Connecting IBM Storage to Multi-Cloud Environments

IBM Spectrum Connect Simplifies Cloud Storage Deployments

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Introduction

The digital transformation of the data center is underway and IT organizations are rapidly updating their operating models to keep pace. Server virtualization and application refactoring have streamlined compute operations, leading to more flexible and scalable data centers that are transitioning quickly to take advantage of cloud resources. The evolution of container technologies makes this transition simple and portable for applications and application services that require flexible compute and storage across multiple cloud environments. Software defined storage adds a layer of flexible capabilities for storing and managing data throughout its lifecycle. The cloud provides new infrastructure and economic options with multi-cloud support being the latest requirement as IT organizations look for resiliency and flexibility. These dynamics lead to the transition to hybrid IT environments with on-premise, private cloud and public cloud infrastructure.

For their part, customers are aware that no single hybrid IT solution can provide all the capabilities they want with all the flexibility they require. They know they need to use a combination of approaches, vendors and products to achieve their unique IT objectives. Providing storage for hybrid IT environments can mean overcoming several downsides including uneven storage resource sharing; lack of a coherent connection between virtual machines, containers, and their datastores; various performance issues; and having single points of failure within the storage infrastructure with incomplete disaster recovery plans in place.

The use of multiple solutions implies that customers will need to use a variety of industry standard and vendor specific APIs to enable the various components to communicate and interoperate in their hybrid IT environment. Individual Application Programming Interfaces (APIs) can be powerful but having to deploy and manage a plethora of APIs to make everything work can become a challenge. The combinations of these components may get more complex in the future.

In this Technical Insight, we look at IBM Spectrum Connect, a recent addition to the IBM Spectrum Storage software family. Spectrum Connect provides value by helping customers integrate IBM's enterprise storage features into their multi-cloud environments. It does this by combining all the API dialogs for IBM storage systems into a common toolset with a single user interface for orchestrating between multiple kinds of cloud platforms and IBM storage devices. IBM has been active and vocal about its multi-cloud initiatives and recently released a number of services and solutions to make multi-cloud deployments easier by leveraging open and container-based technologies to move workloads between private and public clouds. IBM Spectrum Connect helps connect all these environments together whether on-premise or in the cloud.

Introducing IBM Spectrum Connect

IBM has been focused for several years on delivering a broad set of storage capabilities as software-defined solutions for today's datacenter challenges. Delivered under the IBM Spectrum brand, the storage solutions include a scale-out file and block storage, clustered NAS, cloud-scale object storage, physical and virtual data protection, copy data management, and more.

The most recent addition to the Spectrum software defined storage family is IBM Spectrum Connect, which combines a number of IBM tools and resources into a single, consistent user experience for provisioning, monitoring, automating and orchestrating IBM storage solutions in containerized, VMware and Microsoft PowerShell environments. Spectrum Connect leverages existing IBM storage systems capabilities and is provided at no additional charge to IBM storage system customers.

IBM Spectrum Connect has been created by combining private cloud management capabilities (formerly IBM Spectrum Control Base Edition) with several enabling tools and APIs into a single distribution and managed through a single user interface. These tools include:

- IBM Storage Enabler for Containers
- IBM Storage Provider for VMware VASA
- IBM Storage Enhancements for VMware vSphere Web Client
- IBM Storage Plug-in for VMware vRealize Orchestrator
- IBM Storage Management Pack for VMware vRealize Operations Manager
- IBM Storage Automation Plug-in for PowerShell

IBM Spectrum Connect supports the IBM FlashSystem family, IBM Storwize family, and the IBM DS8000 series, IBM SAN Volume Controller, VersaStack and IBM XIV, as well as IBM Spectrum Virtualize and IBM Spectrum Accelerate on supported hardware. Regardless of which IBM storage systems are used, the user interface through Spectrum Connect is always the same.

Highlights

- Single, consistent user experience for IBM storage API dialogs
- Simplifies configuration of storage resources across multi-cloud platforms
- Define storage class and storage profile policies by workload or by SLA
- Enables self-service provisioning of enterprise storage features by non-storage admins
- Supports automation of storage tasks via vRealize orchestration, Kubernetes CLIs and PowerShell
- Enables quick deployment of applications

Evaluator Group Comments: With so many storage systems to support, it makes sense for IBM to develop their APIs in this external and independent approach. Customers only have one tool to learn and IBM can more easily add new technology and cloud interfaces as they develop over time.

Support for storage systems is always evolving and may depend on specific releases of all the components involved. Customers should verify their unique hardware and software configurations with the vendors before implementation.

As mentioned previously, there are three main cloud environments that IBM Spectrum Connect supports at this time - containers (specifically Kubernetes-orchestrated Docker containers), VMware and Microsoft PowerShell. The following sections provide more detail on each of these areas.

