IBM XIV Storage System

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IBM XIV Storage Profile

- XIV® was acquired by IBM on December 31, 2007
  - Moshe Yanai XIV CEO (father of EMC’s Symmetrix) was appointed an IBM Fellow
- IBM XIV Storage System has a unique virtualized grid technology that changes the disk system paradigm: Storage Reinvented
- XIV innovation has been tested and accepted
  - Hundreds of systems installed to date
  - Product in development for more than 6 years
    - More than 3 years in production
    - More than 50 patents filed
- XIV now part of IBM. For our customers, this means:
  - Next-generation storage product
  - IBM integration, support and service
IBM XIV® Storage System

- Exceptional XIV architecture and function
- Enhanced for greater scalability
  - Up to 180 x 1TB disk drives; 79 TB usable
  - Supports FC and iSCSI host connections
  - Up to 120GB of memory

- World Class IBM Service and Support
  - 1 Year & 3 Year Options; 24x7x4; On-Site Repair
  - IBM HW and SW Installation

- IBM XIV Storage System Software - V10
  - Includes Snapshot, Thin Provisioning, Remote Mirroring, Data Migration
  - Built-in Self-Tuning and Self-Healing
  - Intuitive, Simple Management Interface

IBM XIV revolutionary storage with IBM support and service
XIV: Scaling Reinvented - Grow performance with capacity

• Capacity upgrades can be deployed easily and quickly to enable growth from 27TB up to 79 TB Usable Capacity

  • Minimum initial order starts at 6 modules
    • 72 x 1TB disk drives; 27 TB usable capacity
    • Can upgrade from 6 modules to 9 modules
    • Can upgrade from 9 modules to 10, 11, 12, 13, 14 and/or 15
      • In one or more module increments

• Smart capacity allows scaling of capacity while in production

  • Consistently fast access to information is maintained with design that scales performance linearly as storage is added because modules containing both disks and processors are added
  • Self optimizing disk system redistributes data as drives are added, minimizing hotspots
  • Built-in virtualization automates and simplifies disk system management and configuration of additional capacity
With this legacy architecture, scalability is achieved by using more powerful (and more expensive) components.
IBM XIV Storage is a Grid Architecture
IBM XIV Storage Distribution Algorithm

- 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
XIV Distribution Algorithm on System Changes

- 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
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**The fact that distribution is full and automatic ensures that all spindles join the effort of data re-distribution after configuration change.**

Tremendous performance gains are seen in recovery/optimization times thanks to this fact.
IBM XIV Automates for Performance and Protection

- IBM XIV Storage System is virtualized within the system
  - **Automatically** distributes data across all disks in the system
  - XIV’s overall disk usage approaches 100% in all scenarios.
  - Data is redistributed across disks 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
  - All disks join in redistribution of data after changes

- XIV self heals and self optimizes
  - Protects information with self healing
    - Fast rebuilds - 30 minutes or less for 1TB - other vendor products can take hours to rebuild
  - Automatically optimizes for performance, eliminating hotspots without manual tuning
IBM XIV Storage: Concept of “Spare”

- **Traditional approach**
  - Dedicated disks used for spares
  - In many systems spares are dedicated for a RAID group

- **IBM XIV Storage approach**
  - Recovery time: 30 minutes for 1 TB disk (full)
  - No dedicated spare disk, only global capacity
  - All disk are equally used
  - Minimize the risk of technician mistakes
  - Higher availability with no performance impact

- **180TB raw is 79 TB net**
  - Spare space for 3 disks and a full module
  - \[80 = \frac{(180 - 12 - 3)}{2} - 3.5\] (internal use)
IBM XIV Storage System Software Replicates and Saves

- **XIV snapshot copy capability: Truly revolutionary**
  - Outstanding performance with even multiple snapshots
  - Instant snapshot creation
  - Writable snapshots
  - Simple administration
  - Virtually unlimited snapshots - up to 16,000!

- **Thin Provisioning - Natively designed into system**
  - XIV System designed from day 1 for Thin provisioning
  - Saves in costs, power, and space

- **Synchronous Remote Mirroring for Disaster Recovery**
  - Any to any volume replication
  - Supports iSCSI and FC connections
XIV  Data Migration and Replacing Outdated Hardware

- Automatic data migration
  - XIV is placed between the Servers and the legacy storage array
  - Migrating thick volumes to thin provisioned volumes
  - Online data migration from other Storage arrays
  - Self Tuning

- New hardware can be added to the system
  - Better performance, less power, more density

- Outdated hardware can be phased out and removed

- All system components are replaced, with:
  - No down time
  - No host configuration
  - No administration effort
Management: Unbelievably Simple

It’s as simple as one, two - two parameters for volume allocation - name, size
IBM XIV Storage Supports Lower Total Costs

- Lower capital costs, no added charge for XIV software features – mirroring, snapshot, data migration, management
- Less storage needed, thanks to:
  - Thin provisioning
  - Management efficiency
  - Differential snapshots
- Savings in power, cooling, and space with large capacity SATA drives
- Simple, intuitive management - helps to manage more capacity with less staff
- Future ready - architected for easy module replacement to enable capacity, performance, and power efficiency upgrades
The XIV Bottom Line: Real-World Benefits

- **Reliability**
  - Revolutionary self healing

- **Functionality**
  - Thin provisioning and replication built in

- **Performance**
  - Massive parallelism, disk utilization

- **Manageability**
  - Simple, easy management

- **Cost**
  - No charge additional for software features
Thank You