INFINIDAT

The Standard in Enterprise Storage

Powerful, Cyber Secure, Easy, and Efficient Storage for Kubernetes and OpenShift Environments

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Senior Product Manager

March 2024

InfiniBox

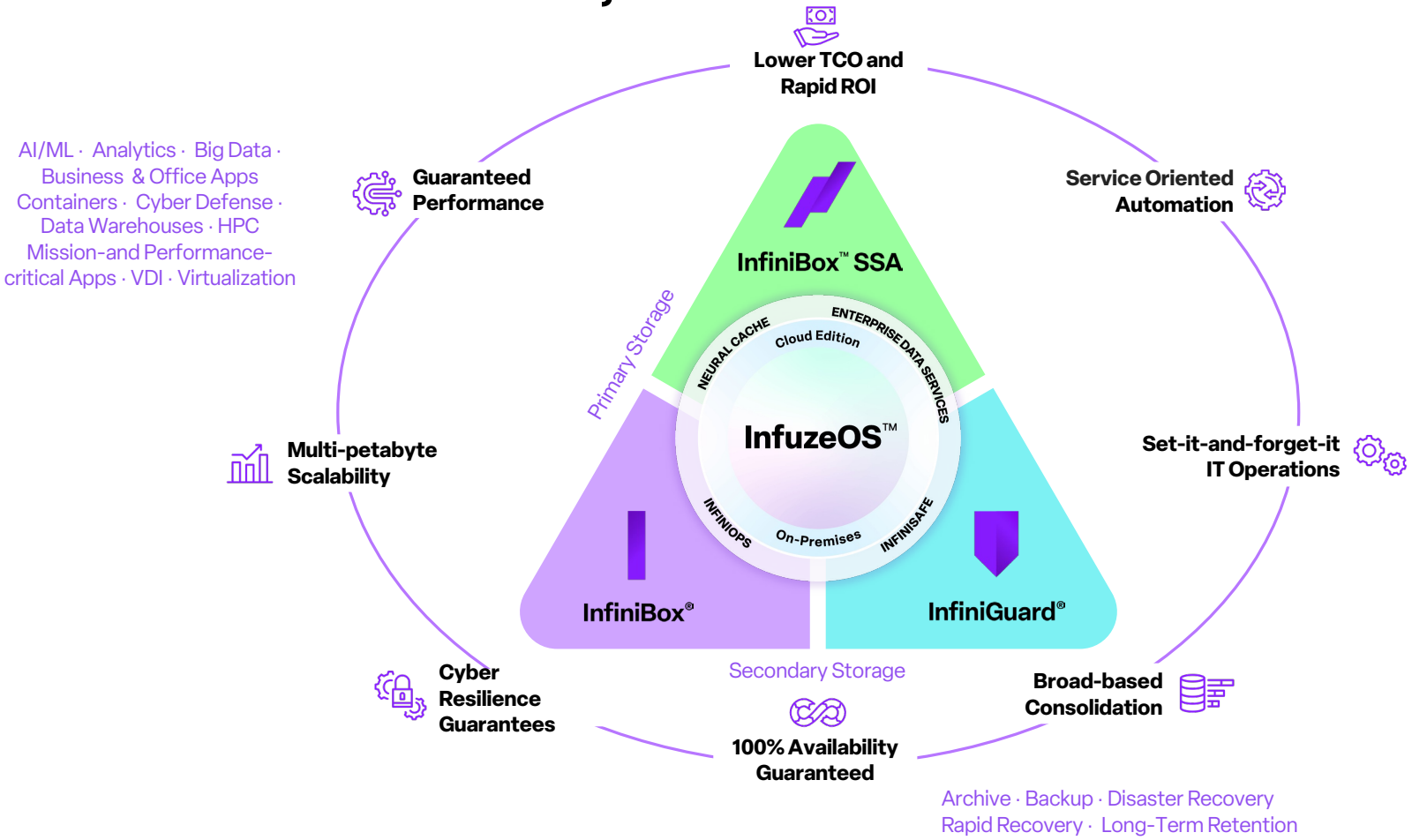
11mo
Payback in 11 months

48%
Reduced overall OPEX

3x
Less Power Consumption

51%
Reduction in storage management

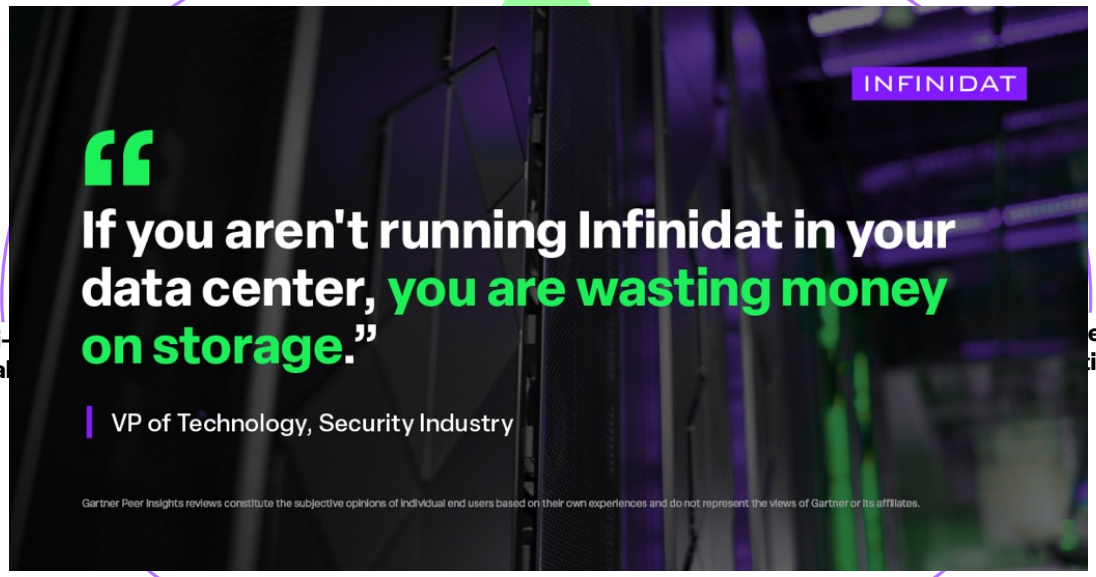
One SDS Architecture, All Platforms



One SDS Architecture, All Platforms

Lower TCO and Rapid ROI

AI/ML · Analytics · Big Data · Business & Office Apps Containers · Cyber Defense · Data Warehouses · HPC Mission-and Performance-critical Apps · VDI · Virtualization



