Spectrum Scale Deployment and Cloud DevOps

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IBM

Deployment Foundation

Spectrum Scale Automated Deployment Today

SDI / ECE / SNC

Scale Install Toolkit
- Core Install & deploy
- Protocol Install & deploy
- Upgrade Core & Protocols
- ECE/FAL/Call home/Perf. Mon.

Implementation:
Python, Ruby Chef DSL

Cross cluster Orchestration
Chef

ESS

Scale install Scripts

Scale Install Toolkit - Protocol install

Hardware setup scripts

Implementation:
Python, Shell scripts

Cross cluster Orchestration
XCAT

Cloud

Scale Install Scripts

Scale Install Toolkit - Upgrade

Cloud Provisioning scripts

Implementation:
Shell Scripts

Cross cluster Orchestration
Amazon Cloud Formation

- **Today there are multiple different implementations for the automated installation of Spectrum Scale**
  - A result of differing use cases and needs
  - Non availability of a unified mechanism
  - Implementations rely on wrapping mm commands and build business logic around install and configuration
- **Scale Install automation is not reusable**
- **Leads to inefficiencies and duplication of effort**
  - When new Spectrum Scale functionality is added, all areas will have to duplicate implementation
  - Fixes in one implementation do not carry over to other areas
  - Implementations are non standard and therefore exhibit different behavior across different implementations. LBS teams have to be aware of implementation specifics.
- **No easy way for customer to integrate and reuse Scale install and configuration automation**
  - No Programmatic Interfaces (API) for easy integration into customer deployment tools

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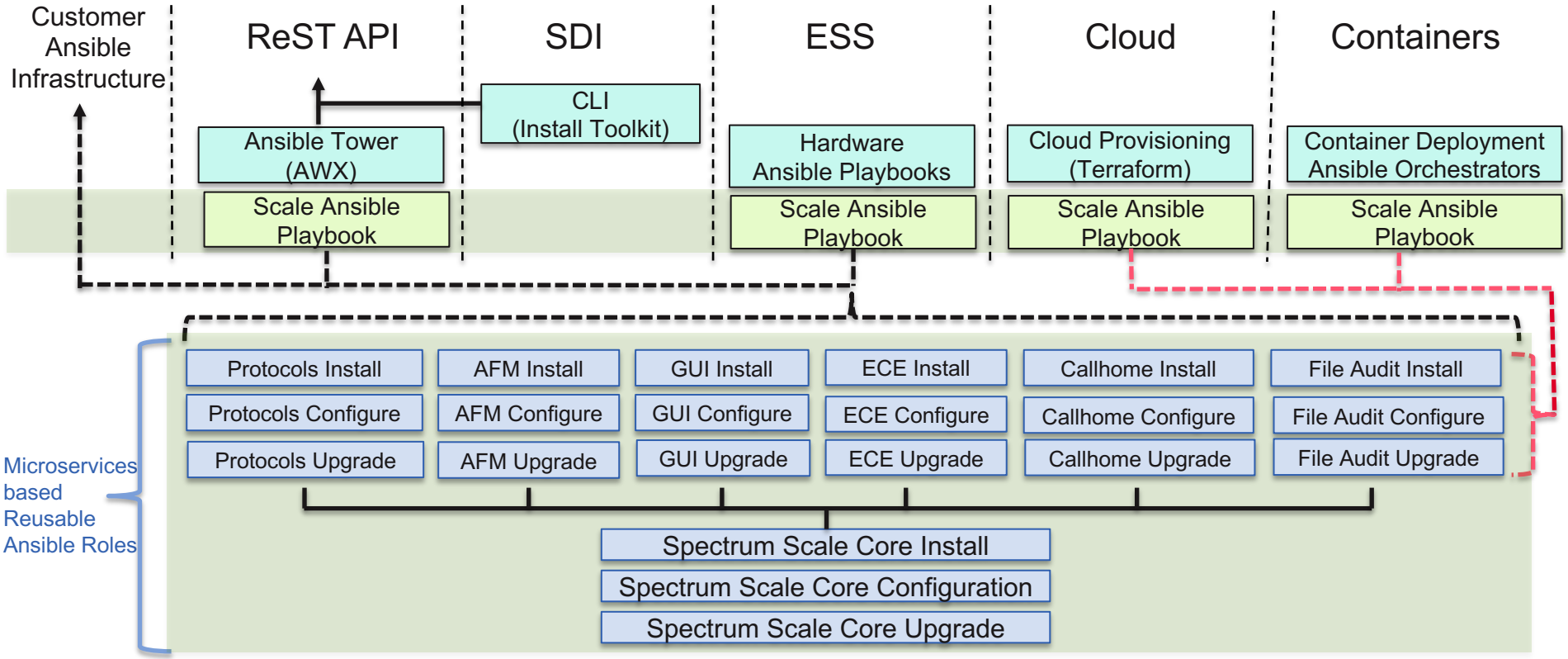
Spectrum Scale Deployment: Strategy

1 Microservices based reusable Ansible infrastructure

(Provides installation, configuration and upgrade capabilities for all Spectrum Scale form factors)



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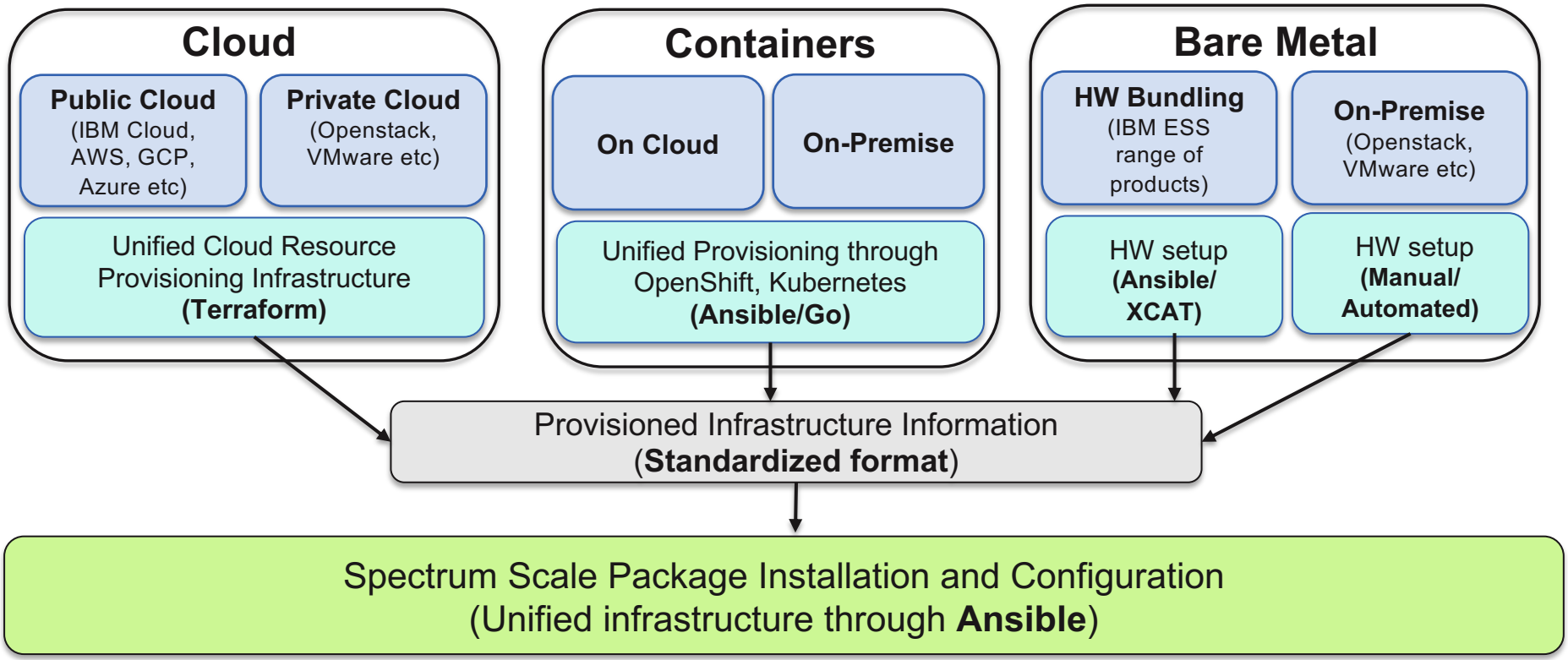
Spectrum Scale Deployment: Strategy

