Azure Kubernetes Backup

Create a Azure kubernetes cluster using azure AKS documnetation

```
export RANDOM_ID="$(openssl rand -hex 3)"
export MY_RESOURCE_GROUP_NAME="myAKSResourceGroup$RANDOM_ID"
export REGION="westeurope"
export MY_AKS_CLUSTER_NAME="myAKSCluster$RANDOM_ID"
export MY_DNS_LABEL="mydnslabel$RANDOM_ID"
```

Create a resource group using the az group create command

```
az group create --name $MY_RESOURCE_GROUP_NAME --location $REGION
```

Create an AKS cluster using the az aks create command

```
az aks create --resource-group $MY_RESOURCE_GROUP_NAME --name $MY_AKS_CLUSTER_NAME
--node-count 1 --generate-ssh-keys
```

Configure kubectl to connect to your Kubernetes cluster using the az aks get-credentials command

```
az aks get-credentials --resource-group $MY_RESOURCE_GROUP_NAME --name
$MY_AKS_CLUSTER_NAME
```

Verify the connection to your cluster using the kubectl get command

```
kubectl get nodes
```

```
admin@DESKTOP-H68VIGB MINGW64 ~
$ export RANDOM_ID="$(openssl rand -hex 3)"
export MY_RESOURCE_GROUP_NAME="myAKSResourceGroup$RANDOM_ID"
export REGION="eastus"
export MY_AKS_CLUSTER_NAME="myAKSCluster$RANDOM_ID"
export MY_DNS_LABEL="mydnslabel$RANDOM_ID"

admin@DESKTOP-H68VIGB MINGW64 ~
$ az group create --name $MY_RESOURCE_GROUP_NAME --location $REGION
{
  "id": "/subscriptions/22512797-4329-4234-a1c4-7871cd677624/resourceGroups/myAKSResourceGroupf3e498",
  "location": "eastus",
  "managedBy": null,
  "name": "myAKSResourceGroupf3e498",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}

admin@DESKTOP-H68VIGB MINGW64 ~
$ az aks create --resource-group $MY_RESOURCE_GROUP_NAME --name $MY_AKS_CLUSTER_NAME --node-count 1 --generate-ssh-keys
{
  "aadProfile": null,
  "addonProfiles": null,
  "agentPoolProfiles": [
    {
      "availabilityZones": null,
      "capacityReservationGroupId": null,
      "count": 1,
      "creationData": null,
      "currentOrchestratorVersion": "1.28.9",
      "enableAutoScaling": false,
```

```
admin@DESKTOP-H68VIGB MINGW64 ~
$ az aks get-credentials --resource-group $MY_RESOURCE_GROUP_NAME --name $MY_AKS_CLUSTER_NAME
Merged "myAKSClusterf3e498" as current context in C:\Users\admin\.kube\config

admin@DESKTOP-H68VIGB MINGW64 ~
$ kubectl get no
NAME                                STATUS   ROLES   AGE   VERSION
aks-nodepool1-18196644-vmss000000   Ready    agent   11m   v1.28.9
```

Apply the manifest file

craetiong pod and Persistant volume Claim

```yaml
---
apiVersion: v1
kind: Pod
metadata:
  name: mysql-pod
  labels:
    app: db
spec:
  containers:
    - name: nopdb
      image: mysql:8.0-debian
      env:
        - name: MYSQL_ROOT_PASSWORD
          value: admin123
        - name: MYSQL_DATABASE
          value: nop
        - name: MYSQL_USER
          value: ltdevops
        - name: MYSQL_PASSWORD
```

```
            value: admin123
        resources:
          limits:
            memory: 512Mi
            cpu: 1000m
        volumeMounts:
          - name: nop-vol
            mountPath: /var/lib/mysql
    volumes:
      - name: nop-vol
        persistentVolumeClaim:
          claimName: nop-pvc
---
apiVersion: v1
kind: PersistentVolumeClaim
metadata:
  name: nop-pvc
spec:
  accessModes:
    - ReadWriteOnce
  storageClassName: managed-csi
  resources:
    requests:
      storage: 1Gi
```

Apply the manifest file for Deplyment and Service

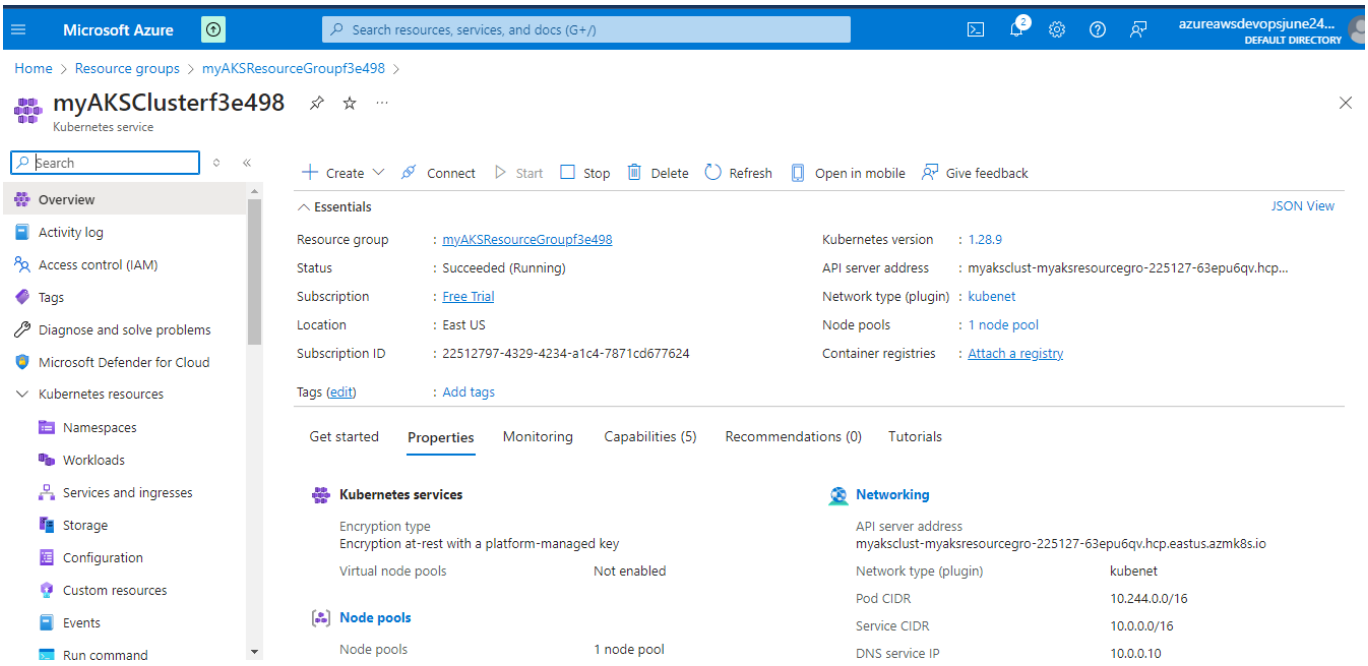
```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: nginx-deployment
  labels:
    app: nginx
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx
  template:
    metadata:
      labels:
        app: nginx
    spec:
      containers:
      - name: nginx
        image: nginx:1.14.2
        ports:
        - containerPort: 80
---
apiVersion: v1
kind: Service
```

```
  metadata:
    name: my-service
  spec:
    type: LoadBalancer
    selector:
      app: nginx
    ports:
      - port: 80
        targetPort: 80
```

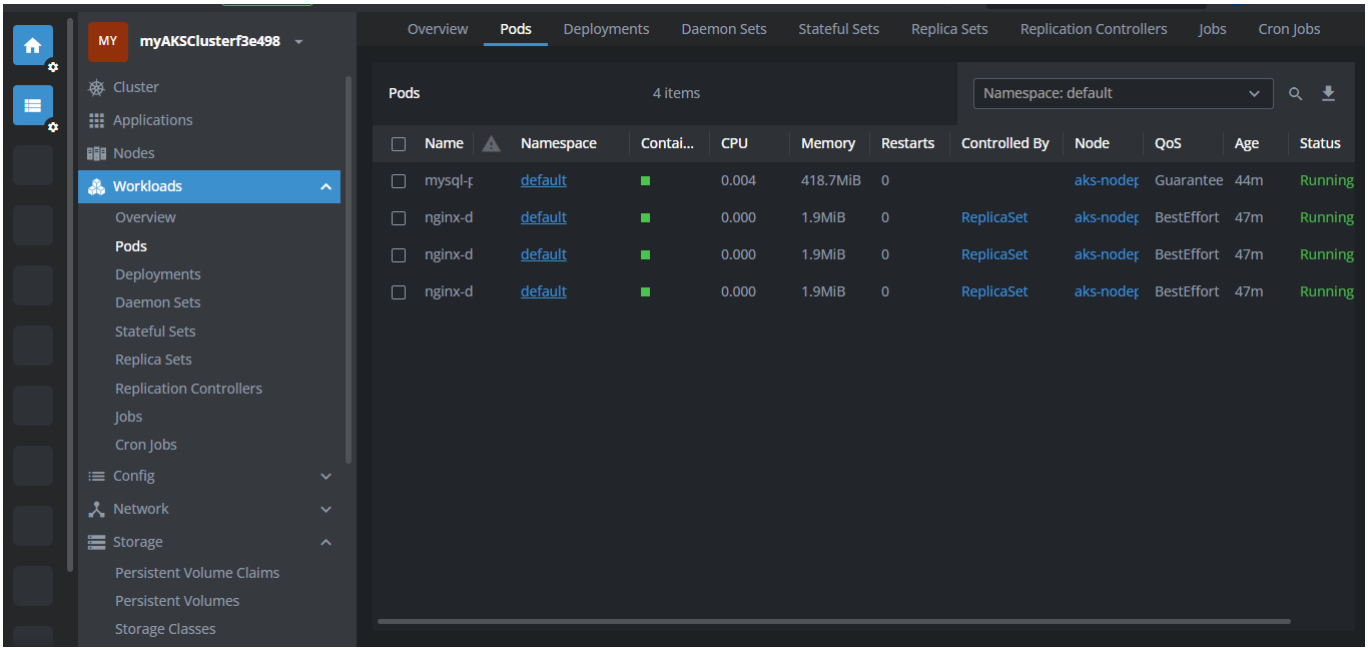
```
kubectl apply -f <fileName>
```

```
admin@DESKTOP-H68VIGB MINGW64 /d/tmp/test/k8s
$ vi test.yaml

admin@DESKTOP-H68VIGB MINGW64 /d/tmp/test/k8s
$ kubectl apply -f test.yaml
deployment.apps/nginx-deployment created
service/my-service created

admin@DESKTOP-H68VIGB MINGW64 /d/tmp/test/k8s
$ kubectl get po
NAME                                READY   STATUS    RESTARTS   AGE
nginx-deployment-86dcfdf4c6-l59j8   1/1     Running   0          7s
nginx-deployment-86dcfdf4c6-lx794   1/1     Running   0          7s
nginx-deployment-86dcfdf4c6-sdgrf   1/1     Running   0          7s

admin@DESKTOP-H68VIGB MINGW64 /d/tmp/test/k8s
$ kubectl get all
NAME                                    READY   STATUS    RESTARTS   AGE
pod/nginx-deployment-86dcfdf4c6-l59j8   1/1     Running   0          15s
pod/nginx-deployment-86dcfdf4c6-lx794   1/1     Running   0          15s
pod/nginx-deployment-86dcfdf4c6-sdgrf   1/1     Running   0          15s

NAME                 TYPE           CLUSTER-IP    EXTERNAL-IP    PORT(S)        AGE
service/kubernetes   ClusterIP      10.0.0.1      <none>         443/TCP        17m
service/my-service   LoadBalancer   10.0.98.191   51.8.235.123   80:31406/TCP   15s

NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/nginx-deployment    3/3     3            3           16s

NAME                                           DESIRED   CURRENT   READY   AGE
replicaset.apps/nginx-deployment-86dcfdf4c6    3         3         3       16s
```

