

Criando e configurando OKE com Backup & Disaster Recovery usando ferramenta opensource da Kasten

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No cenário dinâmico e complexo das operações de TI contemporâneas, a gestão eficiente de dados e a garantia da continuidade operacional são imperativos cruciais. Nesse contexto, a adoção do Kubernetes como orquestrador de contêineres emergiu como uma solução líder para a implementação e escalabilidade de aplicações em ambientes de nuvem. No entanto, a resiliência do ecossistema Kubernetes torna-se ainda mais robusta quando integrada a estratégias de backup estruturadas e eficazes.

Ao explorar as vantagens de uma estratégia de backup no contexto do Kubernetes, é possível vislumbrar um panorama de benefícios que transcendem a simples preservação de dados. O Kubernetes, conhecido por sua capacidade de automação, escalabilidade e orquestração eficiente, se beneficia enormemente de práticas de backup bem planejadas. Dentre os inúmeros ganhos, destacam-se:

1. Recuperação Rápida e Confiável:

Estratégias de backup no Kubernetes asseguram uma recuperação rápida e confiável em caso de falhas inesperadas. A capacidade de restaurar configurações e dados essenciais é vital para minimizar o tempo de inatividade, garantindo assim uma operação contínua.

2. Garantia de Consistência:

Assegurar a consistência entre os dados e os recursos do Kubernetes é um desafio fundamental. Com a implementação de backups regulares, a integridade dos dados é preservada, evitando discrepâncias que poderiam comprometer a estabilidade do ambiente.

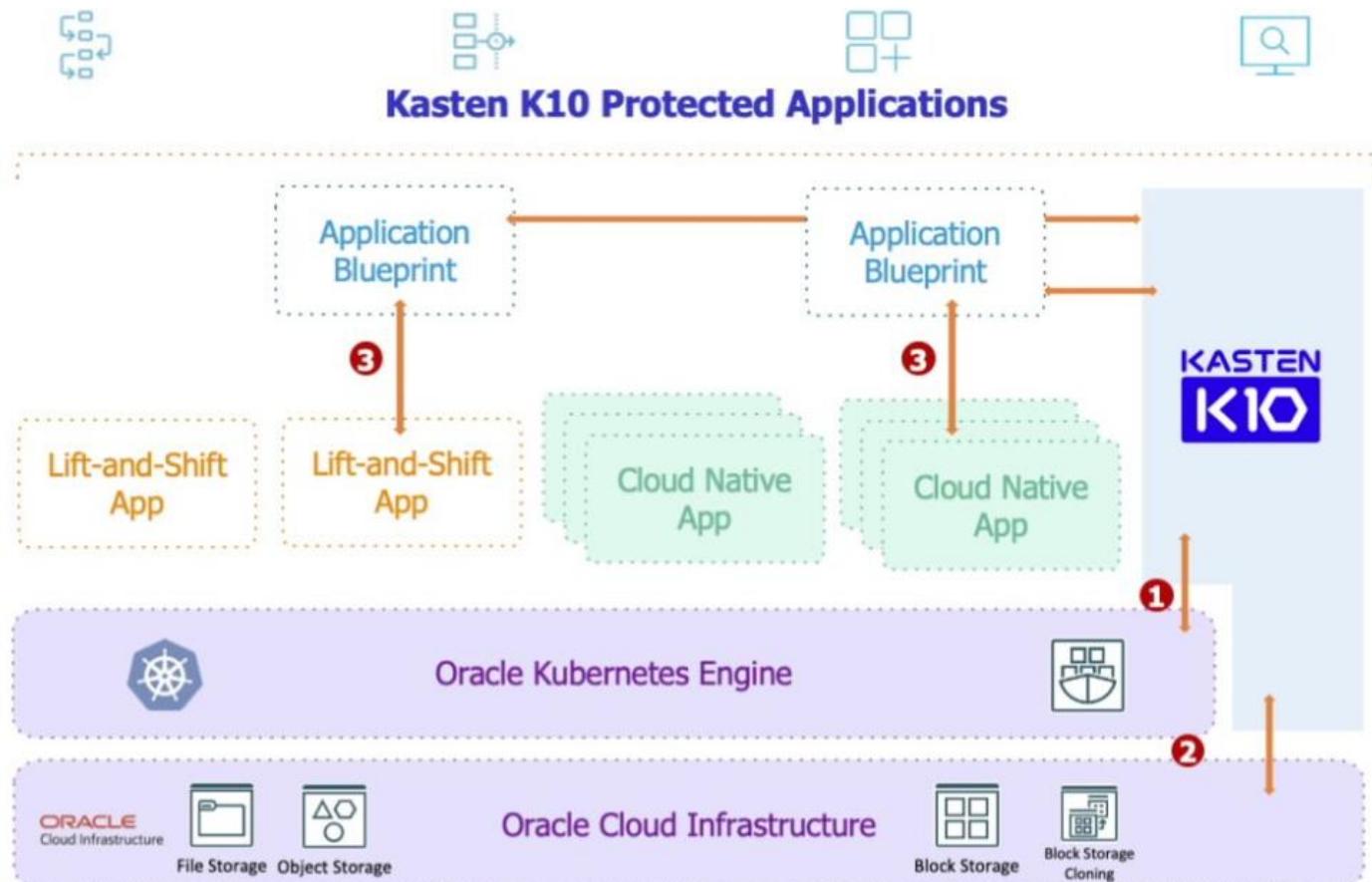
3. Proteção contra Perda de Dados:

A natureza dinâmica das aplicações Kubernetes aumenta o risco de perda de dados devido a atualizações, migrações ou eventos inesperados. Estratégias de backup robustas agem como um escudo protetor, mitigando o impacto de tais incidentes e garantindo a preservação integral dos dados.

4. Conformidade e Segurança Aprimoradas:

Em ambientes regulamentados, a conformidade e a segurança são prioridades inegociáveis. Estratégias de backup fornecem uma camada adicional de segurança, garantindo que as práticas de recuperação atendam aos requisitos normativos e garantam a integridade dos dados sensíveis.

Em resumo, a implementação de estratégias de backup no ecossistema Kubernetes não é apenas uma medida de precaução, mas uma abordagem estratégica para aprimorar a resiliência, garantindo operações contínuas e eficientes em um mundo digital em constante evolução. Este conteúdo explorará a fundo esses benefícios, destacando as melhores práticas e considerações cruciais para a implementação bem-sucedida de uma estratégia de backup no universo Kubernetes.



- 1) Orquestrador
- 2) Infraestrutura
- 3) Aplicação framework

Criando OKE na OCI:

The screenshot shows the Oracle Cloud Developer Services interface. On the left, there's a sidebar with various service links. The 'Developer Services' link is highlighted with a dashed border. The main content area is titled 'Developer Services' and contains several sections: 'Containers & Artifacts' (with 'Kubernetes Clusters (OKE)' selected), 'DevOps' (with 'Overview' and 'Projects'), 'Resource Manager' (with 'Overview', 'Stacks', and 'Jobs'), 'Functions' (with 'Applications' and 'Pre-Built Functions'), 'APEX Application Development' (with 'APEX Instances'), 'Database Tools' (with 'Connections', 'SQL Worksheet', and 'Private Endpoints'), 'App Dependency Management' (with 'Overview', 'Knowledge Bases', 'Vulnerability Audits', 'Remediation Recipes', and 'Remediation History'), and 'API Management'. A 'Related services' sidebar on the right lists various Oracle services like Compute, VMware Solution, Autonomous Database, MySQL HeatWave, Oracle NoSQL Database, Logging, Application Performance Monitoring, Streaming, and Connector Hub. A 'Help' section at the bottom right provides links to developer guides and tutorials.

