IBM XIV Storage System

Grow Capacity without Complexity

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Introduction

An increasingly competitive market that requires rapid decisions; growing volumes of information to manage with reduced IT budgets; compliance to regulations that call for secure retention of data for long periods of time: these are the trends that characterize the storage requirements of companies of all sizes.

IBM’s response is extremely rich and diverse and ensures that every customer has tailored solutions based on their existing infrastructure and development plans.

All of IBM’s offerings are characterized by common core values: advanced technology, enhanced virtualization capabilities, efficiency and low power consumption, optimized systems management.

In this context, IBM XIV solutions have emerged as a winning choice for businesses that must handle a vast amount of data in an effective and simplified manner while reducing costs.

Today there are over 2,000 customers worldwide who have chosen XIV systems and its growing market presence confirms its strength.

The IBM XIV architecture lowers the total costs of a storage infrastructure compared to traditional storage systems thanks to high-level virtualization that automatically optimizes the performance and utilization of all the physical resources available.

Acquired in 2008, the Israeli company XIV was one of the many strategic investments made by IBM in the storage market, one of the key areas in an increasingly interconnected world, where information is the heart and engine of business.
Research from Gartner

Scale-Out Storage Architectures Promise Higher Availability and Disruptive Price Declines

This research examines the operational and financial advantages that scale-out and virtual storage area network (VSAN) systems offer end users relative to midrange and high-end storage systems, deployment options and the impact industry-standard server use may have on storage total cost of ownership (TCO). As the number of scale-out storage vendors grows and these systems gain mind and market share, changes in acquisition and asset management strategies promise significant increases in flexibility and reductions in storage TCO.

Key Findings
- Established storage vendors developing or acquiring scale-out storage systems are tailoring their marketing strategies to minimize product overlaps and revenue cannibalization.
- Emerging storage vendors entering the scale-out storage market are focused purely on selling the technical, operational and financial benefits of their technologies.
- Market interest and acceptance of scale-out storage systems are growing.

Recommendations
- Create or update SLAs that acknowledge the availability, performance/throughput, functionality and cost characteristics of scale-out and VSAN storage systems.
- Create flexible asset management policies that can take advantage of the differences in storage ownership costs that scale-out and VSAN storage systems create.
- Make self-maintenance and third-party maintenance acceptable alternatives to vendor-supplied support within your organization.
- Include emerging storage companies on your shortlists for scale-up and scale-out storage solutions.

ANALYSIS

Architectural Overview
Scale-out storage systems are built from storage nodes that are interconnected to each via an internode switch. This switch is usually a dedicated Ethernet or InfiniBand switch. The storage nodes are usually built using industry-standard x86 servers with direct-attached disks. The “magic” of scale-out storage systems is in their array software, which implements storage system functionality, protection from disk or node failures and the ability to scale linearly until the internode switch bottlenecks on input/output operations per second (IOPS) or bandwidth.

This design approach reduces hardware development and manufacturing costs, and can provide emerging storage vendors with strong marketing and channel advantages. It also enables portfolio companies such as Dell, HP, IBM and Oracle-Sun Microsystems to leverage their investments in server technologies, service and support, and spares depots. Figure 1 shows a high-level schematic of scale-out storage systems.

VSANs are built by placing the “magic software” that converts servers configured with direct-attached disks into scale-out storage system storage nodes inside virtual machines (VMs). Like scale-out storage systems implemented on physical servers, VSAN storage nodes are typically interconnected using Ethernet or InfiniBand. Figure 2 shows a high-level schematic of VSAN storage.

Any enumeration of the salient architectural, operational and financial benefits of scale-out architectures should include:
- Rapid deployment and ease of use
- Availability that asymptotically approaches high-end storage system availability as the number of storage nodes increases
- When storage-vendor-certified, the ability to run storage nodes in virtual machines
- The ability to re-task servers with direct-attached disks into SAN or network-attached storage (NAS) storage
- Lots of computer power per physical disk, which decreases the need for application-specific integrated circuits (ASICs)
- The ability to leverage improvements in microprocessor and disk technologies
- The ready availability of spare parts
Many current generations of scale-out storage systems offer users rich feature sets that include some to all of the following features: thin provisioning, space-efficient snapshots, remote replication features, automatic load balancing, ergonomically designed management tools and intelligent power management. While scale-out storage systems cannot compete against high-end storage system scalability, improvements in microprocessor and interconnect technologies are driving configuration growth.