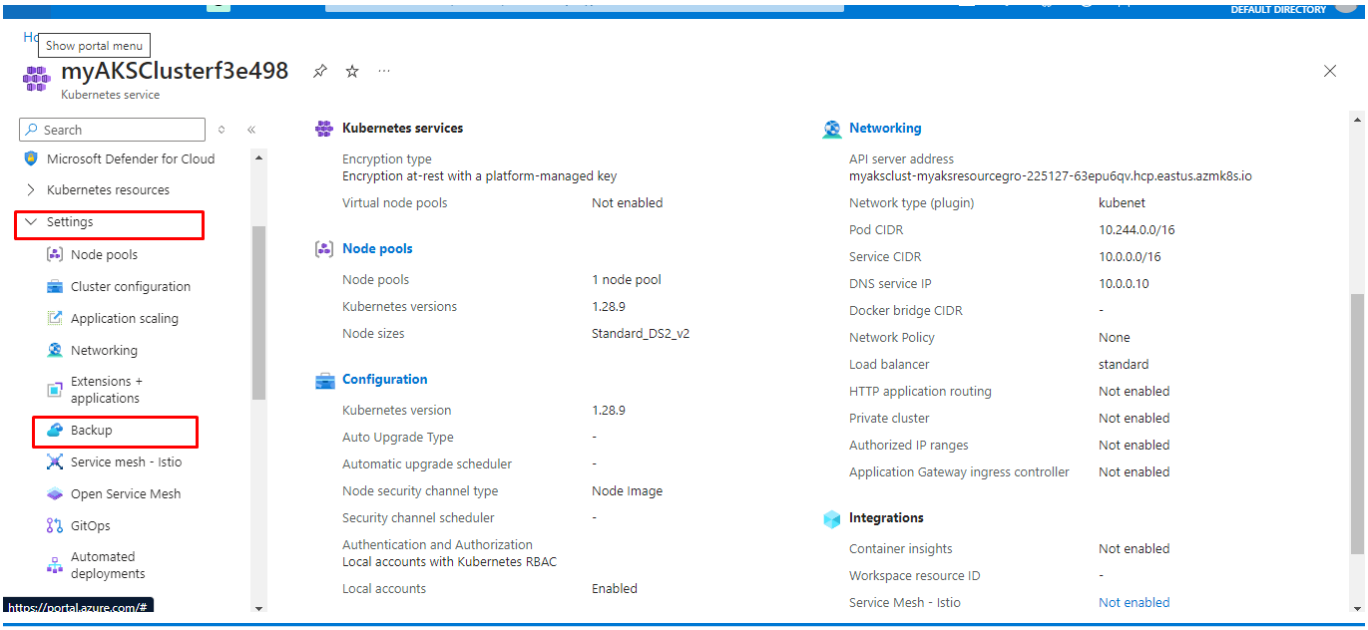
now check the azure portal

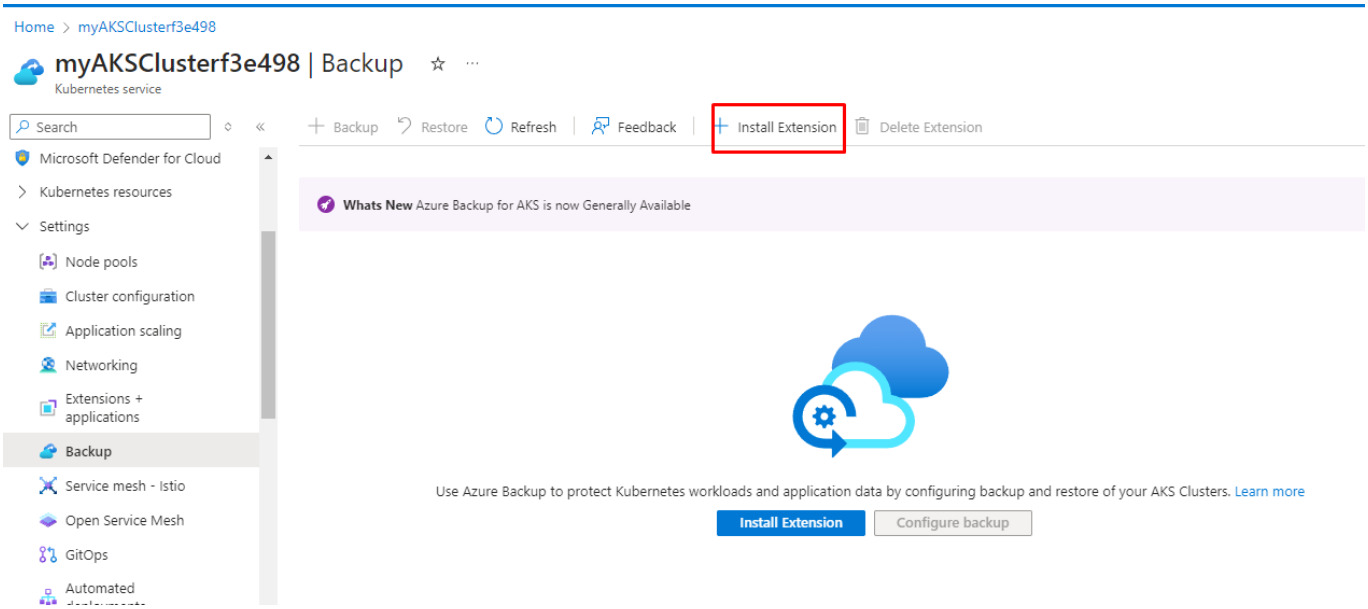


Connect to Lens to see the Cluster information



Now back up the k8s


Show portal menu
myAKSClusterf3e498
Kubernetes service
Search
Microsoft Defender for Cloud
Kubernetes resources
Settings
Node pools
Cluster configuration
Application scaling
Networking
Extensions + applications
Backup
Service mesh - Istio
Open Service Mesh
GitOps
Automated deployments
Kubernetes services
Encryption type
Encryption at-rest with a platform-managed key
Virtual node pools
Not enabled
Node pools
Node pools
1 node pool
Kubernetes versions
1.28.9
Node sizes
Standard_DS2_v2
Configuration
Kubernetes version
1.28.9
Auto Upgrade Type
-
Automatic upgrade scheduler
-
Node security channel type
Node Image
Security channel scheduler
-
Authentication and Authorization
Local accounts with Kubernetes RBAC
Local accounts
Enabled
Networking
API server address
myaksclust-myaksresourcegro-225127-63epu6qv.hcp.eastus.azmk8s.io
Network type (plugin)
kubenet
Pod CIDR
10.244.0.0/16
Service CIDR
10.0.0.0/16
DNS service IP
10.0.0.10
Docker bridge CIDR
-
Network Policy
None
Load balancer
standard
HTTP application routing
Not enabled
Private cluster
Not enabled
Authorized IP ranges
Not enabled
Application Gateway ingress controller
Not enabled
Integrations
Container insights
Not enabled
Workspace resource ID
-
Service Mesh - Istio
Not enabled


Home > myAKSClusterf3e498
myAKSClusterf3e498 | Backup
Kubernetes service
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Backup
Service mesh - Istio
Open Service Mesh
GitOps
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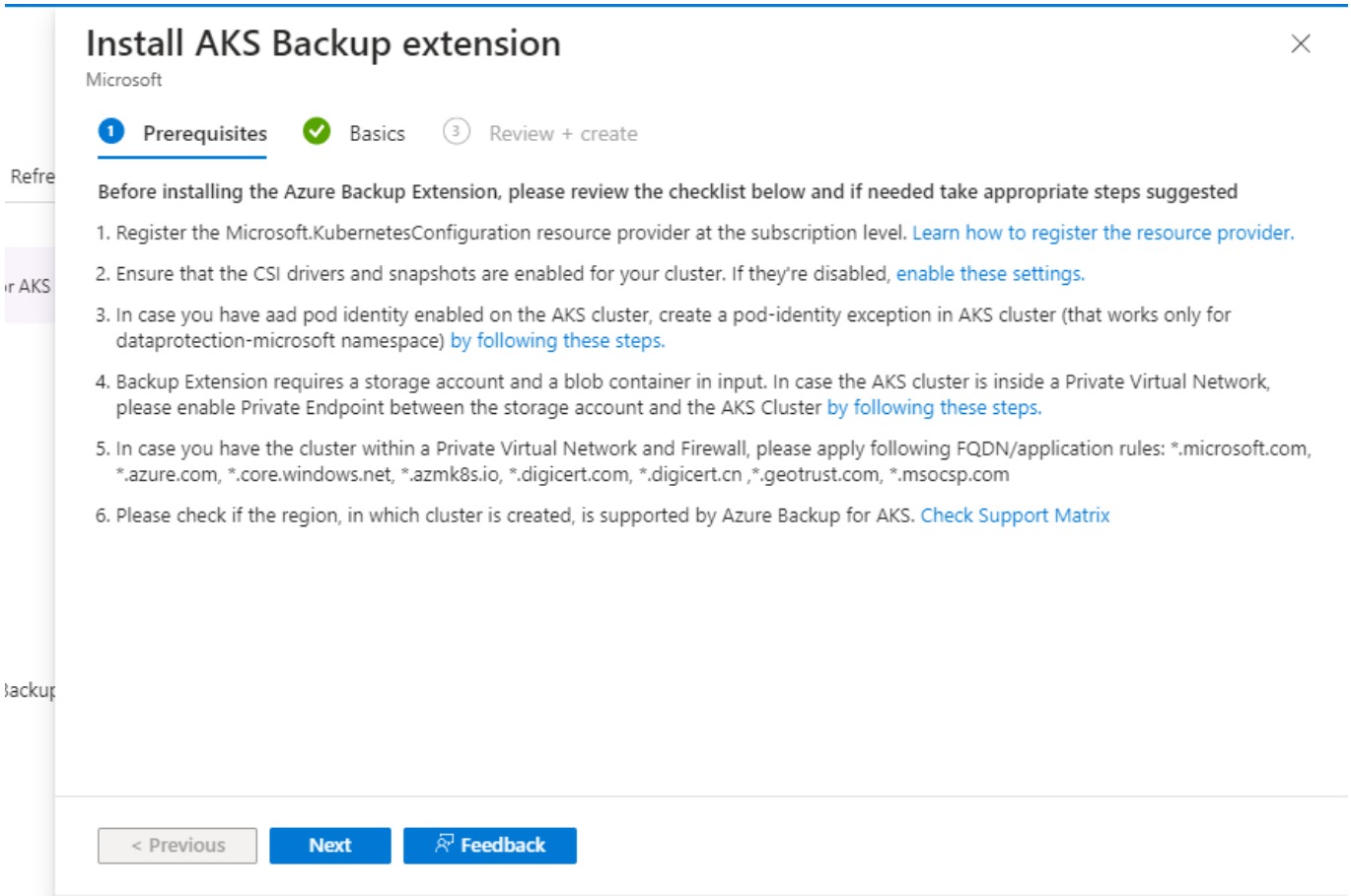
Backup
Restore
Refresh
Feedback
Install Extension
Delete Extension
Whats New Azure Backup for AKS is now Generally Available
Use Azure Backup to protect Kubernetes workloads and application data by configuring backup and restore of your AKS Clusters. Learn more
Install Extension
Configure backup