Seleciona o comportamento desejado e depois no botão Create cluster

The screenshot shows the 'Clusters in sandbox Compartiment' page under the 'Kubernetes Clusters (OKE)' section. At the top, there's a 'Create cluster' button. Below it is a table with columns: Name, Status, Node pools (with an info icon), VCN, Version, and Created. A message 'No clusters exist. Create one to get started.' is displayed. At the bottom right, it says 'Showing 0 items < 1 of 1 >'. On the left, there's a sidebar with 'Containers & Artifacts' and a 'Kubernetes Clusters (OKE)' section containing links for Container Instances, Container Registry, Artifact Registry, and Service Mesh. There are also 'List scope' and 'Compartment' filters, and a 'Tag filters' section with 'add | clear' buttons. A small icon for a multi-region selection is in the bottom right corner.

No modo Quick create, será criado automaticamente a parte de Networking, em clique em Submit

The screenshot shows the 'Create cluster' dialog in Oracle Cloud. It has two main sections: 'Quick create' and 'Custom create'. The 'Quick create' section is selected, with a note that it creates a new cluster along with network resources like a VCN, Internet Gateway, NAT Gateway, Service Gateway, and Kubernetes cluster. The 'Custom create' section allows specifying existing network resources. Below these are 'New resources include' details and a list of items: Virtual Cloud Network (VCN), Internet Gateway (IG), NAT Gateway (NAT), Service Gateway (SGW), Kubernetes cluster, and Kubernetes worker nodes(s) and node pool. At the bottom are 'Submit' and 'Cancel' buttons.

De um nome para o cluster;

Selecione o Compartiment caso não esteja já selecionado o mesmo;

Para a proposta desta demonstração iremos utilizar o node gerenciado;

Mantenha as demais opções default.

The screenshot shows the 'Create cluster (quick)' dialog. It's step 1 of 2. The 'Name' field is set to 'cluster1'. The 'Compartiment' is set to 'sandbox'. The 'Kubernetes version' is set to 'v1.28.2'. Under 'Kubernetes API endpoint', the 'Public endpoint' option is selected, indicating the cluster will be hosted on a public subnet with a public IP address auto-assigned. Under 'Node type', the 'Managed' option is selected, stating that Kubernetes worker nodes are provisioned compute instances in your tenancy. At the bottom are 'Next' and 'Cancel' buttons.

Selecione o tamanho do shape mínimo de 2 ocpu e 16GB de RAM, manual da Kastem solicita mínimo de 3 Worker nodes:

ORACLE Cloud Cloud Classic > Search resources, services, documentation, and Marketplace Brazil East (Sao Paulo) ▾

Create cluster (quick)

Kubernetes worker nodes

Private workers
The Kubernetes worker nodes that are created will be hosted in a private subnet ✓

Public workers
The Kubernetes worker nodes that are created will be hosted in a public subnet

Shape and image

A [shape](#) is a template that determines the number of CPUs, amount of memory, and other resources allocated to an instance. The image is the operating system that runs on top of the shape.

Pod shape [\(i\)](#)
VM.Standard.E3.Flex

The compute service limit applies to pods. Check the service limits.

You can customize the number of OCPUs that are allocated to a flexible shape. The other resources scale proportionately. [Learn more about flexible shapes](#).

Select the number of OCPUs
1 28 57 84 114 2

Amount of memory (GB) [\(i\)](#)
1 444 888 1332 1776 16

Network Bandwidth (Gbps): 2.0 [\(i\)](#) Max. Total VNICs: 2 [\(i\)](#)

Image

Oracle Linux 8
ORACLE Linux Image build: 2023.09.26-0 Kubernetes version: 1.28.2
Change image

Node count [\(i\)](#)
3

Show advanced options

Next Cancel

Verifique as informações configuradas em seu cluster depois pressione **Create Cluster**

ORACLE Cloud Cloud Classic > Search resources, services, documentation, and Marketplace Brazil East (Sao Paulo) ▾

Create cluster (quick)

1 Create cluster

2 Review

Resources to be created

Cluster

Cluster name: cluster1	Secrets encryption key: Oracle-managed
Cluster type: Enhanced	Image signing verification: Not enabled
Compartment: sandbox	Cluster tags: OKEclusterName:cluster1
Version: v1.28.2	Initial load balancer tags: OKEclusterName:cluster1
Pods CIDR block:	Initial block volume tags: OKEclusterName:cluster1
Add-ons: CoreDNS, KubeProxy Show Copy	

Network

Compartment: sandbox	Kubernetes API private endpoint: Auto assigned
VCN name: oke-vcn-quick-cluster1-750161959	Kubernetes API public endpoint: Auto assigned
	Kubernetes CIDR block: 10.96.0.0/16
	Pods CIDR block: 10.244.0.0/16

Node pools

Node pool 1	
Node pool name: pool1	Node pool tags: OKEnodePoolName:pool1
Type: Managed	Node tags: OKEnodePoolName:pool1
Version: v1.28.2	
Compartment: sandbox	
Number of nodes: 3	
Image: Oracle-Linux-8.8-2023.09.26-0-OKE-1.28.2-653	
Shape: VM.Standard.E3.Flex	
OCpus: 2	
Amount of memory (GB): 16	
Network security groups: Enabled	
Eviction grace period (mins): 60	
Network type: OCI_VCN_IP_NATIVE	
Pod communication	
Network security groups: None	
Number of pods per node:	
Kubernetes labels	
Key: name Value: cluster1	

Basic Cluster Confirmation

You have not selected any Enhanced cluster features. An Enhanced cluster will be created unless you select the checkbox below. Creating a Basic cluster will prevent you from using features restricted to Enhanced cluster until you upgrade your cluster.

