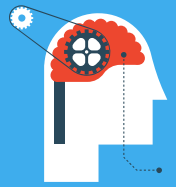
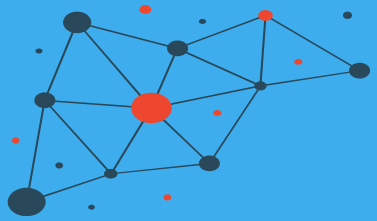


Spectrum Scale User Group, Australia

Persistent Storage For Containers

IBM Spectrum Scale

Join user group:
www.spectrumscaleug.org/join



About the user group

- Independent, work with IBM to develop events
- Not a replacement for PMR!
- Email and Slack community
- www.spectrumscaleug.org/join

IBM CHAMPION

Disclaimer

IBM Spectrum Scale

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Outline

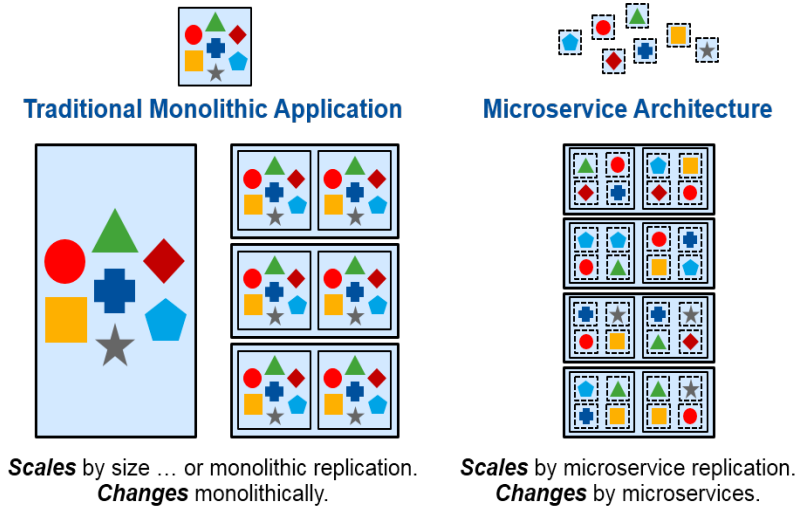
- ***Introduction***
- ***Spectrum Scale CSI Driver***
- ***Use Cases***
- ***Spectrum Scale On OpenShift***

Introduction

Baseline: Containers Everywhere

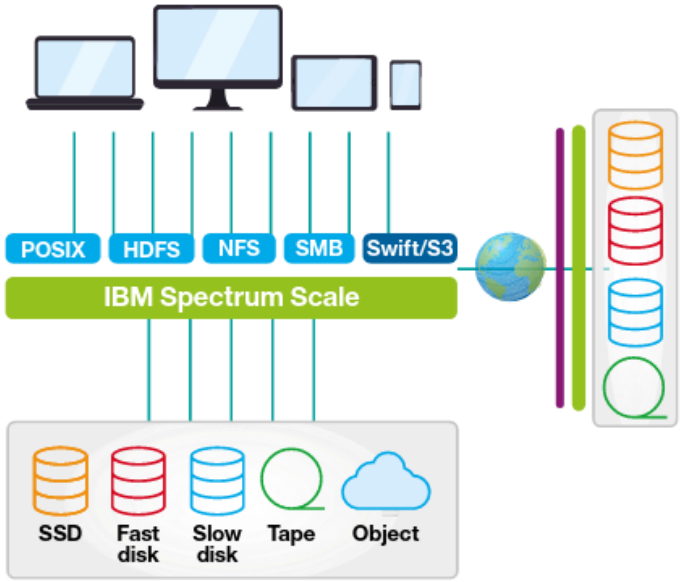
IBM Spectrum Scale

- Multicloud: On-premises and Public Clouds
  - Elastic scheduling and auto-scaling
  - Improved resource utilization
  - Secure isolation and Multi-Tenancy
  - Portable and reproducible service
  - One-click Laptop to Supercomputer
- Development, DevOps and continuous integration
  - Re-use of applications and services
  - Simplify and accelerate application deployment
- Microservices Architecture
  - Programming language and technology stack independence
  - Faster and easier development



Baseline: IBM Spectrum Scale

Highly scalable high-performance unified storage for files and objects with integrated analytics



Remove data-related bottlenecks
- with a parallel, scale-out solution
- 2.5TB/s demonstrated throughput