Spectrum Connect with Containers

Containers are a hot topic in IT these days for good reasons. They facilitate rapid, agile development of workloads for hybrid IT environments. They are lightweight (megabytes in size) and only take seconds to start. Containers enable an application to be packaged with everything needed to operate in any environment – on premise, private cloud, and public cloud. The addition of persistent storage to what started out as a stateless construct has greatly expanded the role of containers in hybrid IT environments.

IBM Spectrum Connect enables persistent storage provisioning for Kubernetes-orchestrated Docker container environments. When coupled with IBM Spectrum Access for IBM Cloud Private, Spectrum Connect delivers a full cloud-stack for on-premise environments equivalent to IBM Cloud. IBM Spectrum Access for IBM Cloud Private simplifies the provisioning of storage for containers by defining policies by Service Level Agreement (SLA) or by workload. It supports multiple and varied IBM storage systems with its single user interface. Spectrum Connect delivers an enhanced storage management and provisioning experience for improved troubleshooting in containerized environments.
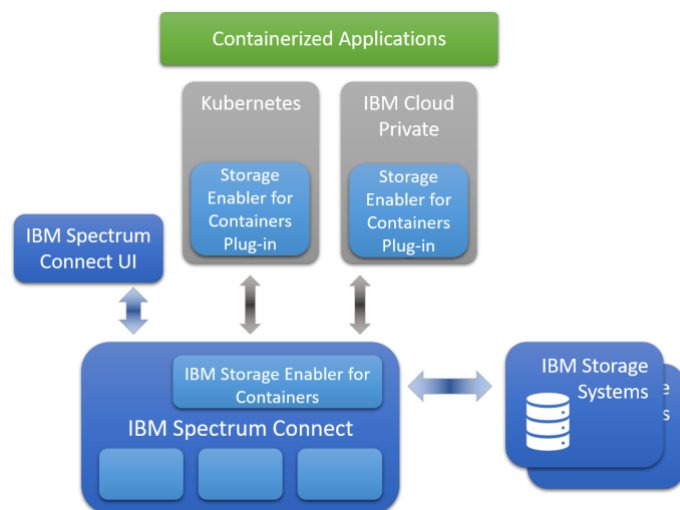

Evaluator Group Comments: Containers are just now beginning to gain broad adoption by IT organizations. We expect to see continued adoption for containers since they offer a flexible way to

use resources across hybrid IT environments including multiple hypervisors, operating systems, private clouds and multiple public clouds. IBM Spectrum Connect adds flexibility to provisioning the persistent storage needed for containers across various IBM storage systems.

Spectrum Connect with VMware

VMware is ubiquitous in today's datacenters and is a leading virtualization technology that IT organizations are using for their hybrid cloud environments. VMware itself has a rich environment of capabilities and offerings which have been developed over the years. IBM developers have been helping their customers integrate with VMware through APIs which are now integrated in Spectrum Connect.
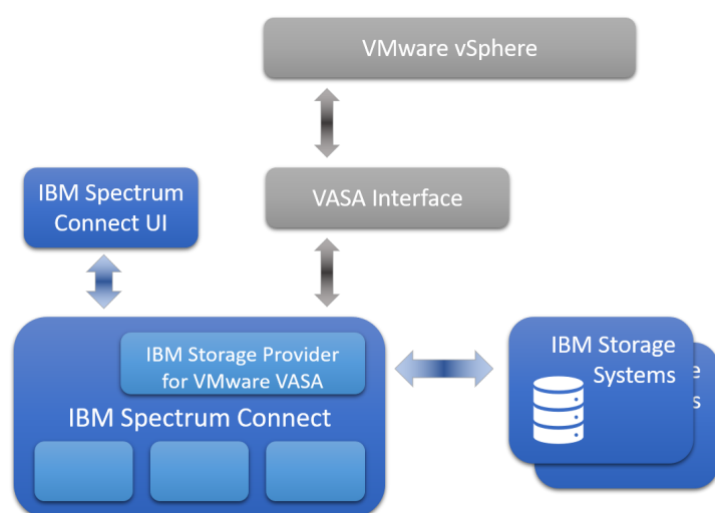
The IBM Storage Provider for VMware VASA (vStorage APIs for Storage Awareness) is one of the important capabilities in Spectrum Connect. A VASA provider communicates with vSphere vCenter to provide topology, capability and state information on connected storage systems which in turn supports policy-based management and operations management. For example, using the VVols 2.0 capabilities in vSphere, a virtualization admin can define storage policies for the VM datastores including what replication services to use based on the specific replication capabilities of the storage system. The VVol centers storage around the VM rather than the IBM storage solution. This visibility makes it easier for virtualization and/or storage admins to allocate, maintain and monitor the VM datastores. More importantly, it provides enterprise-class storage capabilities to the VM admins through the interfaces they know and use.