Create a Basic cluster



Ao realizar a criação do cluster OKE vc terá a seguinte saída, clique em close

☰ ORACLE Cloud Cloud Classic > Search resources, services, documentation, and Marketplace Brazil East (Sao Paulo) ▾    

Creating cluster and associated network resources

▶ Create virtual cloud network (1 resolved)	Done ✓
▶ Create internet gateway (1 resolved)	Done ✓
▶ Create NAT gateway (1 resolved)	Done ✓
▶ Create service gateway (1 resolved)	Done ✓
▶ Create Route tables (2 resolved)	Done ✓
▶ Create security lists (3 resolved)	Done ✓
▶ Create subnets (3 resolved)	Done ✓
▶ Create cluster (1 resolved)	Done ✓
▶ Create node pool (1 resolved)	Done ✓



Close

O deploy leva alguns minutos:

The screenshot shows the Oracle Cloud Cluster details page for a cluster named "cluster1". A large orange hexagonal icon on the left displays the letters "CL". The top navigation bar includes "Cloud Classic >" and a search bar. The cluster status is shown as "Creating". Key details include:

Cluster details	Cluster tags	Initial load balancer tags	Initial block volume tags
Cluster status: Creating			Kubernetes version: v1.28.2
Node pools: 1			Secrets encryption key: Oracle-managed
Cluster Id: ...cfofo3i4xya	Show	Copy	Cluster type: Enhanced
Compartment: brztechcloud01 (root)/Architects/bruno_andrade/sandbox			Cluster credentials expire on: 1/3/2029
Launched: Wed, Jan 3, 2024, 19:26:04 UTC			Complete credential rotation on: -
Created By: BRUNO.A.ANDRADE@ORACLE.COM			

Network information

VCN name:	VCN I:	Kubernetes API endpoint
oke-vcn-quick-cluster1-5222e02f7	...px2xajbq	oke-k8sApiEndpoint-subnet-quick-cluster1-5222e02f7-regional
	Show	
	Copy	
Compartment: brztechcloud01 (root)/Architects/bruno_andrade/sandbox		Kubernetes API private endpoint: 10.0.0.2:6443
Services CIDR: 10.96.0.0/16		Kubernetes API public endpoint: 146.235.39.117:6443
Network type: OCI_VCN_IP_NATIVE		Network security group: Not enabled
		Service LB subnet 1: oke-svclbsubnet-quick-cluster1-5222e02f7-regional
		Service LB subnet 2: -

Após o cluster ter finalizado terá o seguinte status

The screenshot shows the Oracle Cloud Cluster details page for the same cluster "cluster1", now in an "Active" state. The large green hexagonal icon on the left displays the letters "CL". The top navigation bar includes "Cloud Classic >" and a search bar. The cluster status is shown as "Active". Key details include:

Cluster details	Cluster tags	Initial load balancer tags	Initial block volume tags
Cluster status: Active			Kubernetes version: v1.28.2
Node pools: 1			Secrets encryption key: Oracle-managed
Cluster Id: ...cfofo3i4xya	Show	Copy	Cluster type: Enhanced
Compartment: brztechcloud01 (root)/Architects/bruno_andrade/sandbox			Cluster credentials expire on: 1/3/2029 Start Rotation
Launched: Wed, Jan 3, 2024, 19:26:04 UTC			Complete credential rotation on: -
Created By: BRUNO.A.ANDRADE@ORACLE.COM			

Network information

VCN name:	VCN I:	Kubernetes API endpoint
oke-vcn-quick-cluster1-5222e02f7	...px2xajbq	oke-k8sApiEndpoint-subnet-quick-cluster1-5222e02f7-regional
	Show	
	Copy	
Compartment: brztechcloud01 (root)/Architects/bruno_andrade/sandbox		Kubernetes API private endpoint: 10.0.0.2:6443
Services CIDR: 10.96.0.0/16		Kubernetes API public endpoint: 146.235.39.117:6443
Network type: OCI_VCN_IP_NATIVE		Network security group: Not enabled
		Service LB subnet 1: oke-svclbsubnet-quick-cluster1-5222e02f7-regional
		Service LB subnet 2: -

Para acessar o cluster clique em Access cluster:

Cloud Shell Access

Use Kubectl to manage the cluster remotely via Cloud Shell.

Local Access

Use kubectl and the Kubernetes Dashboard to manage the cluster Locally.

Manage the cluster via Cloud Shell.

1 Launch Cloud Shell

2 To access the kubeconfig for your cluster via the VCN-Native public endpoint, copy the following command:

```
$ oci ce cluster create-kubeconfig --cluster-id ocid1.cluster.oc1.sa-saopaul-0-1.aaaaaaaaazhkmddyosgrs2c45r5tchp5ydvv5o3f3dt2o3j72syccfo3i4xya --file $HOME/.kube/config --region sa-saopaulo-1 --token-version 2.0.0 --kube-endpoint PUBLIC_ENDPOINT
```

[Learn more about Cloud Shell](#)

[Close](#)

Network type: OCI_VCN_IP_NATIVE

Service LB subnet 1: [oke-svc1bsubnet-quick-cluster1-5222e02f7-regional](#)

Service LB subnet 2: -

Clique em Lauch Cloud Shell, uma instancia com sessão shell será disponibilizada, assim que o prompt for liberado copie o comando de acesso acima e cole

View Network: Public

Cloud Shell

```
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ oci ce cluster create-kubeconfig --cluster-id ocid1.cluster.oc1.sa-saopaulo-1.aaaaaaaaazhkmddyosgrs2c45r5tchp5ydvv5o3f3dt2o3j72syccfo3i4xya --file $HOME/.kube/config --region sa-saopaulo-1 --token-version 2.0.0 --kube-endpoint PUBLIC_ENDPOINT
```

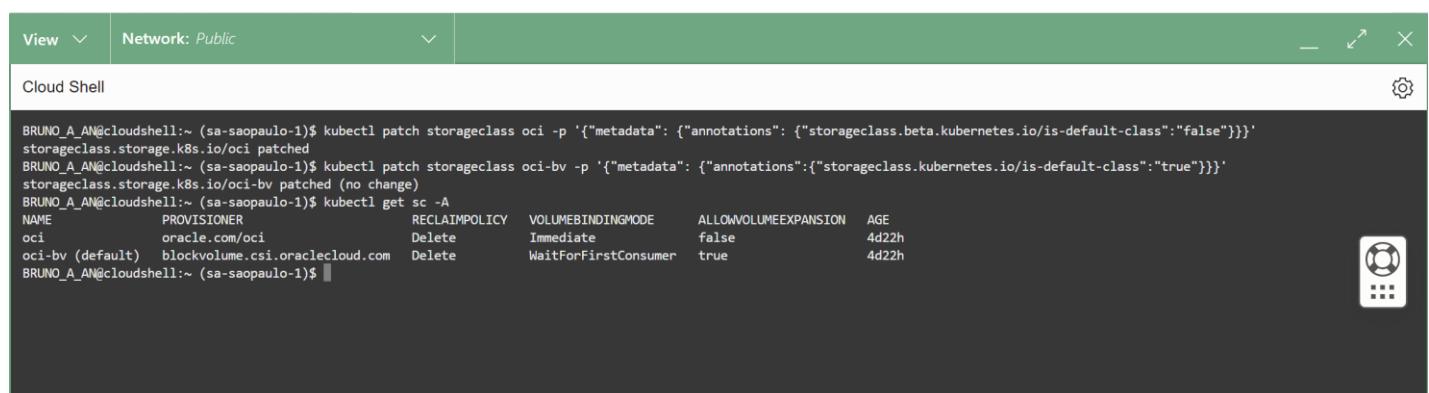
Uma vez conectado no cluster você pode rodar o comando para listar os nodes do cluster:



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl get nodes
NAME      STATUS  ROLES   AGE     VERSION
10.0.10.109 Ready   node    4d22h  v1.28.2
10.0.10.123 Ready   node    4d22h  v1.28.2
10.0.10.221 Ready   node    4d22h  v1.28.2
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

Preparar o ambiente Kubernets para a instalação da solução de Backup Kasten(K10):