2 Infrastructure specific resource provisioning
Unified Installation and Configuration through reusable Ansible playbooks



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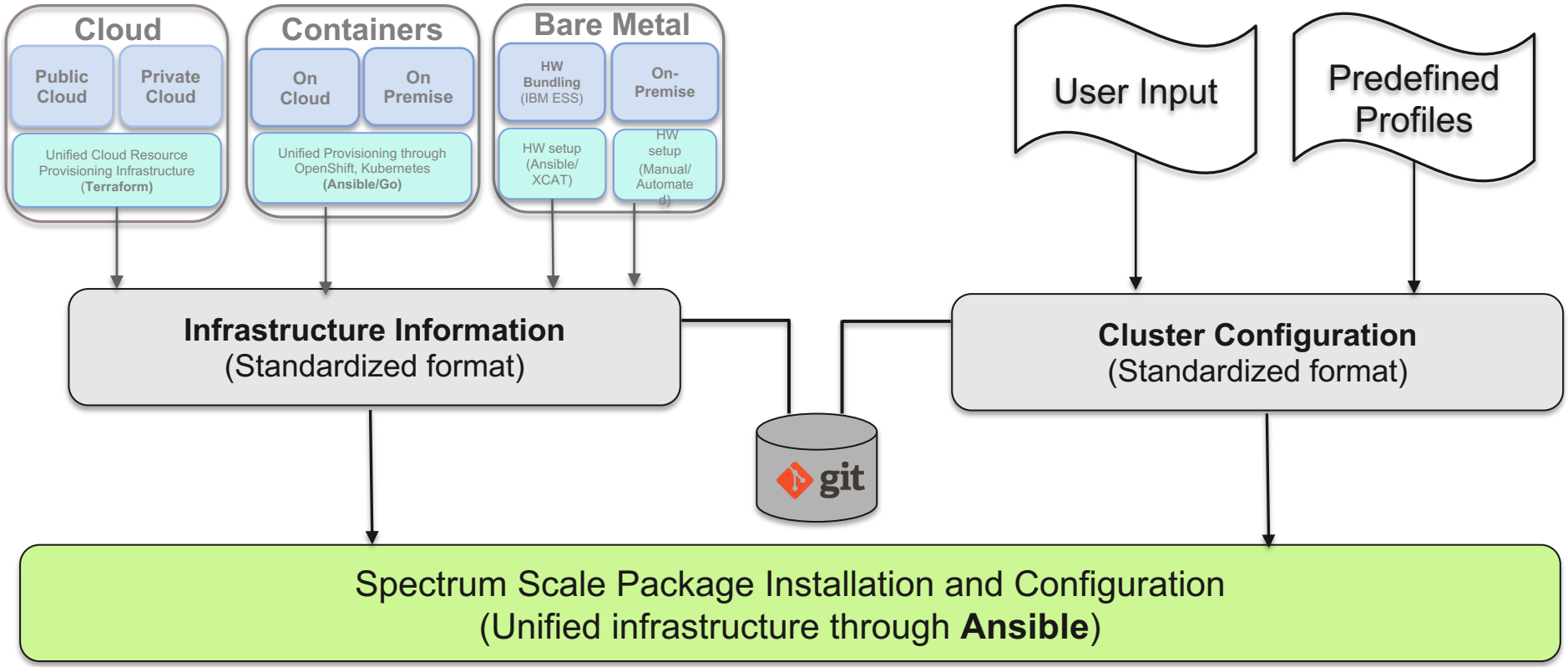
Spectrum Scale Deployment: Strategy