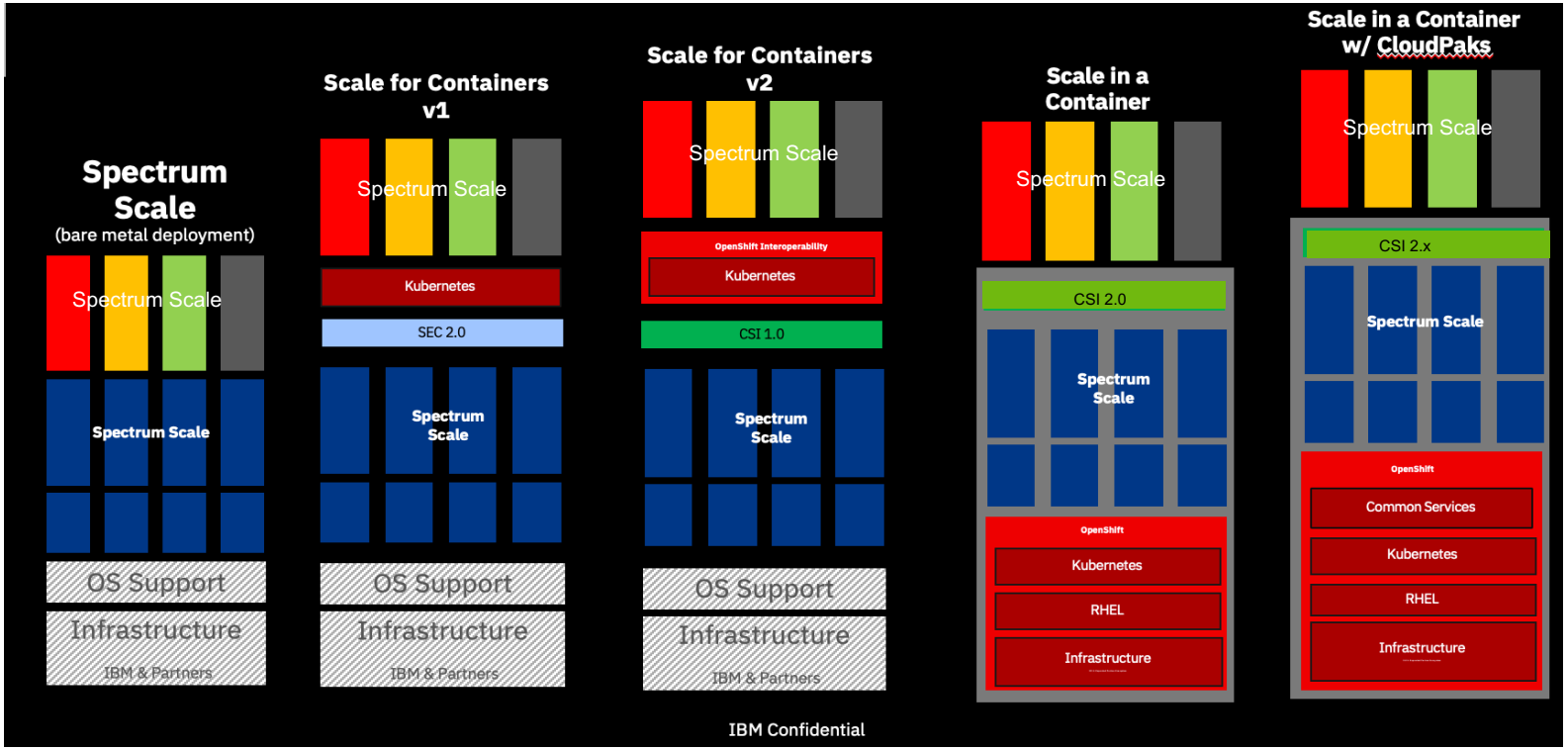
Enable global collaboration
- with unified storage and global namespace
- Data Lake serving HDFS, files and object across sites

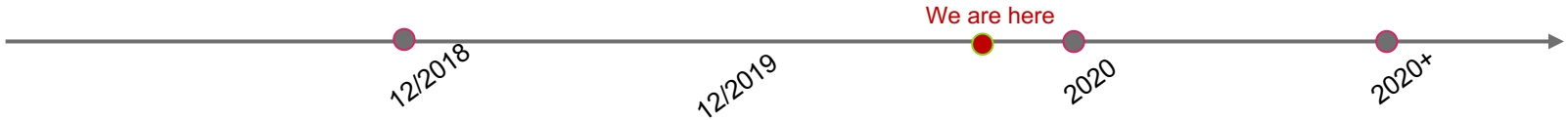
Optimize cost and performance
- with automated data placement
- thin-provisioning preview and TRIM support, QOS on project preview

Ensure data availability, integrity and security
- with erasure coding, replication, snapshots, and encryption
- End-to-end checksum, Spectrum Scale RAID, NIST/FIPS certification

