

# EMC ViPR Software-Defined Storage

## Virtualize Storage without Compromise

### ESSENTIALS

#### Simple

- Abstracts storage from physical arrays into a single pool of virtual storage
- Centralizes storage management across physical and virtual infrastructure
- Automates provisioning, orchestration, and change management
- Delivers self-service access to virtual storage arrays on existing infrastructure

#### Extensible

- Provides a hyper-scale, cloud architecture that dynamically adapts and responds to new use cases and workloads
- Integrates third-party arrays
- Integrates with cloud stacks such as VMware® and OpenStack®

#### Open

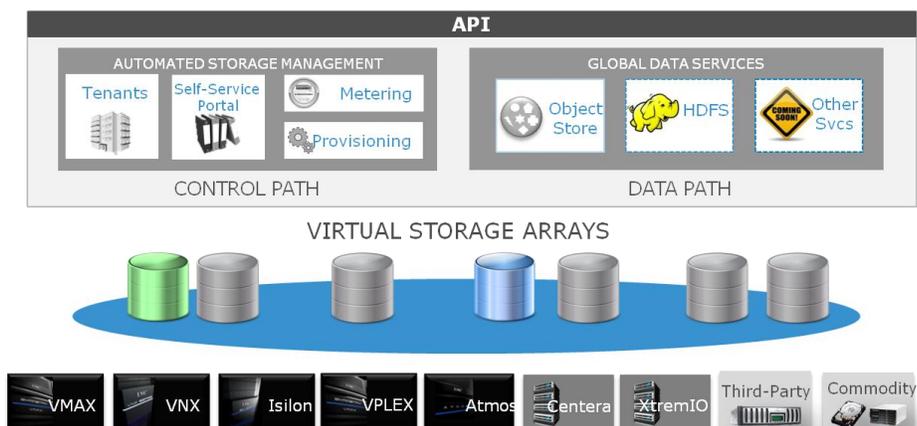
- Provides an open, API-driven storage platform
- Supports REST-based APIs include Amazon S3™, OpenStack® Swift, and EMC® Atmos™
- Provides a platform for creating and delivering global data services that span block, file and object storage

### MAKING THE STORAGE SHIFT

The virtual, on-demand world, where users expect instant access to data and applications, is forcing IT to rethink storage. But embracing new, disruptive technologies without compromising existing IT investments is difficult. Traditional data centers were designed to support specific applications, workloads and users. While this approach met business needs at the time, it has resulted in siloed, multi-vendor storage environments that lock data and applications to individual systems. These environments can be inefficient, costly to manage, and drive developers outside IT for instant storage access - limiting IT's ability to drive innovation and provable business value. To be successful in today's world, enterprises and service providers need to transform storage to reduce management and operational complexity, automate storage for better operational efficiencies, and provide users with simple, on-demand storage access.

### TRANSFORM WITH VIPR SOFTWARE-DEFINED STORAGE

EMC ViPR provides true storage virtualization without compromise. ViPR abstracts storage with all its unique capabilities from physical arrays into a single pool of virtual storage. Once virtualized, storage delivery and management is simple. ViPR automates provisioning by creating pre-defined policy-driven, virtual storage arrays and delivering self-service access. It centralizes storage management and monitors utilization, performance and health all through a single interface across physical and virtual storage. And, because ViPR is software-defined, you can easily extend ViPR to support non-EMC arrays and integrate with cloud stacks. ViPR is the first truly open software-defined storage platform. It supports open APIs, including Amazon Simple Storage Service™ (S3), OpenStack® Swift, and Atmos to completely free data and applications from storage dependencies. IT can meet new workloads and use cases with existing infrastructure, create new data services, or leverage new data services offered by the ViPR open development community.



## VIRTUALIZE STORAGE WITHOUT COMPROMISE

ViPR abstracts storage and all its unique capabilities from physical arrays and creates a single pool of virtual storage. ViPR decouples the storage control path from the data path, which enables ViPR to centralize all data provisioning and data management tasks, yet allow applications to access block and file data as they always have and continue to use the unique capabilities of the underlying arrays.

Much like partitioning a physical server into a number of virtual machines, storage administrators can create virtual storage arrays that are managed at the virtual layer according to automated policies. They can then define Virtual Storage Pools with different storage performance characteristics and capabilities to meet a variety of workloads. ViPR presents Virtual Storage Pools in a catalog accessed via a ViPR self-service portal or through a custom interface to an organization's existing catalog.

ViPR provides all the functionality of physical block and file storage arrays as virtual services as if the user were accessing a physical array. ViPR block and file services maintain all the advanced features of the arrays such as mirrors, clones, snapshots, and multi-site high-availability, and replication. You get all the value of virtualization, no compromises.

## SIMPLIFY STORAGE MANAGEMENT

ViPR centralizes and automates storage management and delivery across all physical and virtual storage environments. ViPR automates storage provisioning through policy and delivers self-service storage access to virtual storage. With ViPR, administrators no longer manually provision storage; instead they define, deliver and manage pre-defined data services that span arrays. Then provide users with instant access to self-select storage by performance, availability, cost and size requirements from a catalog.