**Market Dynamics**

Bundling servers with direct-attached disks and “magic” software to create scale-out storage systems gives established storage companies the ability to maintain profitability in a deflationary storage market and new methods of attacking competitors’ dual controller midrange and smaller high-end storage systems. It also provides them with an escape route from server commodity pricing by moving servers and direct-attached disks onto storage system purchase, maintenance, and software price curves, while lowering inventory and sparing costs.

As emerging scale-out storage system companies gained market mind share and traction, established storage system companies began acquiring the more successful ones, beginning in November 2007 with Dell’s acquisition of EqualLogic. This was followed by IBM acquiring XIV and HP purchasing LeftHand Networks. Eliminating questions of company viability and support capabilities, coupled with larger marketing and sales channels, has further increased end-user willingness to deploy scale-out storage systems in environments where they meet scalability needs, and where there is no need for mainframe support or disaster recovery (DR) solutions with sub-minute recovery point objectives (RPOs).

While each company that has acquired scale-out systems has taken a somewhat different approach to the marketplace, the service and support of existing customers has not suffered in any systemic way, and each of these companies is continuing to invest in the technology even as new entrants like Seanodes and ParaScale emerge into the marketplace.

**User Challenges**

For end users, the challenges are in developing SLAs that can take full advantage of scale-out storage systems and a conversion strategy that allows them to be cost-effectively integrated into end-users’ storage infrastructure. Organizations should develop a culture that allows them to deal
with emerging storage companies and a flexible asset management strategy that enables them objectively consider the advantages of self- or third-party maintenance, if for no other reason than it maximizes user choice and the benefits of competition. Legal and finance should also be involved in the acquisition of storage systems to review vendor terms and conditions with the objective of determining whether hardware and software maintenance can be separated, and that the cost of software maintenance is low enough to make it financially attractive to extend the planned service life of scale-out storage systems. Third-party software maintenance is not an option because ownership of the software always remains with the storage vendor.

Deploying self-maintained systems in non-mission-critical environments like development and test and supporting applications with small communities of users is a good strategy for gaining experience in maintaining storage systems with minimum risk. This is particularly important for organizations that have no experience with self- or third-party maintenance and are experiencing double-digit growth rates in unstructured and stale data. End users can further reduce the real and perceived risks of using self- or third-party maintenance by using data protection schemes that can protect against multiple simultaneous disk or node failures; examples include redundant array of independent disks RAID 6, Reed-Solomon and erasure codes that can protect adjustable levels or protection disk or node failures.

The impact of extending the planned service life of a storage system is profound and self-evident once the unit of measure becomes dollars per gigabyte per month. Dividing by 48 or 60 months instead of 36 months lowers storage costs by 33% to 66%, excluding the cost of self-maintenance and software license fees for Year 4 and Year 5. Keeping storage systems installed longer than three or four years makes perfect business sense because the service lives of storage systems are usually limited by the high cost of maintenance, rather than an increase in hardware failure rates. As a practical matter, storage systems can easily deliver five to eight years of reliable operation before failure rates begin climbing to unacceptable levels:

- Disk or hard-disk drive (HDD) manufacturers regularly offer five-year guarantees on their enterprise class disks.
- Cloud storage vendors doing their own maintenance may keep their storage nodes in production until they fail or become too costly to power and cool.

**Developing an End-User Strategy**

Converting the promise of scale-out architectures into reality will require a strategy that shares many elements of successful consolidation, server virtualization or infrastructure modernization strategies. All strategies should include at least the following elements:

- Obtain senior management support to:
  - Make storage system asset management policies flexible. Service lives should be set by support cost and operational considerations, rather than by the finance department. Although it would be fair to observe that with many finance departments setting the useful service lives of storage systems at five years, this prerequisite for leveraging scale-out storage system maintenance costs into lower storage TCOs may already exist.
  - Deploy scale-out storage systems from established or emerging storage companies’ systems where technical, support, risk and financial considerations permit.
- Identify candidate workloads for scale-out storage systems:
  - The expense of high-end storage cannot be justified.
  - The impact of electronics failures in dual controller storage architectures is unacceptable.
- Ease of deployment and management become major competitive advantages: remote sites, first time replication based DR solutions, project based deployments.
  - Bundling of hardware and value-add software makes the solution affordable.
  - Use storage software layers which are not device dependent, thus enabling improved and lower cost device, data and storage migration.
• Develop a TCO model that includes alternate scenarios and takes into account:
  • Conversion costs
  • Migration fees
  • Acquisition, maintenance and facilities costs
  • The impact of changing planned services lives and upgrade price premiums
  • Possible re-tasking of servers into SAN storage that may or may not include virtualized server technology

Scale-Out Vendor Overview

• Dell’s EqualLogic and HP’s LeftHand Networks series are Internet Small Computer System Interface (iSCSI)-only solutions that target first time storage area network (SAN) users and smaller storage requirements.

