WHY K8S CAN'T GET AROUND FINOPS

Manuela Latz | FinOps Analyst

Vanessa Kantner | FinOps Manager

intro
speakers

REPLY LIQUID

vanessa kantner

FinOps manager

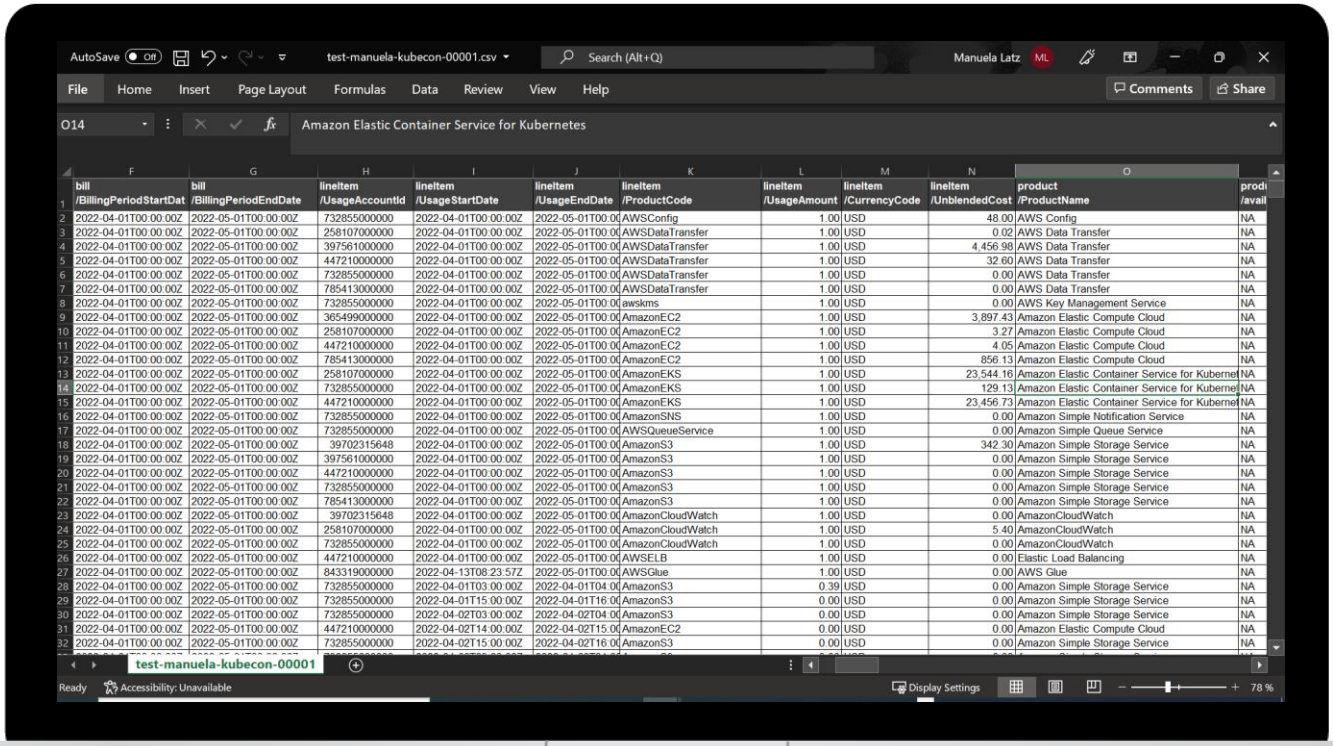
vanessa-kantner

manuela latz

FinOps analyst

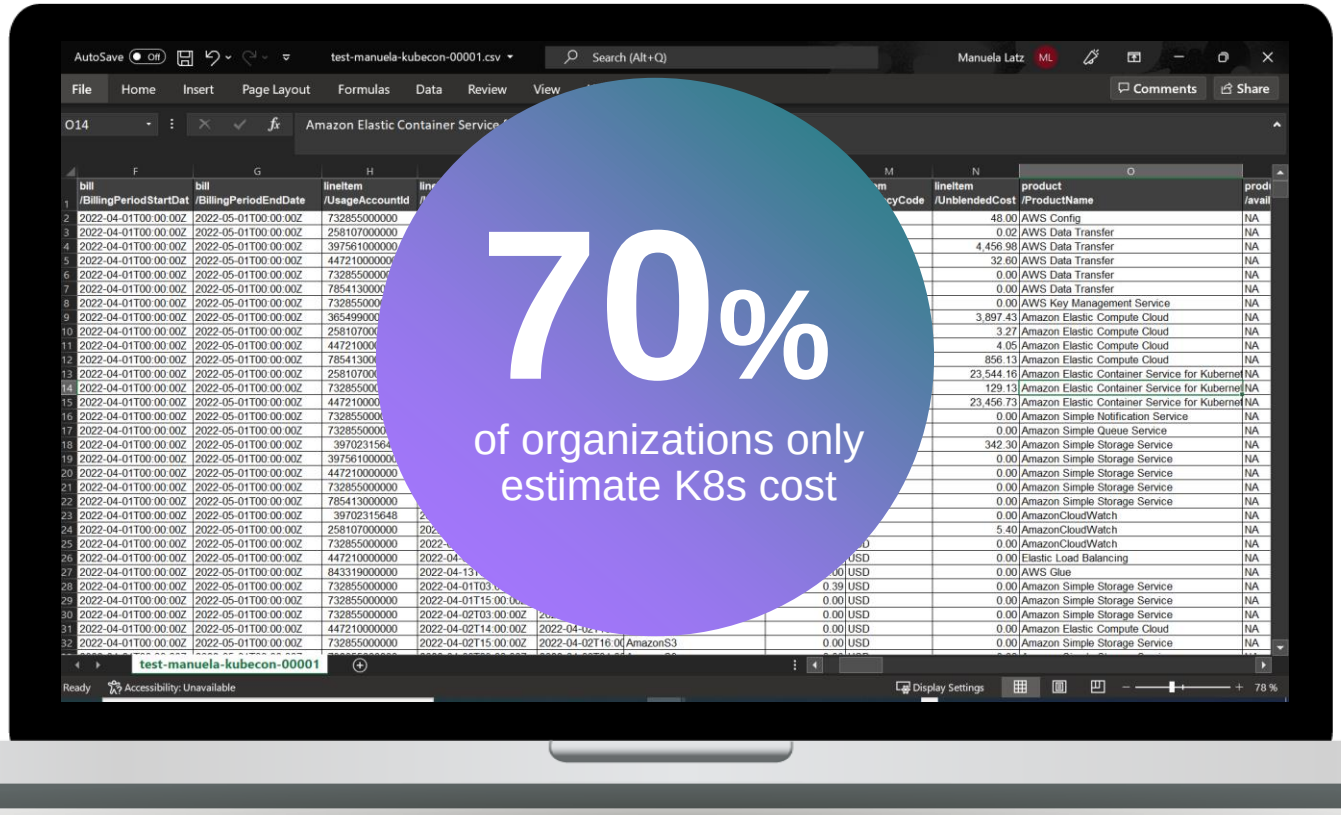
manuela-latz

intro
speakers



	F	G	H	I	J	K	L	M	N	O	
1	bill /BillingPeriodStartDat	bill /BillingPeriodEndDate	lineItem /UsageAccountId	lineItem /UsageStartDate	lineItem /UsageEndDate	lineItem /ProductCode	lineItem /UsageAmount	lineItem /CurrencyCode	lineItem /UnblendedCost	product /ProductName	prodi /avail
2	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSConfig	1.00	USD	48.00	AWS Config	NA
3	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	258107000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSDataTransfer	1.00	USD	0.02	AWS Data Transfer	NA
4	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	397561000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSDataTransfer	1.00	USD	4,456.98	AWS Data Transfer	NA
5	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSDataTransfer	1.00	USD	32.60	AWS Data Transfer	NA
6	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSDataTransfer	1.00	USD	0.00	AWS Data Transfer	NA
7	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	785413000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSDataTransfer	1.00	USD	0.00	AWS Data Transfer	NA
8	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	awskms	1.00	USD	0.00	AWS Key Management Service	NA
9	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	365499000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEC2	1.00	USD	3,897.43	Amazon Elastic Compute Cloud	NA
10	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	258107000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEC2	1.00	USD	3.27	Amazon Elastic Compute Cloud	NA