IBM Spectrum Scale

Spectrum Scale and Containers: Evolution

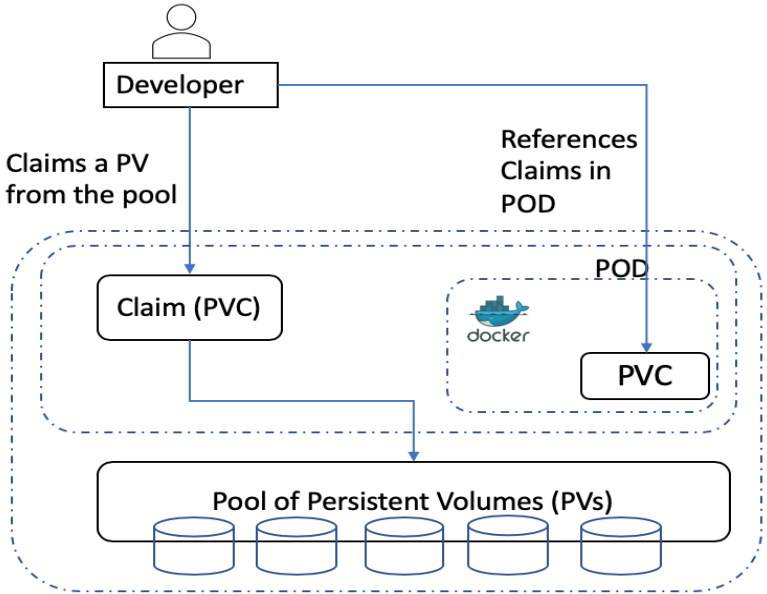




IBM Spectrum Scale
CSI Driver

Persistent Storage For Containers

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*



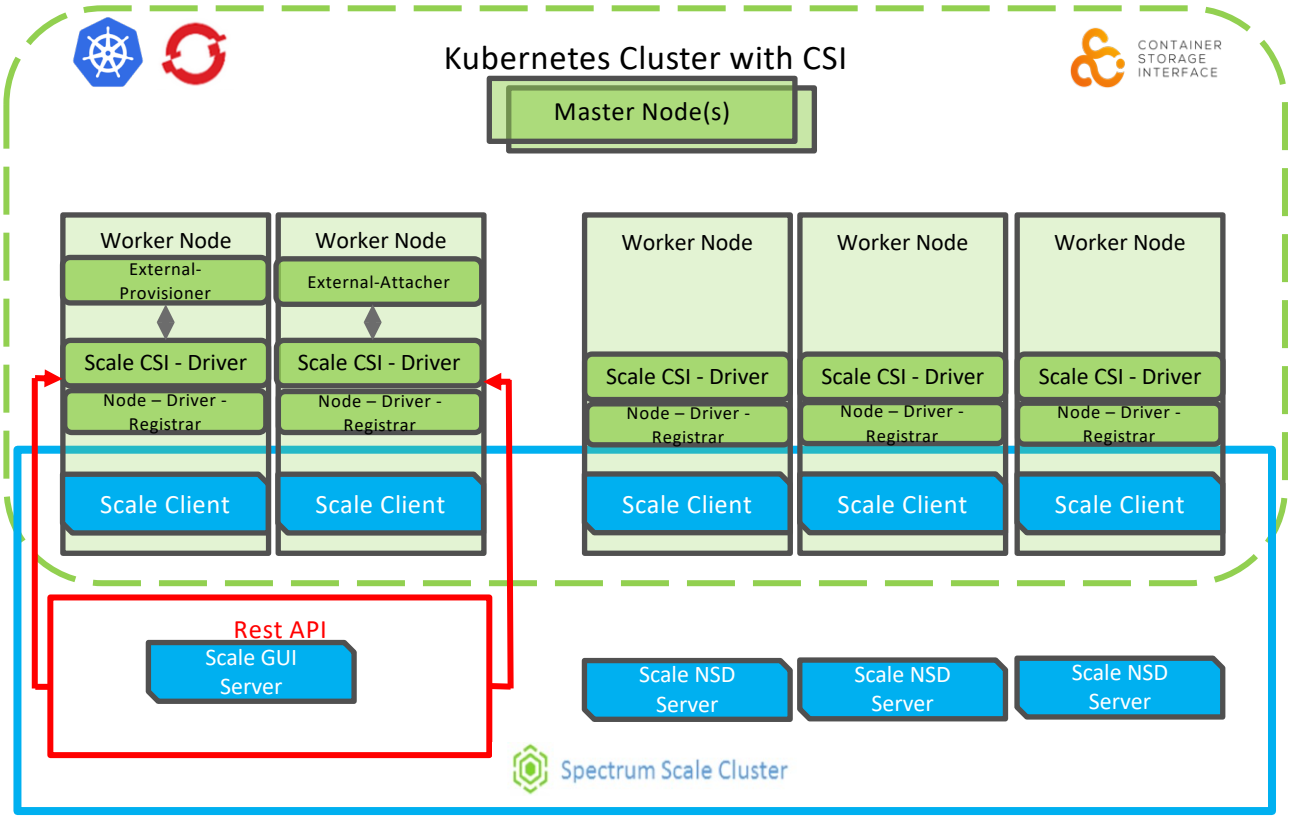
Kubernetes Volumes: PVC or Persistent Volume Claim is a request request for storage by a user. PVCs consume PV (Persistent Volume) resource.

Dynamic Provisioning: Allows storage volumes to be created on-demand. Eliminates the need for cluster administrators to pre-provision storage.