In a similar manner, Spectrum Connect supports other VMware solutions through targeted APIs. The IBM Storage Enhancements for VMware vSphere Web Client integrates IBM storage systems into the vSphere Web Client platform through plugins that enable VMware admins to centrally manage IBM storage resources. The IBM Storage Plug-in for VMware vRealize Orchestrator (vRO) enables the automation of discovery and provisioning of IBM storage systems as part of the vRO automation blueprints and workflows. The Storage Management Pack for VMware vRealize Operations Manager (vROps) provides comprehensive monitoring information about the IBM storage resources used in the environment and provides dashboards to help troubleshoot issues from the VM all the way to the storage.

Evaluator Group Comments: IBM's integrations with various VMware solutions enable the provisioning, monitoring, automation and orchestration of IBM storage systems by VMware admins from the comfort of VMware user interfaces. The delivery of these APIs through a single point of integration makes them simpler to deploy by the customer and easier for IBM to upgrade and enhance as advancements are made to both VMware and to the IBM storage systems.

Spectrum Connect with PowerShell

PowerShell from Microsoft is a task automation and configuration management framework consisting of both a command-line shell as well as a scripting language. IBM has developed multiple PowerShell command-lets (cmdlets) for provisioning and managing IBM storage systems through trusted PowerShell commands to the devices. These command-lets are included in the IBM Storage Automation Plug-in for PowerShell which is deployed on a PowerShell host using Spectrum Connect as the common user interface. The capabilities can also be used with PowerCLI to automate storage related tasks for Microsoft environments managed in VMware vSphere.
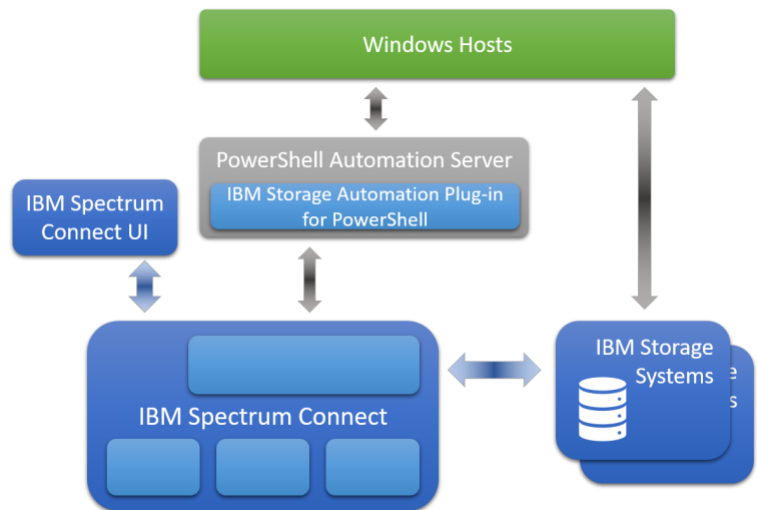
Evaluator Group Comments: Support for the popular PowerShell environment should be well received by IBM storage customers who want to automate end to end storage provisioning and management for their Microsoft environments.

Conclusions

IBM Spectrum Connect allows IBM storage system customers to integrate different storage classes into their multi-cloud and container environments with simplicity, efficiency and agility. These benefits include:

- **Simplicity**. Spectrum Connect simplifies the delivery and use of APIs that integrate IBM storage systems and features in hybrid and multi-cloud IT environments. It provides a common user interface - a single pane of glass - for integrating enterprise storage with the complex combination of operating systems, hypervisors, containers, storage and cloud providers that comprise today's hybrid IT environments.

- **Efficiency**. Spectrum Connect supports a storage provisioning policy which enables the definition of easy to consume storage classes, such as by Service Level Agreement or by workload. These storage classes enable efficient self-service or easy automation of storage provisioning across container, VMware and PowerShell environments. This provides a single point of integration, control and automation across the IBM storage portfolio.
- **Agility**. Spectrum Connect allows self-service provisioning of storage by non-storage admins. It supports the agility of containers by providing flexible and reliable persistent storage on the backend. The consolidated delivery vehicle of Spectrum Connect will make expansion of the capabilities easier for IBM and faster for customers to deploy as the technologies advance in the future.

IBM Spectrum Connect is not a single solution for creating a hybrid IT environment nor does it profess to be. There are many pieces that go into making that happen which customers need to be aware of. However, it will simplify cloud storage deployment through single point API management and easy configuration of IBM storage resources across hybrid environments. IBM storage customers should take advantage of this no additional charge offering from IBM.

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