

Cloud & Container Update

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IBM Storage and SDI

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Spectrum Scale Cloud & Containers

- Spectrum Scale on Cloud - Vision
- Spectrum Scale Solutions
- Persistent Storage for Containers
- Future Plans



Spectrum Scale On Cloud - Vision

Cloud Readiness

- Public, Private, Hybrid
- Multi-Cloud

Offerings

Ecosystem Integration

Workload Support

- Analytics & Cognitive
- High Performance Computing
- AI Data Pipeline

Workload Ecosystem

- Containers
- CaaS
- Ephemeral and Persistent Volumes
 - Storage Enabler for Containers (SEC)
 - Container Storage Interface (CSI)
- Hybrid Use Cases
 - Cloud Burst
 - Multi Cloud Data Sharing
 - Archive
 - High Performance Tier

Spectrum Scale On Cloud - Vision

Cloud Readiness

- Public, Private, Hybrid

Offerings

Ecosystem Integration

User Deployed - DIY

- IBM Cloud

Spectrum Scale Solutions

- IBM Spectrum Scale on AWS

Private Cloud Solutions

- IBM Cloud Private (ICP)
- Others

Partner Solutions

Trials

- AWS Quickstart
- Google (soon)

Spectrum Scale On Cloud - Vision

Cloud Readiness

- Public, Private, Hybrid

Offerings

Ecosystem Integration

User Interface (Look and Feel)

Resource Provisioning and Initialization

- Provision Virtual Machines, Storage etc. and initialize

Deployment Automation and Orchestration

- AWS Cloud Formation etc.

Spectrum Scale Cluster Creation and Configuration

- Cluster Creation, File system Creation. Feature enablement and configuration

Digital Business Integration

Service & Support Processes

Durability & Elasticity

Spectrum Scale Journey on AWS

IBM Storage and SDI



AWS Quick Starts

[Spectrum Scale Trial link](#)

- 3 months trial license
- Released Sept. 13 2017
- Data Management Edition



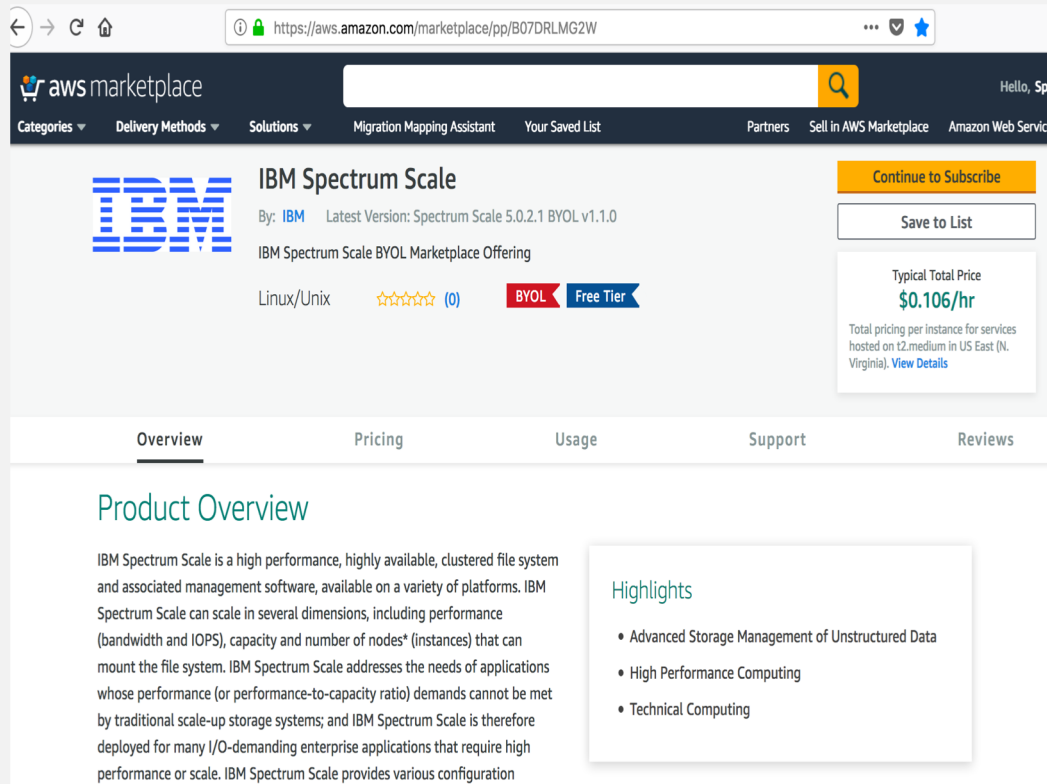
awsmarketplace

[Spectrum Scale Marketplace link](#)