11	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEC2	1.00	USD	4.05	Amazon Elastic Compute Cloud	NA
12	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	785413000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEC2	1.00	USD	856.13	Amazon Elastic Compute Cloud	NA
13	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	258107000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEKS	1.00	USD	23,544.16	Amazon Elastic Container Service for Kubernet	NA
14	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEKS	1.00	USD	129.13	Amazon Elastic Container Service for Kubernet	NA
15	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonEKS	1.00	USD	23,456.73	Amazon Elastic Container Service for Kubernet	NA
16	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonSNS	1.00	USD	0.00	Amazon Simple Notification Service	NA
17	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSQueueService	1.00	USD	0.00	Amazon Simple Queue Service	NA
18	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	39702315648	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonS3	1.00	USD	342.30	Amazon Simple Storage Service	NA
19	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	397561000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonS3	1.00	USD	0.00	Amazon Simple Storage Service	NA
20	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonS3	1.00	USD	0.00	Amazon Simple Storage Service	NA
21	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonS3	1.00	USD	0.00	Amazon Simple Storage Service	NA
22	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	785413000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonS3	1.00	USD	0.00	Amazon Simple Storage Service	NA
23	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	39702315648	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonCloudWatch	1.00	USD	0.00	AmazonCloudWatch	NA
24	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	258107000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonCloudWatch	1.00	USD	5.40	AmazonCloudWatch	NA