Static Provisioning: Creates PVs upfront that carry details of the real storage. Administrator should know the storage requirements upfront.

Storage Class: Provides a way for administrators to define “classes” of storage.

Spectrum Scale CSI Driver – Architecture



Interface
CSI

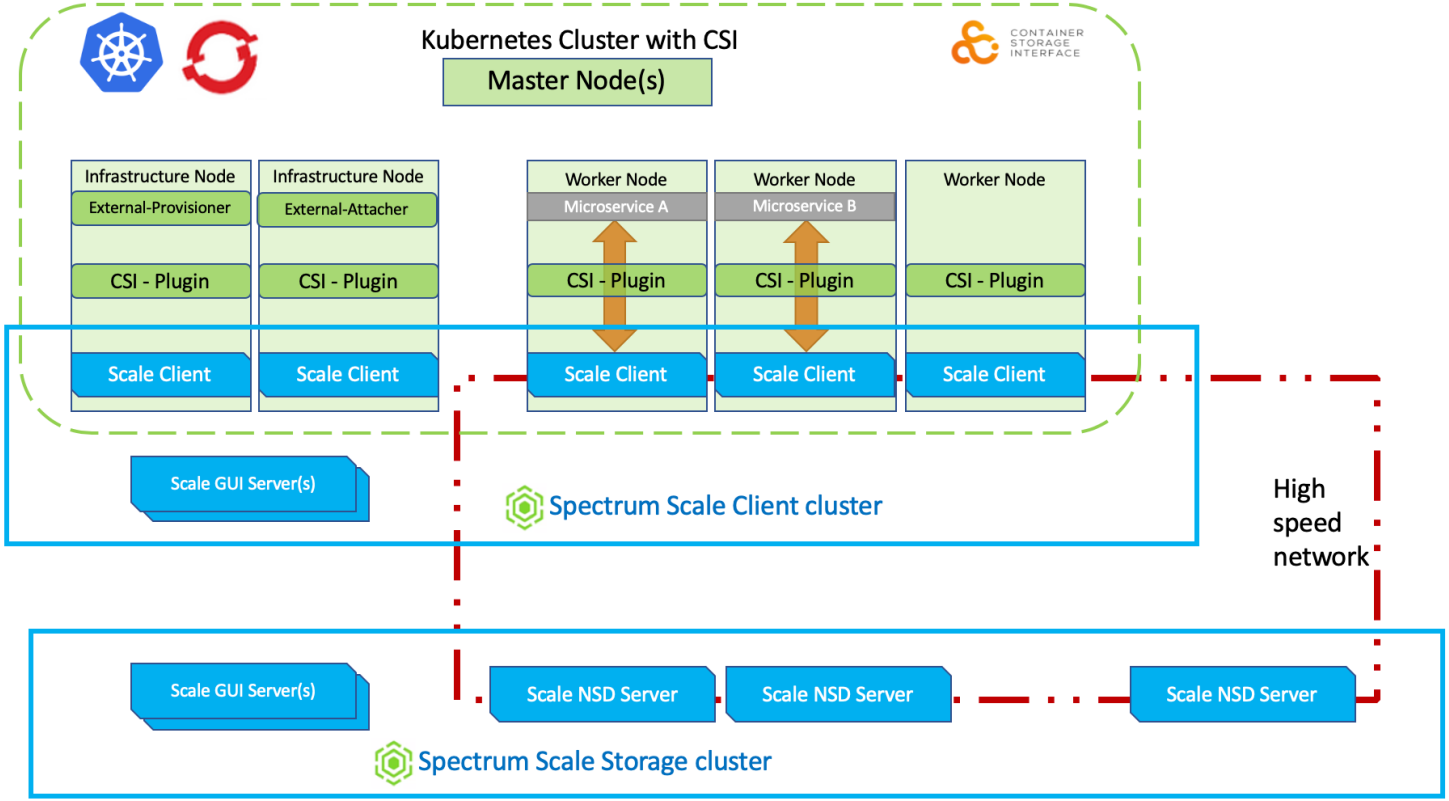
Container platform
OPENSHIFT
kubernetes

Arch
x86
Power Systems
IBM Z
Roadmap

Installation
Red Hat Quay
The registry for Kubernetes Operators
OperatorHub.io

IBM Spectrum Scale

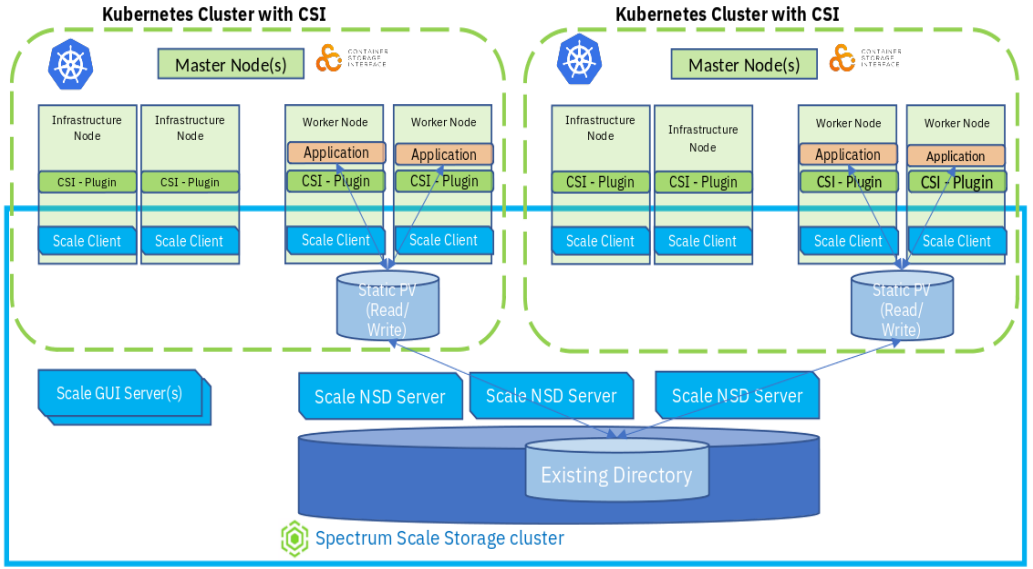