- Bring your own license
- Released Sept. 28 2018
- Data Management Edition

Spectrum Scale Listing On AWS Marketplace

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The screenshot shows the AWS Marketplace listing for IBM Spectrum Scale. The browser address bar displays the URL <https://aws.amazon.com/marketplace/pp/B07DRLMG2W>. The listing header includes the IBM logo, the product name "IBM Spectrum Scale", and the version "Latest Version: Spectrum Scale 5.0.2.1 BYOL v1.1.0". Below this, it states "IBM Spectrum Scale BYOL Marketplace Offering" and "Linux/Unix". A star rating of 0 is shown. Pricing information indicates a "Typical Total Price" of "\$0.106/hr" for a "t2.medium" instance in the US East (N. Virginia) region, with a note that this is the "Total pricing per instance for services hosted on t2.medium in US East (N. Virginia)". A "Continue to Subscribe" button is present. The listing is categorized under "Categories", "Delivery Methods", "Solutions", "Migration Mapping Assistant", "Your Saved List", "Partners", "Sell in AWS Marketplace", and "Amazon Web Services". The "Overview" tab is selected, showing a "Product Overview" section. The "Highlights" section lists three key features: "Advanced Storage Management of Unstructured Data", "High Performance Computing", and "Technical Computing".

IBM Spectrum Scale

By: IBM Latest Version: Spectrum Scale 5.0.2.1 BYOL v1.1.0

IBM Spectrum Scale BYOL Marketplace Offering

Linux/Unix ☆☆☆☆☆ (0) BYOL Free Tier

Typical Total Price
\$0.106/hr

Total pricing per instance for services hosted on t2.medium in US East (N. Virginia). [View Details](#)

Continue to Subscribe

Save to List

Overview Pricing Usage Support Reviews

Product Overview

IBM Spectrum Scale is a high performance, highly available, clustered file system and associated management software, available on a variety of platforms. IBM Spectrum Scale can scale in several dimensions, including performance (bandwidth and IOPS), capacity and number of nodes* (instances) that can mount the file system. IBM Spectrum Scale addresses the needs of applications whose performance (or performance-to-capacity ratio) demands cannot be met by traditional scale-up storage systems; and IBM Spectrum Scale is therefore deployed for many I/O-demanding enterprise applications that require high performance or scale. IBM Spectrum Scale provides various configuration

Highlights

- Advanced Storage Management of Unstructured Data
- High Performance Computing
- Technical Computing

Easy configuration through cloud formation

Parameters

File System Configurations:

Block Size 4M File system block size.

GPFS Mount Point /gpfs/fs1 The mount point for the Spectrum Scale

NSD Configurations:

EBS Type gp2 EBS volume type for each NSD server node NSD disk. Options are: General Purpose SSD (gp2), HDD(st1), Cold HDD (sc1) and EBS Magnetic (standard).

Disk Per Node 1 Number of disks attached to each NSD

Disk Size 500 Disk size of each NSD server node, in GB

Server Node Configurations:

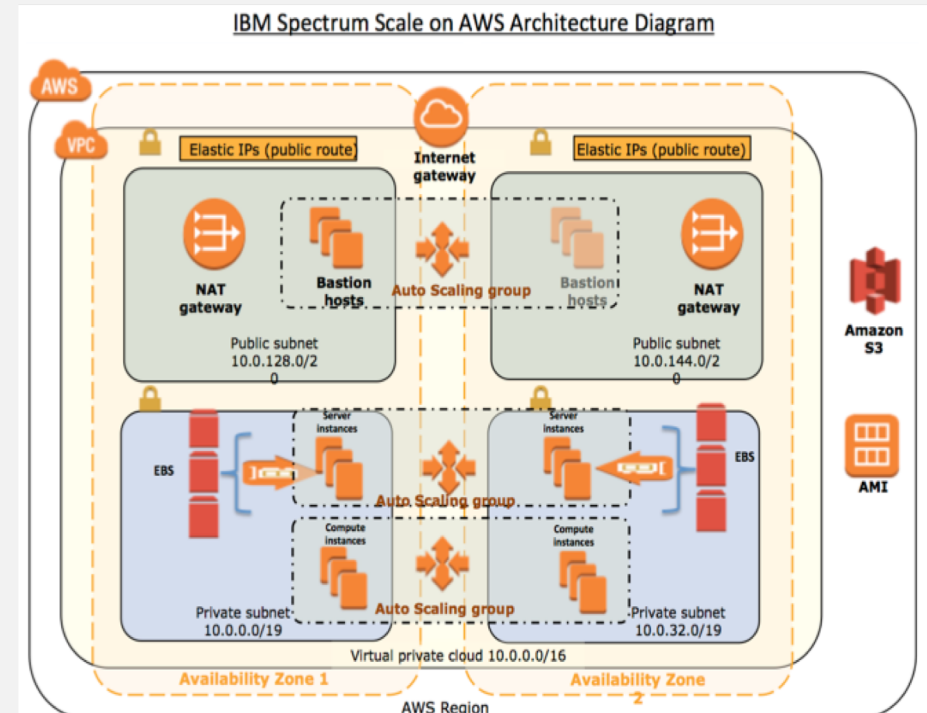
Server Node Count 2 Number of EC2 instances to launch for the NSD