1. Configurar o Storage Class oci-bv (CSI) como default

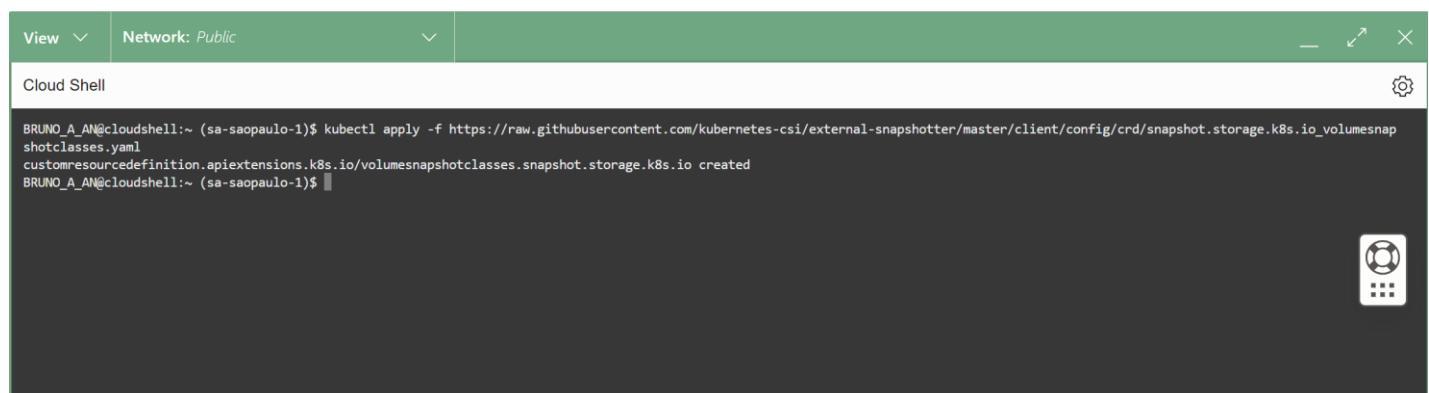


```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl patch storageclass oci -p '{"metadata": {"annotations": {"storageclass.beta.kubernetes.io/is-default-class": "false"}}}'
storageclass.storage.k8s.io/oci patched
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl patch storageclass oci-bv -p '{"metadata": {"annotations": {"storageclass.kubernetes.io/is-default-class": "true"}}}'
storageclass.storage.k8s.io/oci-bv patched (no change)
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl get sc -A
NAME      PROVISIONER          RECLAIMPOLICY  VOLUMEBINDINGMODE   ALLOWVOLUMEEXPANSION  AGE
oci       oracle.com/oci        Delete         Immediate           false                4d22h
oci-bv (default)  blockvolume.csi.oraclecloud.com  Delete         WaitForFirstConsumer  true                4d22h
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl patch storageclass oci -p '{"metadata": {"annotations": {"storageclass.beta.kubernetes.io/is-default-class": "false"}}}'
```

```
# kubectl patch storageclass oci-bv -p '{"metadata": {"annotations": {"storageclass.kubernetes.io/is-default-class": "true"}}}'
```

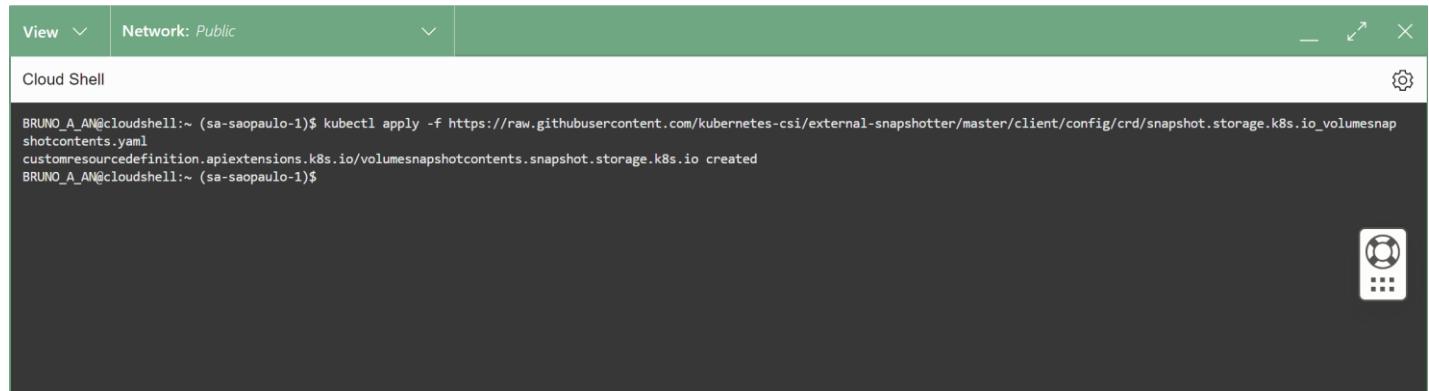
2. Adicionando volume Snapshot Classes (Custom Resource Definition):



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io_volumesnapshotclasses.yaml
customresourcedefinition.apiextensions.k8s.io/volumesnapshotclasses.snapshot.storage.k8s.io created
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io\_volumesnapshotclasses.yaml
```

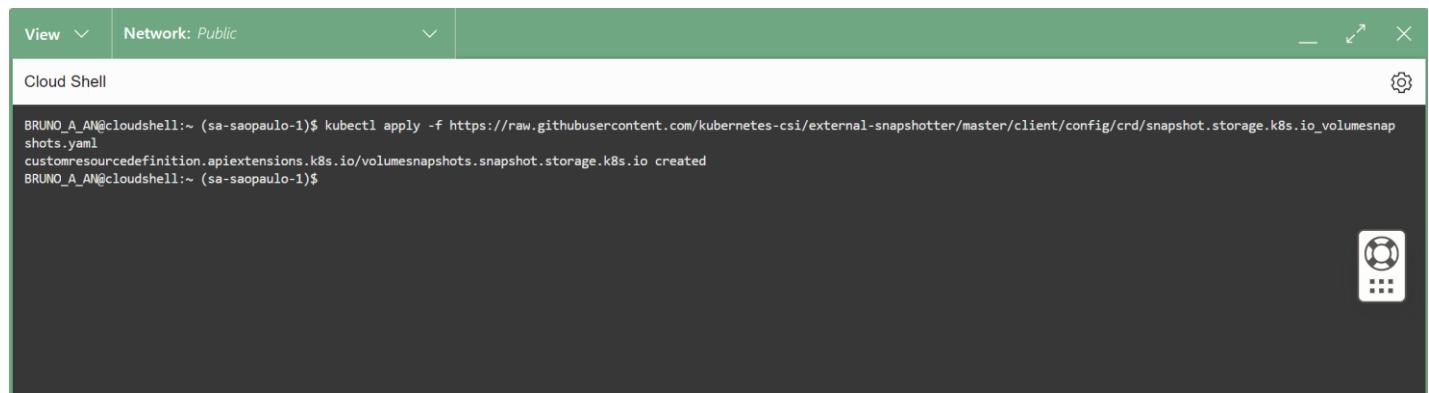
3. Adicionando volume Snapshot Contents (Custom Resource Definition):



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io_volumesnapshotcontents.yaml
customresourcedefinition.apirextensions.k8s.io/volumesnapshotcontents.snapshot.storage.k8s.io created
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io\_volumesnapshotcontents.yaml
```