Spectrum Scale CSI Driver With Remote Cluster



Use Cases

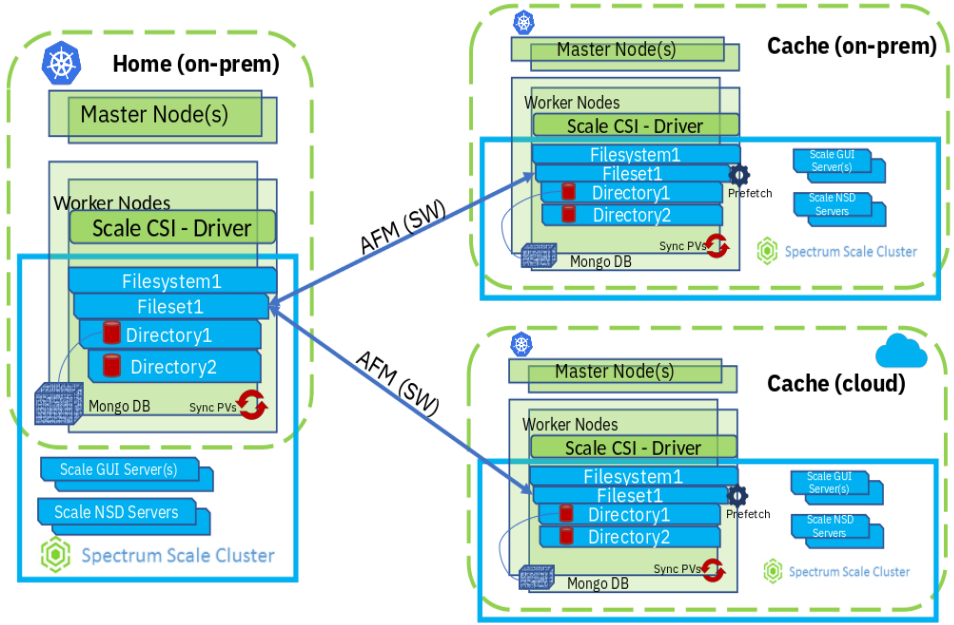
Spectrum Scale use case : Two-site DR

- Kubernetes clusters do not like to be stretched, etcd is very latency-sensitive
- Spectrum Scale stretched cluster can serve as the common data plane
- Additional use case “strong tenant isolation”
  - Separate Kubernetes clusters might have different cluster admins
  - Stronger isolation than Kubernetes namespace separation
  - Still single data plane possible