Server Instance Type t2.medium Instance type to use for the NSD Server

Spectrum Scale on AWS – Architecture

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- Solution based on EC2 instances and EBS volumes
- NSD servers separate from “Compute” nodes that will mount the shared filesystem
- NSD servers using AWS EBS storage for Spectrum Scale
- Data is replicated across multiple availability zones
- Support for creation of new VPCs or launching instances into existing VPCs.
- Connection to these instances only via a Bastion Host (as per AWS best practices)
- Focuses on simplicity/usability of deployment (e.g. reduced config. options) and leverages Amazon features such as Cloud Formation templates and AMIs (Amazon Machine Image)



Containers, Containers, Containers

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HPC and Scientific Computing

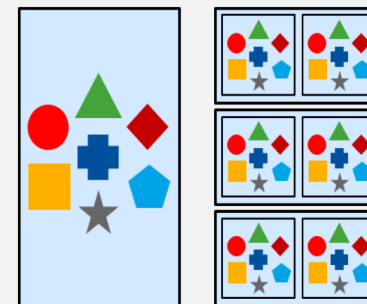
- Portable and reproducible science
- One-Click Laptop to Supercomputer

On-premise and Public Clouds

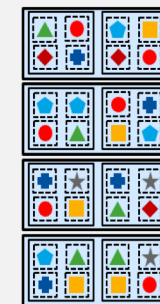
- Scheduling and Auto-Scaling
- Improved resource utilization
- Isolation and Multi-Tenancy

Development, DevOps and continuous integration

- Re-use of applications and services
- Simplify and accelerate application deployment



Scales by size ... or monolithic replication.
Changes monolithically.



Scales by microservice replication.
Changes by microservices.

Next Gen, Micro-Service, and Traditional Applications

Persistent Storage For Containers

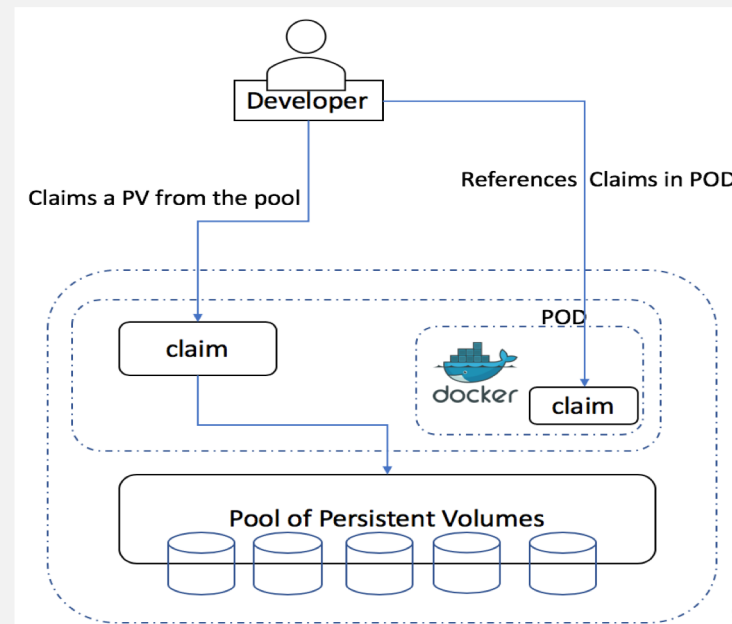
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Stateful Containers: *Persistent data with high availability and data protection is one of the biggest barriers for container adoption in the enterprise for production workloads*

- Storage volume plug-ins are required to enable external storage to containers
- Each orchestrator has its own provisioning API for integrating storage

Concepts

- **Persistent Volume (PV):** Unit of storage in the cluster that has been provisioned by an administrator or dynamically provisioned via a storage driver/plugin
- **Persistent Volume Claim (PVC):** Is a request for storage by a user.
- **Static Volume Provisioning**
 - PVs created upfront
 - Storage requirements to be known upfront
- **Dynamic Volume Provisioning**
 - Volumes created on-demand
 - No need to pre-provision storage
 - Based on StorageClass