25	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AmazonCloudWatch	1.00	USD	0.00	AmazonCloudWatch	NA
26	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-01T00:00:00Z	2022-05-01T00:0(	AWSELB	1.00	USD	0.00	Elastic Load Balancing	NA
27	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	843319000000	2022-04-13T08:23:57Z	2022-05-01T00:0(	AWSGlue	1.00	USD	0.00	AWS Glue	NA
28	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T03:00:00Z	2022-04-01T04:0(	AmazonS3	0.39	USD	0.00	Amazon Simple Storage Service	NA
29	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-01T15:00:00Z	2022-04-01T16:0(	AmazonS3	0.00	USD	0.00	Amazon Simple Storage Service	NA
30	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-02T03:00:00Z	2022-04-02T04:0(	AmazonS3	0.00	USD	0.00	Amazon Simple Storage Service	NA
31	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	447210000000	2022-04-02T14:00:00Z	2022-04-02T15:0(	AmazonEC2	0.00	USD	0.00	Amazon Elastic Compute Cloud	NA
32	2022-04-01T00:00:00Z	2022-05-01T00:00:00Z	732855000000	2022-04-02T15:00:00Z	2022-04-02T16:0(	AmazonS3	0.00	USD	0.00	Amazon Simple Storage Service	NA

intro
speakers



70%

of organizations only estimate K8s cost

intro
goals

FinOps purpose – why K8s can’t get around FinOps?

K8s FinOps goals – how to gain cost transparency and control?

K8s FinOps practice – how to implement FinOps in your daily doing?

why **K8s** can’t get around FinOps

back then

cost producer = cost manager

new normal

engineers produce cost

business and finance manage costs and approve budgets

info

FinOps

FinOps is an evolving cloud financial management discipline and cultural practice that

helps
breaking silos

increase
business value

enables
spending decisions

Source: FinOps Foundation

FinOps questions

How efficient is a
project/unit/application/…?

