Spectrum Scale on IBM Cloud

Spectrum Scale User Group Meeting 2022
NYC – September 20th, 2022

Piyush Chaudhary (IBM)
HPC & Spectrum Scale Architect – IBM Cloud

IBM Cloud HPC Offerings

- IBM Cloud Catalog BYOL tile offerings with automated provisioning of HPC clusters using

  - **Workload schedulers:** IBM Spectrum Symphony (financial workloads) & IBM Spectrum LSF (non-financial workloads), SLURM (open-source scheduler)

  - **High performance storage**: IBM Spectrum Scale

- Automated deployment, elastic scaling, tools for data management and single vendor for support

- Hybrid cloud connectivity and secure configurations

- Based on IBM Research benchmarks and current capabilities targeting four workload types

Symphony + Spectrum Scale
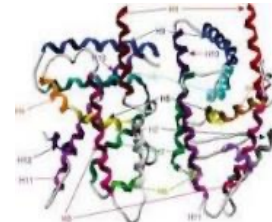
LSF + Spectrum Scale

Financial Services Sector (FSS)

- Risk Analytics
- Regulatory compliance
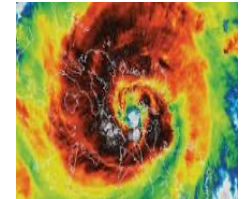- Monte Carlo
- FSS Asset Pricing

Electronic Design Automation (EDA)

- Optical Proximity Correction (OCP)
- Design Rule Checking (DRC)
- Simulations (like timing analysis)