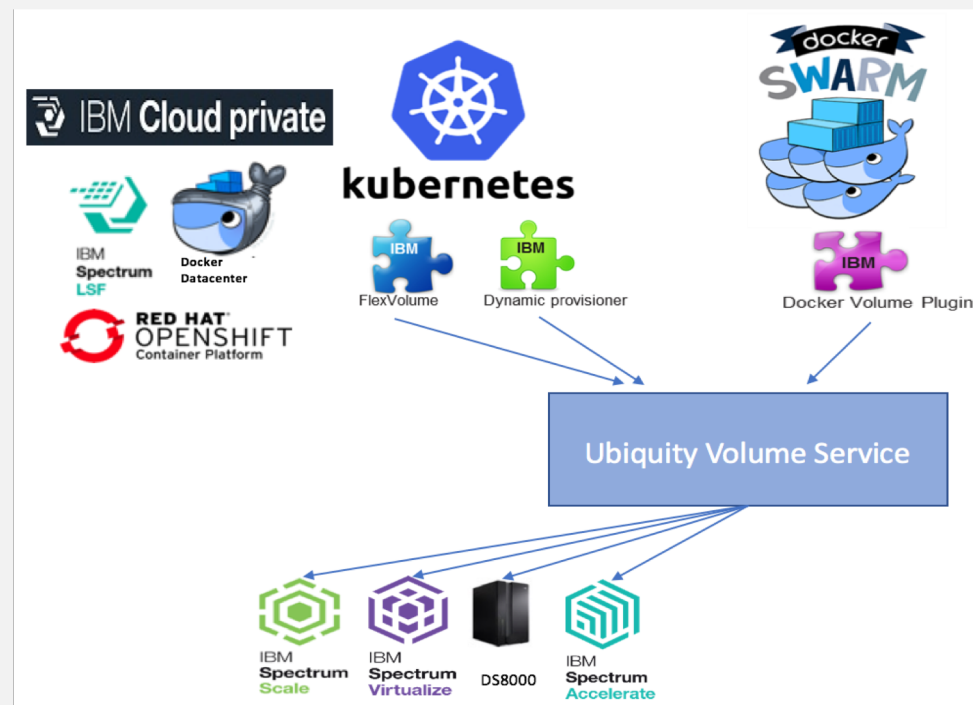


Spectrum Scale and Containers

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Storage Enabler for Containers: *Solution to enable IBM storage for containers*

- Unified solution across IBM storage
- Supports different containers' orchestrators
- Provides storage specific extensions (CLIs) & tools
- Pluggable architecture to support 3rd party storage
- Open Source



IBM Spectrum Scale Offering For Containers

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Spectrum Scale containers plugin (x & p) was GA'd as part of **IBM Storage Enabler for Containers** in Dec 2018

Support for Z on RHEL and SLES was GA'd in Jan 2019

Key Features:

- Provides persistent volumes for stateful applications on **Kubernetes**
- Support for dynamic provisioning of volumes as well as creating volumes using existing filesets
- REST API based volume management
- Support for Quota management

Downloading From Fix Central

IBM Storage and SDI

- Spectrum Connect landing page:

<https://www.ibm.com/us-en/marketplace/spectrum-connect>

- Click the "Download Now" button to come to the Fix Central Page

- From the Fix Central download links for Spectrum Connect, select the "Installer for IBM Storage Enabler for Containers" link:

Installer for IBM Storage Enabler for Containers

Search:

	Description	Release date
<input type="checkbox"/>	1 tool: → Installer for IBM Storage Enabler for Containers v1.2.0 Installer for IBM Storage Enabler for Containers, Version 1.2.0 Release Notes User Guide	2018/09/17
<input type="checkbox"/>	2 tool: → Installer for IBM Storage Enabler for Containers v1.1.1 Installer for IBM Storage Enabler for Containers, Version 1.1.1 Release Notes User Guide	2018/05/15

1-2 of 2 results

tool:

Installer_for_IBM_Storage_Enabler_for_Containers_v1.2.0

[Release Notes](#)

[User Guide](#)

Installer for IBM Storage Enabler for Containers, Version 1.2.0

The following files implement this fix.

[↓ installer-for-ibm-storage-enabler-for-containers-1.2.0-92.tar.gz](#) (20.86 KB)

[↓ IBM_Spectrum_Connect_3.5.0_RN.pdf](#) (1.01 MB)

[↓ IBM_Spectrum_Connect_3.5.0_UG.pdf](#) (12.1 MB)

ibm.com/storage

Thank you



In a nutshell: What is CSI and why is it important ?

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Standardized storage interface for Container Orchestration Systems (Kubernetes, Mesos, Docker, and Cloud Foundry)

- In addition, makes installing new volume plugins as easy as deploying a pod

CSI spec V1.0 GA level of support in Kubernetes 1.13 (Dec 2018)

- ICP 3.2 plans to support Kubernetes 1.13 in May 2019
- OpenShift 4.1 plans to support Kubernetes 1.13 in May/June 2019



Flex Volume plugins can coexist with CSI plugins. SIG Storage will continue to maintain the Flex API so that existing plugins will continue to work.

New volume features (e.g. snapshots, resize) will be added only to CSI

The new standard requested by customers and adopted by the industry.