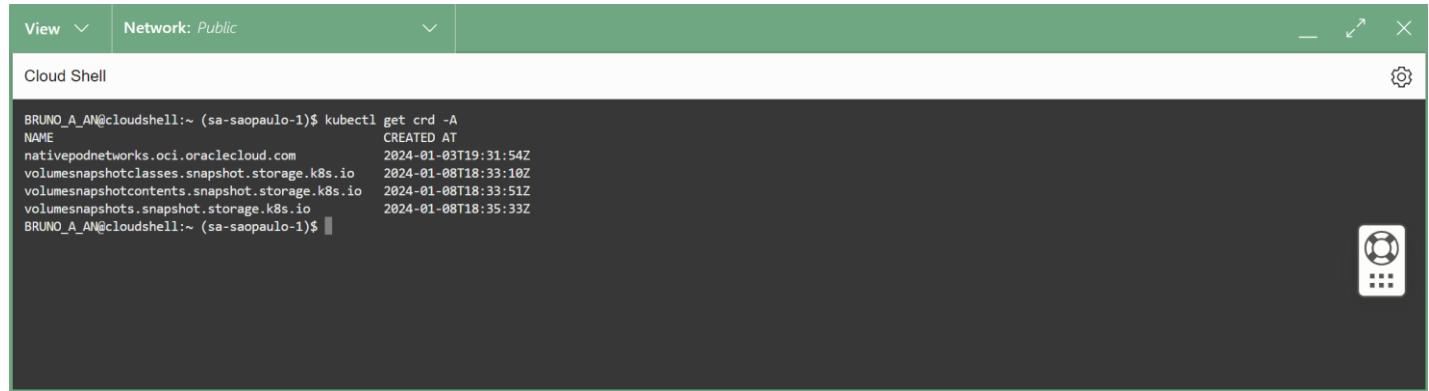
4. Adicionando volume Snapshots (Custom Resource Definition):



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io_volumesnapshots.yaml
customresourcedefinition.apirextensions.k8s.io/volumesnapshots.snapshot.storage.k8s.io created
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl apply -f https://raw.githubusercontent.com/kubernetes-csi/external-snapshotter/master/client/config/crd/snapshot.storage.k8s.io\_volumesnapshots.yaml
```

5. Liste os CRDs adicionados:



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl get crd -A
NAME                           CREATED AT
nativepodnetworks.oci.oraclecloud.com   2024-01-03T19:31:54Z
volumesnapshotclasses.snapshot.storage.k8s.io  2024-01-08T18:33:10Z
volumesnapshotcontents.snapshot.storage.k8s.io  2024-01-08T18:33:51Z
volumesnapshots.snapshot.storage.k8s.io    2024-01-08T18:35:33Z
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

6. Criar Volume Snapshot Class:

```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ cat <<EOF | kubectl create -f -
> apiVersion: snapshot.storage.k8s.io/v1
> kind: VolumeSnapshotClass
> metadata:
>   name: oci-bv-csi-snapclass
>   annotations:
>     k10.kasten.io/is-snapshot-class: "true"
> driver: blockvolume.csi.oraclecloud.com
> deletionPolicy: Delete
> EOF
volumesnapshotclass.snapshot.storage.k8s.io/oci-bv-csi-snapclass created
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# cat <<EOF | kubectl create -f -
apiVersion: snapshot.storage.k8s.io/v1
kind: VolumeSnapshotClass
metadata:
  name: oci-bv-csi-snapclass
  annotations:
    k10.kasten.io/is-snapshot-class: "true"
driver: blockvolume.csi.oraclecloud.com
deletionPolicy: Delete
EOF
```

7. Adicionando o Kasten ao seu repositório:

```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ helm repo add kasten https://charts.kasten.io/
WARNING: Kubernetes configuration file is group-readable. This is insecure. Location: /home/BRUNO_A_AN/.kube/config
WARNING: Kubernetes configuration file is world-readable. This is insecure. Location: /home/BRUNO_A_AN/.kube/config
"kasten" has been added to your repositories
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# helm repo add kasten https://charts.kasten.io/
```

8. Instalando o Kasten:

```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ helm install k10 kasten/k10 --namespace=kasten-io --create-namespace
NAME: k10
LAST DEPLOYED: Mon Jan  8 18:59:56 2024
NAMESPACE: kasten-io
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
Thank you for installing Kasten's K10 Data Management Platform 6.5.1!

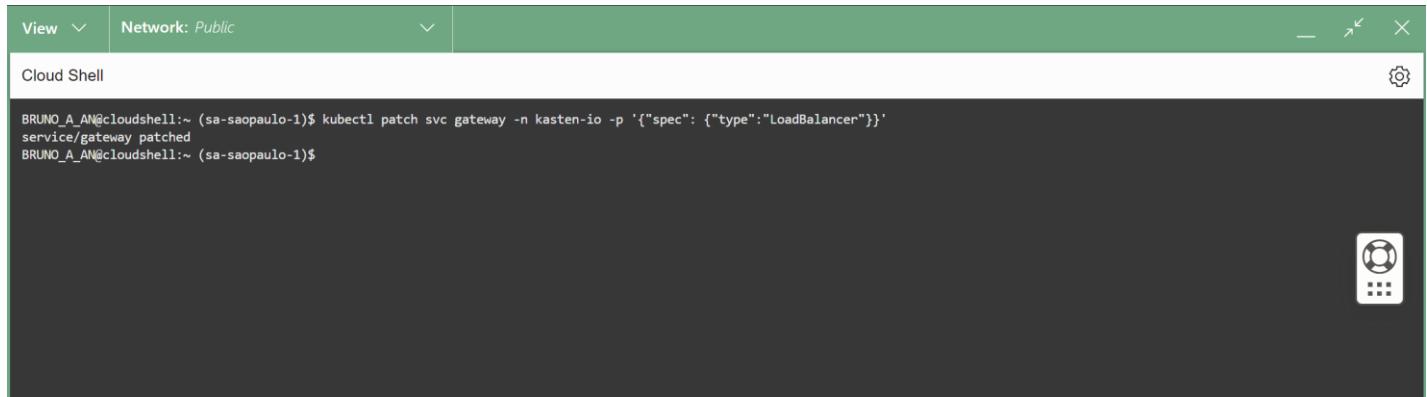
Documentation can be found at https://docs.kasten.io/.