• Seanodes supports the deployment of its scale-out technology into VMs or packaging it with inexpensive industry-standard servers to create low-cost, scale-out storage solutions.

• Isilon Systems is a scale-out NAS solution that can be optimized for high transaction rates, bandwidth or near-line storage needs.

• IBM’s XIV is targeting smaller, high-end storage systems. It supports both Fibre Channel (FC) and iSCSI protocols and currently scales to a maximum of 79 usable terabytes (TBs), and it offers four years of maintenance as a standard option.

• 3PAR does not meet the Gartner definition of a scale-out architecture because scalability is limited to eight nodes. However, as a practical matter, 3PAR generally competes against high-end arrays.

• Scale Computing supports iSCSI, Common Internet File System (CIFS) and NFS NAS solutions that use industry-standard solutions.

• Pillar Data Systems-like 3PAR does not meet the strict definition of a scale-out architecture, but it does support FC, iSCSI, CIFS and NFS, and scale hosts connections, internal bandwidth and computing power, and back-end capacity independently and usually without upgrade premiums.

Excerpt from Gartner RAS Core Research Note G001172391, Stanley Zaffos, 22 March 2010
A New Approach Leads to a New Paradigm

Autonomic Computing is an initiative started by IBM in 2001. Its ultimate aim is to develop computer systems capable of self-management, to overcome the rapidly growing complexity of computing systems management, and to reduce the barrier that complexity poses to further growth. In other words, autonomic computing refers to the self-managing characteristics of distributed computing resources, adapting to unpredictable changes whilst hiding intrinsic complexity to operators and users.

Autonomic storage represents a new and compelling solution to the on-coming tidal wave of data you’re all dealing with. While tiered storage solutions provide choice and flexibility, they are also resource intensive to manage.

The value proposition to the new autonomic model is the attainment of high service levels at moderate pricing levels and very low administrative overhead. By leveraging commodity hardware in a grid-based architecture, the XIV storage system either automates or eliminates most of the considerations relevant to tiered-storage models.

Between the two paradigms, IBM is the only major storage provider with both, and a solid strategy for determining what is most appropriate based on client objectives.

The key areas of differentiation are IBM’s leadership position in the emerging trends around storage virtualization, autonomic storage platforms, and scale-out file services, as well as seamless inclusion of third-party platforms solutions as part of a virtualized infrastructure.

Source: IBM

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**FIGURE 1** Autonomic: The Evolving Storage Paradigm

![Diagram showing the evolution from tiered storage to autonomic storage, highlighting choices, simplicity, and considerations.](source:image)
XIV Architecture

The XIV Storage is the fastest growing solution in the IBM storage history; it is leading the new market of Scale Out Architecture or, as IBM uses to define, the New Autonomic Storage Market.

The primary reason that XIV is so highly differentiated in the enterprise storage market is its revolutionary grid architecture fully virtualized and made by industry standard component.

The blue horizontal line in this graphic represents the “commodity barrier”. Everything above it is the proprietary IP that is unique to the solution; everything below is standard, off the shelf component.

This architecture has a number of advantages over the legacy, dual-controller architecture, as showed in the picture.

How is XIV Different?
The traditional storage is controller-centric and has bottlenecks coming from a central cache that make the performances. With XIV we have storage modules made by CPU, cache and disks that scale in every dimension. The virtualized management guarantees an intelligent use of all the components with an uniform I/O distribution like “communicating vessels”.

Source: IBM

FIGURE 2   How is XIV different?