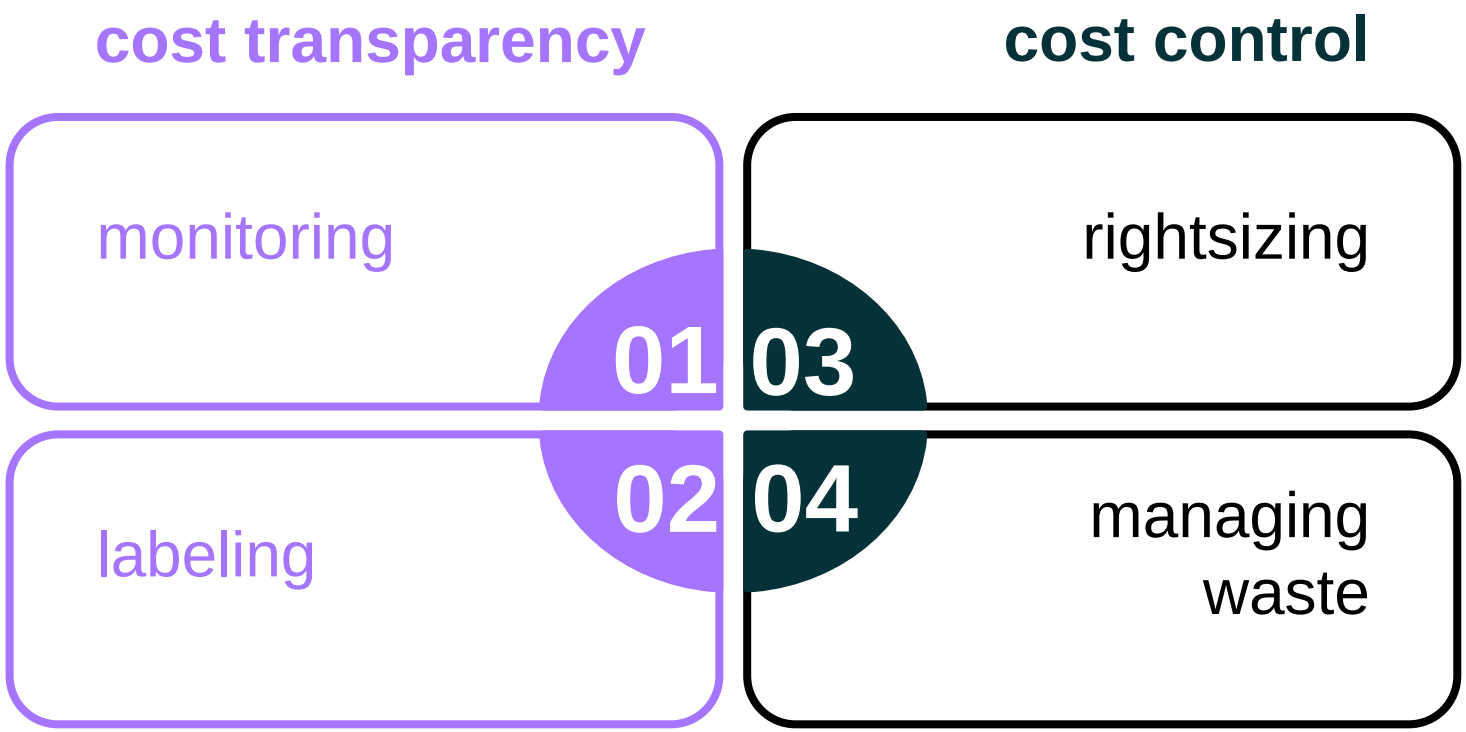
What are the top spending drivers
per environment/cluster/namespace/pod/…?

What is used
when and by what and is it needed?

What and where and with whom
can we start optimizing?

how to gain cost transparency and control

FinOps
how to’s



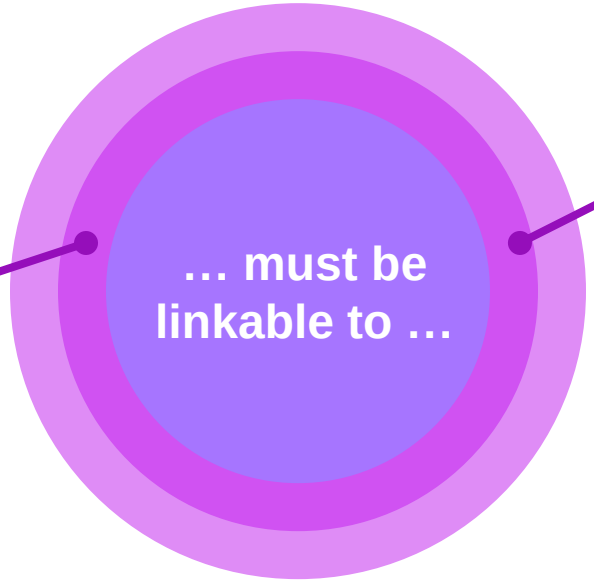
monitoring

01

how to monitoring

technical metrics

- CPU
- RAM
- running hours
- data transfer
- logs, APIs
- error messages
- …



cost metrics

- spend
- total costs
- reserved coverage
- unused reservations
- potential costs
- pricing models (purchase options)
- …