3 Cluster and Resource configuration that can be stored, versioned and replayed



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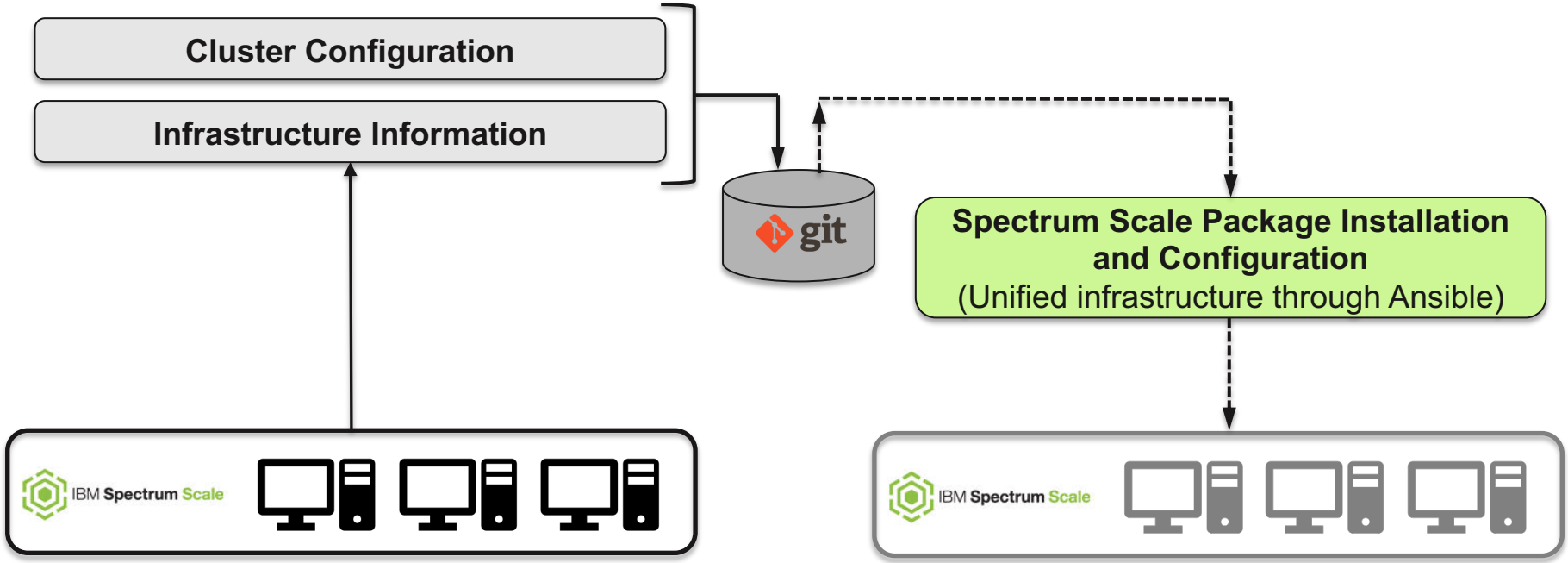
Spectrum Scale Deployment: Strategy

4 Stored Cluster and Infrastructure configuration can be used to replicate validated and tested configurations from existing clusters to new ones