Install AKS Backup extension
Microsoft
1 Prerequisites
Basics
3 Review + create
Before installing the Azure Backup Extension, please review the checklist below and if needed take appropriate steps suggested
1. Register the Microsoft.KubernetesConfiguration resource provider at the subscription level. Learn how to register the resource provider.
2. Ensure that the CSI drivers and snapshots are enabled for your cluster. If they're disabled, enable these settings.
3. In case you have aad pod identity enabled on the AKS cluster, create a pod-identity exception in AKS cluster (that works only for dataprotection-microsoft namespace) by following these steps.
4. Backup Extension requires a storage account and a blob container in input. In case the AKS cluster is inside a Private Virtual Network, please enable Private Endpoint between the storage account and the AKS Cluster by following these steps.
5. In case you have the cluster within a Private Virtual Network and Firewall, please apply following FQDN/application rules: *.microsoft.com, *.azure.com, *.core.windows.net, *.azmk8s.io, *.digicert.com, *.digicert.cn ,*.geotrust.com, *.msocsp.com
6. Please check if the region, in which cluster is created, is supported by Azure Backup for AKS. Check Support Matrix
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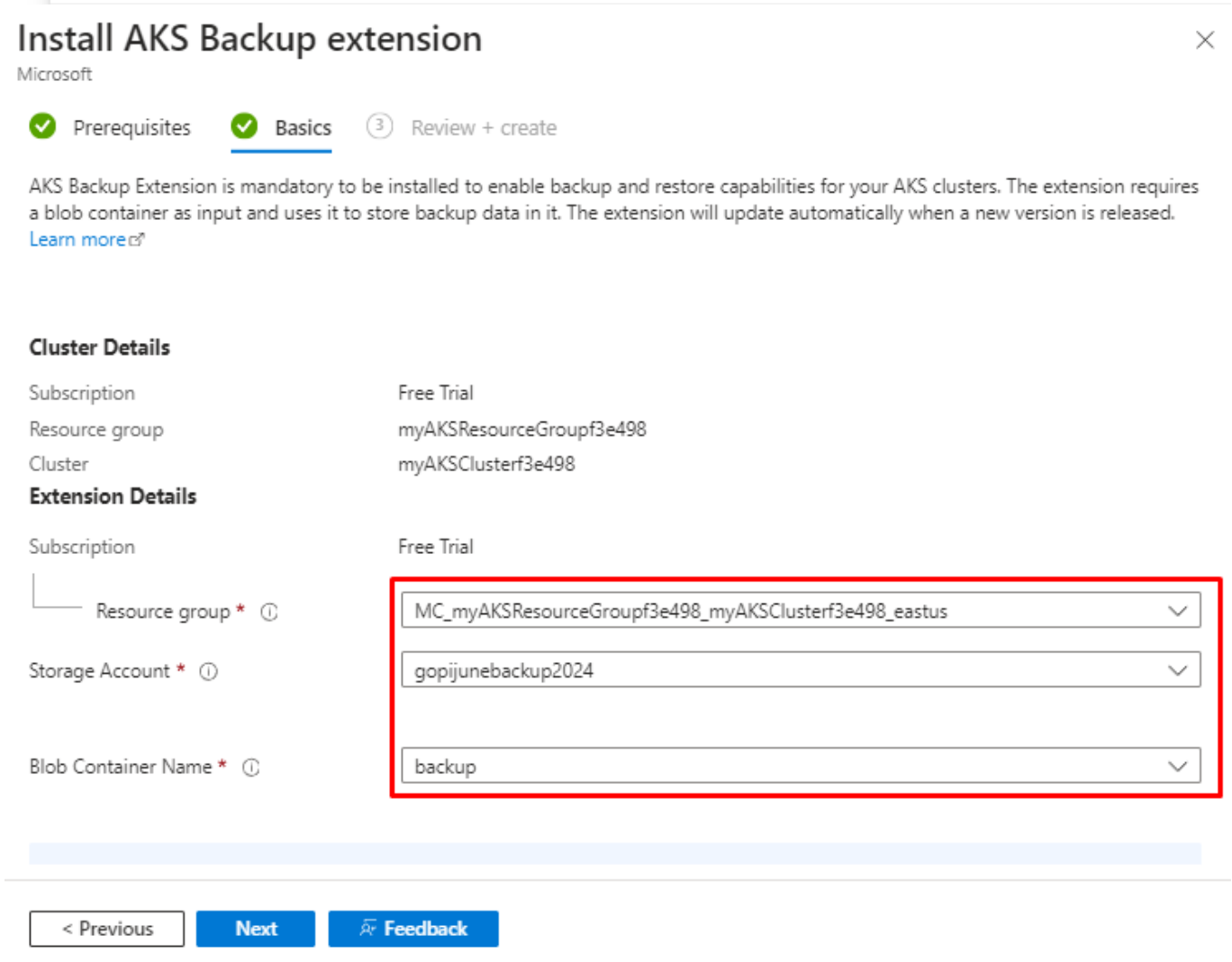
Install AKS Backup extension
Microsoft
Prerequisites
Basics
3 Review + create
AKS Backup Extension is mandatory to be installed to enable backup and restore capabilities for your AKS clusters. The extension requires a blob container as input and uses it to store backup data in it. The extension will update automatically when a new version is released.
Learn more
Cluster Details
Subscription Free Trial
Resource group myAKSResourceGroupf3e498
Cluster myAKSClusterf3e498
Extension Details
Subscription Free Trial
Resource group * MC_myAKSResourceGroupf3e498_myAKSClusterf3e498_eastus
Storage Account * gopijunebackup2024
Blob Container Name * backup
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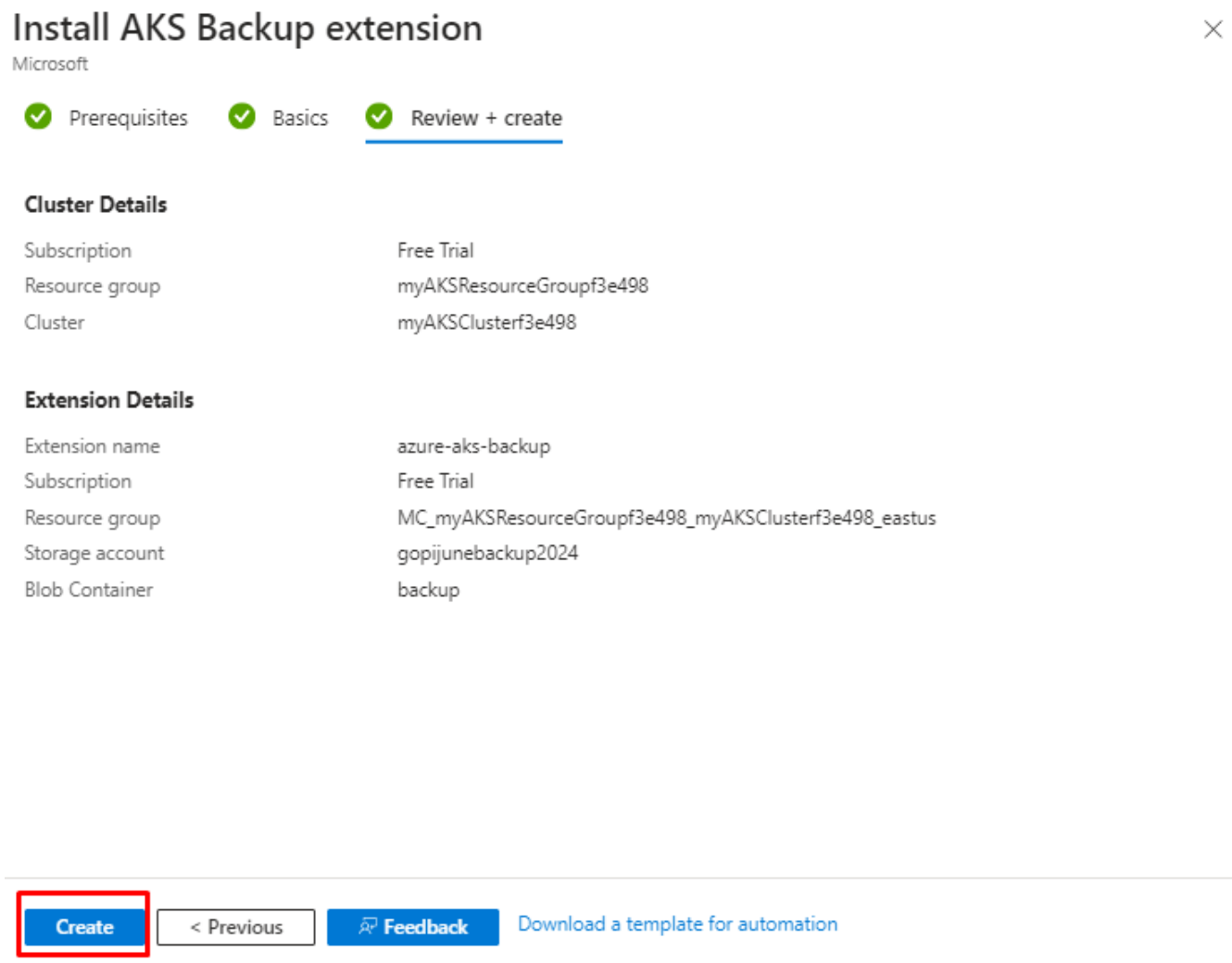
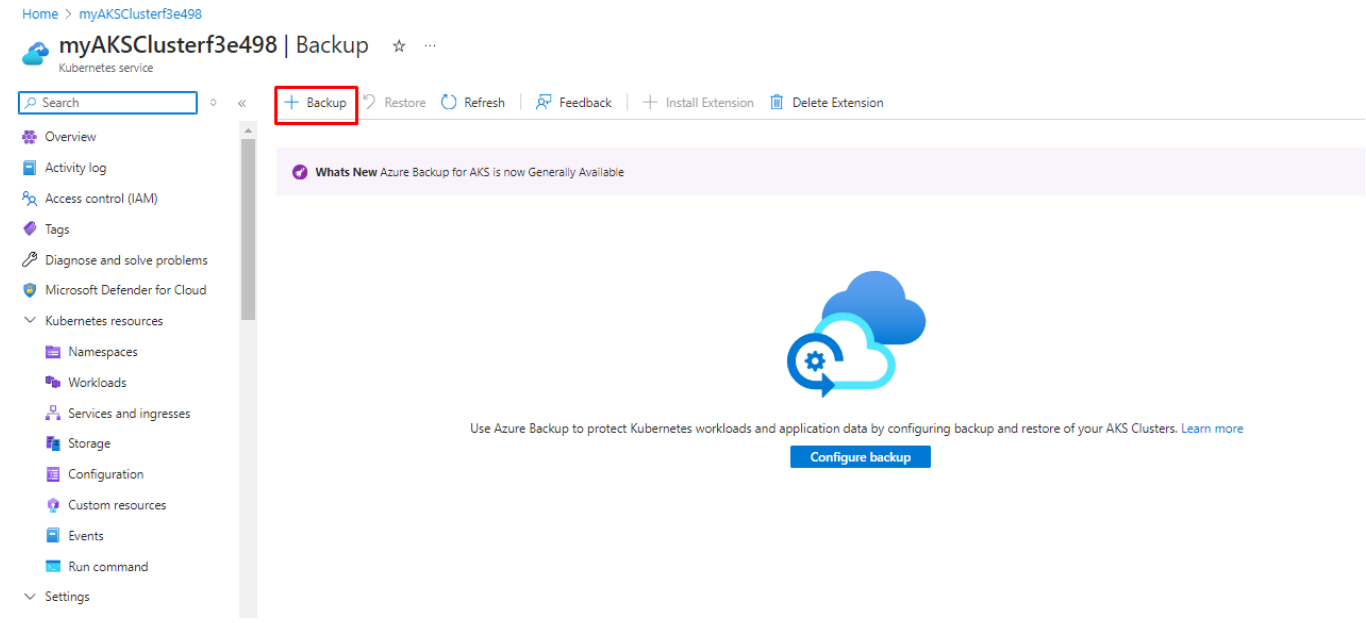


instalation is completed and click on backup and give the necessary values


Home > myAKSClusterf3e498
myAKSClusterf3e498 | Backup
Kubernetes service
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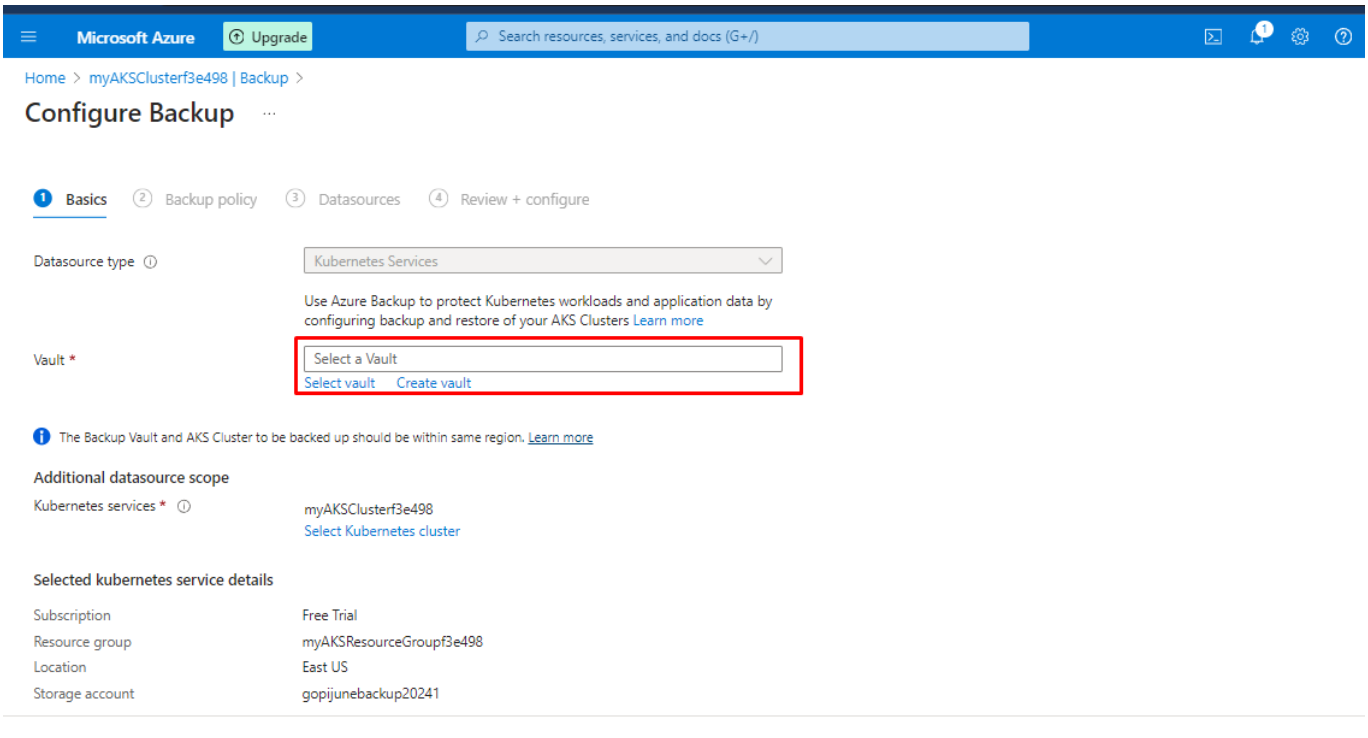
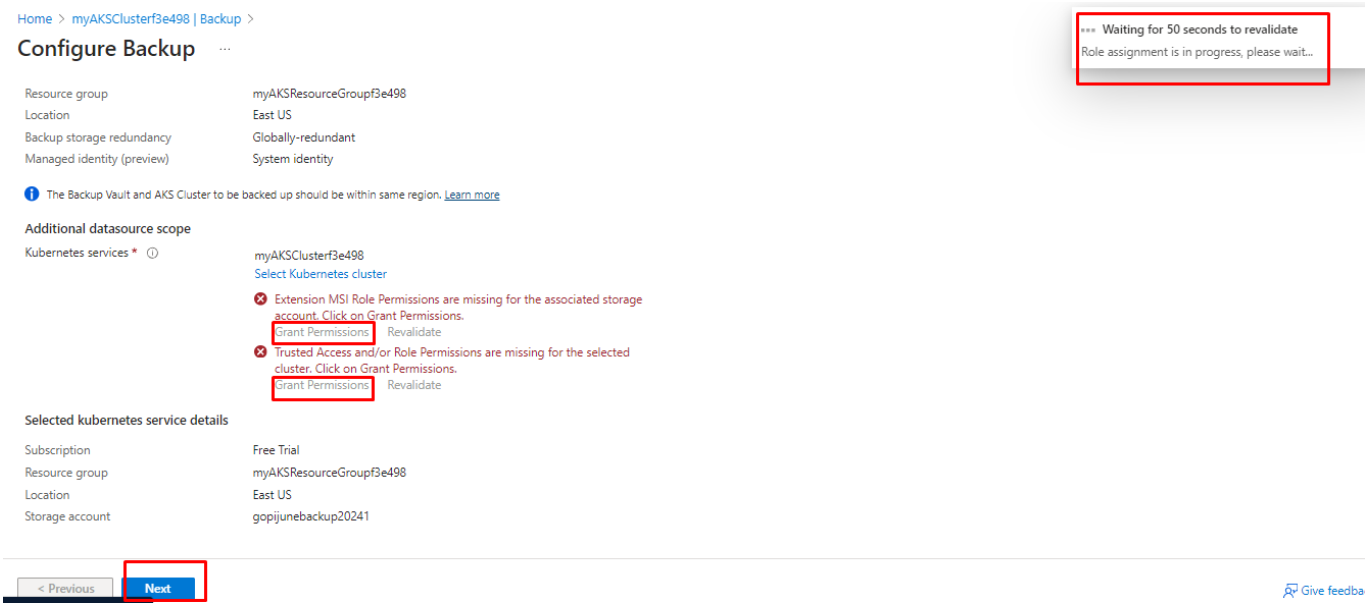
Install Extension
Delete Extension
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Microsoft Defender for Cloud
Kubernetes resources
Namespaces
Workloads
Services and ingresses
Storage
Configuration
Custom resources
Events
Run command
Settings
Whats New Azure Backup for AKS is now Generally Available
Use Azure Backup to protect Kubernetes workloads and application data by configuring backup and restore of your AKS Clusters. Learn more
Configure backup


Microsoft Azure
Upgrade
Search resources, services, and docs (G+/)
Home > myAKSClusterf3e498 | Backup >
Configure Backup
Basics
Backup policy
Datasources
Review + configure
Datasource type
Kubernetes Services
Use Azure Backup to protect Kubernetes workloads and application data by configuring backup and restore of your AKS Clusters Learn more
Vault *
Select a Vault
Select vault
Create vault
The Backup Vault and AKS Cluster to be backed up should be within same region. Learn more
Additional datasource scope
Kubernetes services *
myAKSClusterf3e498
Select Kubernetes cluster
Selected kubernetes service details
Subscription
Free Trial
Resource group
myAKSResourceGroupf3e498
Location
East US
Storage account
gopijunebackup20241
< Previous
Next


Home > myAKSClusterf3e498 | Backup >
Configure Backup
Waiting for 50 seconds to revalidate
Role assignment is in progress, please wait...
Resource group
myAKSResourceGroupf3e498
Location
East US
Backup storage redundancy
Globally-redundant
Managed identity (preview)
System identity
The Backup Vault and AKS Cluster to be backed up should be within same region. Learn more
Additional datasource scope
Kubernetes services *
myAKSClusterf3e498
Select Kubernetes cluster
Extension MSI Role Permissions are missing for the associated storage account. Click on Grant Permissions.
Grant Permissions
Revalidate
Trusted Access and/or Role Permissions are missing for the selected cluster. Click on Grant Permissions.
Grant Permissions
Revalidate
Selected kubernetes service details
Subscription
Free Trial
Resource group
myAKSResourceGroupf3e498
Location
East US
Storage account
gopijunebackup20241
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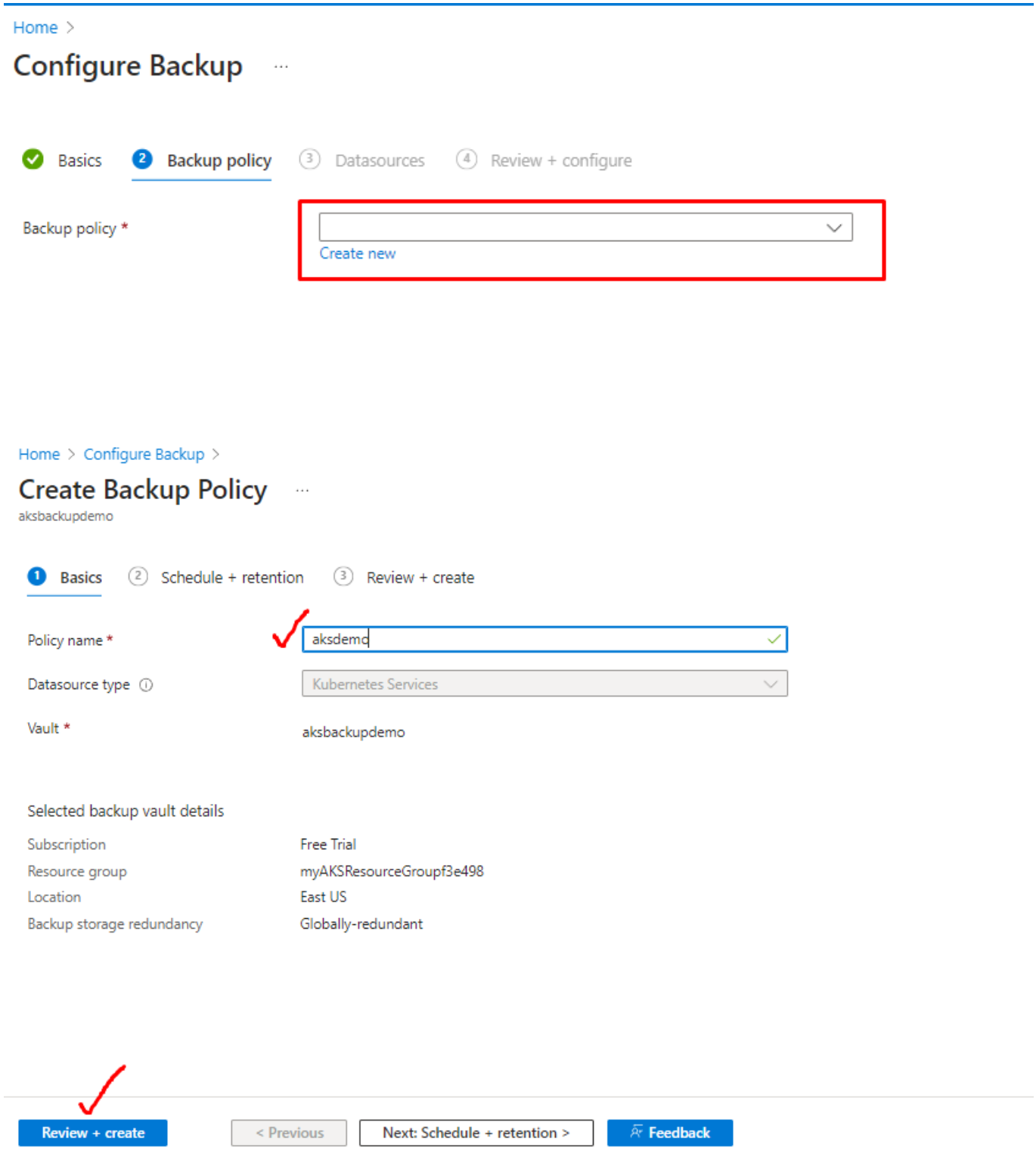
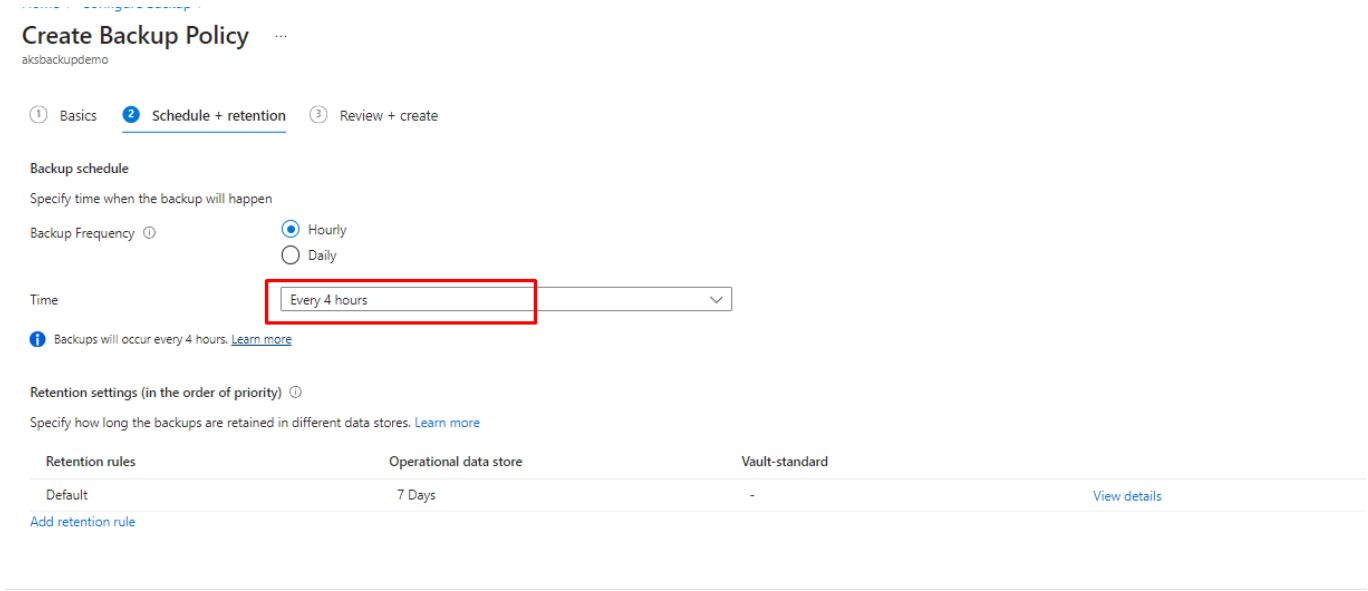
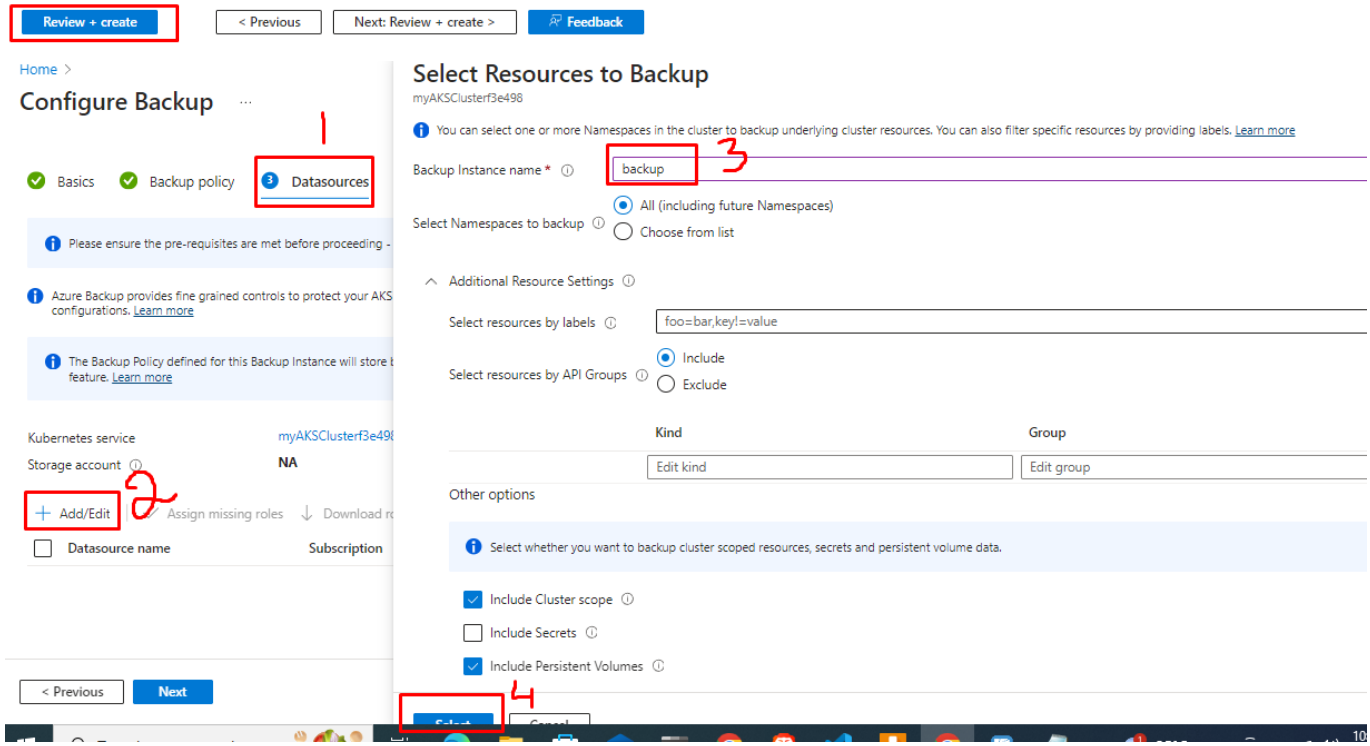
Give feedba

Create a backup policy




Create Backup Policy
aksbackupdemo
1 Basics
2 Schedule + retention
3 Review + create
Backup schedule
Specify time when the backup will happen
Backup Frequency
Hourly
Daily
Time
Every 4 hours
Backups will occur every 4 hours. Learn more
Retention settings (in the order of priority)
Specify how long the backups are retained in different data stores. Learn more
Retention rules
Operational data store
Vault-standard
Default
7 Days
-
View details
Add retention rule


Review + create
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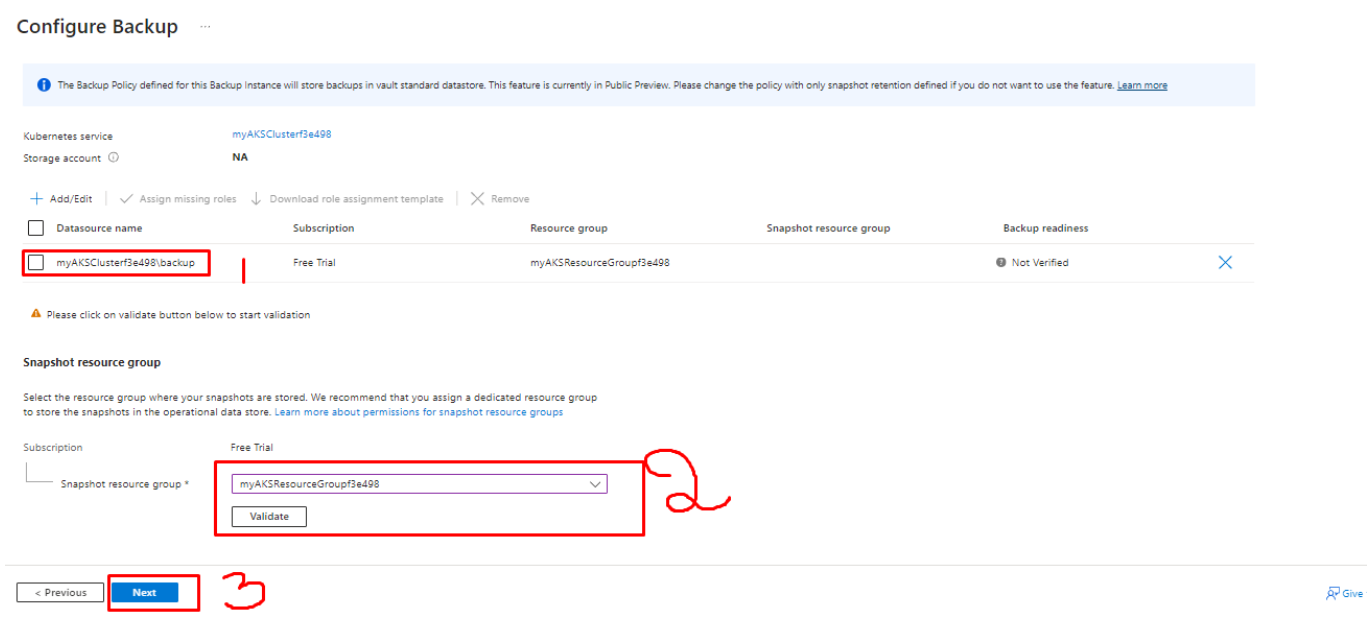
Next: Review + create >
Feedback
Home
Configure Backup
1
Basics
Backup policy
3 Datasources
Please ensure the pre-requisites are met before proceeding -
Azure Backup provides fine grained controls to protect your AKS configurations. Learn more
The Backup Policy defined for this Backup Instance will store b feature. Learn more
Kubernetes service
myAKSClusterf3e49
Storage account
NA
2
Add/Edit
Assign missing roles
Download r
Datasource name
Subscription
< Previous
Next
Select Resources to Backup
myAKSClusterf3e498
You can select one or more Namespaces in the cluster to backup underlying cluster resources. You can also filter specific resources by providing labels. Learn more
Backup Instance name *
backup
3
Select Namespaces to backup
All (including future Namespaces)
Choose from list
Additional Resource Settings
Select resources by labels
foo=bar,key!=value
Select resources by API Groups
Include
Exclude
Kind
Group
Edit kind
Edit group
Other options
Select whether you want to backup cluster scoped resources, secrets and persistent volume data.
Include Cluster scope
Include Secrets
Include Persistent Volumes
4
Select
Cancel


Configure Backup
The Backup Policy defined for this Backup Instance will store backups in vault standard datastore. This feature is currently in Public Preview. Please change the policy with only snapshot retention defined if you do not want to use the feature. Learn more
Kubernetes service
myAKSClusterf3e498
Storage account
NA
Add/Edit
Assign missing roles
Download role assignment template
Remove
Datasource name
Subscription
Resource group
Snapshot resource group
Backup readiness
myAKSClusterf3e498\backup
Free Trial
myAKSResourceGroupf3e498
Not Verified
1
Please click on validate button below to start validation
Snapshot resource group
Select the resource group where your snapshots are stored. We recommend that you assign a dedicated resource group to store the snapshots in the operational data store. Learn more about permissions for snapshot resource groups
Subscription
Free Trial
Snapshot resource group *
myAKSResourceGroupf3e498
Validate
2
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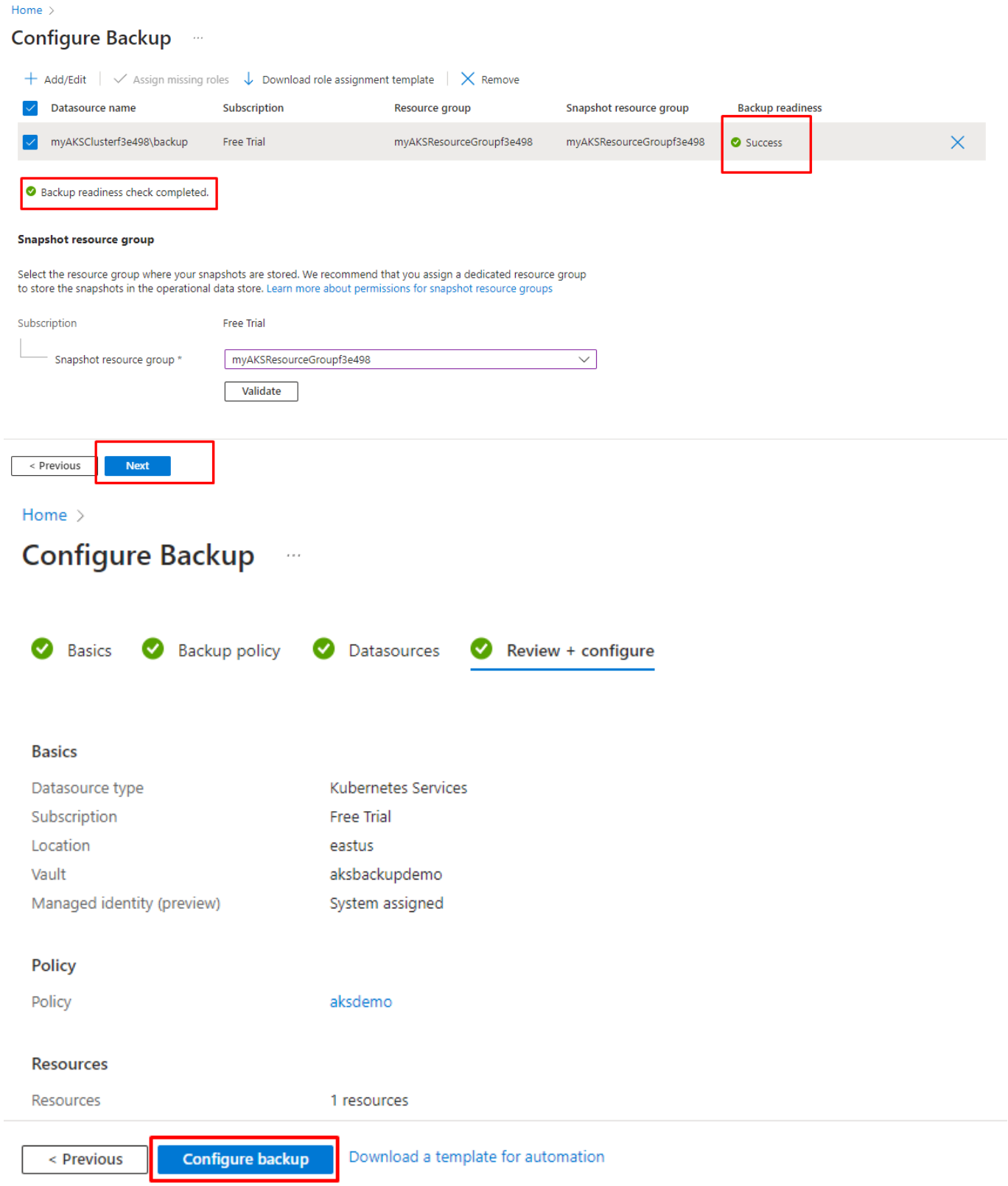
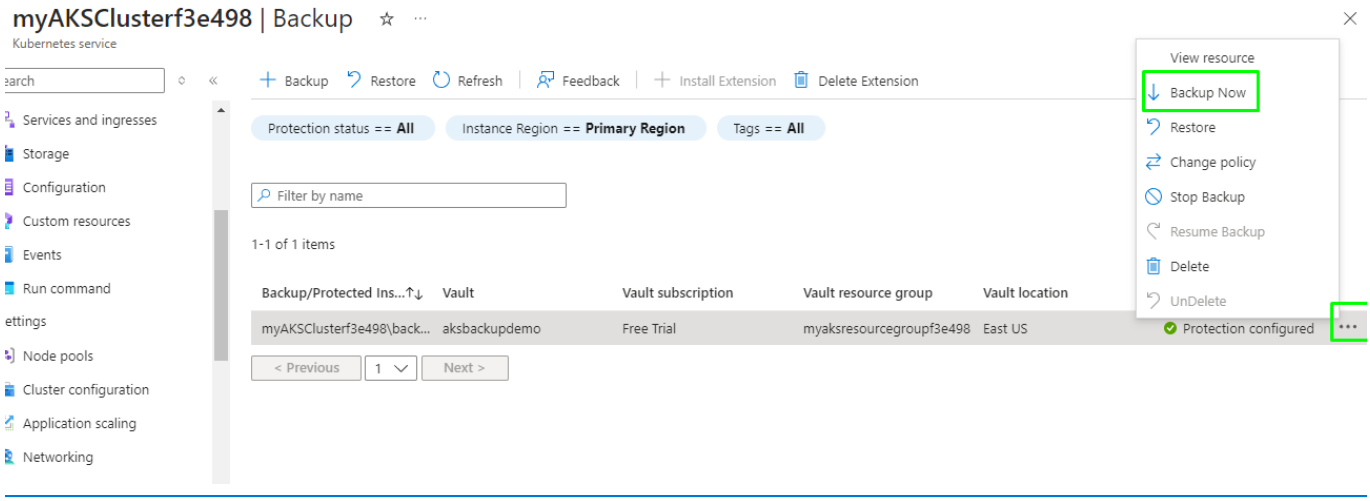
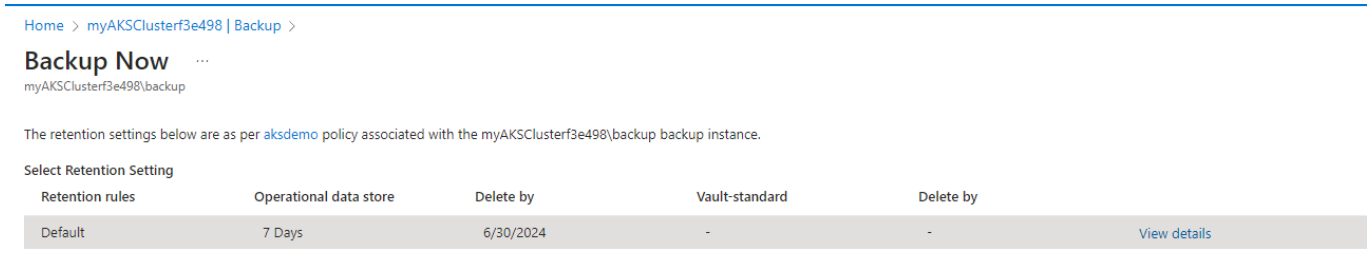
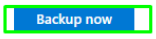
3
Give



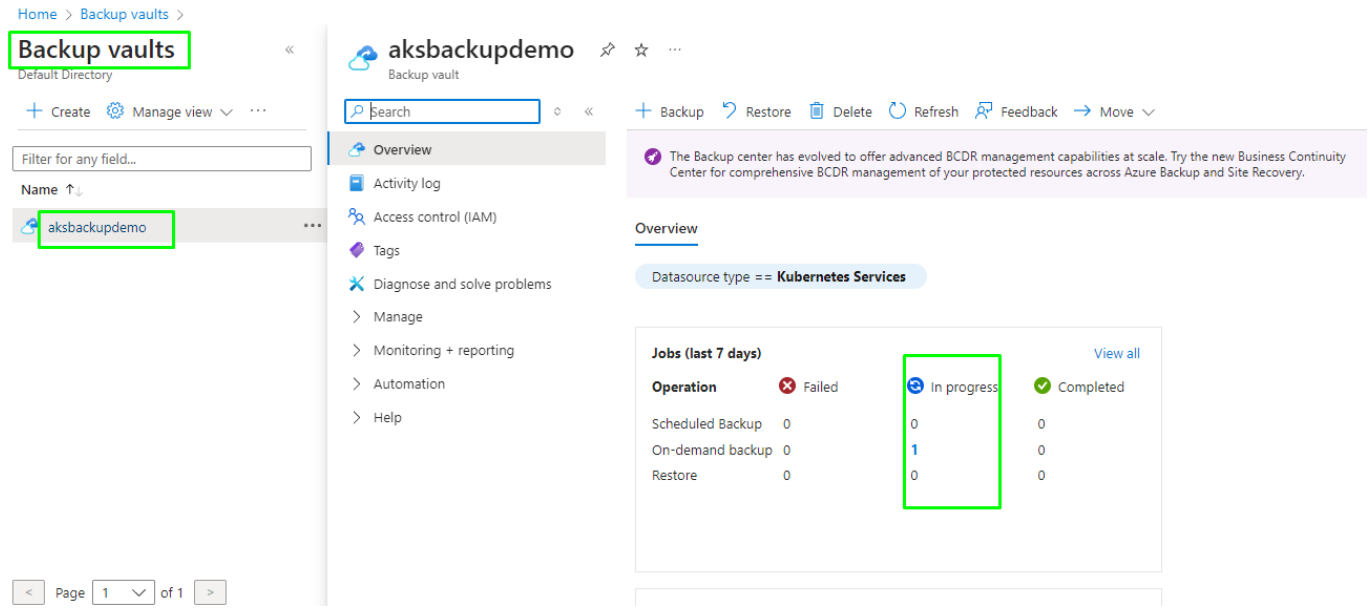
Now Backup the cluster



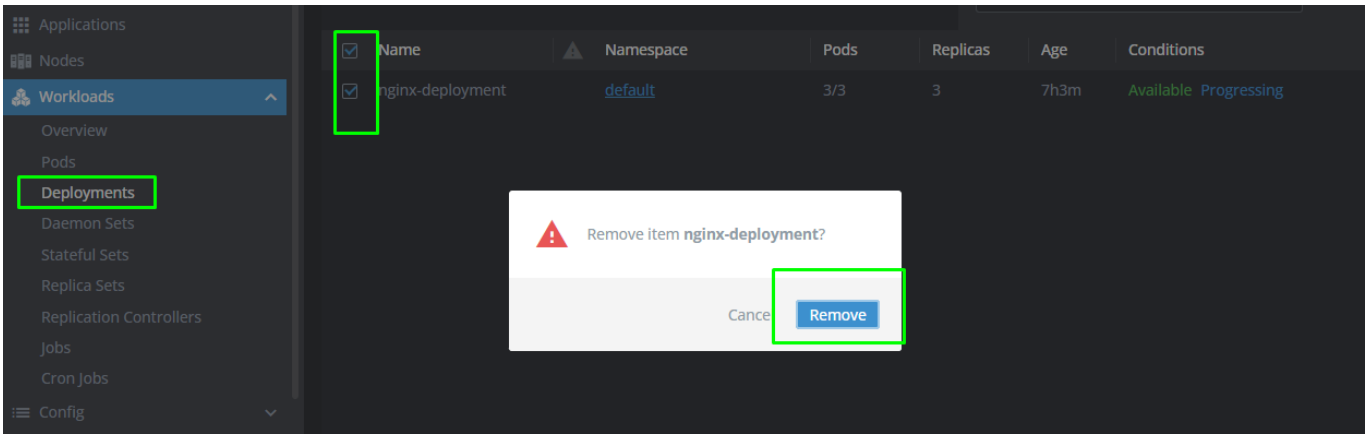


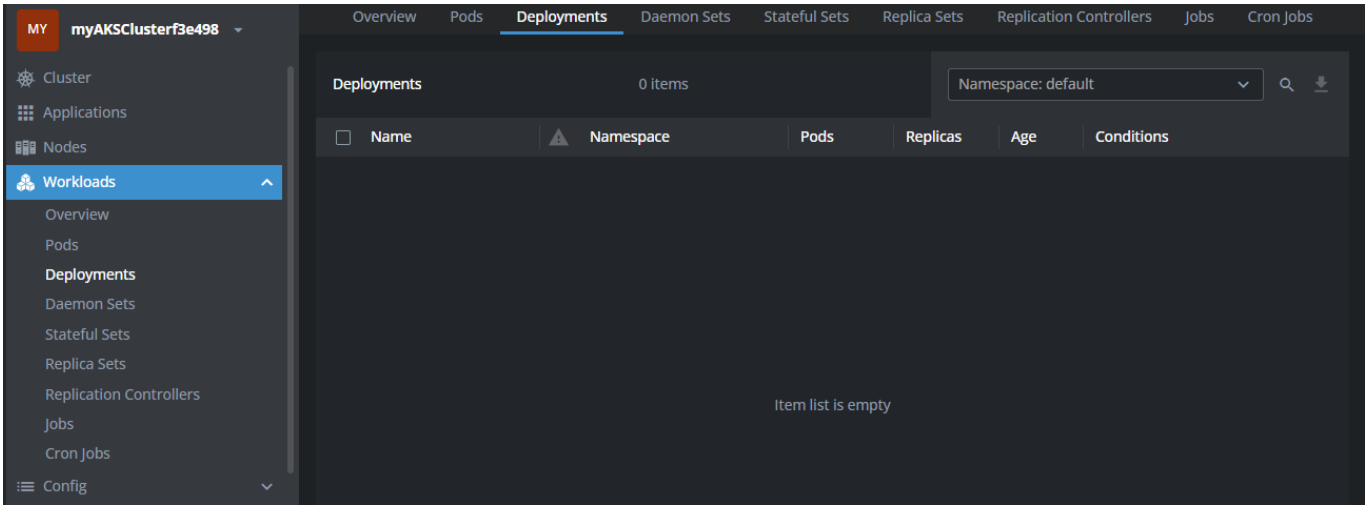


Check the backup status

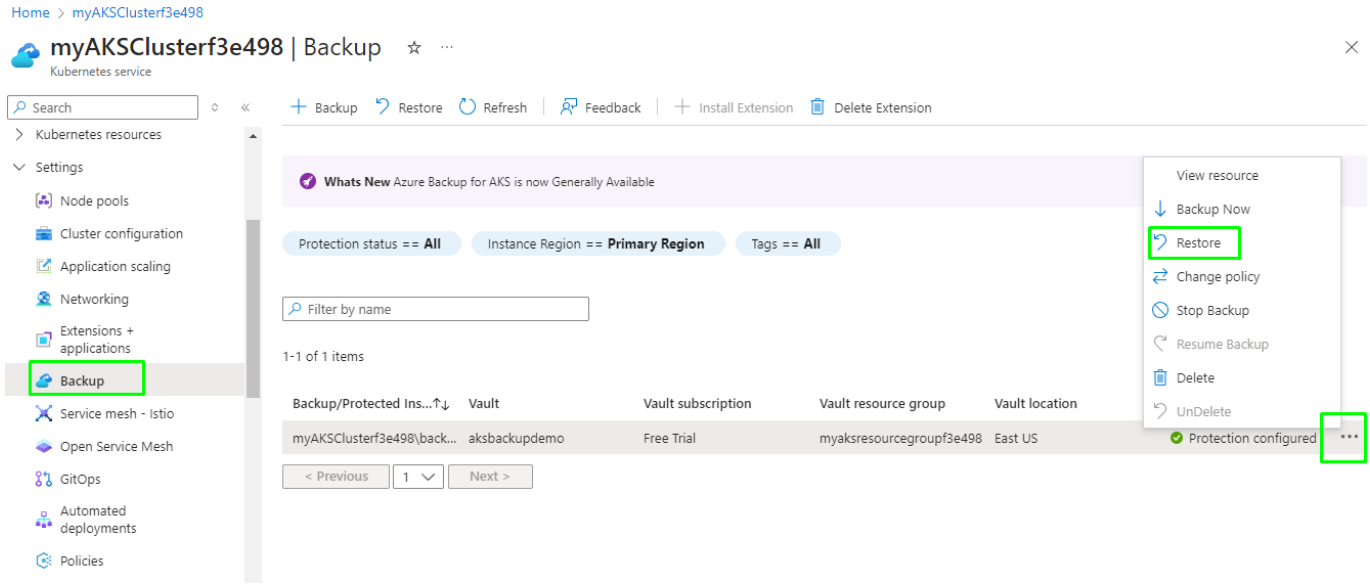


Select the Deployment and delete the Deployment





To Restore the Deployment


Home > myAKSClusterf3e498
myAKSClusterf3e498 | Backup
Kubernetes service
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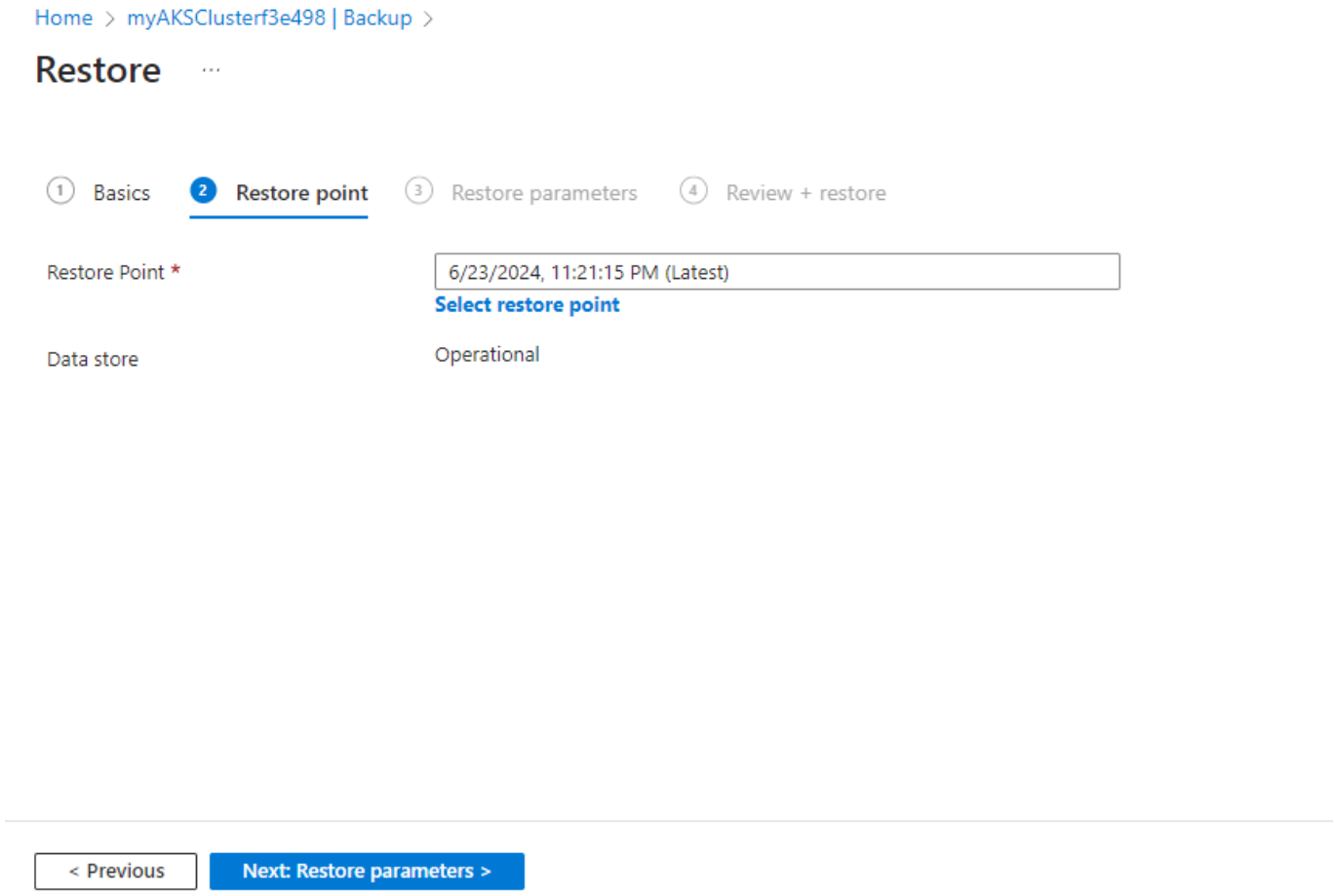
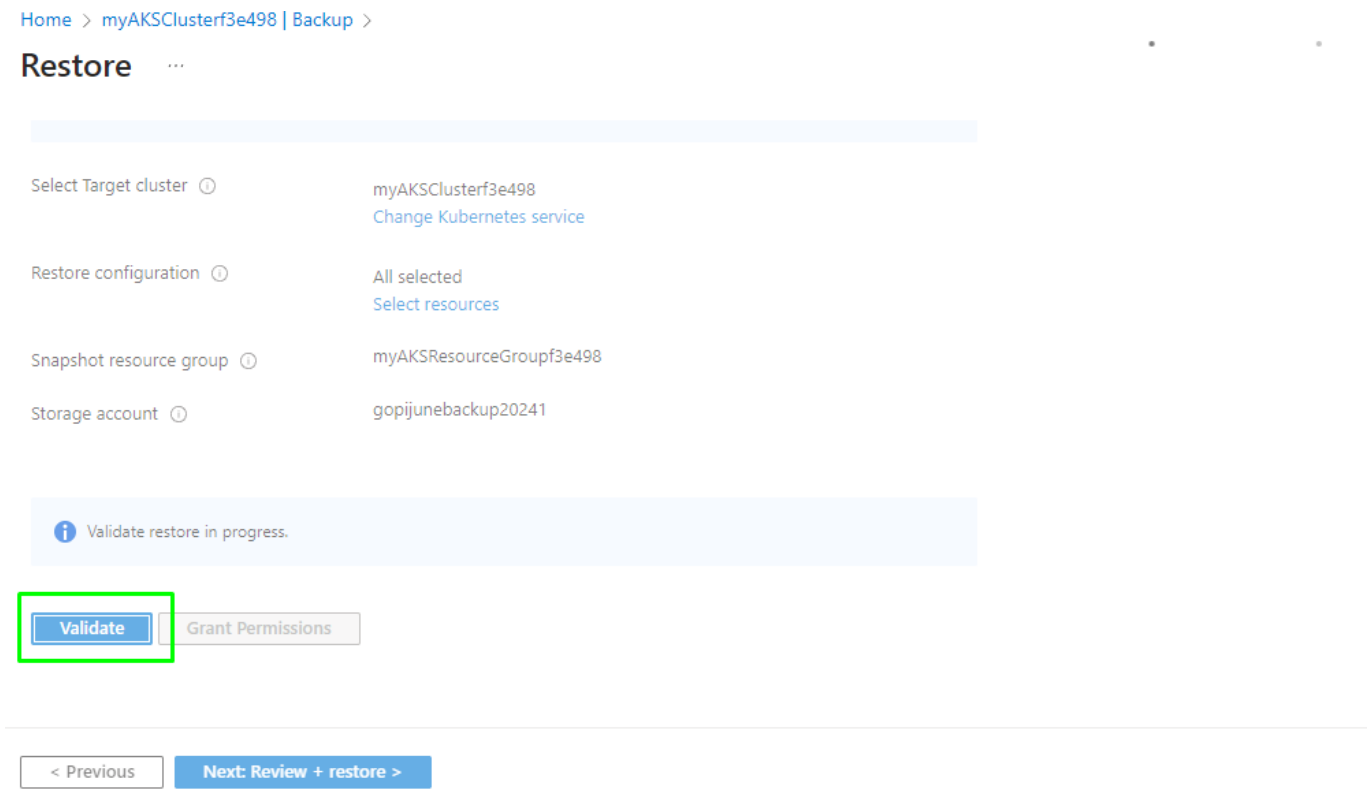
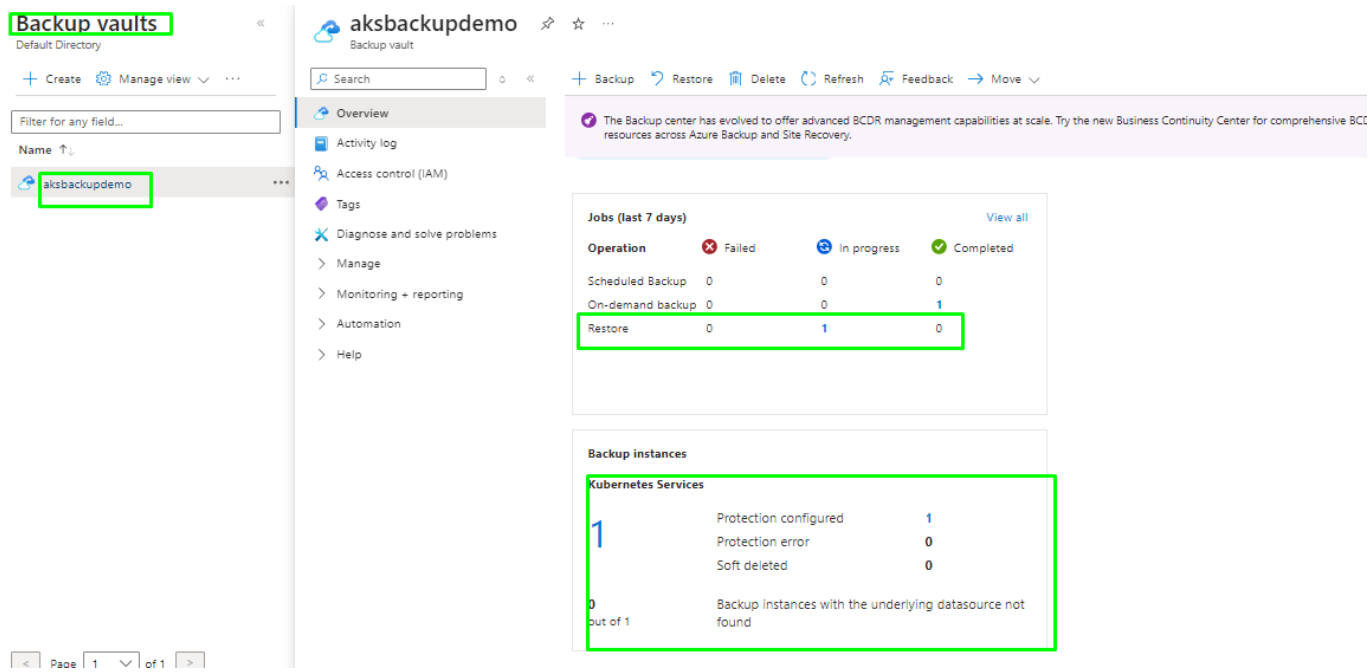
Node pools
Cluster configuration
Application scaling
Networking
Extensions + applications
Backup
Service mesh - Istio
Open Service Mesh
GitOps
Automated deployments
Policies
Backup
Restore
Refresh
Feedback
Install Extension
Delete Extension
Whats New Azure Backup for AKS is now Generally Available
Protection status == All
Instance Region == Primary Region
Tags == All
Filter by name
1-1 of 1 items
Backup/Protected Ins...
Vault
Vault subscription
Vault resource group
Vault location
myAKSClusterf3e498\back...
aksbackupdemo
Free Trial
myaksresourcegroupf3e498
East US
Protection configured
< Previous
1
Next >
View resource
Backup Now
Restore
Change policy
Stop Backup
Resume Backup
Delete
UnDelete

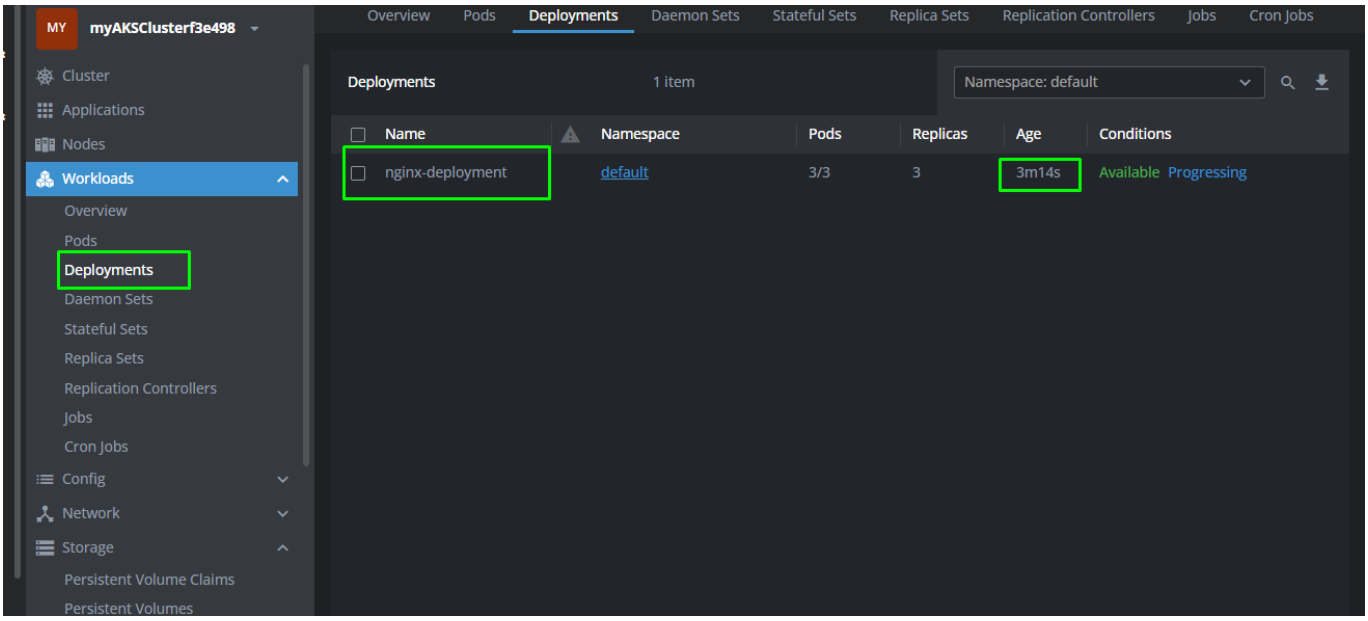

Home > myAKSClusterf3e498 | Backup >
Restore
1 Basics
2 Restore point
3 Restore parameters
4 Review + restore
Restore Point *
6/23/2024, 11:21:15 PM (Latest)
Select restore point
Data store
Operational
< Previous
Next: Restore parameters >



Check the restore process => go to backup vaults and select the vault



Completed the Restore check the Deployment



Delete the Resource group

```
az group delete --name $MY_RESOURCE_GROUP_NAME --no-wait --yes
```