Life Sciences

- Genomic sequencing
- Drug discovery
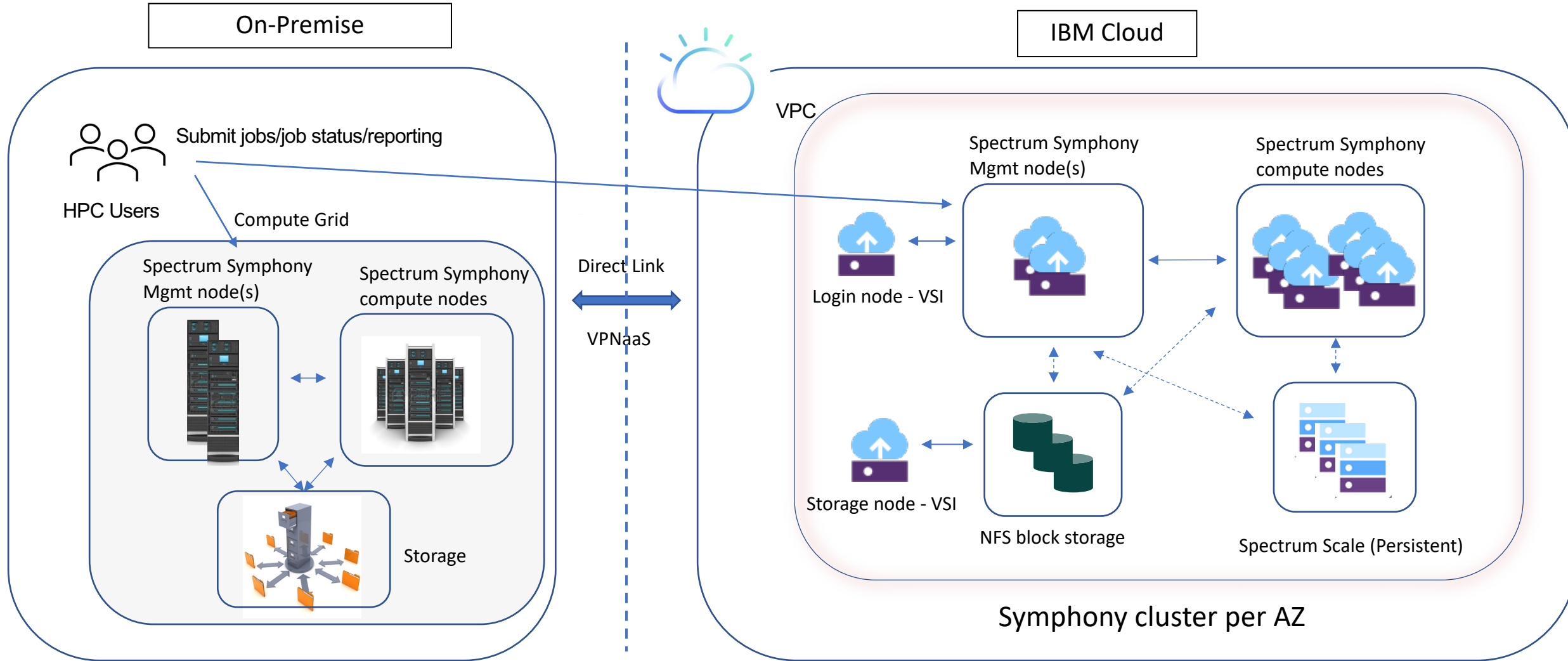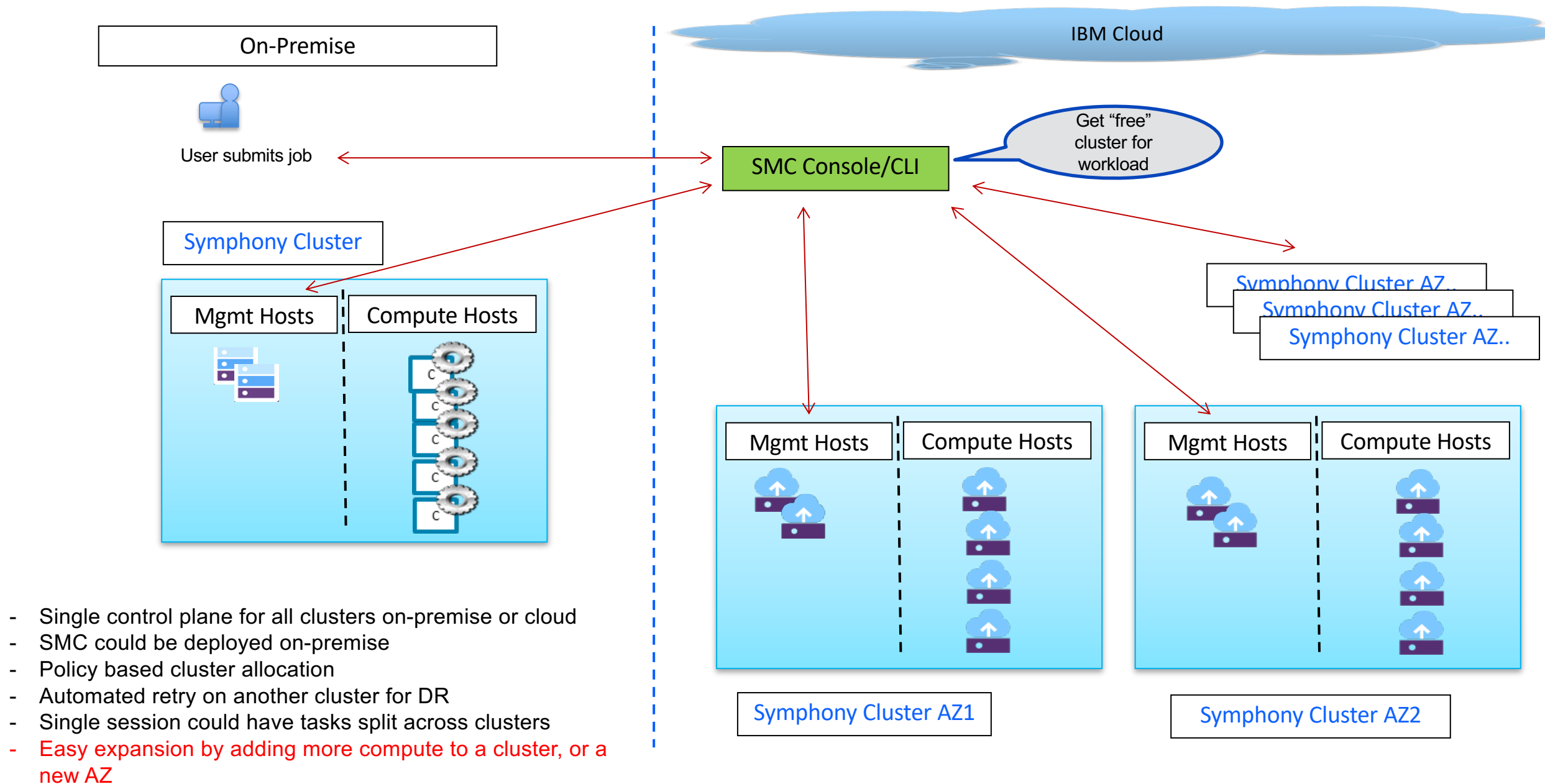- Molecular modeling
- Protein docking

Weather

- Climate modeling
- Forecasting and Severe storm prediction
- Ocean Modeling

Reference Architecture

- Hybrid cloud with Direct Link/VPNaaS OR standalone in cloud
- Independent Spectrum Symphony cluster per AZ, leveraging IBM Cloud VPC infrastructure
- Spectrum Scale for data intensive workloads
- BYOL for Spectrum Symphony and Spectrum Scale

IBM Spectrum Symphony Multi-Cluster (SMC)

On-Premise

User submits job

IBM Cloud

SMC Console/CLI

Get "free" cluster for workload

Symphony Cluster

Mgmt Hosts   Compute Hosts

C
C
C
C
C

Symphony Cluster AZ..
Symphony Cluster AZ..
Symphony Cluster AZ..

Mgmt Hosts   Compute Hosts

Mgmt Hosts   Compute Hosts

- Single control plane for all clusters on-premise or cloud
- SMC could be deployed on-premise
- Policy based cluster allocation
- Automated retry on another cluster for DR
- Single session could have tasks split across clusters
- Easy expansion by adding more compute to a cluster, or a new AZ

Symphony Cluster AZ1

Symphony Cluster AZ2
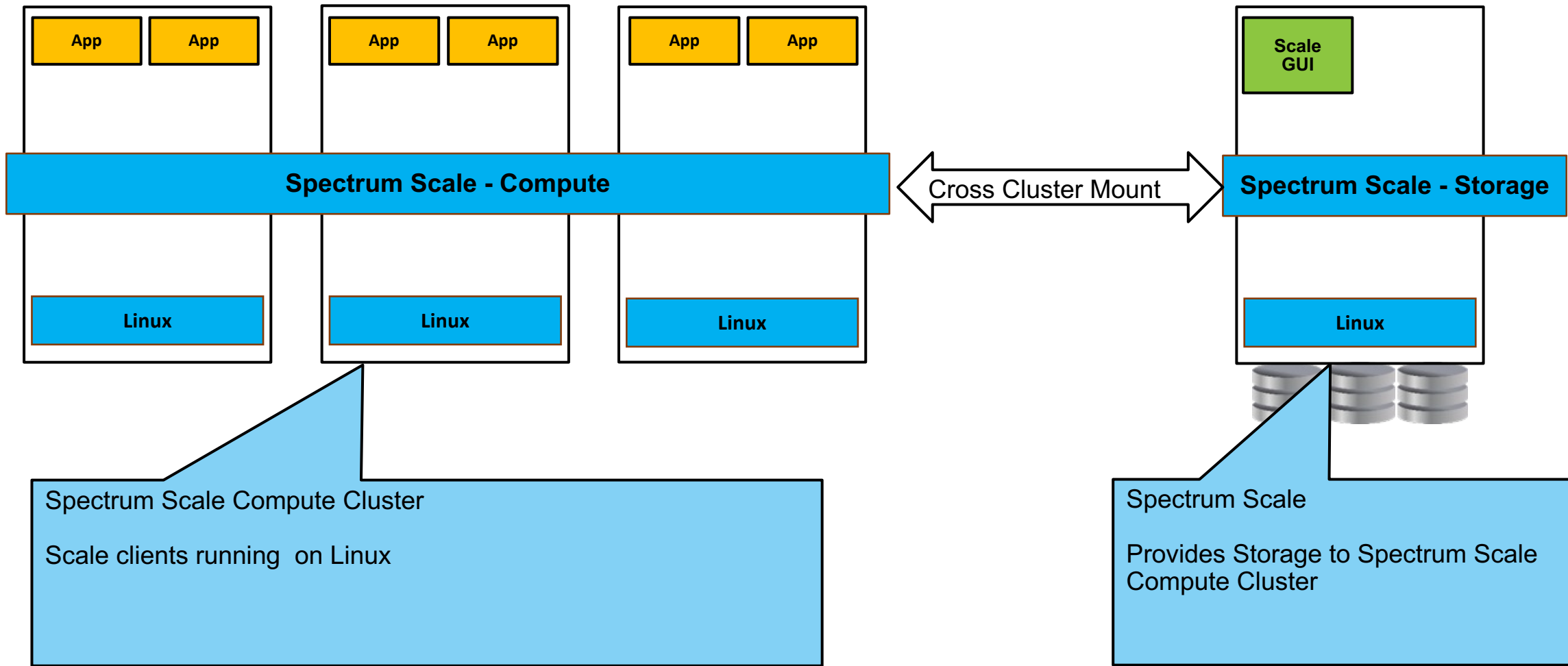
Recent Success Story

- HPC-as-a-service using managed service wrapper from IBM Consulting, multi year contract
- IBM Spectrum Symphony & IBM Spectrum Scale
- Start with two applications, adding a third soon
- Starting with 10K vCPU, ramp up to 200K vCPU
- Distributed across 3 Regions in North America, each with 2 AZ's

Key Factors for Win
- Deep HPC Expertise, only IBM knows Symphony & Scale solutions
- ONE IBM value for customer, deep collaboration across business units, solutioned all issues effectively
- Customer can focus on critical business application development
- PoC success with first application, lead to second and now third application wins!

Spectrum Scale in IBM Cloud - Architecture

IBM Spectrum Scale

App App   App App   App App

Scale GUI

Spectrum Scale - Compute   Cross Cluster Mount   **Spectrum Scale - Storage**

Linux   Linux   Linux   Linux

Spectrum Scale Compute Cluster

Scale clients running on Linux

Spectrum Scale

Provides Storage to Spectrum Scale Compute Cluster

Spectrum Scale Tile in IBM Catalog

Catalog /

IBM Spectrum Scale

IBM Spectrum Scale is a high-performance, highly available, clustered file system and associated management software.

Create | About

Type
Terraform

Provider
IBM

Updated on
06/27/2022

Category
Storage

Related links
Docs
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Readme

Content source URL ⓘ

https://cm.global...

Select your deployment target

> IBM Cloud Schematics ✓
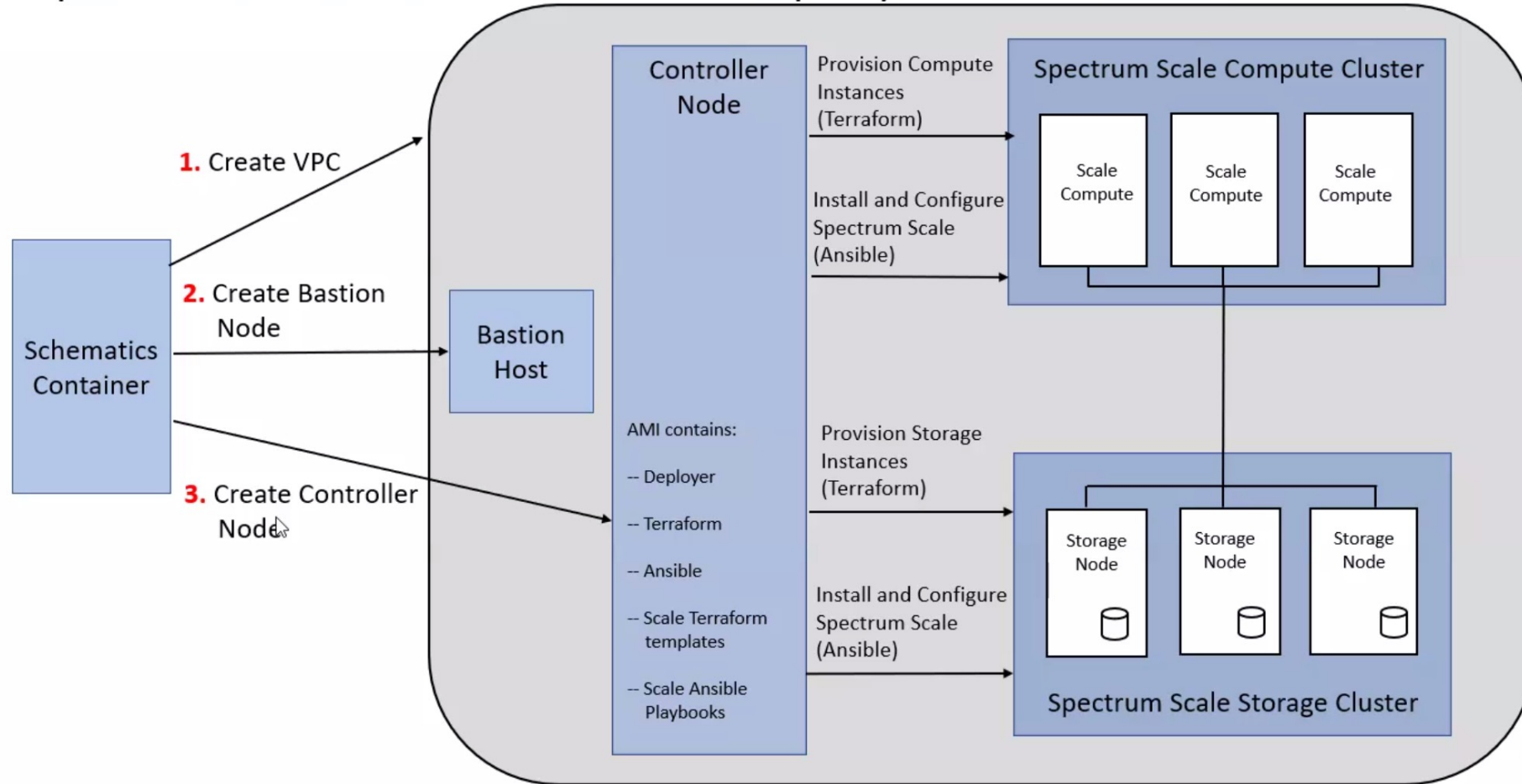
Select a delivery method
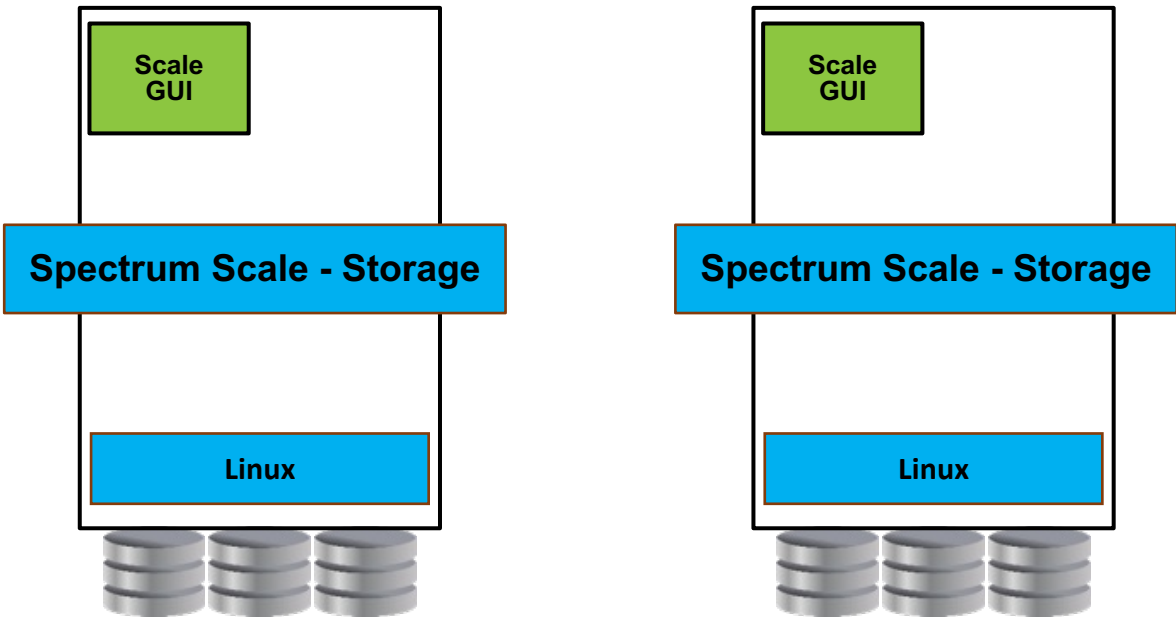
> Terraform ✓