- **Controller-centric**
  - Custom hardware & software

- **Centralized, shared cache**
  - Needs lots of shared bandwidth
  - Complex cache lock management

- **How do you scale beyond the controller?**

- **Distributed grid of commodity servers**
  - Software only

- **Distributed cache**
  - No shared bandwidth needed
  - No complex lock management

- **Scales in every dimension**

Source: IBM
Every enterprise storage system must fulfill 5 fundamental requirements:

1. **Performance** – consistent performance under all conditions eliminating hotspots

2. **Reliability** – no tolerance for down time or disruption of service

3. **Functionality** – Tier 1 functions that scale with no performance penalty

4. **Manageability** – total system virtualization

5. **Cost** – TCO

The difference is that, with many legacy storage systems, you must sacrifice something – cost, ease of operation, power consumption, etc. – in order to achieve all of them. XIV was designed from the very beginning to achieve all of these, but with a revolutionary architecture that does not require the user to sacrifice anything. You get all you need at the lowest TCO. IBM XIV Storage System integrates the latest technology advances and an innovative design to deliver a grid-based storage system in an extremely easy-to-manage environment. It is a fully scalable, high-end system that delivers an excellent TCO-benefit ratio.

The System is built as a grid-based storage system of independent modules, connected in any-to-any topology by means of massively parallel, non-blocking Gigabit Ethernet.

The modules are implemented using off-the-shelf, Intel-based servers within a customized, Linux-based architecture, and are interconnected over redundant Gigabit Ethernet switches. The modules act jointly as a large data grid devoid of a common backplane. The grid is managed by sophisticated distributed algorithms and delivers enterprise-class performance, reliability, and functionality.

The XIV system is built modularly, from the following components:

- **Data modules.** The data modules are Intel-based servers with a large number of disks. The modules store the data and perform all advanced storage functionality, such as redundancy, snapshots, and caching. Some of the data modules also contain interface connectivity; these are responsible for accepting host I/O commands (via FC or iSCSI) and forwarding them to the appropriate data module.

- **Gigabit Ethernet switches.** The switches are the interconnect between all the data and interface modules.

- **UPS units.** The UPS units ensure that the system has enough time to de-stage all cached data upon a power outage.

The main innovation of XIV is the distribution algorithm where each volume is spread across all drives; data is “cut” into 1MB “partitions” and stored on the disks; XIV algorithm automatically distributes partitions across all disks in the system pseudo-randomly. The result of that is:

1. **Better performance** - more drives are serving the application, yielding much better performance (both reads and writes), and the elimination of hot spots

2. **Better system optimization** - because of the granularity you don’t have to tune the system constantly

Data distribution only changes when the system changes:

- Equilibrium is kept when new hardware is added
- Equilibrium is kept when old hardware is removed
- Equilibrium is kept after a hardware failure

The fact that distribution is full and automatic ensures that all spindles join the effort of data re-distribution after configuration change. This guarantees also tremendous performance improvement in recovery/optimization times and the data recovery is managed in few minutes instead of many hours of the traditional storage.

The XIV system provides a management function that handles all system-wide management functions: allocating new volumes, etc. In keeping with IBM XIV’s streamlined, standardized approach to architecture, the function does not have its own dedicated
hardware. Instead, it runs on one of the standard modules and, in the event of failure of that module, automatically restarts on another module. XIV technology translates into a totally new experience in storage management. It achieves this breakthrough on several fronts and by numerous means:

- **Performance** – Innovatively using mass parallelism, a unique caching design, and perfect load-balancing, the XIV system delivers outstanding performance and maintains consistent high performance through any failure.

- **Reliability** – The system’s grid architecture and revolutionary redundancy scheme immunize against any single failure and greatly reduce double-failure risk.

- **Single-architecture storage** – The XIV system delivers first-class performance, reliability and features, at low TCO, eliminating the need for tiered storage management.

- **High density drives for enterprise** – The XIV system extracts high-end performance from enterprise-class, very high density slower rotation (VHDSR) drives while granting its users their cost, density and power savings benefits.

- **Snapshots** – The XIV system combines revolutionary replication technology with huge CPU and cache power to offer endless differential snapshots with performance intact.

- **Thin provisioning** – The XIV system allocates physical disk space per actual storage used rather than per storage space defined, reducing capital and operational costs.

- **Scalability** – The XIV system scales to petabytes of storage and provides linear scalability with respect to CPU power, cache, and bandwidth.

- **100% standard components** – The XIV system runs entirely on off-the-shelf hardware, such as standard Intel-based servers and gigabit Ethernet switches, offering an exceptionally cost-effective and future-proof solution.

- **Grid architecture** – Built from a grid of components connected via any-to-any topology, the XIV system offers exceptional scalability, performance and reliability.