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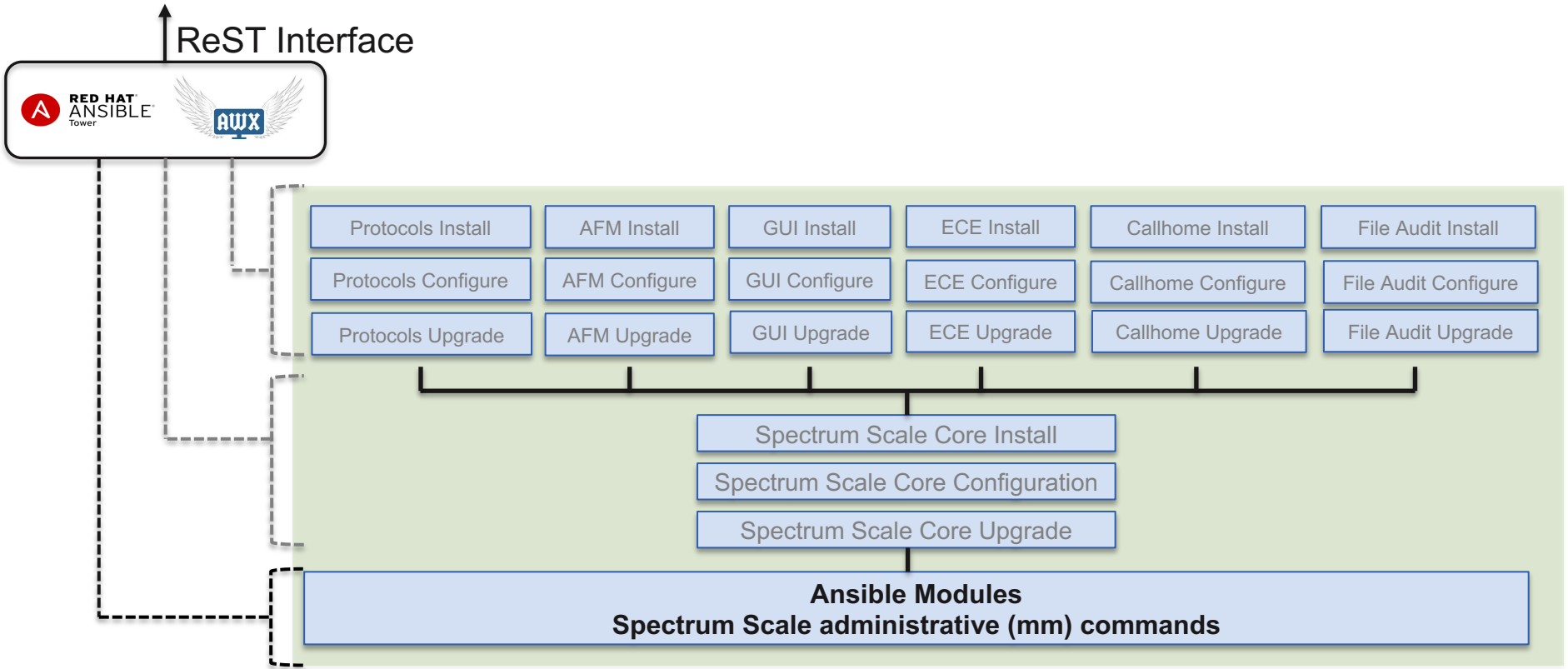
Spectrum Scale Deployment: Strategy

5 ReST based Programmatic API access to Spectrum Scale administrative commands and installation, configuration and upgrade playbooks



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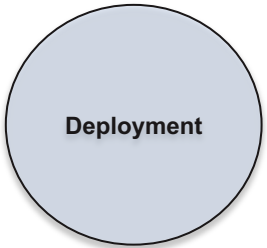
Cloud DevOps

Spectrum Scale Cloud: Deployment Today



User Interface	Accept User Input to deploy Scale Cluster [AWS CloudFormation]
Resource Provisioning and Initialization	Provision AZ, VPC, Bastion Host, Instances, Storage [AWS Cloud Formation]
Spectrum Scale Cluster Creation and Configuration	Cluster Creation & Config, Feature enablement, Filesystem creation [Custom Scripts]
Cluster Expansion (and Contraction)	Provision Instance, Storage [AWS API] Add Instance to Cluster [Custom Scripts]
Upgrade	Upgrade [Custom Script and Install Toolkit]

- **Scale cloud deployment automation is tightly coupled to Amazon Web Services (AWS) Tooling and Technology**
  - No ability to reuse this automation for other clouds (IBM Cloud, Google Cloud Platform, Azure etc)
  - Requires a complete rewrite of existing automation to enable Spectrum Scale on new Cloud environments
- **Spectrum Scale deployment on AWS relies on pre-created VM images (AMI)**
  - Prevents customers from creating custom AMIs with their applications pre-installed and configured
  - Customers want to pre-create their own AMIs that adheres to their individual security policies
  - AWS Marketplace AMIs are not available with AWS private, Government, Secure Clouds
  - Limited flexibility in choosing instance types
  - No way to mix and match different AMIs in the same cluster (prevents rolling upgrade through replacement of instances with different versions of AMIs)
  - Prevents customers from using deployment automation

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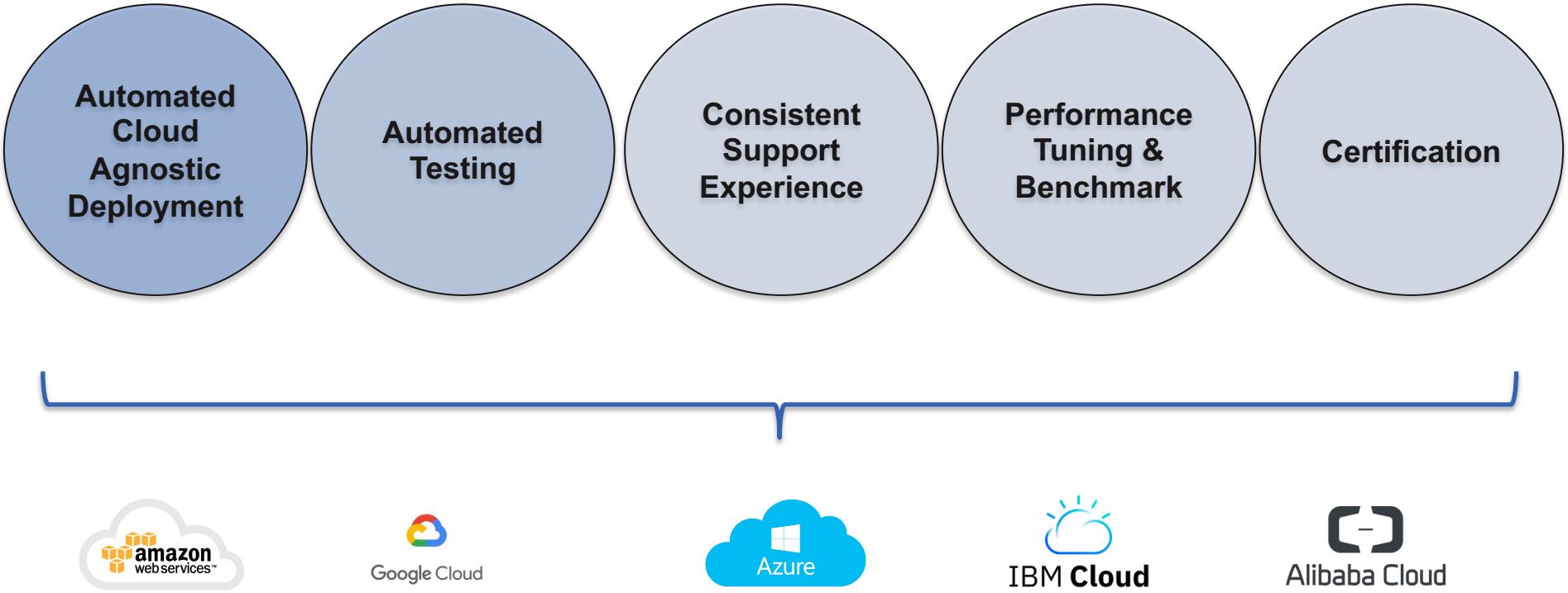
Spectrum Scale Cloud: Cloud DevOps