Select product version

1.0.0

IBM **Offering Management**

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Spectrum Scale on IBM Cloud - Deployment

Spectrum Scale Controller Deployment Model

IBM **Offering Management**

Spectrum Scale – Storage Cluster

Scratch

VSIs with Instance Storage

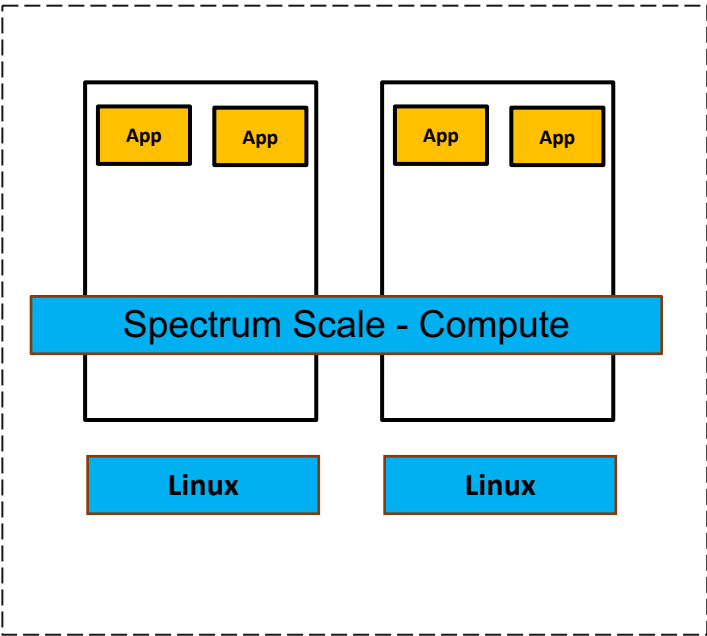**Persistent**

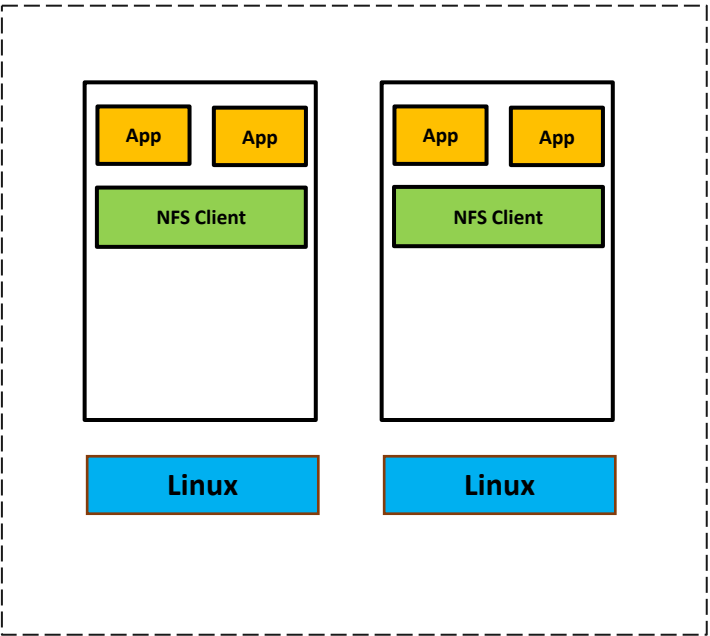Bare Metal Nodes with NVMe Drives

Additional Capabilities (Future)

- Erasure Code Edition (ECE)
- Cross AZ replication
- Async replication to S3
- Protocol integration
- AFM connection to on-prem
- Backup/Restore
- Archive

IBM Offering Management

Spectrum Scale – Compute Cluster

Native Spectrum Scale Access

High Performance NFS Access

Container Native Access

IBM **Offering Management**

Spectrum Scale – Roadmap
(Subject to Change)

Feature Enhancements

- Erasure Code Edition (ECE)

- Cross AZ replication

- Async replication to S3

- Protocol integration

- AFM connection to on-prem
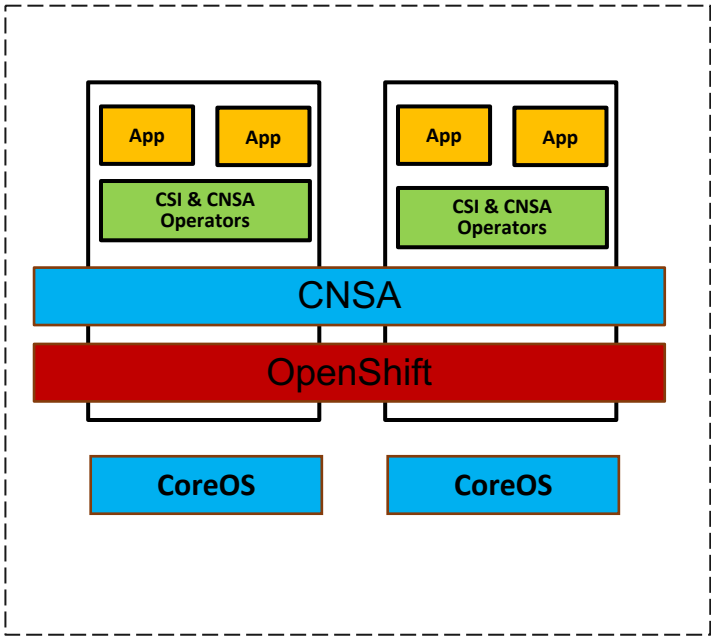
- Backup/Restore

- Archive

Use Cases

- FSS

- Life Sciences / Healthcare

- Electronic Design Automation (EDA)

- Weather / Climate

- Automotive

- Analytics & AI

- Industrial Manufacturing

IBM Offering Management

Thank you for using
IBM Spectrum Scale on IBM Cloud!