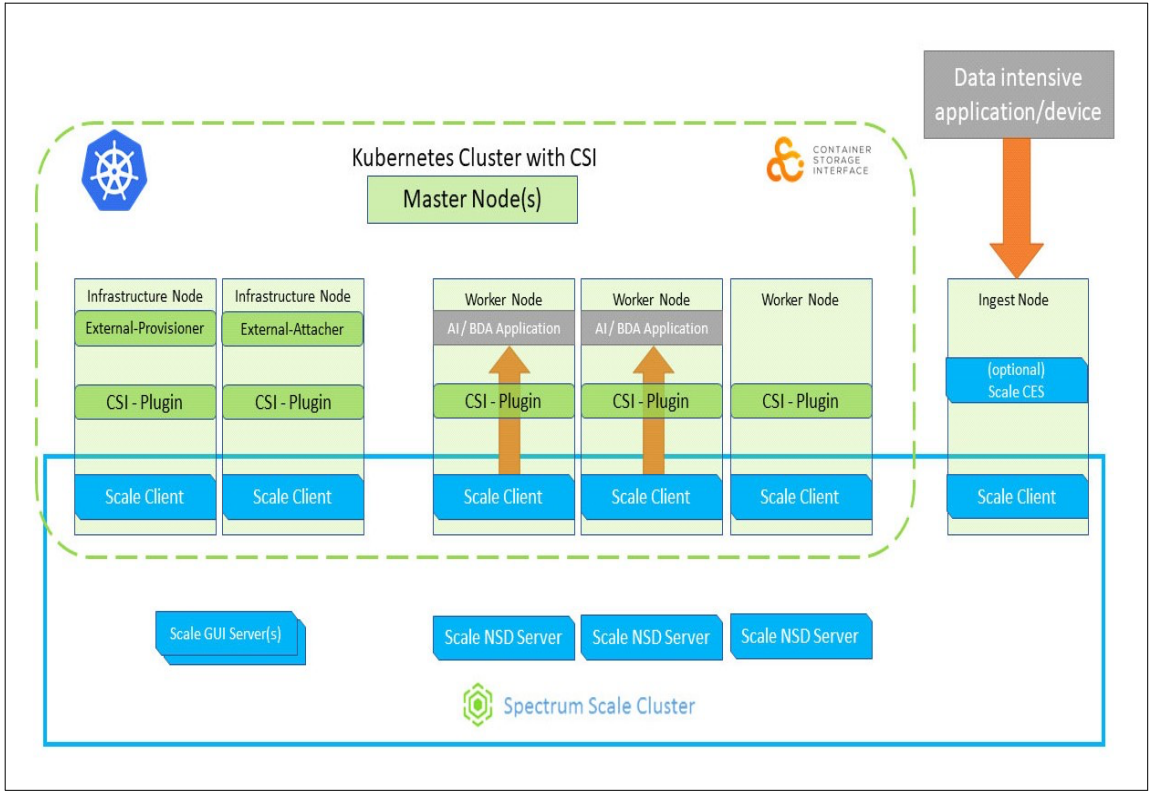


Spectrum Scale use case : Multicloud

- To service workload on cloud
  - Single-writer (home site) only
  - Processed data should be pushed to separate file system
- For DR purposes
  - Only one workload container should be up at given time
  - Independent writer can be used, but monitor cloud data outgoing traffic (EGRESS)



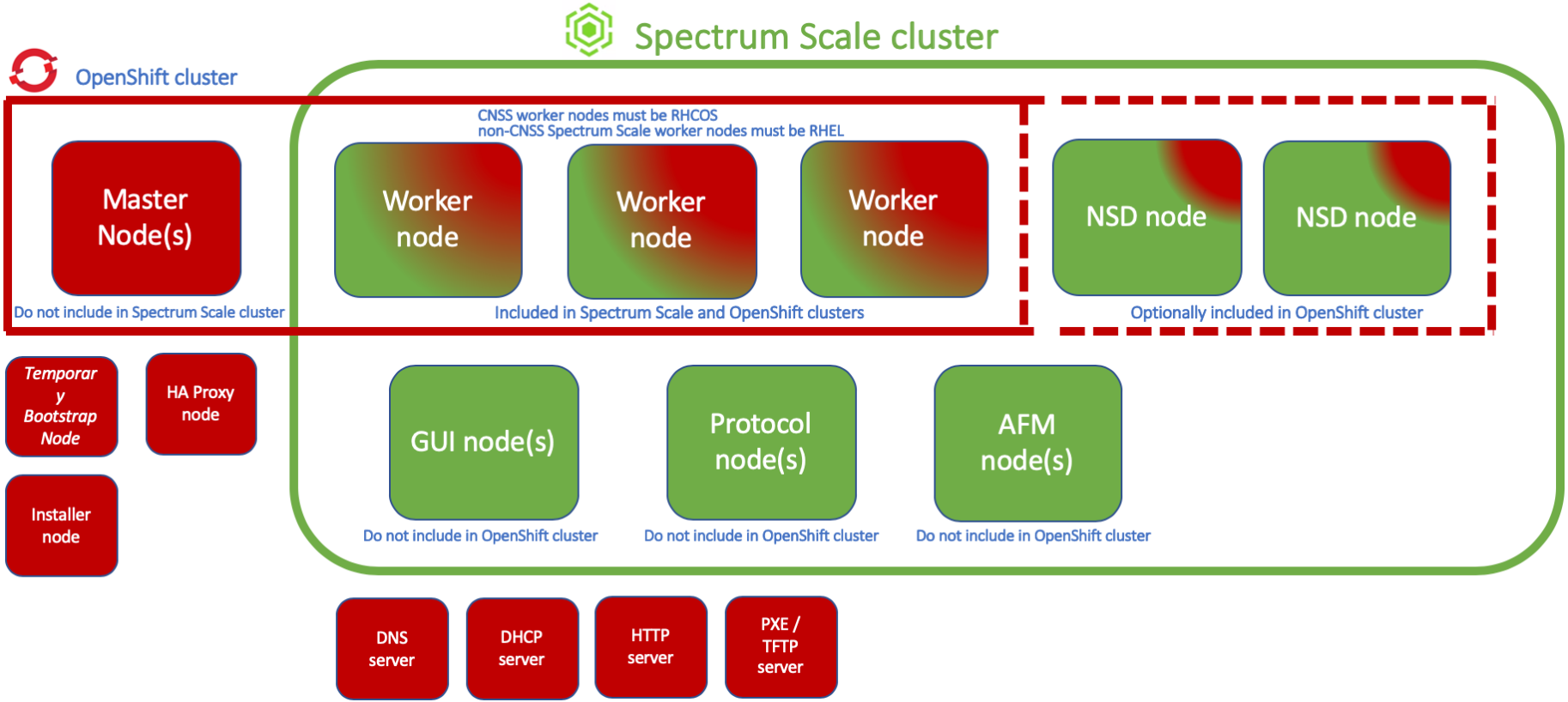
Spectrum Scale CSI Driver Use Case: Multi-protocol Access



Spectrum Scale On OpenShift

IBM Spectrum Scale

OpenShift - High Level Cluster Configuration

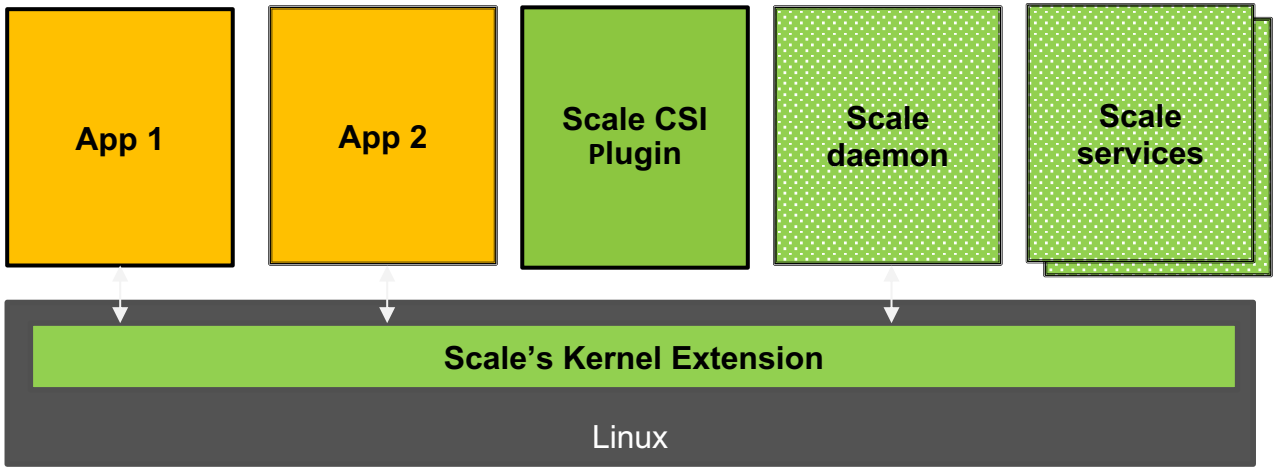


Containerized Spectrum Scale

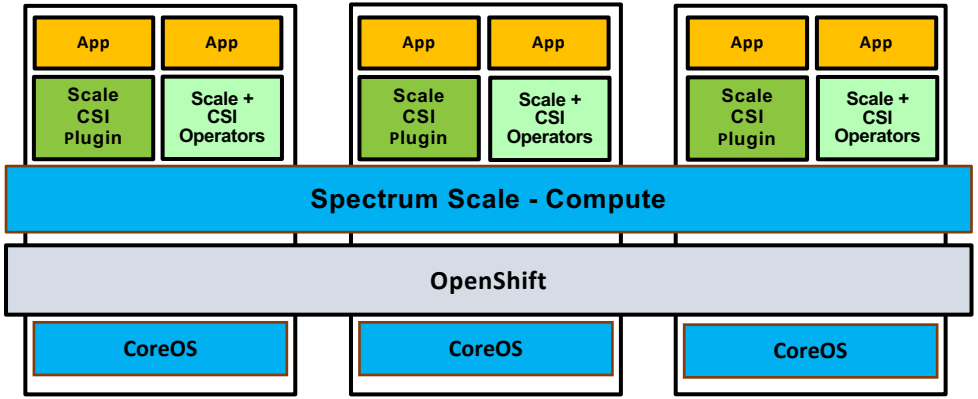
The core of containerized Scale is a daemonset of containers that run on every worker node, load the kernel extension and start the filesystem daemon. This set of containers needs special privileges to load kernel modules, mount file systems, access block devices and access the host network.

Other Scale services like ReST API, GUI, performance data collection, etc. run in separate containers.