labeling

02

how to
labeling

pod template

labels need to be added in the specifications of the pod template

cost keys

application
business unit
company
cost center
environment
project

```
3   metadata:
4     name: emoji
5     namespace: emojivoto
6     uid: d12e0555-80ef-4f1f-a905-49dd111227f0
7     resourceVersion: '1276938'
8     generation: 2
9     creationTimestamp: '2022-04-07T10:30:19Z'
10  spec:
11
12    template:
13      metadata:
14        creationTimestamp: null
15        labels:
16          app: emoji-svc
17          application: EmojiVoto
18          businessunit: FinOps
19          company: LiquidReply
20          costcenter: muc-123456789-cc
21          environment: dev
22          project: Labeltest-KubeCon
23          version: v11
24      spec:
25        containers:
26          - name: emoji-svc
27            image: docker.l5d.io/buoyantio/emojivoto-emoji-svc:v11
28            ports:
29              - name: grpc
30                containerPort: 8080
31                protocol: TCP
32              - name: prom
33                containerPort: 8801
34                protocol: TCP
35
```

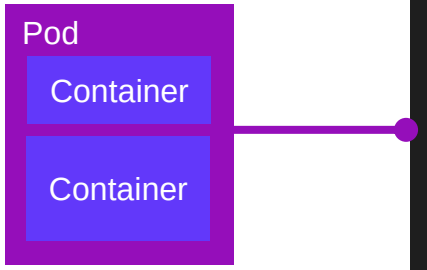
value description

use meaningful value descriptions that non-technical stakeholders can comprehend

03

rightsizing

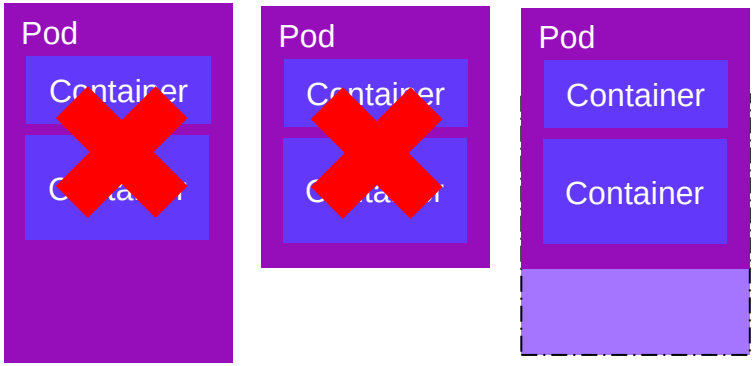
how to
rightsizing




```yaml
apiVersion: v1
kind: Pod
metadata:
    name: frontend
spec:
    containers:
    - name: app
    image: images.my-company.example/app:v4
    resources:
        requests:
        memory: "64Mi"
        cpu: "250m"
    limits:
        memory: "128Mi"
        cpu: "500m"
```

how to
rightsizing

vertical pod autoscaler (vpa)

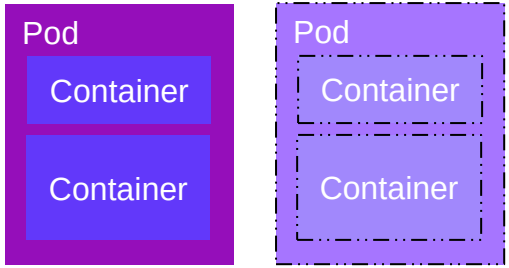


scale up: pods

- automatically update requested pod resources for future deployments
- monitors actual usage and suggests target values for new pod size

how to
rightsizing

horizontal pod autoscaler (hpa)