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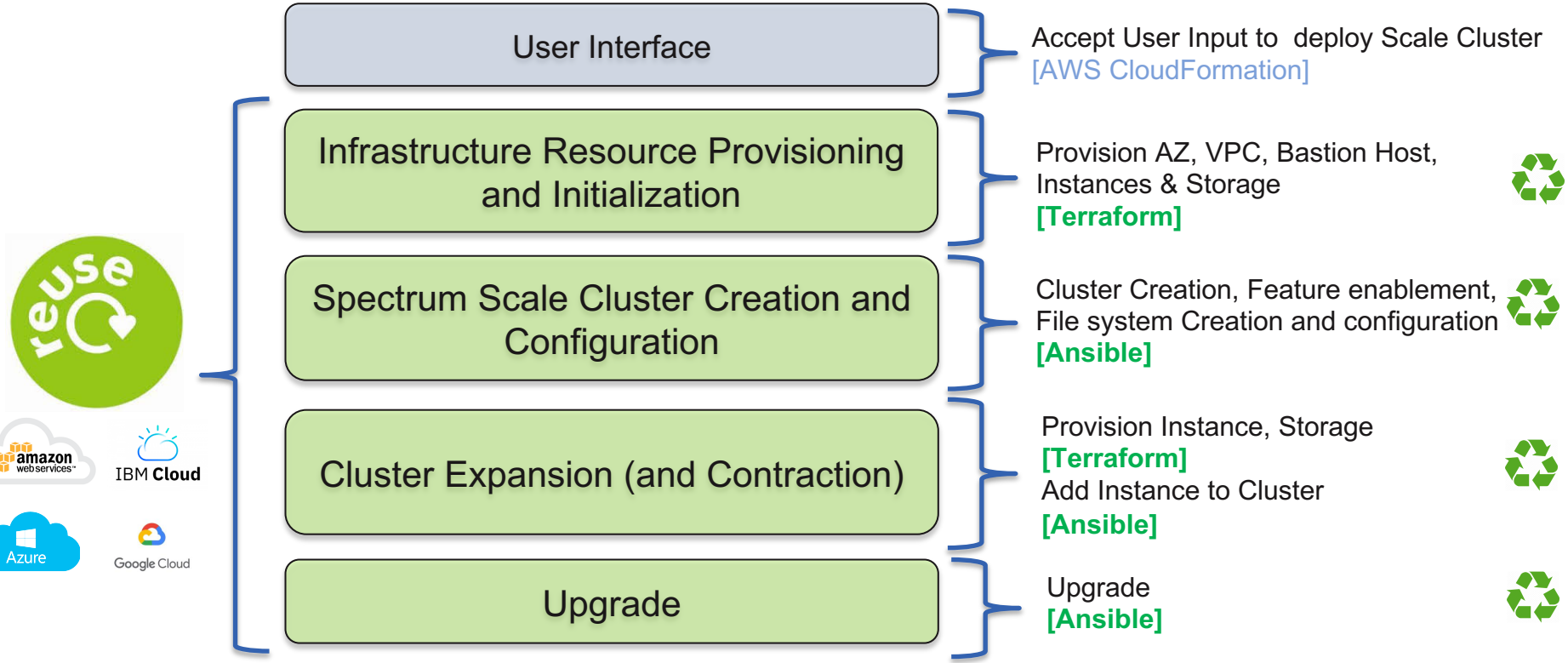
Spectrum Scale Cloud: Cloud DevOps Deployment

1 Cloud Agnostic, infrastructure provisioning through Terraform
Cloud Agnostic, Spectrum Scale installation and configuration through Ansible



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Spectrum Scale Cloud: Cloud DevOps Deployment

2 Containerized installation and deployment of Spectrum Scale on any Cloud

IBM Cloud

amazon web services

Azure

Google Cloud

Spectrum Scale Install Container

Spectrum Scale Install Containers has:

- Spectrum Scale Packages
- Terraform templates for resource provisioning
- Ansible playbooks for Spectrum Scale installation and configuration

1. Cloud specific container infrastructure used to start up and run Spectrum Scale Install Container

2. Install Container uses Terraform templates to provision all required infrastructure on the Cloud (Network, VMs, Storage Volumes etc)

3. Install Container runs Ansible playbooks to Install Spectrum Scale and configure

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Spectrum Scale Cloud: Cloud Foundation Deployment

- Multi cloud deployment
  - Consistent deployment architecture across clouds
  - Reuseable deployment assets that facilitate faster enablement on new cloud environments
    - Cloud agnostic tooling
  - Consistent User interface and experience across clouds
  - Consistent support experience across clouds
  - Faster time to deliver Spectrum Scale automation on new cloud environments
- Allows customers flexibility to create their own custom VM images
  - Customers can pre-create VM images with their workloads and security policies
  - Customers can use the Spectrum Scale cloud deployment automation in Private/Secure Cloud environments (without access to Marketplace)
- Microservices based deployment of Spectrum Scale “advanced” services
  - Automated “on demand” deployment of advanced Scale Services
- Hybrid Cloud enablement
  - Support for remote orchestration of Cloud resource provisioning and Scale deployment
  - Automated deployment of AFM across On-prem and Cloud
  - Enhance Blueprints for easier “on-prem” and cloud connectivity (VPN etc)

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Spectrum Scale Cloud: Cloud Foundation Deployment

- Out of the box automation
  - Rapid automated initial deployment
  - Automated expansion and contraction of cluster
  - Fully automated teardown
  - Support for data archival and retrieval from cheaper Cloud storage
  - Rerun failed deployments
- Governance
- Unification of on-prem and cloud deployment tools
  - Adoption of same deployment infrastructure across all deployments of Spectrum Scale (install toolkit)
- Development efficiency
  - Automated Cloud image creation and verification

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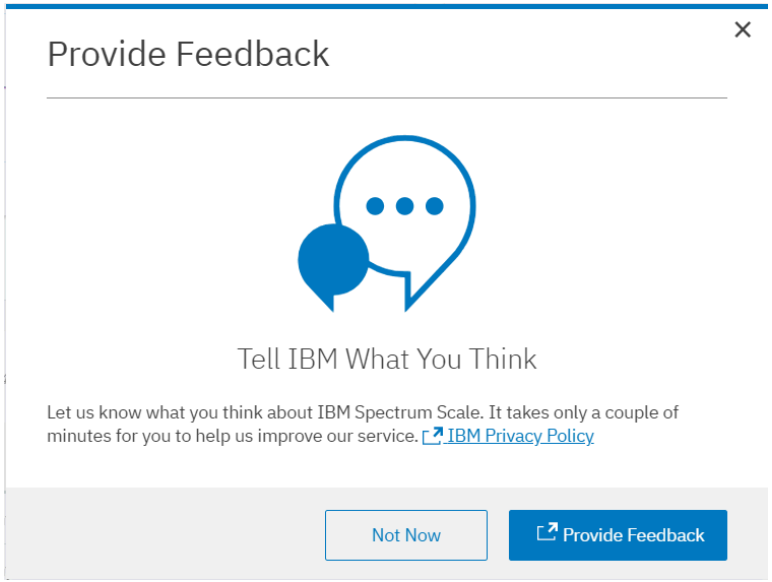
Thank You



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

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Thank you

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