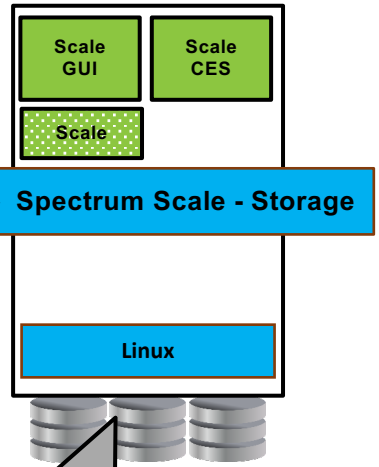
Deployment and operation is implemented via operators.



Cloud-Native IBM Spectrum Scale (CNSS)



Cross Cluster Mount



Cloud Native Spectrum Scale

Scale Containers running in Openshift
Kernel module for CoreOS

Needs „Classic Spectrum Scale“ to provide Storage

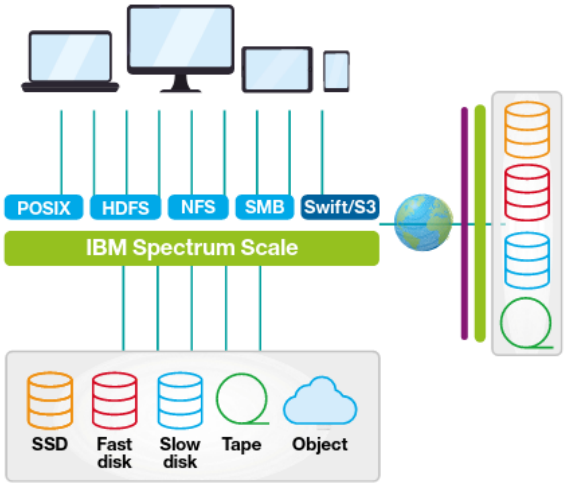
„Classic“ Spectrum Scale

Provides Storage to Cloud Native Spectrum Scale

CNSS Beta1 started on 30th July 2020

Summary and call to action

- Spectrum Scale is a perfect match for Kubernetes and OpenShift container environments featuring
  - Virtually unlimited throughput
  - Exabyte scalability
  - Single namespace eliminating data silos
  - Multicloud readiness
- Talk to your IBM sales contact for an RPQ or write to scale@us.ibm.com

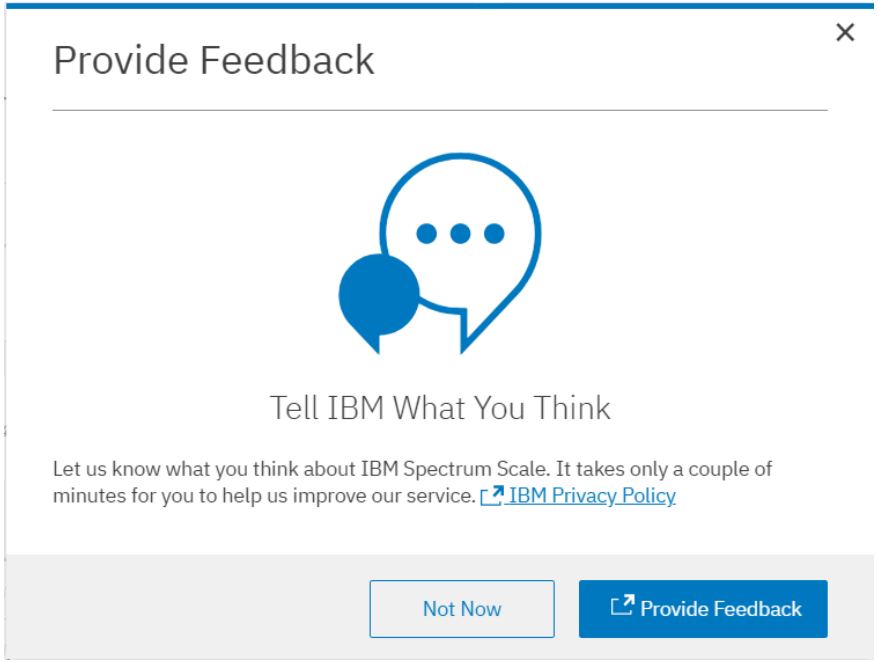


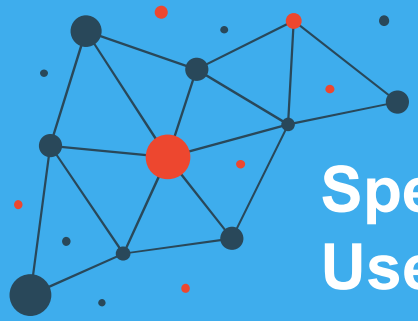
Thank you!

IBM Spectrum Scale

Please help us to improve Spectrum Scale with your feedback

- If you get a survey in email or a popup from the GUI, please respond
- We read every single reply





Spectrum Scale User Group

The Spectrum Scale (GPFS) User Group is free to join and open to all using, interested in using or integrating IBM Spectrum Scale.

The format of the group is as a web community with events held during the year, hosted by our members or by IBM.

See our web page for upcoming events and presentations of past events. Join our conversation via mail and Slack.

www.spectrumscaleug.org