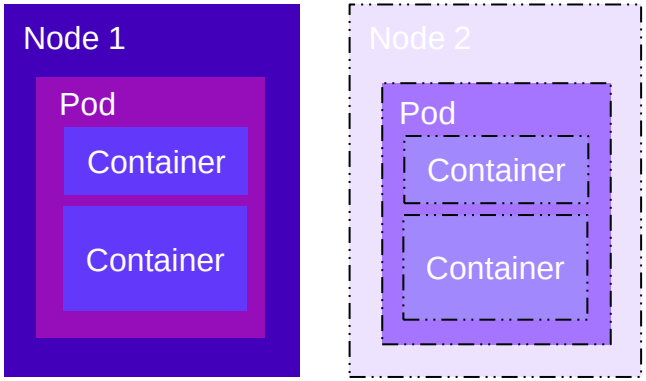


scale out: pods

- add or remove pod replicas based on target metrics
- monitors actual usage against specified target value and creates new pods to hit the target

how to
rightsizing

cluster autoscaler (ca)



scale out: nodes

- add or remove nodes based on node utilization and scheduling status of pods
- monitors resource requests, not actual usage

04

eliminating waste

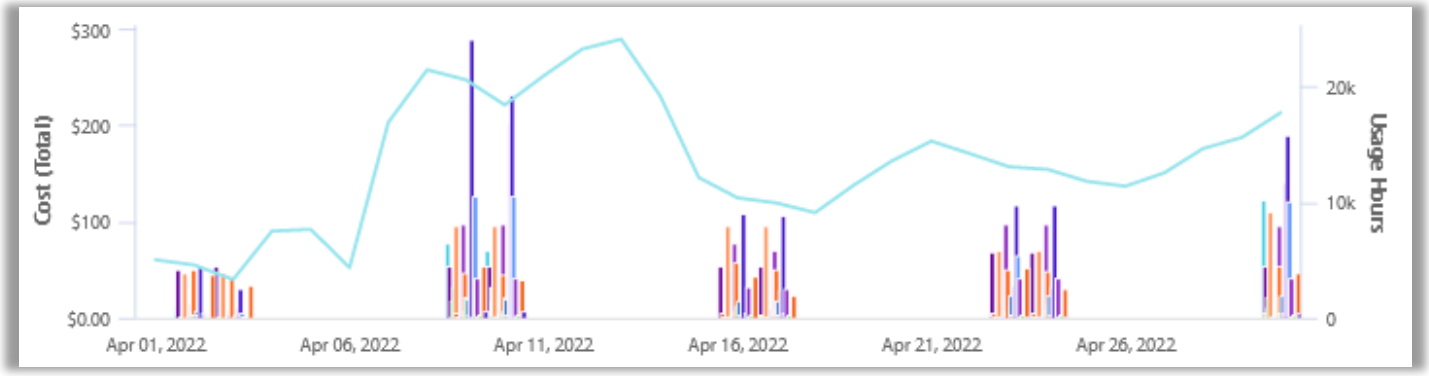
how to
waste management

automate cleanups

use policies and autoscalers to execute directly where possible

shutdown during offhours

use timetable scheduling to turn off in offhours e.g. weekend shutdowns



how to implement FinOps practice in your daily work

FinOps practice
daily

01 to ensure common understanding across roles

- have the list of labels approved by Business/Finance (documentation)
- naming of clusters and labels (standardized conventions across all projects)

CLUSTERS	COLUMN_METADATA.COST	
Name	Total	Utilized
k8s-SPR-QA	$1,375.78	$636.72
k8s-SPR-QA	$1,960.66	$438.94

FinOps practice
daily

02 to ensure functional monitoring & labeling

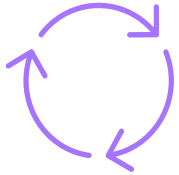
- always include new clusters in monitoring (yaml/agents)
- always include labels (policies)
  - add labels in your pod template specifics
  - add manually for existing workloads
  - for future workloads, include integration in configuration process

FinOps practice
daily

03 to ensure rightsizing & waste management

- use load tests & monitoring to define realistic resource requests
- combine vertical and horizontal autoscalers only if they are NOT using the same metrics
- use vertical pod autoscaler for stateful, horizontal pod autoscaler for stateless workloads
- make sure your auto scalers match your shutdown policies and are configured accordingly and do not trigger any alarms

goals
summary



FinOps purpose – enable data driven decision making & free up resources to invest elsewhere

K8s FinOps goals – monitoring, labeling, rightsizing and scheduling

K8s FinOps practice – acknowledge it necessity and ensure technical set up to provide info

questions

feel free to reach out to us at our booth SU32