IBM XIV: Ideal storage infrastructure for cloud services

Delivering simplicity, resiliency, and predictability to address service provider storage needs

Highlights

- Elastic and responsive to demanding, dynamic workloads
- Flexible acquisition options ideally suited for service providers
- Consistent and predictable SLAs
- Extremely easy to use and manage
- Low TCO with software licensing options and footprint and power efficiencies
- Exceptional integration with VMware and OpenStack environments

The cloud opportunity is upon us, and companies are increasingly turning to service providers to address their cloud infrastructure needs. While this trend presents huge promise, it poses considerable challenges to service providers and their customers as well.

To meet demand, service providers must ensure that their cloud infrastructure will grow in lockstep with their clients' needs. They must be able to deploy and scale rapidly while keeping IT service management simple, and without compromising performance or service levels. Similarly, service providers must also minimize costs and prevent disruption to their own businesses even as they expand IT infrastructure and enhance the delivery of services.

Along with establishing a robust networking and server foundation, service providers need to deploy data storage suited for a cloud environment to ensure their success. Designed well before the cloud era, traditional storage architectures have struggled to meet stringent service-provider requirements for storage, which include resiliency, ease of deployment and integration with technologies prevalent in cloud-centric data centers.

With its advanced grid design, the IBM® XIV® Storage System is a proven solution deployed as the storage platform for private and public clouds by service providers worldwide.

XIV Storage System: Keeping service providers ahead of the curve

The IBM XIV Storage System delivers enterprise-class cloud storage that offers service providers consistent and predictable high performance, scalability and agility, while keeping costs low. By combining a modular grid architecture with groundbreaking software, the XIV system addresses service providers' challenging storage requirements.

Resiliency for continuous operation

Downtime is not an option in service provider environments. Typical cloud SLAs dictate that services and infrastructure be always available. Service providers must, therefore, provide high levels of availability—at least 99.99%—with storage infrastructure that is resilient and quick to return to normal operations should issues occur.

The XIV system is designed for uncompromising five-nines availability—offering continuous operation over its lifetime without interruption to data access.

All key system components—disks, modules, switches, host connectivity and UPS units—are fully redundant and protected through active-active N+1 redundancy.

The XIV system provides exceptionally fast disk rebuilds—under one hour for a 4 TB drive—and unique proactive self-healing. Both of these features allow service providers to minimize downtime and promote rapid return to operations, helping to guarantee SLA compliance, to dramatically reduce impact on ongoing operations, and to avert risk in the event of hardware failure or disaster.

In contrast, traditional storage systems, which aggregate disks into RAID groups, can risk hours to days of data-recovery delays to return to contractual performance levels following a hardware or disk failure.

Additionally, software features such as snapshots, and synchronous and asynchronous mirroring—part of the XIV Storage System's all-inclusive software at no extra charge—further bolster service provider data protection and business continuity.

Figure 1: **IBM XIV addresses service provider needs for cloud**

Optimal cloud economics for low TCO

To stay lean and competitive, service providers must maintain downward pressure on capital and operating expenses. The XIV system offers exceptional TCO value for enterprise storage through a combination of factors such as: inclusive software at no extra charge, relatively low cost per TB, high capacity densities, low power consumption and footprint, optimal capacity utilization (in part through space-reclamation support for VMware, Microsoft, and others), and thin provisioning across the XIV Storage System environment.

XIV Storage payment and pricing flexibility are also geared to the service provider business model. The XIV Cloud Storage for Service Providers product empowers users with the flexibility to combine a robust set of base functions with license-per-need features. The ability to pay for functionality such as flash caching, mirroring, and encryption when they are required enables cloud providers to tailor services to customer needs even more cost-effectively.

In addition, the IBM Advanced System Placement program lets users purchase subsequent XIV systems for only USD1 upon installation and pay the balance when capacity reaches a predetermined threshold. This highly flexible payment program helps service providers manage their growing data volumes and adopt cloud storage solutions quickly with low up-front costs.

Security and privacy for a trusted platform

In establishing a cloud platform, a service provider must lay an IT foundation that ensures enterprise-class security and privacy.

IBM intends to offer multi-tenancy in XIV systems.[1] Multi-tenancy is designed to help cloud service providers provide tenant-specific access authorization and quality of service (QoS). To further address security requirements, XIV Storage System offers data-at-rest encryption—with separate key management by IBM Security Key Lifecycle Manager, which supports the Key Management Interoperability Protocol (KMIP). XIV systems are available with self-encrypting hard drives (SEDs) and software-based encryption of (optional) flash drives.

Like many other aspects of the XIV system, encryption is easy and flexible to deploy. It is non-disruptive, can be activated in minutes, and uses AES 256-bit keys—a requirement cited in many compliance guidelines, such as HIPAA.

"XIV is ideal for cloud delivery of services. It's very, very elastic; it's very, very scalable. XIV is designed to support all of the things that cloud defines in terms of reactivity and responsiveness to business requirements."

— Leading managed services provider, UK

Simplicity and predictability that befit cloud

Management simplicity is essential for a successful cloud storage platform. The XIV Storage System combines powerful enterprise storage with surprising ease of use, directly contributing to reduced complexity, which translates into cost and time savings for cloud service providers.

In some cloud models, service providers do not have visibility into the specific usage of the storage or business application. In these cases, service providers are consequently unable to tune storage to address specific application needs, fluctuations in demand, or other variables—resulting in suboptimal application performance.