- **True virtualization built-in** – The XIV system separates logical and physical entities, and applies all volume to all disks, for top performance and easy management.

Source: IBM
XIV Benefits for Customers

The XIV benefits that the customers can achieve are:

- **Easy to use**: The system can go in production in 2 hours; the storage management is dramatically simplified; new provisioning can be performed in few minutes.

- **Reliable**: Highly fault tolerant autonomic grid; self healing; five 9’s availability proactive management of the failures.

- **Fast**: massively parallel and self-tuning coming from the management algorithm.

- **Green**: thanks to the higher effective utilization the power consumption is strongly reduced.

- **Cost-effective**: all the software features (management, snapshot, synchronous and asynchronous replication, thin provisioning) are included in the solution price; no hidden costs; strong reduction in every component of the TCO, specifically thanks to an improved capacity utilization.

**Improved Capacity Utilization**

XIV is unique in that we only sell USABLE capacity. Traditional storage sells raw capacity and your staff must go through a complex process of defining spare drives, RAID groups, and handling any special requirements for advanced features such as local replication. With XIV you will always know what usable capacity you are buying and thus how much of your data can be stored.

Also, the fully virtual design supports thin provisioning which allows you to finally resolve one of the largest impediments to greater effective utilization: over allocating storage.

It is really hard to know how much storage you need and the operational impact of running out is too great. XIV thin provisioning allows you to over provision storage as a way to counter act this effect. And finally, XIV storage is designed to perform well at very high capacity utilization rates. Many traditional arrays need to stay below 50% to deliver good performance.

- **XIV sold as USABLE capacity**
  - NO lost capacity due to: spares, special system areas, volume set asides for replication, etc.

- **Capacity usage easy to monitor**
  - Complete system, storage pool, or volume.

- **XIV all virtual**
  - Configured with a single disk type and no RAID groups to minimize islands of capacity.

  - No physical disk binding.

  - THIN provisioning standard.

- **Designed to Perform Well at >90% Capacity Utilization**

**Reliability: Agility, Responsiveness, Flexibility**

Rapid provisioning enables faster application deployments. Seamless capacity additions reduce project delivery times and costs. Fast, efficient snaps equate to better DR, better recoverability, cleaner dev/test environment management.

Improving IT’s alignment with mission goals is often rated as a top CIO requirement. XIV can help with one aspect of that - improving the agility, flexibility, and responsiveness of your storage infrastructure. Requests for new storage can be handled in minutes not hours or days.

And requests for changes to your storage layout are also immediate and require very little planning.

With the XIV simplicity comes a new opportunity to delegate SNAPSHOT replication duties to your DBA’s or application owners. This can empower them to take advantage of this power feature which can in turn, improve their ability to meet goals.
For example:

A DBA could use SNAPshots to support repetitive application testing that could reduce the time to restore the base test environment to minutes versus hours. This could improve the number of test cycles per day from 2-3 to 6-8. This can help improve application quality efforts while meeting project milestones.

- **Provision Storage in < 1 Minute**
- **Resize Volumes Dynamically**
- **HIGH PERFORMANCE SNAPSHOTS**
  - Replicate data for backups or other apps
  - Empower DBAs to manage SNAPs
- **Multi-Tenant Management**
  - Delegate responsibility

- **Add New Capacity Quickly, Transparently**
  - Added capacity available near real-time
  - Existing data automatically re-balanced across all storage resources

The key to XIV’s environmental benefits comes from the innovative use of commodity hardware including 1TB SATA disk drives. While traditional storage systems use these for tier 3 archive or backup, the unique architecture of XIV provides tier 1 levels of performance and availability.

This 1TB disk uses 50-65% LESS power per usable TB than traditional 300-400GB fiber channel disks which allows us to store more usable capacity per square foot and consume far less power.

With the new 2TB SATA disk drives the above consideration are strongly reinforced.

Source: IBM
**IBM XIV Customer Presence**

More than 2,500 units already installed; with 619 new IBM Customers on the open storage across every industry/sector and with a large range of applications managed.

<table>
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<tr>
<th>Industry</th>
<th>Features</th>
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<tbody>
<tr>
<td>Communication</td>
<td>• 25 XIV frames, ease of management</td>
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<td></td>
<td>• All features included</td>
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<td>Construction</td>
<td>• Performance and reliability</td>
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<td>• Easy to manage and scale-up</td>
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<tr>
<td>Manufacturing</td>
<td>• Excellent performance and efficient snap shuts</td>
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<td></td>
<td>• Best ROI on XIV</td>
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<td>Distribution</td>
<td>• High performance SAP</td>
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<td>• Complete IBM solution</td>
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<td>Manufacturing</td>
<td>• Significant performance improvements with SAP</td>
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<td></td>
<td>• Great TCO, efficient migration</td>
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<td>Government</td>
<td>• Reduced physical space and power</td>
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<td>• Management simplicity</td>
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<td>Health Care</td>
<td>• VMware, Oracle and SQL Server (TSM and SVC)</td>
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<td>• Green Storage – Temperature dropped by 6 degrees</td>
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<td>Hosting Services</td>
<td>• Top Reliability with no performance compromise</td>
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<td>• VMware storage provisioned in minutes</td>
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<td>Banking</td>
<td>• Single Tier high performance architecture saves money</td>
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<td>• Extensive use of snapshots for Oracle</td>
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<td>Financial Services</td>
<td>• Simple and fast data migration</td>
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<td></td>
<td>• Less administration time</td>
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<tr>
<td>Media Publishing</td>
<td>• Streamlined backup processes</td>
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<td>• Robust Exchange environment</td>
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The IBM XIV Storage System market in Italy is starting to grow very fast; after less than 2 years from the launching on the European market, there are more than 25 Italian customers that are using XIV in their application environment; More than 40 systems installed, both on the enterprise customers than on the medium enterprises.

The main environments where the Italian customers are using the XIV are:

1. Virtualized OS: IBM XIV storage systems support all applications running on virtual servers within a VMware and AIX VIOS environment. With IBM XIV systems scaling to support larger capacities and higher levels of performance is as simple as adding additional systems, there is no need to stop the production environment - additional resources can be added non-disruptively in real-time. IBM XIV storage systems are running 10,000+ virtual servers today within a single environment. These environments started small with 1,000+ virtual servers and have steadily grown to support some of the largest virtual infrastructures in use.

2. Open OS heterogeneous consolidation, with:
   - SAP - traditionally, customers have deployed SAP applications across multiple individual infrastructure silos for ERP, BW, CRM, SCM, and PI resulting in complex planning and storage configuration layouts - often referred to as a 3-stage approach (production, quality assurance, and development). Since XIV is optimized for multiple I/O workloads, it ideally can serve current Netweaver multi-system SAP environments and delivers a stable I/O performance for all SAP applications.
   - Oracle - IBM XIV storage systems provide near-instant point-in-time copies of mission-critical Oracle databases using space efficient snapshot technology and IBM XIV storage systems provide replication, both synchronous and asynchronous between one or multiple systems locally or geographically distributed ensuring your data and applications are protected and RPO and RTO are met, if not exceeded. Further, IBM XIV storage systems are tightly integrated with Tivoli Storage Manager FlashCopy and SnapShot services to make keeping the data available simply by automating the entire data protection process.

3. Deduplication Solutions with Diligent gateway - The solution combines the ProtecTIER data protection software with the high performance and scalability of the IBM TS7650G and XIV Storage. IBM’s TS7650G and Diligent’s ProtecTIER™ Data Deduplication software enables customers to enjoy all of the benefits of disk-based backup and recovery for a fraction of the cost of traditional solutions. ProtecTIER is the established leader in data deduplication for enterprise data centers. Now, with the TS7650G and XIV pairing, any size customer can benefit from this game-changing technology by achieving up to 25:1 compression on data backups. The unique value that ProtecTIER delivers has led to its deployment in data centers of all sizes and complexities around the world across a range of industries. This solution delivers the full power of ProtecTIER to any type of data center environment in an easily deployable, scalable manner. This solution integrates seamlessly into your existing backup environment and is based on a high performance, efficient, and highly reliable infrastructure.
Some examples of customers experience in Italy:

**A Major Company in the Fashion Industry**

**The challenge:**
- New system (server + storage) scalable and reliable according to the next 3 years business needs
- Upgrade SAP R/3 from release 4.7 to ECC 6.0
- New flexible and easy system to be managed and monitored
- Performance
- Maintenance cost reduction
- Fast implementation of the new architecture matching the project schedule
- Savings in space (floor), power and conditioning

**The solution:**
- Three Server Power System 570/16 P6 @ 5.0 GHz and new XIV storage
- Single core specific power – Higher “SAPS / core” (P6 @ 5.0 GHz vs. Itanium2)
- 1 XIV box 6 module (27 TB user)