ViPR provides a single view of the storage environment to monitor, meter and report on storage usage, available capacity, and performance – including chargeback to tenants and integration with existing billing systems.

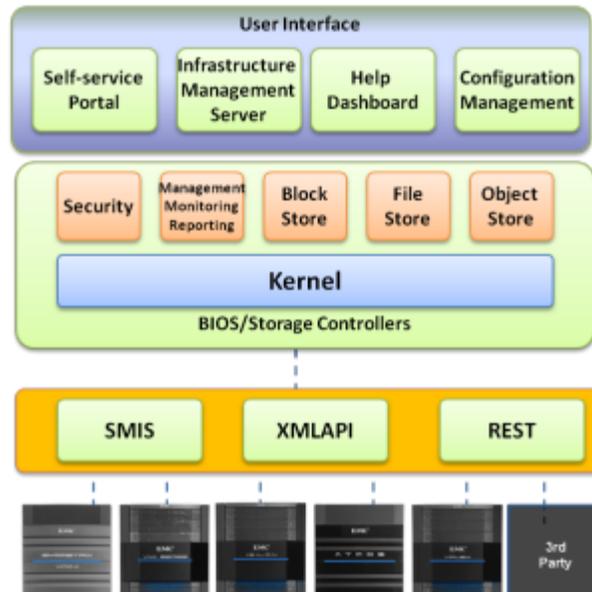
ViPR is integrated with, and uses the same presentation layer as the EMC Storage Resource Management and Service Assurance Suites. Alternatively, organizations can use ViPR APIs to easily integrate their existing storage management, orchestration and change management systems.

## EXTEND BEYOND EMC

ViPR provides a hyper-scale, cloud architecture built with standard APIs, so any customer, service provider or vendor can extend it to support non-EMC storage, develop new data services, and integrate with cloud stacks such as VMware®, and OpenStack.

Using SMIS and a multitude of APIs that are exposed by vendor arrays, EMC has built adapters for different arrays and exposes a consistent and simple API to build new adapters to support new arrays. This creates an extensible “plug and play” storage environment that can automatically connect to, discover and map arrays, hosts and SAN fabrics. Administrators and developers can also create unique new data services that span arrays and support hybrid data types such as objects-on-file.

ViPR can now be another programmatic component in the Software-Defined Data Center. An organization can easily integrate ViPR into their existing data center operations to deliver true storage virtualization.



## OPEN ARCHITECTURE

EMC ViPR supports Representational-State Transfer (REST) based APIs that provide developers with an open approach to build applications. APIs free applications from storage, so that applications developed on public clouds can be brought back into the enterprise or used in combination with a cloud service provider in a hybrid cloud.

EMC publishes ViPR APIs to facilitate the addition of new array adapters and new data services. This allows developers to focus on the functionality and value they are adding, rather than on the details of the underlying storage. ViPR also enables enterprises and service providers to build developer communities that attract developers and ISVs to expand the universe of value-adding data services.

## GLOBAL DATA SERVICES

A unique feature of ViPR is its extensibility; administrators and developers can develop new global data services that can span arrays and support hybrid data types. Global data services are storage abstractions that reflect the combination of a data type (file, object, block of data or hybrid data type), access protocols (iSCSI, NFS, REST, etc.), and durability, availability, and security characteristics (snapshots, replication, etc.). Global data service examples include:

- **Object-on-File Data Service:** Store, access and manipulate unstructured data (e.g. images, video, audio, online documents) as objects on file-based storage such as EMC VNX and Isilon and NetApp® storage systems without having to rewrite or rework existing file-based applications.
- **Hadoop® Distributed File System (HDFS) Data Service:** Apply location-awareness to data-intensive applications using object and file data services. Processing will be done on the worker node where the data resides without unnecessarily traversing the network thereby reducing backbone traffic.
- **Business Continuity/Mobility Data Service:** Provides a (virtual) block controller combined with VPLEX and RecoverPoint (physical) block data nodes deliver a global business continuity and mobility data service for VMAX and VNX block storage capable of supporting any workload with snapshots, replication, high-availability, and mobility in a metro area all managed from a single management control point.

## EXTRACT NEW VALUE FROM YOUR STORAGE

With the storage resources virtualized and defined in software, storage administrators are no longer bound by physical storage constraints, and can present heterogeneous storage environment to users and applications as a set of data services to which users can subscribe. The open, extensible platform serves as a foundation for developing new and innovative data services that expose previously locked data to new use cases and applications and give enterprises and service providers the ability to attract an ecosystem of developers and ISVs that add new value-adding data services.

### CONTACT US

To learn more about how EMC products, services, and solutions can help solve your business and IT challenges, [contact](#) your local representative or authorized reseller—or visit us at [www.EMC.com](http://www.EMC.com).

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