Maintaining predictable high performance across applications is not an issue with the XIV system, as its tune-free, autonomic nature ensures that storage is always optimally tuned. The XIV Storage System automatically maintains optimal performance with no hotspots and no tuning or management throughout an application's lifetime, regardless of workload growth or fluctuation.

In addition, the XIV system allows service providers to provision and decommission storage rapidly and on-the-fly. The same cannot be said of traditional storage systems, given the complexities associated with provisioning and ongoing management.

Furthermore, to realize maximal efficiency out of the XIV system cloud storage, an add-on self-service portal—IBM Cloud Storage Access—is available for business end-users, technical teams, and IT administrators. It offers a simple, web-based self-service interface to provision and manage XIV system-based cloud storage.

Smooth scaling with IBM Hyper-Scale

To ensure service provider agility, cloud storage must exhibit high elasticity as well as the ability to maintain high performance that stays linear as capacity demands rise and fall.

The modular XIV system architecture simplifies capacity expansion by enabling the non-disruptive addition of storage modules into the system grid. Not only is newly added capacity immediately and fully usable, the system automatically redistributes data among all modules to optimize utilization.

However, capacity elasticity alone is not sufficient to satisfy service provider cloud requirements. The XIV Storage System also offers consistent, predictable I/O performance as capacity grows or shrinks, allowing service providers to meet contracted service quality levels.

Cloud environments must be able to expand across multiple numerous systems for more storage capacity. To support this level of enterprise scalability, the XIV system implements the IBM Hyper-Scale family of features, including:

- Hyper-Scale Manager—scaling the acclaimed XIV GUI across up to 144 XIV systems to enable centralized, consolidated administration of multi-petabyte environments.
- Hyper-Scale Mobility—optimizing use of existing capacity by enabling the migrating of volumes across XIV systems without disruption to hosts.
- Hyper-Scale Consistency—scaling data protection by coordinating consistent snapshots of application volumes that span multiple XIV systems.

Affinities with cloud infrastructure solutions

The cloud computing resource-sharing model uses large pools of virtual servers and storage, requiring tight integration between servers and storage. All too often, organizations deploying server virtualization don't take into account the storage that underlies their virtual IT systems. The resulting challenges quickly become evident in the form of unevenly distributed workloads, performance degradation and compromised reliability.

These issues are elegantly bypassed by the XIV Storage System architecture and its tight integration with virtualization offerings. The XIV system supports numerous hypervisors, including VMware, IBM PowerVM®, Microsoft Hyper-V, and Xen. With its inherent design and VMware and Hyper-V interoperability, the XIV Storage System provides the ideal storage-architecture complement to these platforms.

The XIV system architecture leverages the range of interoperability features provided by VMware, such as support for VASA, VAAI, vCenter plug-in, vStorage APIs for Data Protection (VADP), and XIV Storage Replication Adapter (SRA) for VMware Site Recovery Manager (SRM). IBM Storage Integration Server simplifies cloud infrastructure building by providing a unified point of deployment for host platforms, including VMware.

The IBM XIV Storage System further supports cloud deployments through integration with cloud management frameworks such as:

- OpenStack: IBM is one of the leading contributors to OpenStack Cinder and has support for the broad IBM storage portfolio, including XIV Storage System. OpenStack users can leverage all the advanced features of the XIV Storage System.
- XIV Storage System RESTful API: helps organizations customize their cloud solutions with native monitoring and provisioning available in the XIV system.
- IBM Tivoli storage software family: Enables organizations to enhance and centralize management across their infrastructure using, for example, Tivoli Storage Manager, Tivoli Storage FlashCopy® Manager, Tivoli Storage Productivity Center and Tivoli Usage and Accounting Manager.

Choose cloud storage wisely

Service providers are rapidly taking advantage of the significant opportunities afforded by novel cloud computing models. In these new models, service providers deliver flexible, affordable IT services to clients using elastic, efficient, and cost-effective cloud technologies. Choosing the right storage to support cloud computing is fundamental to ensuring success and client satisfaction.

IBM is leading the charge with the IBM XIV Storage System, a robust component of the IBM storage portfolio that offers unique value to service providers and their clients. The XIV Storage System handles a large variety of workloads—from business analytics to web applications to ecommerce to content stores—without compromising on performance, scalability, and cost.

It is no wonder that many service providers and Fortune 500 companies already rely on IBM cloud solutions and the cloud-proven success of the XIV Storage System—which has become an essential element of IT cloud infrastructures across the world.

Service providers: Grow your cloud with IBM

Whether you're just getting started as a managed services provider or have an established services business, competing in a crowded market requires more time, skill and resources than ever before. When you team with IBM, you'll have access to a broad portfolio of offerings and services that can help you build your environment and a wide range of support to ensure your success.

IBM offerings and support for service providers are based not on where your business has been, but where it's going. Visit the MSP area of ibm.com to discover how IBM can support you and your needs as you take your cloud-based business to new heights: **https://ibm.biz/BdRjrL**

Further reading and information:

IBM XIV Storage System landing page:
ibm.com/xiv

IBM System Storage landing page:
ibm.com/systems/storage/

IBM XIV Blue Skies for Cloud
White paper: https://ibm.biz/BdRjr9
Audiocast: https://ibm.biz/BdRjrC

IBM XIV and VMware: An Ideal Fit
https://ibm.biz/BdRjr3

Using IBM XIV in OpenStack Environments
https://ibm.biz/BdRjrw

Demo: XIV for Cloud with OpenStack
https://ibm.biz/BdRjrk

1. All information to be released represents the current IBM intent, is subject to change or withdrawal, and represents only goals and objectives.

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