB per module)	4 TB and 6 TB capacity points (400 GB or 800 GB per module)
1/6	72	6	144/288	2.4	2.4 or 4.8
1/9	108	9	216/432	3.6	3.6 or 7.2
1/10	120	10	240/480	4.0	4.0 or 8.0
1/11	132	11	264/528	4.4	4.4 or 8.8
1/12	144	12	288/576	4.8	4.8 or 9.6
1/13	156	13	312/624	5.2	5.2 or 10.4
1/14	168	14	336/672	5.6	5.6 or 11.2
1/15	180	15	360/720	6.0	6.0 or 12.0
144 <sup>†</sup> / 2,160	25,920	2,160	51,840/103,680	864	864.0 or 1,728.0

**IBM XIV Storage System (Model 2810/2812-214) – power usage (typical)**

Number of frames/modules	Number of disks	1 TB*/2 TB/3 TB/4 TB/6 TB kVA	
		Without flash caching	With flash caching
1/6	72	2.4/2.4/2.5/2.5/2.5	2.5/2.5/2.6/2.6/2.6
1/9	108	3.5/3.5/3.7/3.8/3.8	3.6/3.6/3.8/3.9/3.9
1/10	120	3.9/3.9/4.1/4.2/4.2	4.0/4.0/4.2/4.3/4.3
1/11	132	4.2/4.2/4.4/4.5/4.5	4.3/4.3/4.5/4.6/4.6
1/12	144	4.6/4.6/4.8/4.9/4.9	4.7/4.7/4.9/5.0/5.0
1/13	156	4.9/4.9/5.2/5.3/5.3	5.0/5.0/5.3/5.4/5.4
1/14	168	5.3/5.3/5.5/5.6/5.6	5.5/5.5/5.7/5.8/5.8
1/15	180	5.6/5.6/5.9/6.0/6.0	5.8/5.8/6.1/6.2/6.2

---

**IBM XIV Storage System (Model 2810/2812) – System specifications**

---

**General properties**

Capacity per drive (nearline SAS)	1 TB,* 2 TB, 3 TB, 4 TB or 6 TB self-encrypting hard drives (SEDs)
Number of disk drives (min/max)	72/180
Encryption	All disk drives are SEDs. When encryption is enabled, the data on the flash drives is also encrypted. XIV encryption requires an external key management solution, such as IBM Security Key Lifecycle Manager.
Data reduction using IBM Real-time Compression	Provides up to five times the capacity per compressed volume

**Performance features**

Maximum number of CPUs	15 Intel® Xeon® Processor E5645
Maximum number of CPU cores	90 physical (180 logical cores with Intel Hyper-Threading technology)
Maximum memory	Up to 360 GB (24 GB of memory per module) – 1 TB,* 2 TB or 3 TB capacity points Up to 720 GB (48 GB of memory per module) – 4 TB or 6 TB capacity points
Maximum cache-to-disk bandwidth	480 Gbps
Flash caching (optional)	Up to 6 TB (400 GB flash caching per module) – all capacity points Up to 12 TB (800 GB flash caching per module) – 4 TB or 6 TB capacity points

**Physical features**

Temperature	10°C – 35°C (50°F – 95°F)
Altitude (max)	2,134 m/7,000 ft
Humidity	25% – 80% noncondensing
Dimensions (height × width × depth)	202 cm × 66 cm × 120 cm (79.53 in. × 25.98 in. × 47.24 in.)
Maximum weight	1,041.5 kg (2,296 lb)
Clearance front/rear	120 cm/120 cm (47.24 in./47.24 in.)
Redundant power feed	√
Input voltage	180 – 264 V ac at 60 A or 30 A (±10%)

**Host connectivity**

FC rates	8 Gbps
iSCSI rates	1 Gbps or 10 Gbps
Capacity-on-demand configurations	√
Warranty	1 and 3 year limited warranty, onsite service, same day around-the-clock

## For more information

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

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



### Additional online resources:

- [SPC-1 benchmark results](#)
- [SPC-2/E benchmark results](#)
- 2013 Microsoft [ESRP](#) benchmark results
- [IBM Redbooks: XIV Storage System: Architecture and Implementation](#)
- [IBM Redbooks: XIV and IBM Real-time Compression](#)
- [IBM Redbooks: XIV Storage System: IBM Hyper-Scale Mobility Overview and Usage](#)
- [IBM System Storage Interoperation Centre \(SSIC\)](#)
- [IBM ISV Solutions Resource Library](#)
- [Search for XIV on IBM Techdocs library](#)
- [White paper on XIV and Virtual Volumes](#)
- [White paper on IBM Spectrum Accelerate](#)
- [Advanced System Placement program for IBM XIV](#)

### IBM United Kingdom Limited

PO Box 41  
North Harbour  
Portsmouth  
Hampshire  
PO6 3AU  
United Kingdom

### IBM Ireland Limited

Oldbrook House  
24-32 Pembroke Road  
Dublin 4

IBM Ireland Limited registered in Ireland under company number 16226. The IBM home page can be found at [ibm.com](http://ibm.com)

IBM, the IBM logo, [ibm.com](http://ibm.com), AIX, HACMP, i5/OS, IBM, IBM Spectrum, PowerHA, PowerVM, Real-time Compression, Redbooks, XIV and z/VM are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries.

A current list of IBM trademarks is available on the Web at 'Copyright and trademark information' at [ibm.com/legal/copytrade.shtml](http://ibm.com/legal/copytrade.shtml)

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product and service names may be trademarks, or service marks of others.

References in this publication to IBM products, programs or services do not imply that IBM intends to make these available in all countries in which IBM operates.

Any reference to an IBM product, program or service is not intended to imply that only IBM products, programs or services may be used. Any functionally equivalent product, program or service may be used instead.

IBM hardware products are manufactured from new parts, or new and used parts. In some cases, the hardware product may not be new and may have been previously installed. Regardless, IBM warranty terms apply.

This publication is for general guidance only. Information is subject to change without notice. Please contact your local IBM sales office or reseller for latest information on IBM products and services.

This publication contains non-IBM Internet addresses. IBM is not responsible for information found at these Web sites.

Photographs may show design models.

© Copyright IBM Corporation 2015

IBM does not provide legal, accounting or audit advice or represent or warrant that its products or services ensure compliance with laws. Clients are responsible for compliance with applicable securities laws and regulations, including national laws and regulations.

\* System utilising 1 TB per disk capacity

† Maximum managed capacity with IBM Hyper-Scale – up to 144 XIV frames, with 15 modules each

<sup>1</sup> Based on using a 15-module system with 6 TB disk drives.

<sup>2</sup> For database-like workloads. All performance data contained in this publication was obtained in an IBM lab environment under simulated conditions and is presented as an illustration. Performance obtained in other operating environments may vary, and customers should conduct their own testing.

<sup>3</sup> For latest support details, check with the vendor.

<sup>4</sup> SoftLayer Technologies was acquired by IBM in July of 2013.

<sup>5</sup> IBM Spectrum Control with VASA 2.0 support.



Please Recycle