**Why XIV:**
- Ideal platform for consolidating multiple SAP instances, high level of integration
- Easy cloning or data refresh for test systems with actual PIT images
- Simple backup-to-disk implementation by exploiting XIV snap shot functions (Flash copy manager implemented with TSM) integrated with SAP and Oracle
- Easy to manage thin provisioning (34 TB configured on 27 TB box)
- Very good performance both on transactional and batch job
- Installation and roll-out of new storage architecture in few days according to the schedule; Respect of implementation costs

**FIGURE 4** Backup on-line with XIV snap snf Tivoli FCM
A Major Company in the Multimedia Advertising Market

The challenge:

- Improve the performance and reliability of tier-2 storage (current on 3 x DS4800) on VMware environment

The solution:

- 1 XIV box 6 module (27 TB user)

Why XIV:

- Improve the performance and reliability
- Easy management (fast storage provisioning)
- Implement backup via snapshot

A Major Company in the Financial Sector

The challenge:

Due to merge of two companies it was needed:

- Support of 60% data growth
- Enhance service levels and business continuity capabilities
- Achieve easy and flexible data system management
- Reduce the total cost of ownership (TCO) to balance the huge integration costs

The Solution:

- 2 IBM System Storage XIV storage devices, with 80TB capacity each, running synchronously.
- The migration from the previous heterogeneous storage systems was accomplished in one month, which fabulously showcased the System Storage XIV devices’ migration capabilities.

Why XIV:

- High performance infrastructure that is totally virtualized, flexible, scalable and effectively leveraging optimized resources.
- Operations can be managed with a high level of security. In case of technical failures, the System Storage XIV device uses self-repair capabilities that minimize the impact on daily activities.
- Additionally, data storage management costs and energy consumption have been reduced to contribute to the overall cost savings of over 50 percent.

A Services company for the Financial Institution

The challenge:

- Optimize and simplify the processes supporting the business
- Better services to the customers
- Reduce of the Time to market
  - Reduce the total cost of ownership (TCO) to balance the huge integration costs
- Reduce energy costs

The Solution:

- 1 IBM System Storage XIV storage devices, with 60TB capacity

Why XIV:

- Consolidation of more than 200 physical server
- 50% saving in space floor
- 50% saving in Power Consumption
- 50% saving in Power Cooling
- Easy to use
- Speed on space supply (in 2 minutes it is possible to allocate space to the host)
- Flat performance even with increase of the workload
- One XIV technical specialist available for free for one year

To guarantee the best customer experience, IBM has built in Italy a dedicated valued-added business partners organization, with a solution competence centre, available demo-boxes, certified professionals (sales, presales and delivery people).

Source: IBM
About IBM Italia

Registered Office and Head Office:  Circonvallazione Idroscalo 20090 Segrate (MI)

Tel: 02/59621 Fax: 02/59625937

Start of Operations: 1927

Geographic area of activity: Italy

Branches and customer centres: on all the national territory

Turnover in 2009: 2,148 million euros

Number of employees: about 7,000

Internet Site: www.ibm.com/it/

IBM’s mission is to be a partner in innovation, helping companies and institutions develop infrastructure, processes and new models of business aimed towards growth and competitiveness.

IBM, which has always been a player of the Information Technology market, has continuously strengthened its commitment to developing the most advanced technologies: for seventeen years now it has been the company with the most number of patents in the United States and holds records in all areas of technology, from microprocessors to supercomputers, from server to software for development and management of complex informational infrastructures.

At the same time, IBM turns to clients with an offer in which the hardware, software and service components are harmonized in the broadest concept of solution that creates and transfers value. To do this, it has developed in depth skills in the various market sectors (banks and financial services, industry, communication, public sector, distribution, small and medium sized enterprises) and integrates them with specific know-how in the different technological and application areas. In the context of the organization dedicated to services, which represents more than 50% of global personnel, consultancy has an increasingly important role.

In Italy since 1927, IBM works in the Country through branches and technical support centres on all of the national territory, and is backed by a network of more than 3,500 business partners. In Italy, IBM also carries out software development and applied research, which are part of the Rome Tivoli Laboratory, with a global mission in the field of network software, and of the solution development centres in Naples, Bari, Catania and Cagliari. The e-Government Open Solution Centre, opened in Rome in 2005, is dedicated to innovation for the Public Administration.