Multi-
Scala

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ions

Cyber Resilience Guarantees

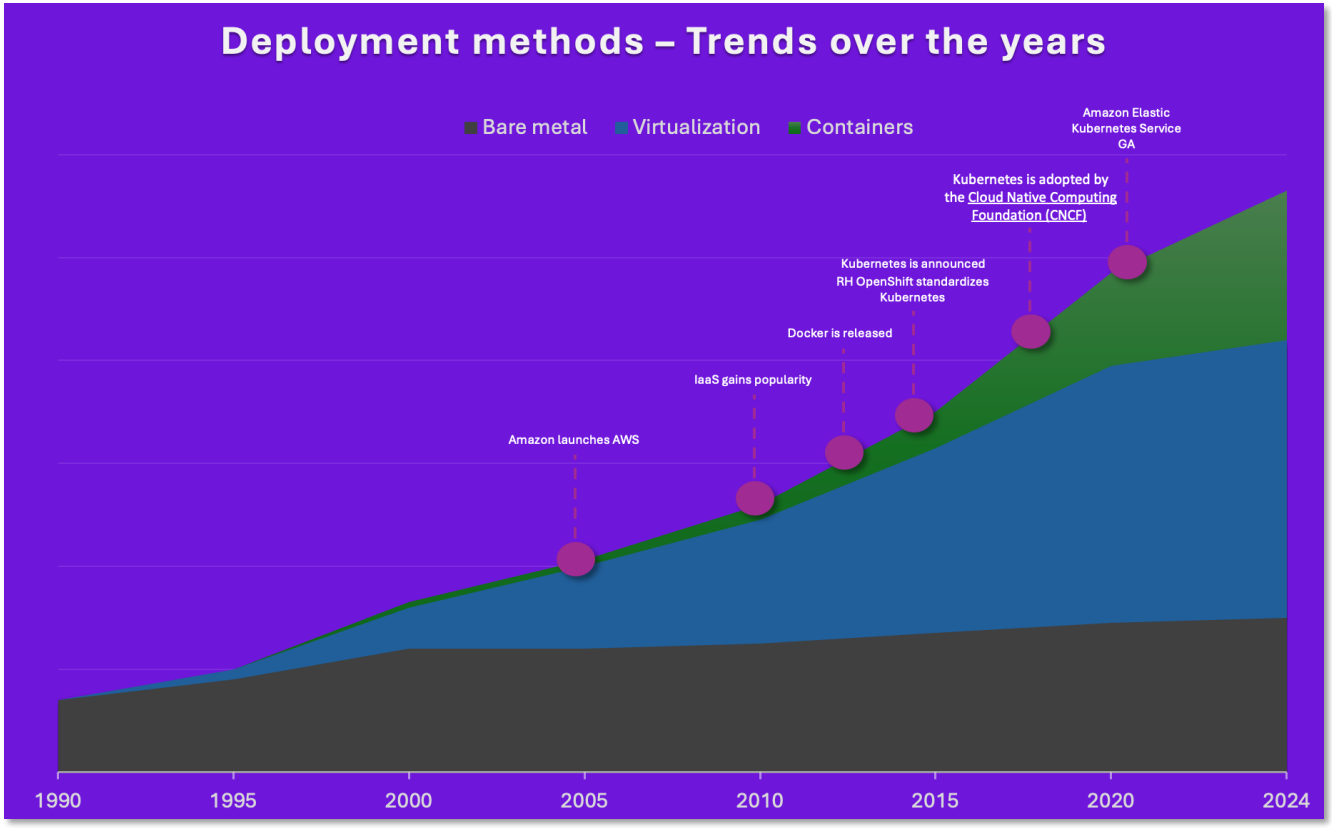
Secondary Storage

Broad-based Consolidation

100% Availability Guaranteed

Archive · Backup · Disaster Recovery
Rapid Recovery · Long-Term Retention

Deployment Methods - Trends

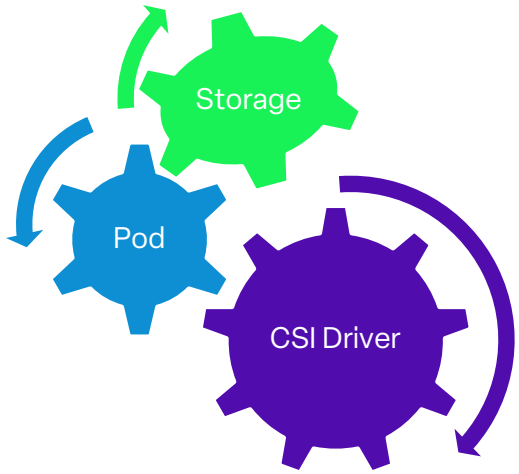


Containers - Evolution

- **Container Introduction** - Docker, simplified container management
- **DevOps Emergence** - Automation, continuous integration and delivery
- **Orchestration Tools** – Kubernetes; automate large-scale container management
- **Simplification of Infrastructure Management** – OpenShift: Orchestration abstracts away infrastructure complexities
- **Transition to Private Cloud Environments**: The scalability, flexibility and efficiency of a public cloud services, on premises.

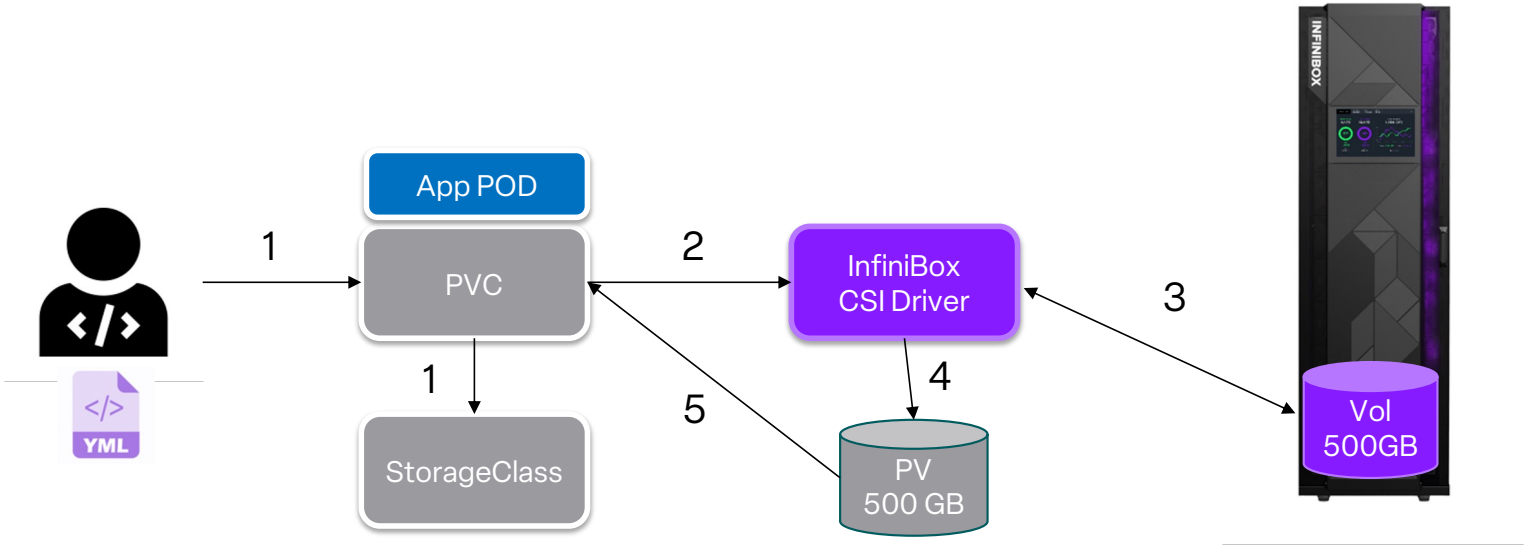
In what way does persistent storage integrate with OpenShift?

- OpenShift is the de-facto standard for a simplified container orchestration
- Heavy demand to run Stateful Applications
- Advanced Storage and Data protection capabilities
- CSI (Container Storage Interface) is a standard for exposing arbitrary block and file storage systems to containerized workloads on Kubernetes
- CSI increased the autonomy and flexibility of developers



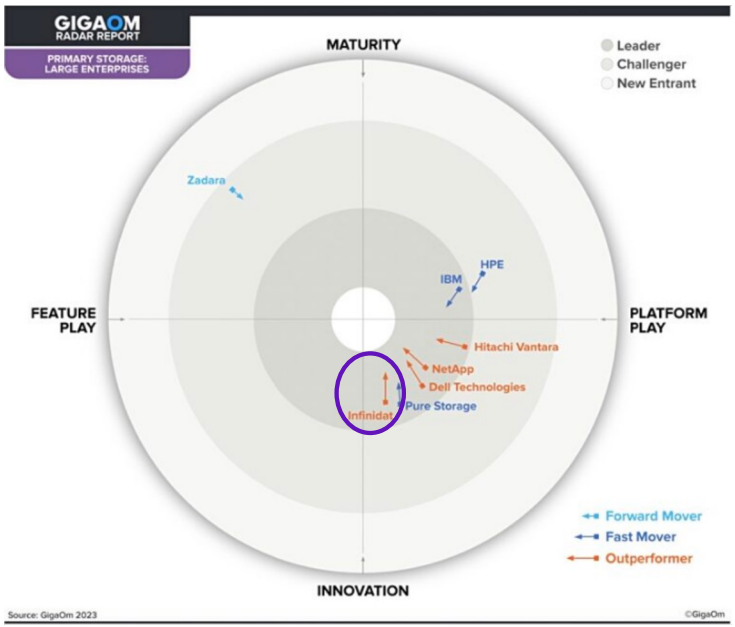
PV Creation Flow

1. An application creates a PVC (Persistent Volume Claim) and specifies a StorageClass
2. The CSI driver is notified of this request
3. It then provisions a volume on InfiniBox
4. The CSI driver creates a PV (Persistent Volume) resource
5. Finally, Kubernetes binds the PV with the PVC



InfiniBox Container Storage Interface (CSI) Driver

- Features
  - Multiple InfiniBox systems
  - Dynamic provisioning
  - Raw block
  - Cloning
  - Resize
  - Immutable snapshots
  - Restore
  - Import
- Protocols
  - FC / iSCSI / NFS / NFS-TreeQ
- Deployment Methods
  - Helm for upstream K8s
  - Operator for OpenShift

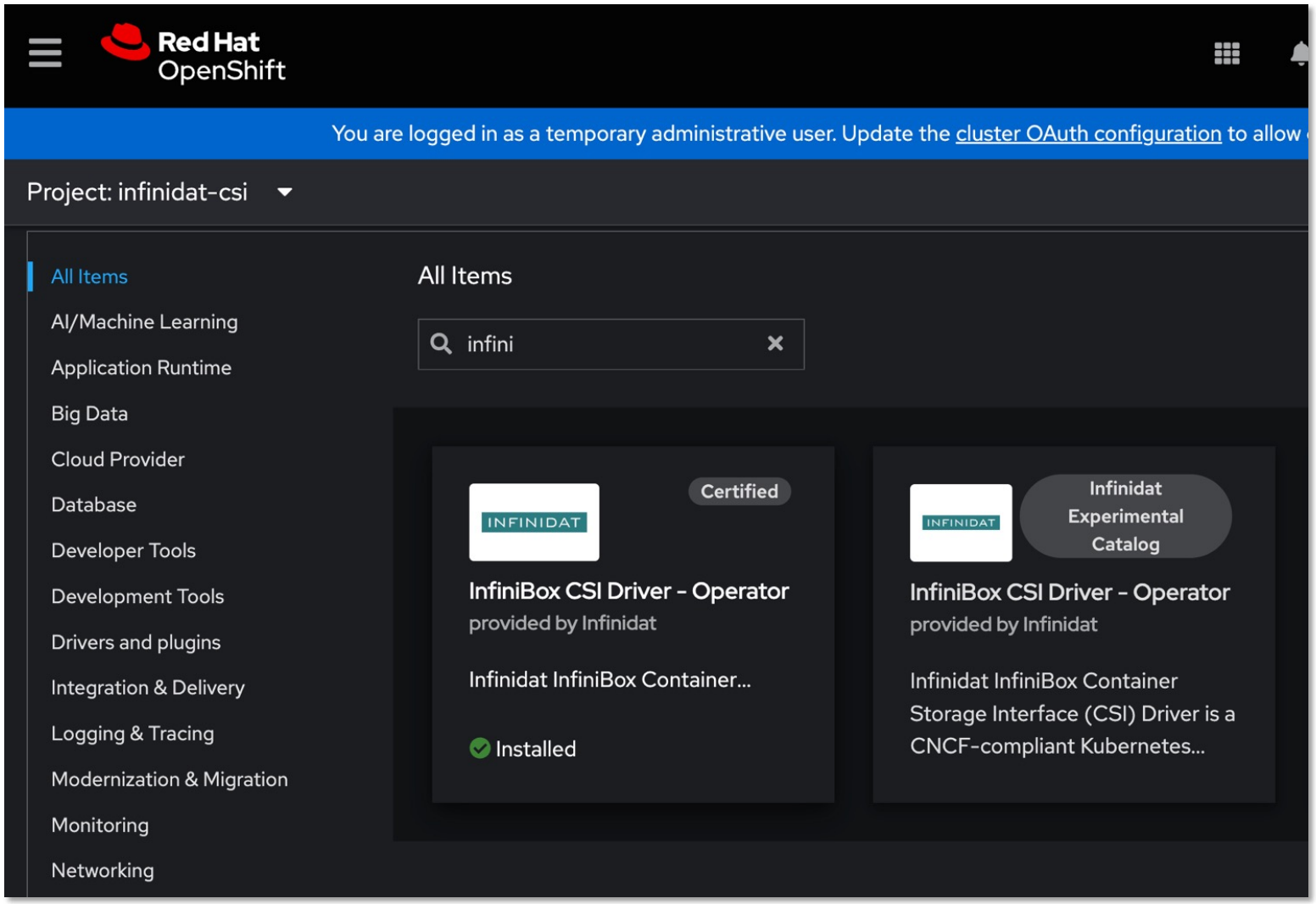


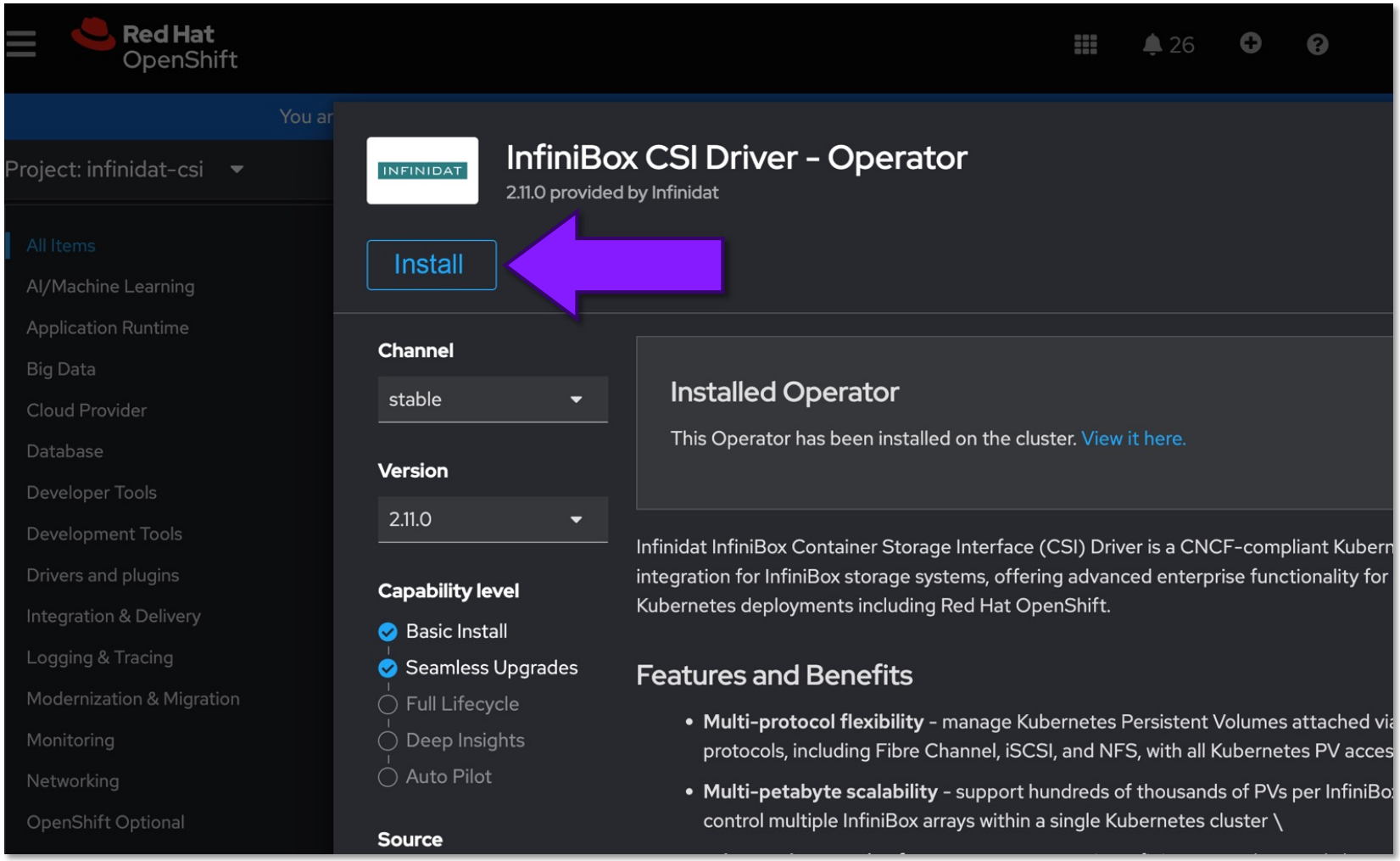
"Infinidat is the front-runner for enterprise storage innovation" *GigaOm 2023*

InfiniBox CSI Driver - Advanced Features

- Advanced private cloud features:
  - Tenancy: Select the relevant pool per each customer or application
  - Service level provisioning: Specify the right InfiniBox system for each application
- Protect your Kubernetes cluster against ransomware by using InfiniBox Immutable Snapshots for your application with InfiniBox CSI Driver
- Monitor CSI metrics using Prometheus / InfiniBox
- Leverage InfiniBox resiliency by supporting multiple Network Spaces and network redundancy
- Enjoy seamless OpenShift Operator upgrades, without disruptions or manual intervention

Demo


Red Hat
OpenShift
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow
Project: infinidat-csi
All Items
AI/Machine Learning
Application Runtime
Big Data
Cloud Provider
Database
Developer Tools
Development Tools
Drivers and plugins
Integration & Delivery
Logging & Tracing
Modernization & Migration
Monitoring
Networking
All Items
infini
INFINIDAT
Certified
InfiniBox CSI Driver - Operator
provided by Infinidat
Infinidat InfiniBox Container...
Installed
INFINIDAT
Infinidat Experimental Catalog
InfiniBox CSI Driver - Operator
provided by Infinidat
Infinidat InfiniBox Container Storage Interface (CSI) Driver is a CNCF-compliant Kubernetes...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26
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Big Data
Cloud Provider
Database
Developer Tools
Development Tools
Drivers and plugins
Integration & Delivery
Logging & Tracing
Modernization & Migration
Monitoring
Networking
OpenShift Optional
INFINIDAT
InfiniBox CSI Driver - Operator
2.11.0 provided by Infinidat
Install
Channel
stable
Version
2.11.0
Capability level
Basic Install
Seamless Upgrades
Full Lifecycle
Deep Insights
Auto Pilot
Source
Installed Operator
This Operator has been installed on the cluster. View it here.
Infinidat InfiniBox Container Storage Interface (CSI) Driver is a CNCF-compliant Kubern
integration for InfiniBox storage systems, offering advanced enterprise functionality for
Kubernetes deployments including Red Hat OpenShift.
Features and Benefits
Multi-protocol flexibility - manage Kubernetes Persistent Volumes attached via
protocols, including Fibre Channel, iSCSI, and NFS, with all Kubernetes PV acces
Multi-petabyte scalability - support hundreds of thousands of PVs per InfiniBox
control multiple InfiniBox arrays within a single Kubernetes cluster \

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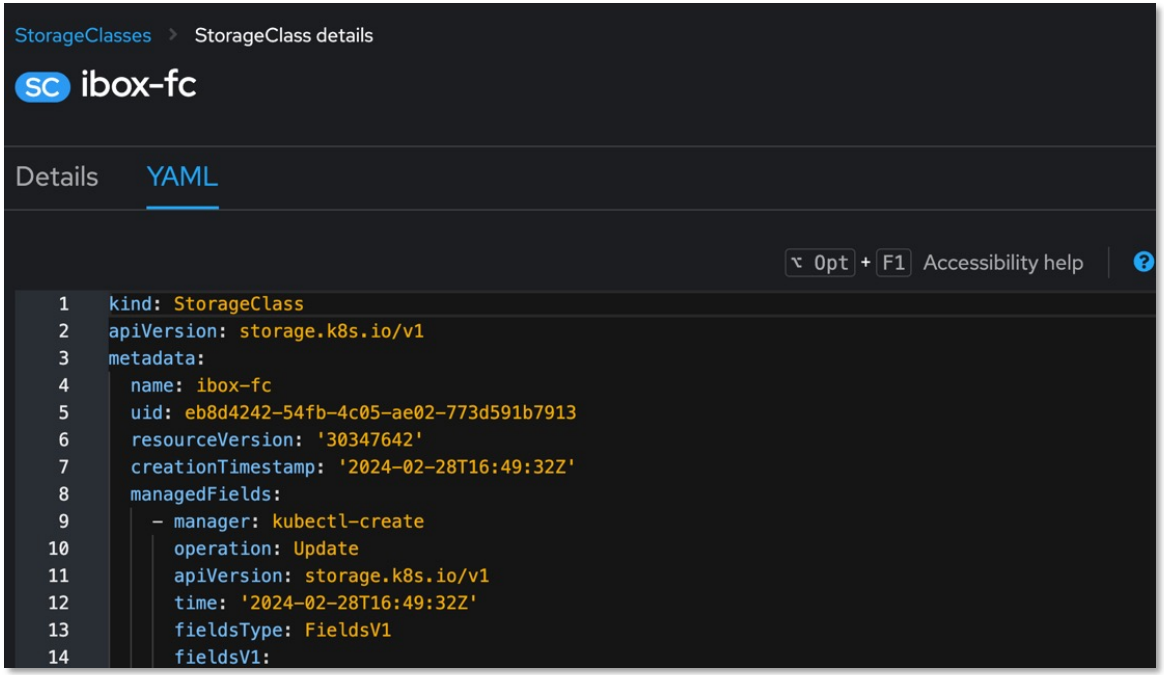
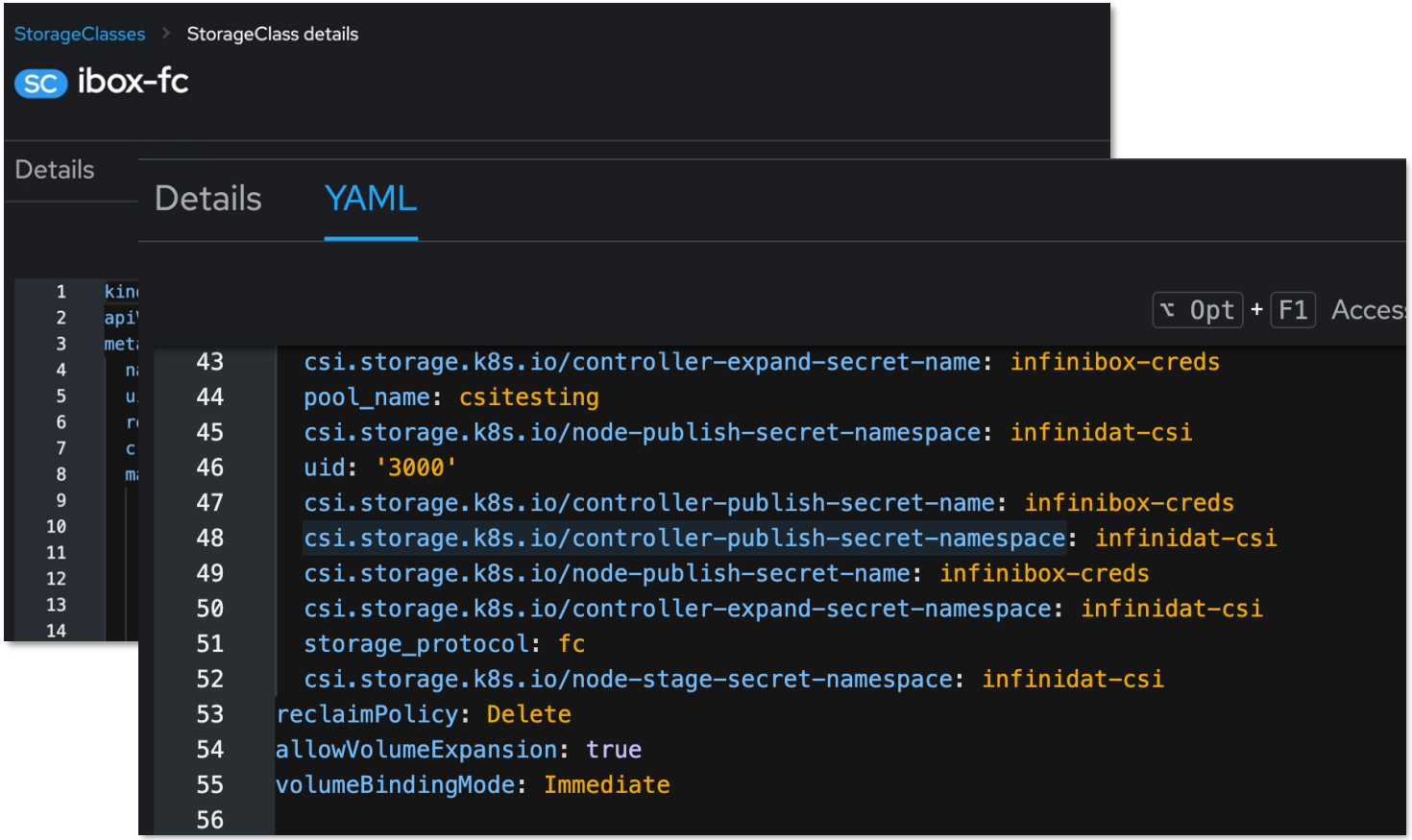
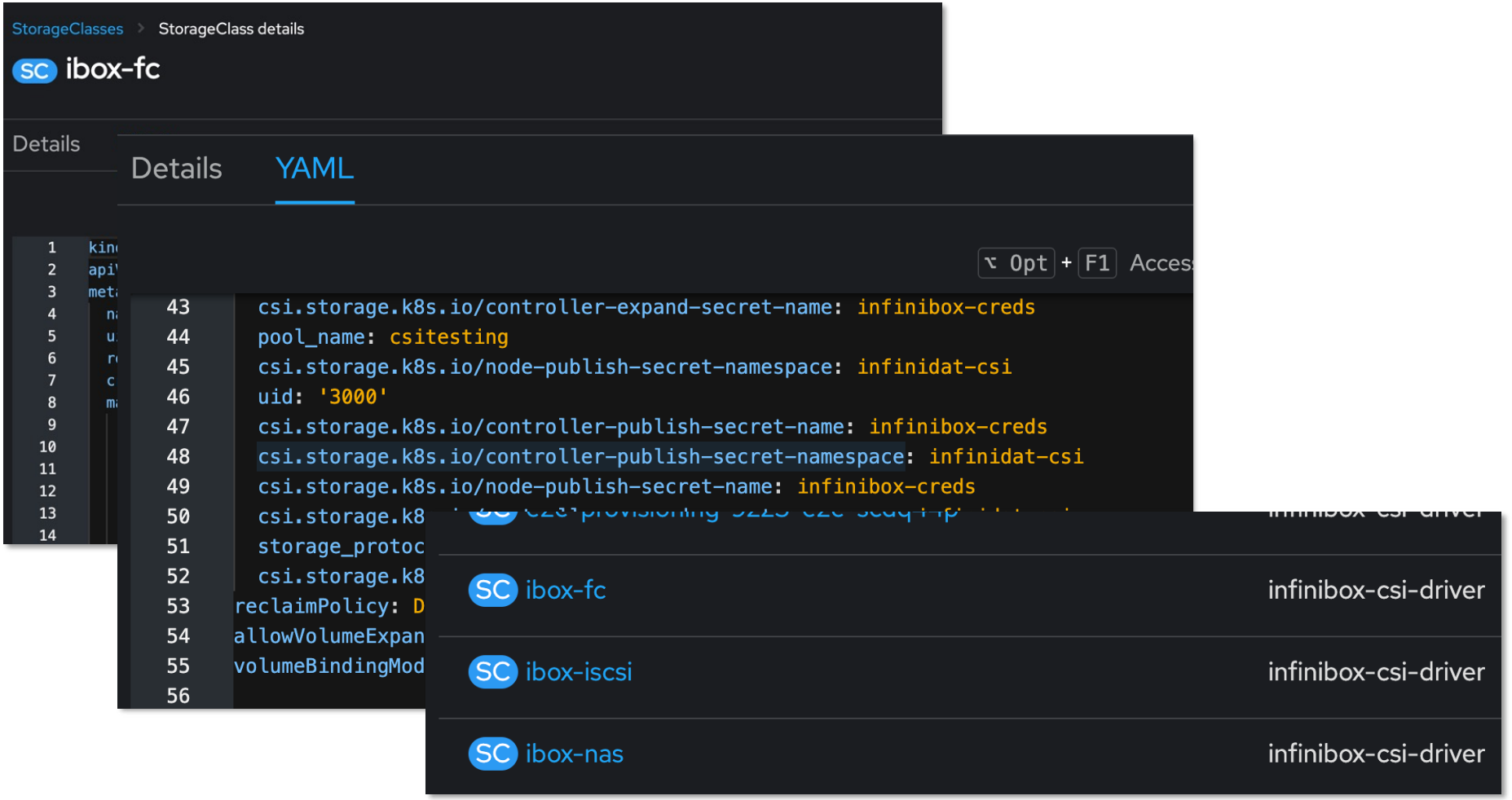

StorageClasses
StorageClass details
SC ibox-fc
Details
YAML
⌥ Opt + F1 Accessibility help
1 kind: StorageClass
2 apiVersion: storage.k8s.io/v1
3 metadata:
4 name: ibox-fc
5 uid: eb8d4242-54fb-4c05-ae02-773d591b7913
6 resourceVersion: '30347642'
7 creationTimestamp: '2024-02-28T16:49:32Z'
8 managedFields:
9 - manager: kubectl-create
10 operation: Update
11 apiVersion: storage.k8s.io/v1
12 time: '2024-02-28T16:49:32Z'
13 fieldsType: FieldsV1
14 fieldsV1:


StorageClasses
StorageClass details
ibox-fc
Details
Details
YAML
⌥ Opt + F1
43 csi.storage.k8s.io/controller-expand-secret-name: infinibox-creds
44 pool_name: csitesting
45 csi.storage.k8s.io/node-publish-secret-namespace: infinidat-csi
46 uid: '3000'
47 csi.storage.k8s.io/controller-publish-secret-name: infinibox-creds
48 csi.storage.k8s.io/controller-publish-secret-namespace: infinidat-csi
49 csi.storage.k8s.io/node-publish-secret-name: infinibox-creds
50 csi.storage.k8s.io/controller-expand-secret-namespace: infinidat-csi
51 storage_protocol: fc
52 csi.storage.k8s.io/node-stage-secret-namespace: infinidat-csi
53 reclaimPolicy: Delete
54 allowVolumeExpansion: true
55 volumeBindingMode: Immediate
56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48 csi.storage.k8s.io/controller-publish-secret-namespace: infinidat-csi
49 csi.storage.k8s.io/node-publish-secret-name: infinibox-creds
51 storage_protoc
53 reclaimPolicy: D
54 allowVolumeExpan
55 volumeBindingMod
ibox-fc infinibox-csi-driver
ibox-iscsi infinibox-csi-driver
ibox-nas infinibox-csi-driver

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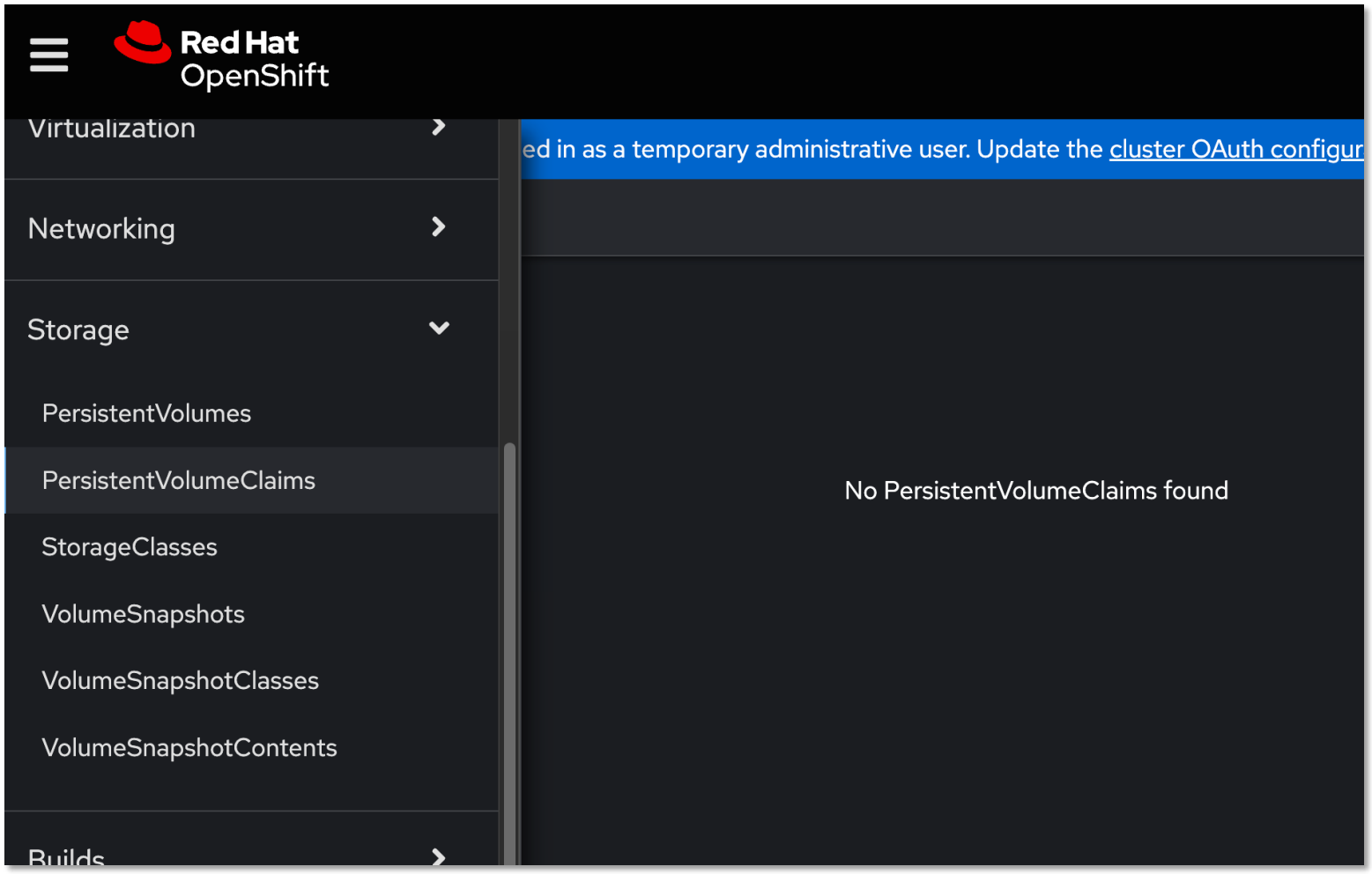
Red Hat
OpenShift
Virtualization
Networking
Storage
PersistentVolumes
PersistentVolumeClaims
StorageClasses
VolumeSnapshots
VolumeSnapshotClasses
VolumeSnapshotContents
Builds
ed in as a temporary administrative user. Update the cluster OAuth configur
No PersistentVolumeClaims found

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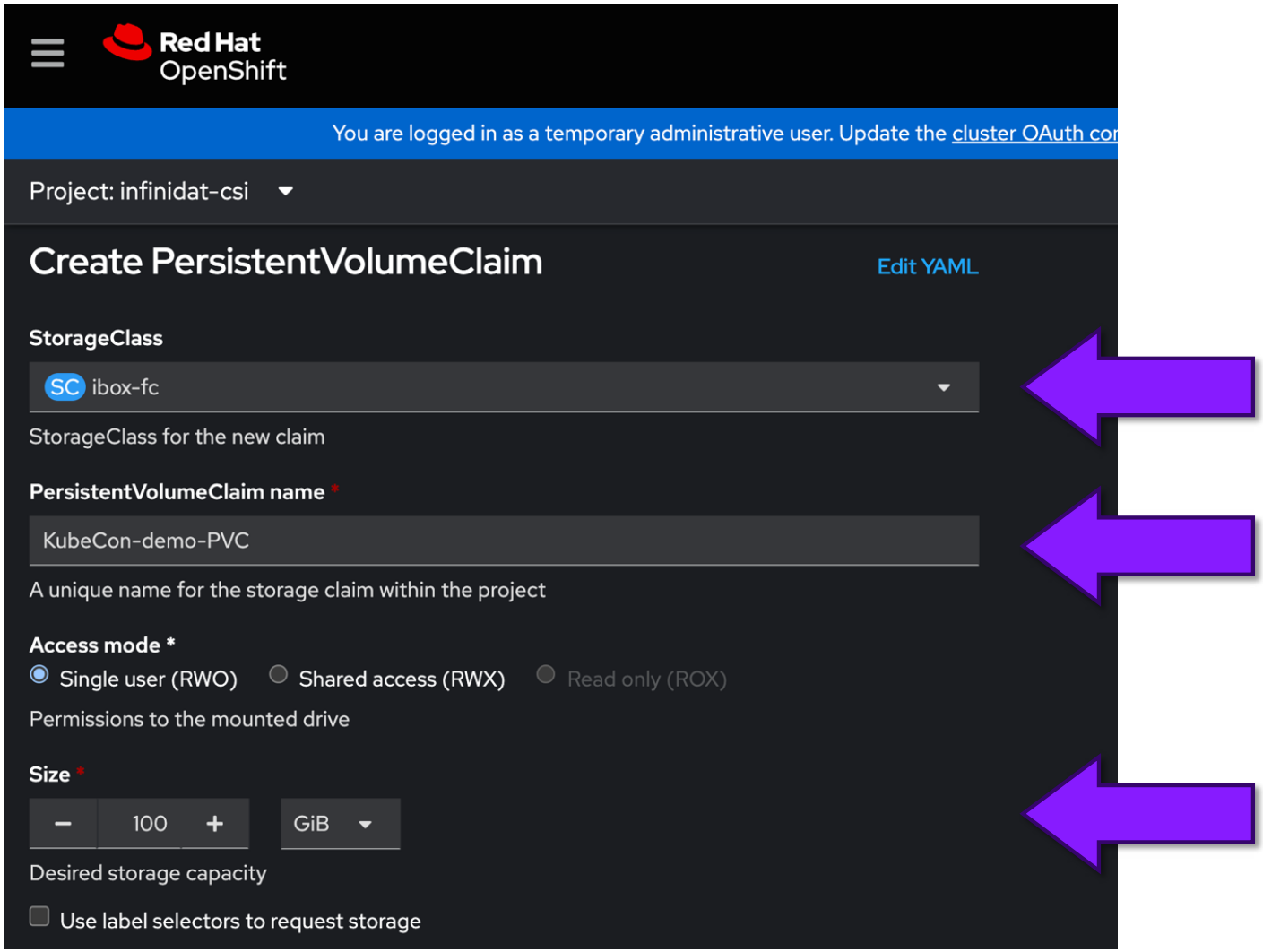
Red Hat
OpenShift
You are logged in as a temporary administrative user. Update the cluster OAuth co
Project: infinidat-csi
Create PersistentVolumeClaim
Edit YAML
StorageClass
SC ibox-fc
StorageClass for the new claim
PersistentVolumeClaim name *
KubeCon-demo-PVC
A unique name for the storage claim within the project
Access mode *
Single user (RWO)
Shared access (RWX)
Read only (ROX)
Permissions to the mounted drive
Size *
100
GiB
Desired storage capacity
Use label selectors to request storage

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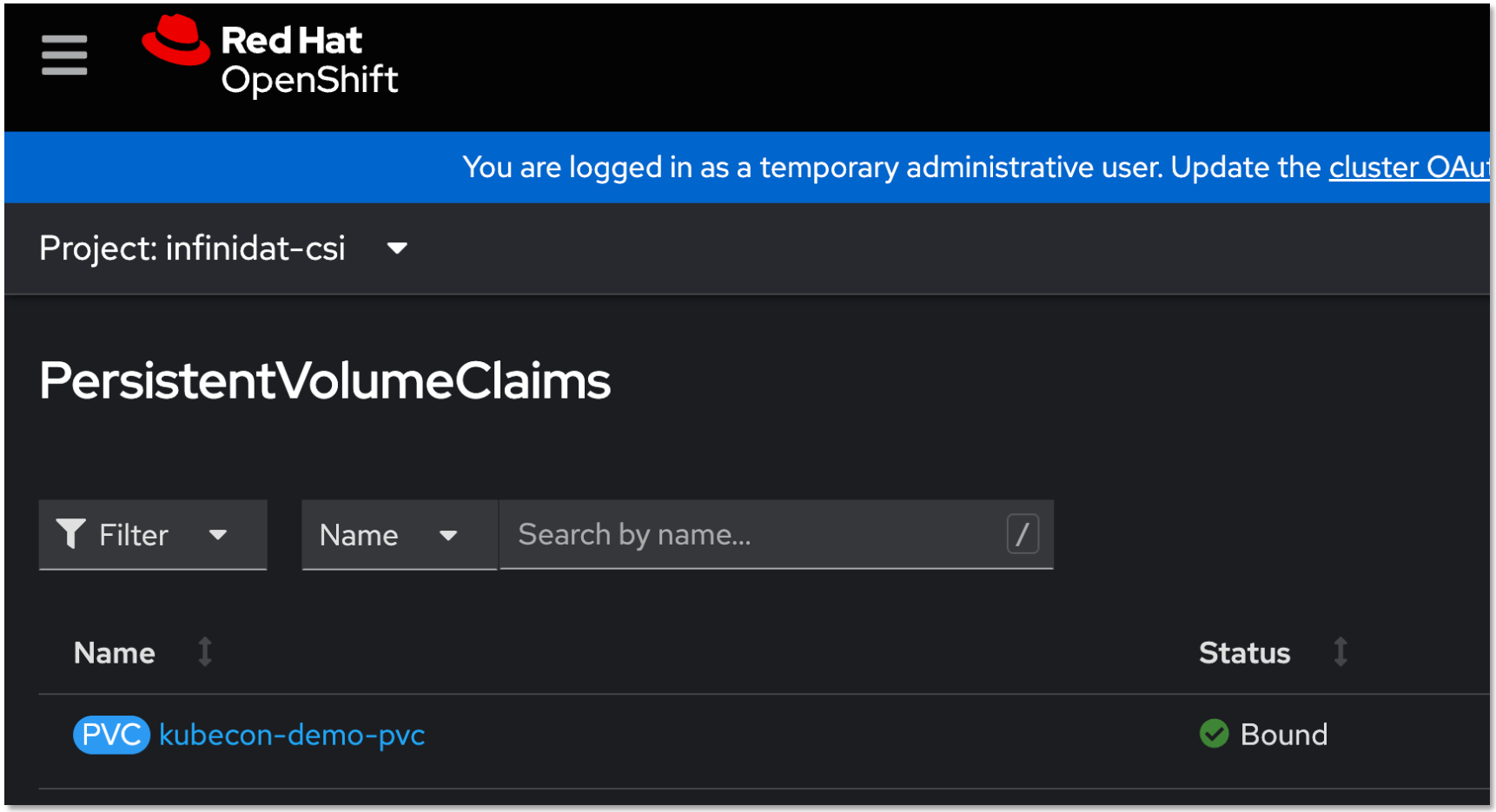
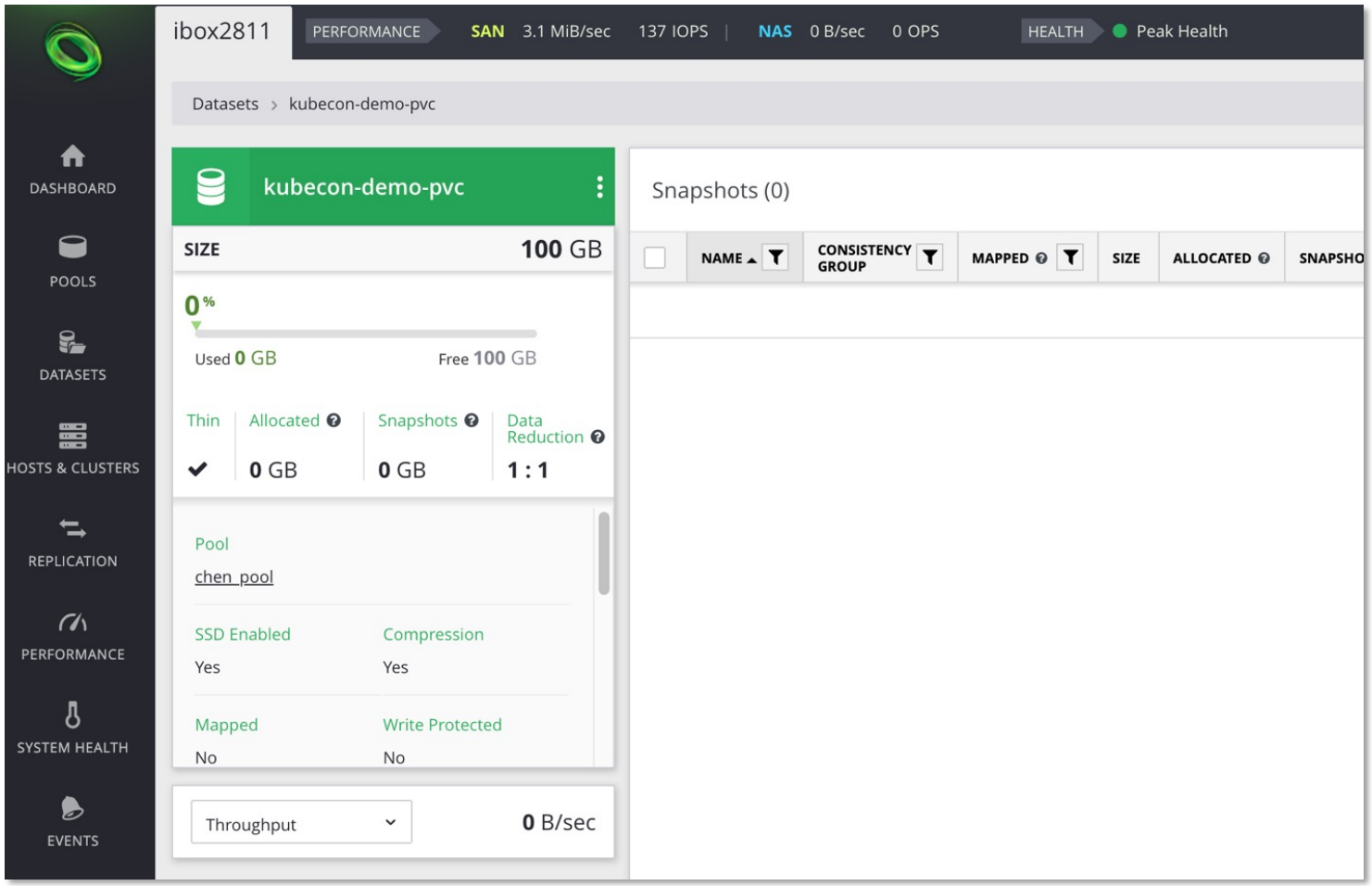

Red Hat
OpenShift
You are logged in as a temporary administrative user. Update the cluster OAu
Project: infinidat-csi
PersistentVolumeClaims
Filter
Name
Search by name...
/
Name
Status
PVC kubecon-demo-pvc
Bound


ibox2811
PERFORMANCE
SAN 3.1 MiB/sec 137 IOPS
NAS 0 B/sec 0 OPS
HEALTH
Peak Health
Datasets › kubecon-demo-pvc
DASHBOARD
POOLS
DATASETS
HOSTS & CLUSTERS
REPLICATION
PERFORMANCE
SYSTEM HEALTH
EVENTS
kubecon-demo-pvc
SIZE 100 GB
0%
Used 0 GB
Free 100 GB
Thin
Allocated
Snapshots
Data Reduction
0 GB
0 GB
1 : 1
Pool
chen_pool
SSD Enabled
Yes
Compression
Yes
Mapped
No
Write Protected
No
Throughput
0 B/sec
Snapshots (0)
NAME
CONSISTENCY GROUP
MAPPED
SIZE
ALLOCATED
SNAPSHO

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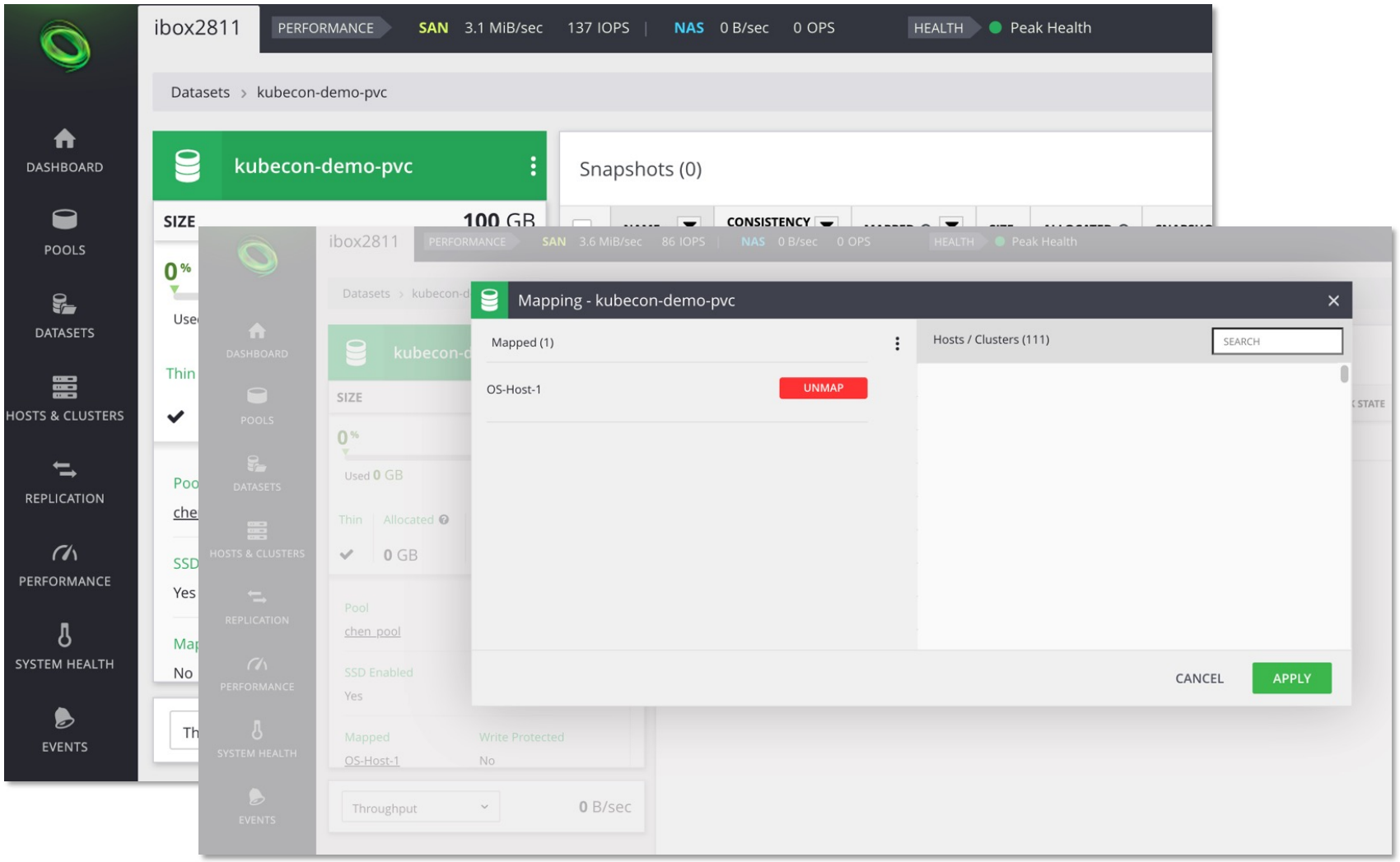
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SAN 3.1 MiB/sec 137 IOPS
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HEALTH
Peak Health
Datasets › kubecon-demo-pvc
kubecon-demo-pvc
Snapshots (0)
SIZE
100 GB
CONSISTENCY
DASHBOARD
POOLS
DATASETS
HOSTS & CLUSTERS
REPLICATION
PERFORMANCE
SYSTEM HEALTH
EVENTS
SAN 3.6 MiB/sec 86 IOPS
NAS 0 B/sec 0 OPS
Mapping - kubecon-demo-pvc
Mapped (1)
OS-Host-1
UNMAP
Hosts / Clusters (111)
SEARCH
CANCEL
APPLY
Used 0 GB
Thin
Allocated
0 GB
Pool
chen_pool
SSD Enabled
Yes
Mapped
Write Protected
OS-Host-1
No
Throughput
0 B/sec

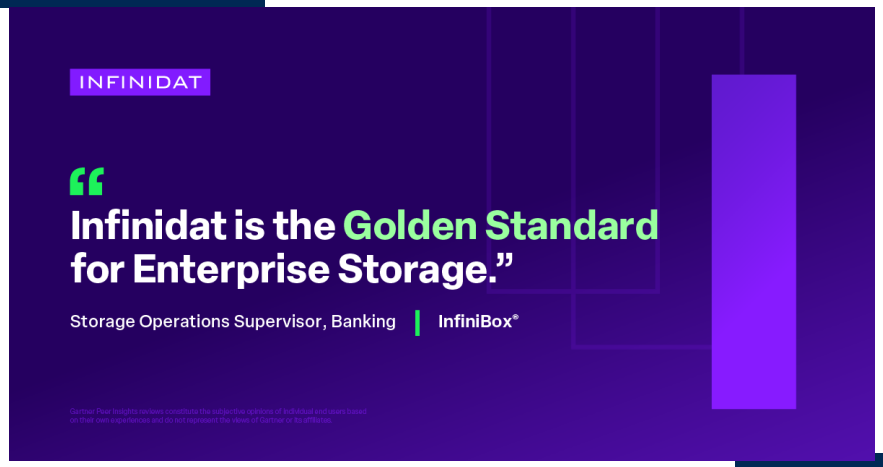
INFINIDAT

Ecosystem

The End Users Have Spoken

As of 18 March 2024

The End Users Have Spoken



As of 18 March 2024

Thank you