How to access the K10 Dashboard:
To establish a connection to it use the following `kubectl` command:
`kubectl --namespace kasten-io port-forward service/gateway 8080:8000`

The Kasten dashboard will be available at: `http://127.0.0.1:8080/k10/#/`
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# helm install k10 kasten/k10 --namespace=kasten-io --create-namespace
```

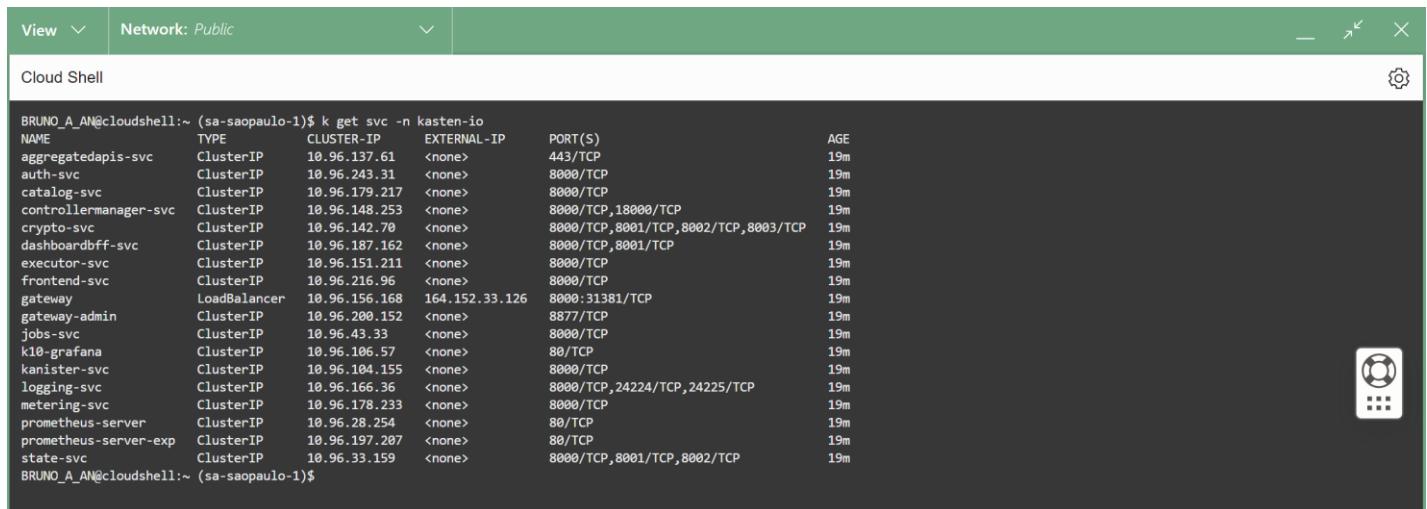
9. Habilitar Load Balancer no service gateway do namespace kasten-io:



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl patch svc gateway -n kasten-io -p '{"spec": {"type": "LoadBalancer"}}'
service/gateway patched
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl patch svc gateway -n kasten-io -p '{"spec": {"type": "LoadBalancer"}}'
```

10. Listar o service gateway para descobrir o ip publico do Loadbalancer e acessar a console do Kasten:



```
View Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ k get svc -n kasten-io
NAME      TYPE      CLUSTER-IP    EXTERNAL-IP    PORT(S)          AGE
aggregatedapis-svc  ClusterIP   10.96.137.61  <none>        443/TCP         19m
auth-svc    ClusterIP   10.96.243.31  <none>        8000/TCP        19m
catalog-svc  ClusterIP   10.96.179.217 <none>        8000/TCP        19m
controllermanager-svc  ClusterIP   10.96.148.253 <none>        8000/TCP,18000/TCP  19m
crypto-svc   ClusterIP   10.96.142.70  <none>        8000/TCP,8001/TCP,8002/TCP,8003/TCP  19m
dashboardbfff-svc  ClusterIP   10.96.187.162 <none>        8000/TCP,8001/TCP  19m
executor-svc   ClusterIP   10.96.151.211 <none>        8000/TCP        19m
frontend-svc   ClusterIP   10.96.216.96  <none>        8000/TCP        19m
gateway       LoadBalancer  10.96.156.168  164.152.33.126  8000:31381/TCP  19m
gateway-admin  ClusterIP   10.96.200.152 <none>        8877/TCP        19m
jobs-svc     ClusterIP   10.96.43.33  <none>        8000/TCP        19m
k10-grafana   ClusterIP   10.96.106.57  <none>        80/TCP          19m
kanister-svc   ClusterIP   10.96.104.155 <none>        8000/TCP        19m
logging-svc    ClusterIP   10.96.166.36  <none>        8000/TCP,24224/TCP,24225/TCP  19m
metering-svc   ClusterIP   10.96.178.233 <none>        8000/TCP        19m
prometheus-server  ClusterIP   10.96.28.254 <none>        80/TCP          19m
prometheus-server-exp  ClusterIP   10.96.197.207 <none>        80/TCP          19m
state-svc     ClusterIP   10.96.33.159 <none>        8000/TCP,8001/TCP,8002/TCP  19m
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

*utilize o seu endereço publico para acessar

Acessando o Kasten, insira seu email e nome de empresa e clique em Accept para acessar a console:

The screenshot shows a web browser window titled "Kasten • Cluster Dashboard". The URL is "Not secure 164.152.33.126:8000/k10/#/dashboard". The main content is a "Welcome to Kasten K10" screen. It displays a large text block of the "KASTEN END USER LICENSE AGREEMENT". Below the text are two input fields: "Email*" and "Company name*". A small note below the company name field states: "By submitting, you agree to receive information about Kasten by Veeam products, services, and events and to have your personal information managed in accordance with the terms of Kasten by Veeam's [Privacy Policy](#). You can unsubscribe at any time." At the bottom is a blue "Accept Terms" button.

```
# http://[Public IP]:8000/k10/#/dashboard
```

The screenshot shows the "Welcome to the K10 Dashboard" screen. The URL is "Not secure 164.152.33.126:8000/k10/#/dashboard". The dashboard has a dark theme. On the left is a sidebar with links: "Dashboard", "Applications", "Policies", "Profiles", "Blueprints", "Transform Sets", "Usage & Reports", "User Roles", "Settings", and "Get Support". The main area has three cards: "Applications" (1 discovered), "Policies" (0 managing resources), and "Data Usage" (0.0 B total backup data). Below these is an "Activity" section showing "No Actions" (Actions will appear here) and a chart of "Action Durations" with 0 seconds. At the bottom are summary metrics: total actions (0), completed actions (0), failed actions (0), skipped actions (0), avg duration (0 sec), live artifacts (1), and retired artifacts (0).

1. Criar Location Profile (Local onde o seu backup será armazenado)

Location > New Profile:

The screenshot shows the Kasten Location Profiles interface. On the left, there's a sidebar with options like Dashboard, Applications, Policies, Profiles (selected), Location (selected), Infrastructure, Blueprints, Bindings, Transform Sets, and Examples. The main area is titled "Location Profiles" and says "No Profiles". A "New Profile" button is visible. On the right, a "New Profile" dialog is open. It has fields for "Profile Name" (set to "ocibucket1"), "Storage Provider" (set to "S3 Compatible"), "S3 Access Key" (set to "7c7514ffe080173f80c8fb90bc28e61af21b117"), "S3 Secret" (redacted), "Endpoint" (set to "https://id3kyspytmyr.compat.objectstorage.sa-saopaulo-0.oraclecloud.com"), "Region" (set to "sa-saopaulo-1"), "Bucket" (set to "ocibucket1"), and "Enable Immutable Backups" (unchecked). At the bottom are "Save Profile" and "Cancel" buttons.

1.1 De um nome ao seu Profile, Exemplo: **ocibucket1**

1.2 Selecione: **S3 Compatible**

1.3 Insira a chave: **S3 Access Key**

1.4 Insira a senha: **S3 Secret**

1.5 Insira a URL: [https://\[namespace\].compat.objectstorage.\[region\].oraclecloud.com](https://[namespace].compat.objectstorage.[region].oraclecloud.com)

Então clique em Save Profile:

The screenshot shows the Kasten Location Profiles list. A green banner at the top says "Profile Created" and "Profile was created successfully." Below it, the "Location Profiles" section is shown with a table. The table has one row for the newly created profile "ocibucket1". The columns are CLOUD PROVIDER (Generic S3), REGION (sa-saopaulo-1), and BUCKET NAME (ocibucket1). The ENDPOINT is listed as "https://id3kyspytmyr.compat.objectstorage.sa-saopaulo-0.oraclecloud.com". The STATUS is "Valid". There are buttons for revalidate, yaml, edit, and delete.

2. Política de Backup da aplicação Criar Location Profile (Local onde o seu backup será armazenado)

Policies > Create New Policy:

The screenshot shows the Kasten Policies interface. On the left, a sidebar lists various management categories like Dashboard, Applications, Policies, Profiles, Location, Infrastructure, Blueprints, Bindings, Transform Sets, Examples, Usage & Reports, Data Usage, Reports, User Roles, Roles, Assignments, Settings, System Information, Licenses, Disaster Recovery, and Interface. The 'Policies' section is currently selected. In the main area, there's a 'Create New Policy' button and a search bar. A message says 'No Policies' and 'No policies have been created yet.' On the right, a 'New Policy' dialog is open. It has fields for 'Name' (set to 'hello'), 'Comments', 'Action' (radio button selected for 'Snapshot'), 'Backup Frequency' (radio button selected for 'Daily'), 'Select Applications' (radio button selected for 'By Name' and 'hello' is listed), and 'Select Application Resources' (radio button selected for 'All Resources'). At the bottom right of the dialog is a red-bordered 'Create Policy' button.

2.1 De um nome à sua política de backup, Exemplo **hello**

2.2 Seleciona a ação **Snapshot**

2.3 Selecione a frequência do Backup, Exemplo **Daily**

2.4 Selecione o namespace da sua aplicação: **hello**

2.5 Selecione o location, que é onde será armazenado seu backup: **ocibucket1**

Então clique em Create Policy:

The screenshot shows the Kasten Policies interface after the policy has been created. A green success message at the top center says 'Policy Created' and 'The policy hello was created successfully.' Below it, the 'Policies' section is displayed. A message states 'POLICY hello Valid' and 'Snapshot on-demand' with the note 'Use the location profile ocibucket1 for exporting data.' On the right side of the policy card, there are several buttons: 'invalidate', 'edit', 'get', 'run once' (which is highlighted with a red box), and 'delete'. The bottom right corner of the screen shows the text 'version 6.5.1'.

Após a criação da sua política de backup você pode executar o seu Backup clicando em **Run Once**

The screenshot shows the Kasten Cluster Dashboard. The left sidebar has a 'Dashboard' button highlighted. The main area has three cards: 'Applications' (2 discovered, 1 Compliant, 0 Non-Compliant, 1 Unmanaged), 'Policies' (1 Backup Policy, 0 Import Policies), and 'Data Usage' (0.0 B total backup data, 0 B Snapshots, 0 B Object Storage). Below these are sections for 'Activity' (Action Durations chart and summary) and 'Actions' (list of 42 actions, including a 'Policy Run' entry for 'hello' policy with status 'running').

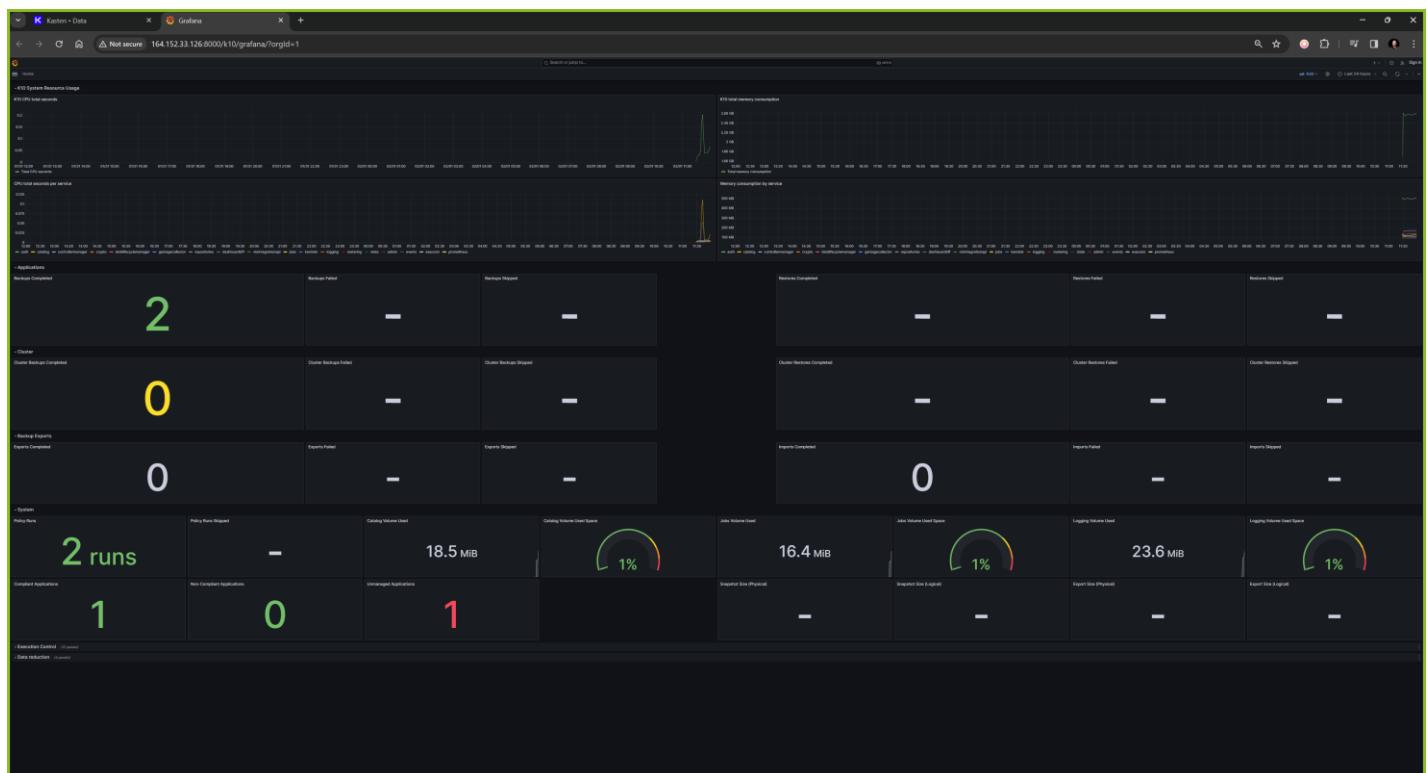
Após o Backup realizado você poderá verificar o status desta política de backup incluindo as ações que queira realizar, como por exemplo realizar o [Restore](#) da aplicação

The screenshot shows the Kasten Applications page. The left sidebar has an 'Applications' button highlighted. The main area shows a table of applications with columns: NAME, STATS, POLICY, and LAST BACKUP. Two applications are listed: 'default' (status: 1 Compliant, 1 Non-Compliant, 1 Unmanaged) and 'hello' (status: 1 Compliant). A context menu is open over the 'hello' application, with the 'Restore' option highlighted.

Adicionalmente é possível vc usar o Dashboard integrado do Grafana para visualizar seus backup de forma mais ampla, acesse em Usage & Reports > Data Usage:

The screenshot shows the 'Data Usage' dashboard from the Kasten interface. On the left, a sidebar menu includes 'Dashboard', 'Applications', 'Policies', 'Profiles', 'Blueprints', 'Transform Sets', 'Usage & Reports' (which is selected and highlighted with a red border), and 'Reports'. Below this is 'User Roles' and 'Get Support'. The main content area is titled 'Data Usage' and describes current and historical statistics about data being used by applications in the cluster. It features a chart titled 'Total Snapshot Storage' showing 0.0 B logical snapshots. A callout box in the top right corner says 'More Charts and Alerts' and 'Create your own dashboards using Grafana.' The URL in the browser bar is 164.152.33.126:8000/k10/#/data.

O seguinte Dashboard será apresentado sem a necessidade de qualquer configuração adicional



Habilitando o Kasten DR. Navegue em Settings > Disaster Recovery depois em Enable K10 DR

K10 Disaster Recovery

K10 Disaster Recover creates a policy that snapshots K10 data stores and exports to external storage using settings defined in the provided location profile.

Also, K10 DR requires a user-provided passphrase for encryption. This **passphrase has not yet been provided**. You will be prompted to provide one while K10 DR is being enabled.

Enable K10 DR

K10 DR

Location Profile
Select a location profile for exported K10 DR backups. When restoring K10 you will need to provide these credentials. **Please store them securely.**

ocibucket1
ocibucket1
S3, sa-saopaulo-1, "ocibucket1"

Raw Passphrase HashiCorp Vault

AWS Secrets Manager

Passphrase
A passphrase is required for encrypting the snapshot data. You will need to supply this passphrase if you perform a restore, so please **store this passphrase securely**.

 Somewhat strong passphrase

Enable K10 DR **Cancel**

Com a criação da configuração do DR é necessário guardar o cluster ID para o caso de restore das configurações:

The screenshot shows the Kasten K10 interface with the 'Disaster Recovery' tab selected. A prominent message states 'K10 Disaster Recovery is enabled.' Below it, a note says 'Save the cluster ID displayed below. It will be needed during the restore process.' A red box highlights the cluster ID 'd163acce-8abf-4202-8001-e814580ce1b6' which has a 'copy' button next to it. A 'Disable K10 DR' button is also visible.

Subindo o DR em um novo cluster kubernetes

Criar o namespace kasten-io:

```
Actions Network: Public
Cloud Shell
DANILo_DE_@cloudshell:~ (sa-saopaulo-1)$ kubectl create ns kasten-io
namespace/kasten-io created
DANILo_DE_@cloudshell:~ (sa-saopaulo-1)$
```

#kubectl create ns kasten-io

Criar uma secret da senha utilizada no DR:

```
Actions Network: Public
Cloud Shell
DANILo_DE_@cloudshell:~ (sa-saopaulo-1)$ kubectl create secret generic k10-dr-secret \
> --namespace kasten-io \
> --from-literal key=XXXXXXXXXX
secret/k10-dr-secret created
DANILo_DE_@cloudshell:~ (sa-saopaulo-1)$
```

#kubectl create secret generic k10-dr-secret --namespace kasten-io --from-literal key=XXXXXXXXXX

Instalando o Kasten:

```
DANILO_DE_@cloudshell:~ (sa-saopaulo-1)$ helm install k10 kasten/k10 --namespace=kasten-io
NAME: k10
LAST DEPLOYED: Thu Feb  1 18:52:27 2024
NAMESPACE: kasten-io
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
Thank you for installing Kasten's K10 Data Management Platform 6.0.12!

Documentation can be found at https://docs.kasten.io/.

How to access the K10 Dashboard:

To establish a connection to it use the following `kubectl` command:

`kubectl --namespace kasten-io port-forward service/gateway 8080:8000`

The Kasten dashboard will be available at: `http://127.0.0.1:8080/k10/#/`
DANILO_DE_@cloudshell:~ (sa-saopaulo-1)$
```

```
#helm install k10 kasten/k10 --namespace=kasten-io
```

Habilitar Load Balancer no service gateway do namespace kasten-io:

```
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$ kubectl patch svc gateway -n kasten-io -p '{"spec": {"type": "LoadBalancer"}}'
service/gateway patched
BRUNO_A_AN@cloudshell:~ (sa-saopaulo-1)$
```

```
# kubectl patch svc gateway -n kasten-io -p '{"spec": {"type": "LoadBalancer"}}'
```

Configurando o procedimento para a volta do DR (Profile → Location):

The screenshot shows the Kasten UI interface. On the left, there is a sidebar with various navigation options: Dashboard, Applications, Policies, Profiles (selected), Locations (highlighted with a red box), Infrastructure, Blueprints, Transform Sets, Usage & Reports, User Roles, Settings, System Information, Licenses, Disaster Recovery, and Interface. At the bottom left are Get Support and Copyright information.

The main area is titled "Location Profiles". It contains a sub-section "No Profiles" which says "No profiles have been created yet. Create a profile." Below this is a "New Profile" button.

A modal window titled "New Profile" is open on the right. It has several fields:

- Profile Name:** Only lowercase letters, numbers, dash, and dot
orcibucket1
- Storage Provider:** Radio buttons for Amazon S3, Azure Storage, Google Cloud Storage, NFS FileStore, and S3 Compatible (selected).
- S3 Access Key:** Text input field containing a long string of characters.
- S3 Secret:** Text input field with a masked password.
- Endpoint:** URL or domain of the S3 service API
https://id3kysplktmr.compat.objectstorage.sa-saopaulo
- Region:** The geography in which the bucket is located
sa-saopaulo-1
- Bucket:** The bucket must be created beforehand and the region must match.
orcibucket1

At the bottom of the modal are "Save Profile" and "Cancel" buttons.

Preencher os campos em vermelho

Provisionando o DR:



```
Actions Network: Public
Cloud Shell
BRUNO_A_AN@cloudshell:~ (sa-vinheiro-1)$ helm install k10-restore kasten/k10Restore --namespace=kasten-io \
> --set sourceClusterID=d163acce-8abf-4202-8001-e814580ce1b6 \
> --set profile.name=ocibucket1
NAME: k10-restore
LAST DEPLOYED: Thu Feb 1 21:06:00 2024
NAMESPACE: kasten-io
STATUS: deployed
REVISION: 1
TEST SUITE: None
BRUNO_A_AN@cloudshell:~ (sa-vinheiro-1)$
BRUNO_A_AN@cloudshell:~ (sa-vinheiro-1)$
```

```
#helm install k10-restore kasten/k10restore --namespace=kasten-io --set sourceClusterID=d163acce-xxxxxxxxxxxxxxxxxx --set profile.name=ocibucket1
```

Sua aplicação rodando com DR em outra região:

