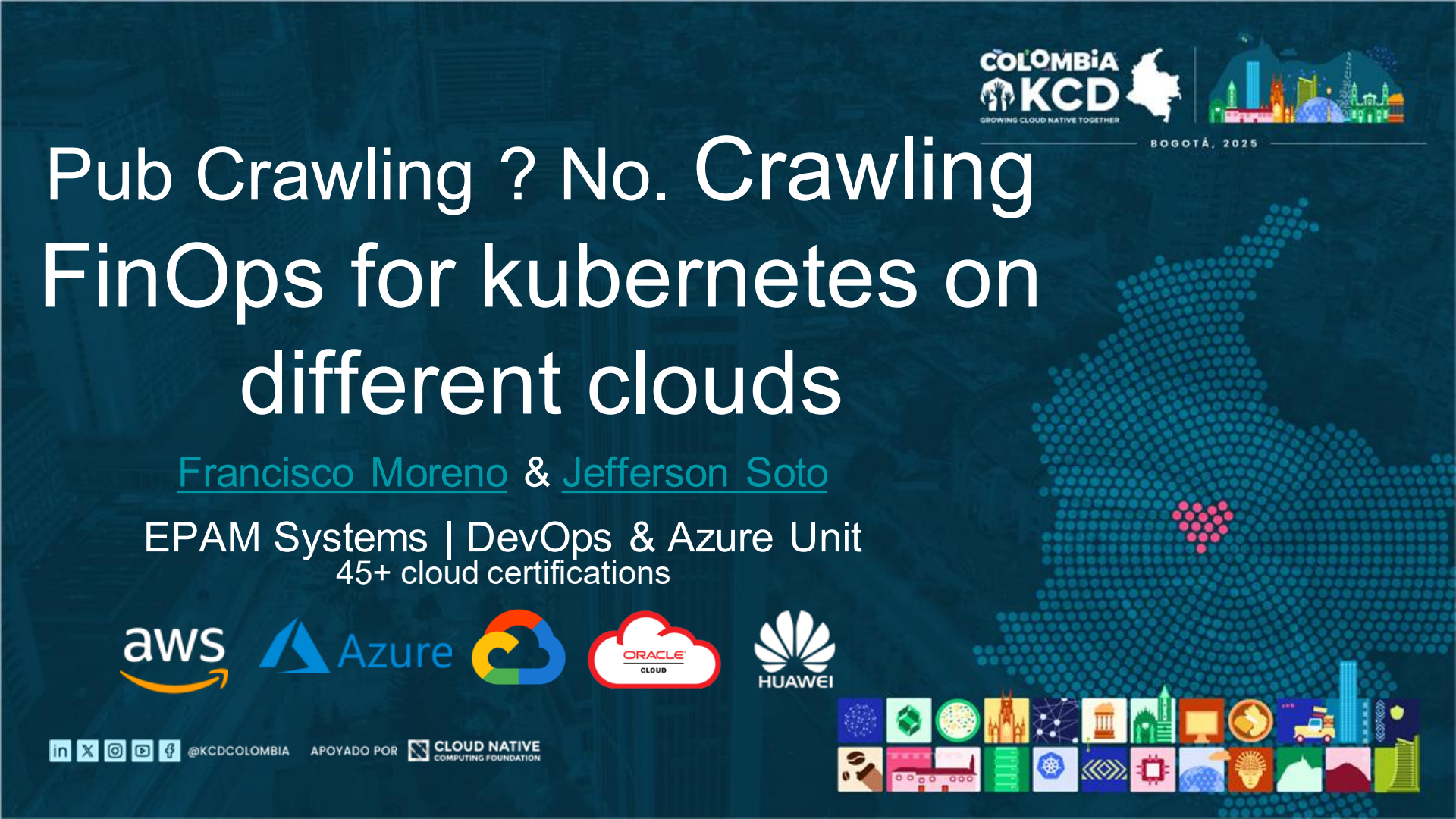
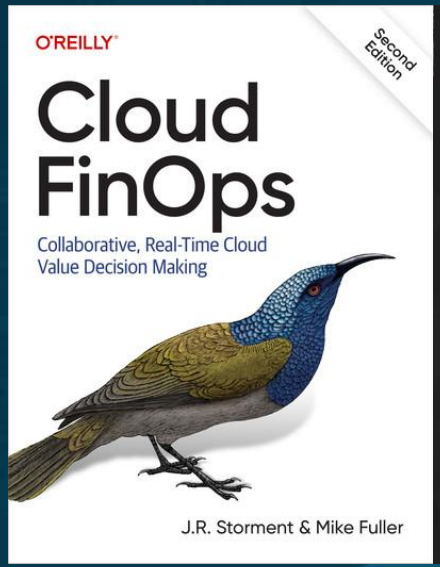

COLOMBIA KCD
GROWING CLOUD NATIVE TOGETHER
BOGOTÁ, 2025
Pub Crawling ? No. Crawling
FinOps for kubernetes on different clouds
Francisco Moreno & Jefferson Soto
EPAM Systems | DevOps & Azure Unit
45+ cloud certifications
aws
Azure
ORACLE CLOUD
HUAWEI
@KCDCOLOMBIA
APOYADO POR
CLOUD NATIVE COMPUTING FOUNDATION

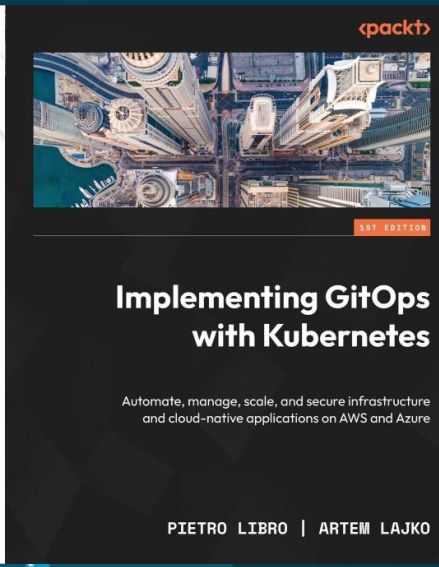
COLOMBIA KCD
GROWING CLOUD NATIVE TOGETHER
BOGOTÁ, 2025

Slides and Code (Terraform for Jefferson and TXT for Francisco)

References / Books



Ref. 1



Ref. 2

Ref. 3

Otherwise, reference are the links are on text, diagrams or icons

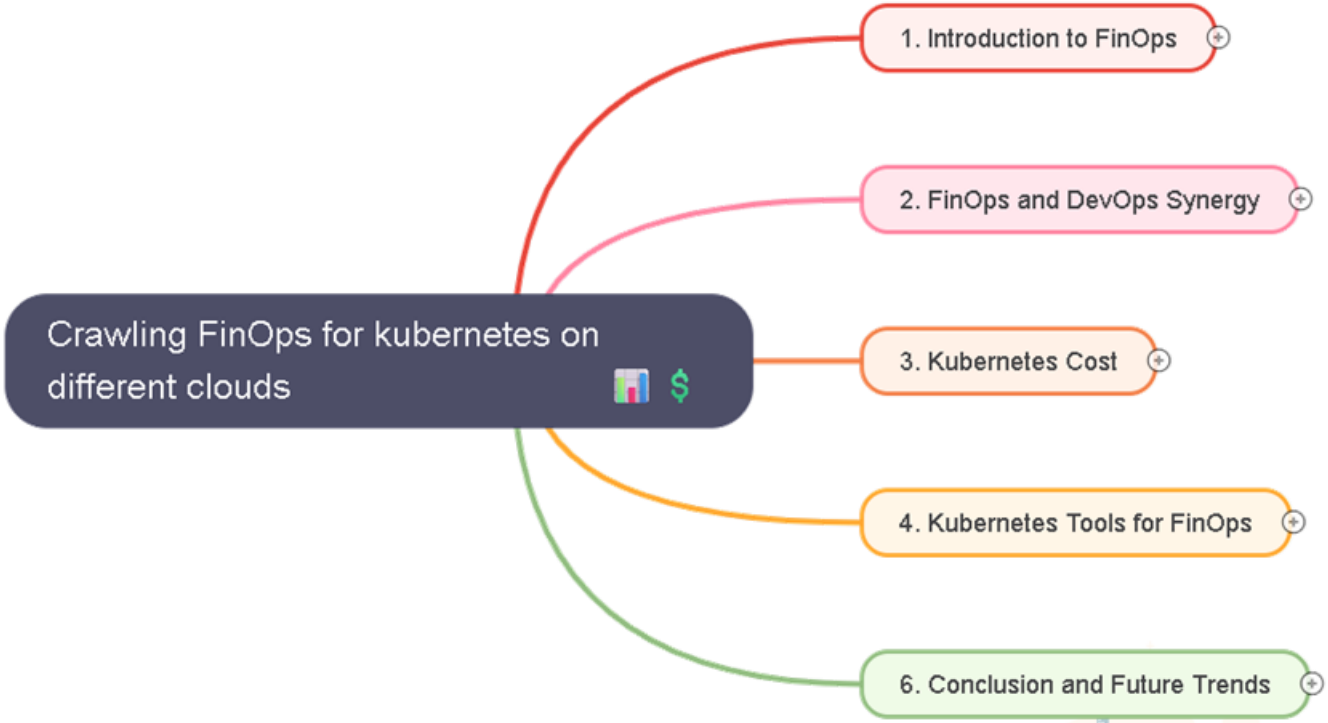
Ref and Pages are on left bottom corner

FinOps Foundation

FinOps Foundation and CNCF is a project of the Linux Foundation (LF)
OpenCost is a CNCF incubating project. Kubecost is built on OpenCost.
KCD Colombia is an event of the CNCF

EPAM is a Platinum sponsor of KCD Colombia 2025.
EPAM has several partnerships with different CSPs: AWS, GCP, Azure, OCI, etc.

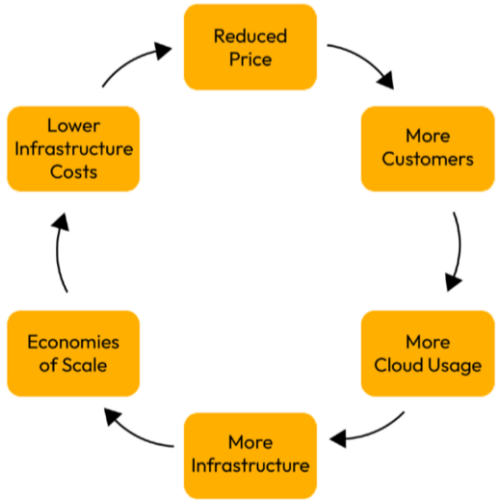
Agenda

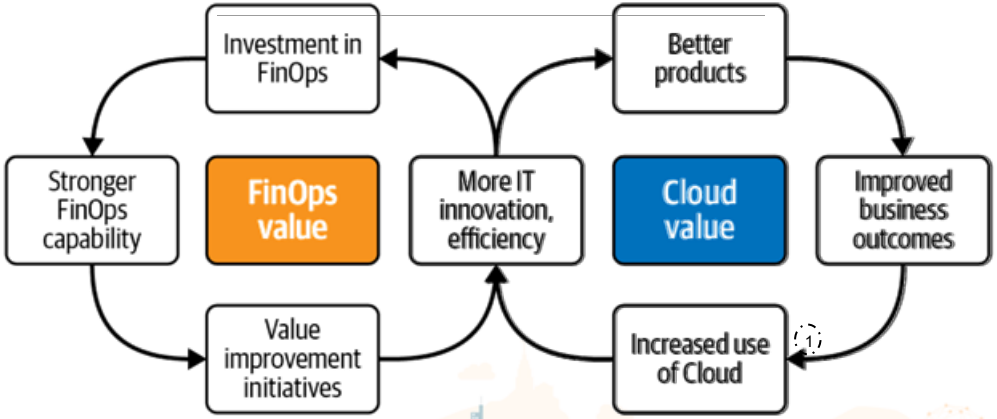

Crawling FinOps for kubernetes on different clouds
1. Introduction to FinOps
2. FinOps and DevOps Synergy
3. Kubernetes Cost
4. Kubernetes Tools for FinOps
6. Conclusion and Future Trends

Introduction to FinOps

NIST Definition: On-Demand Self-Service, Measured Service

FinOps = Finance + Operations =
(Cloud) Financial Operations (fin) =
Cloud Financial Management =
Cloud Financial Engineering =
Cloud Cost Management =
Cloud Optimization





Quotes

"FinOps brings financial accountability to the variable spend model of cloud". 1 (P. 1)

Taking decisions based on a transparent and understandable report.

Panamericana
San Victorino
Compraventas

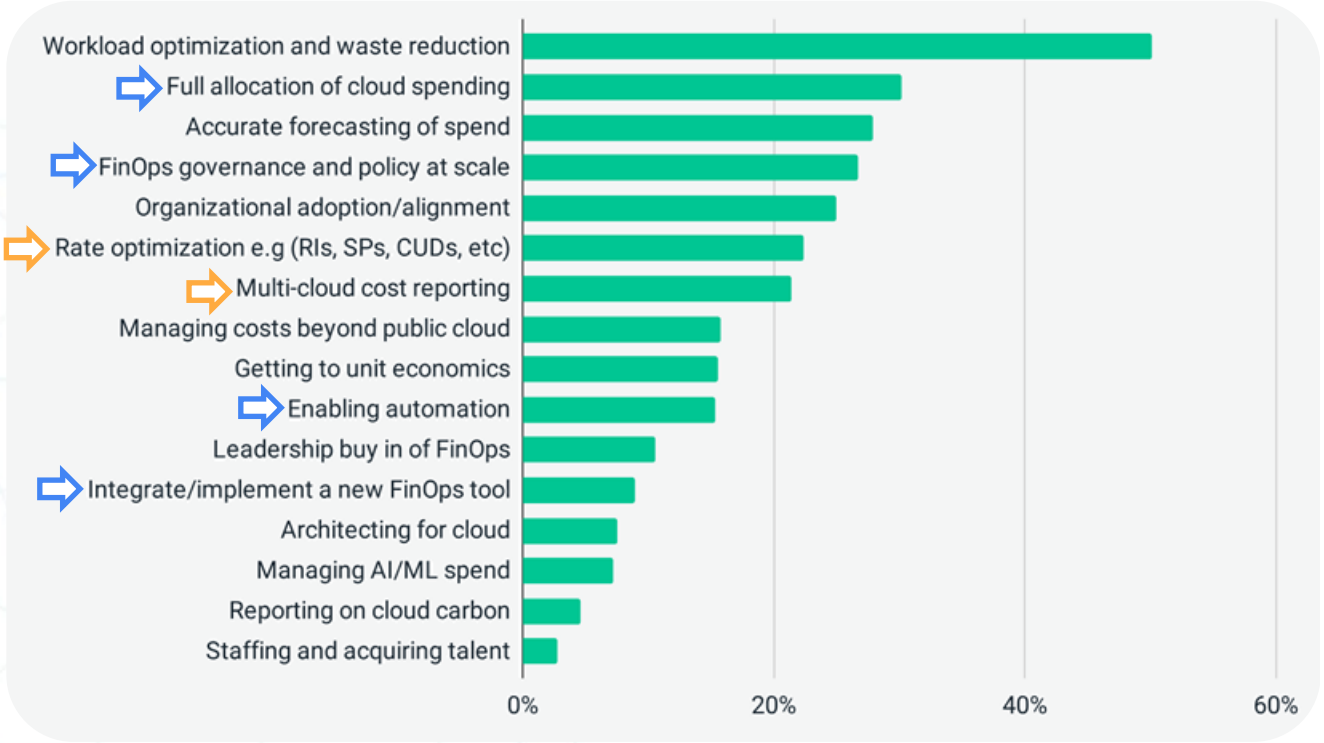
"If it seems like FinOps is about saving money, then think again. FinOps is about making money." 1 (P. 7,8,81,199 & 233)

Savings? Difference between Actual Cost and Budget. ***Cash in hand.***

Accurate forecasting of cloud spending <~ Estimate based on your current consumption.

Motivación
Mejores trabajos
Mejores resultados

State of FinOps 2025



Allocation & Automation

Multicloud-related topics

5th Survey, ~69B Cloud spend, 800+ respondents.

NA: 42%, EMEA:26%, LATAM: 15%, AP: 10%

FinOps Foundation

FinOps Framework 2022

New version: 2025 (reorg domains)

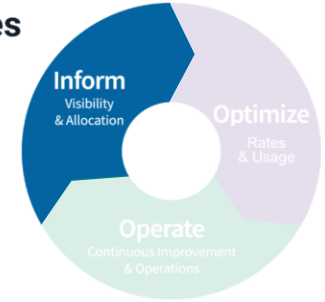
FinOps Framework

Principles

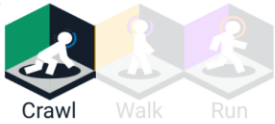
- Teams need to collaborate
- Everyone takes ownership for their cloud usage
- A centralized team drives FinOps
- Reports should be accessible and timely
- Decisions are driven by business value of cloud
- Take advantage of the variable cost model of the cloud

Personas

Phases



Maturity



Domains & Capabilities

Understanding Cloud Usage & Cost	Performance Tracking & Benchmarking	Real-Time Decision Making	Cloud Rate Optimization	Cloud Usage Optimization	Organizational Alignment
Cost Allocation	Measuring Unit Costs	Managing Anomalies	Managing Commitment Based Discounts	Onboarding Workloads	Establishing FinOps Culture
Data Analysis and Showback	Forecasting	Establishing a FinOps Decision & Accountability Structure		Resource Utilization & Efficiency	Chargeback & Finance Integration
Managing Shared Cost	Budget Management			Workload Management & Automation	FinOps Education & Enablement
Data Ingestion & Normalization					Cloud Policy & Governance
					FinOps Intersection with other Frameworks

Capability: Cost Allocation

Cost = Specify cloud-cost model for the service/resource (provisioned, serverless, min. commitment)

Allocation = Link resource to specific project/cost center/team and consumption model

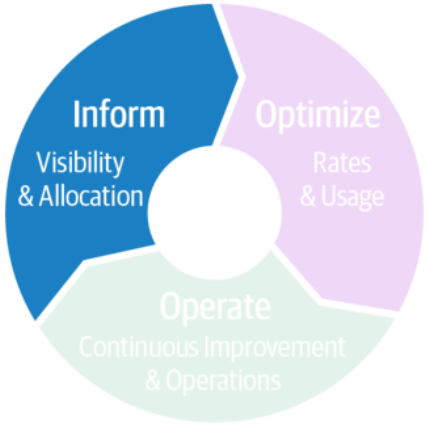
Cost = Usage (time, invocations) x Rate

Use less resources — Paying less

Shareable spendings:

- Licenses
- Network (Dedicated Conn., DNS, Sh. LB)
- Security (Digital Certificates, WAF)
- Sh. Monitoring Platforms
- Sh. Centralized Data Platform

Inform: Visibility & Allocation



- Create showback (and other) reporting

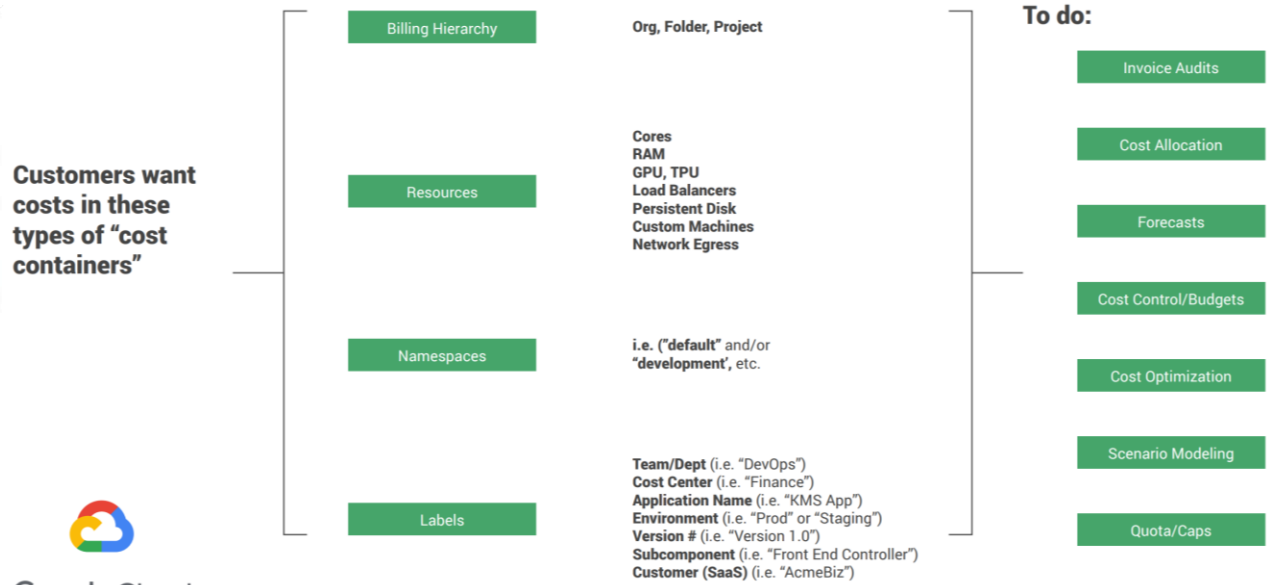
- Set tag strategy and compliance
- Identify untagged (and untaggable) resources
- Allocate shared costs equitably

Set tag strategy and compliance

Hierarchy	Accounts (mgmt. & member)	Projects	Subscriptions and resource groups	Accounts (mgmt. & member)
Meta hierarchy	AWS Organizations	Folders	Management groups, departments	Organization Management
K/V pairs	Tags	Labels (C. Analysis) and tags (Ctrl/RM+C. Allocation)	Tags	Tags
# of tags per resource	50 (~ services allow 10 only)	64	50 (~ services allow 15 only)	10 free-form and 64 defined tags (inc. cost-tracking tags)
Tags automatically allocated to your detailed billing data	No, manual selection required	Yes, some limits apply	Yes, some limits apply	No, only cost-tracking tags
Tag restrictions	Some services limit supported characters	lowercase letters, numeric characters, underscores, and dashes	Some characters not supported	ASCII and Unicode, 100 per Key and 256 per Value
Tags can be applied to	Most services' resources (constantly changes), accounts (via AWS Organizations)	Most services' resources, projects, and folders	Most services' resources, Azure resource groups	Most services' resources.
Compliance	Tag Policies on AWS Organization	Mandatory tags on Organization Policy (Pre-GA)	Azure Policies (Initiative or policy)	Tag Namespace through Organizations Management

1 (175-177, Adapted from P173&174)

Capability: Data Ingestion and Normalization



Crawl

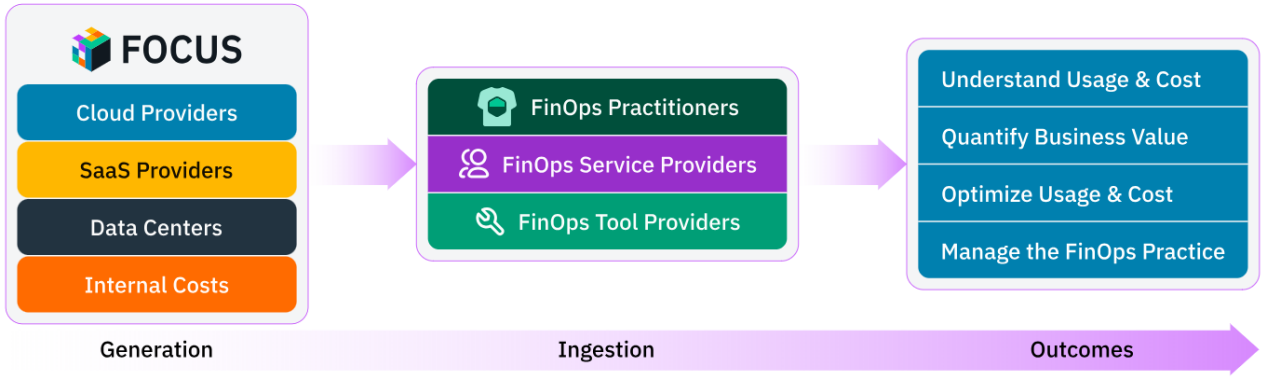
	Description	Example	Type	Maturity
	Application Name	`acme fitness`	string	1 - Crawl
	Cost Center	`acme-1001`	string	1 - Crawl
	Team	`road-runner`	string	1 - Crawl
	Product Name	`acme fitness store`	string	2 - Walk
	Department	`retail`	string	2 - Walk
	Environment	`production`	string	2 - Walk
	Customer Name	`acme`	string	2 - Walk
	Service	`store shopping cart`	string	3 - Run
	Com ent	`database`	string	3 - Run
	Techn y Stack by Purpose	`application`	string	3 - Run

Google Cloud

"One Labeling Strategy to Rule them all"

SIG for Containers on FinOps Foundation

Focus Spec



FOCUS™ dataset providers include:

aws Google Cloud Microsoft ORACLE CLOUD Infrastructure Tencent Cloud Alibaba Cloud databricks Grafana

FOCUS

BOGOTÁ, 2025 COLOMBIA KCD

Cloud Billing Complexity:
i.e.
AWS: 200k SKUs (2020), 791k SKUs (2023).
Azure: ~8k levels SKUs
GCP: ~ 50k SKUs
OCI: ~1.5k + SKUs (2025)

FinOps Open Cost & Usage Specification

Advantages:

- Simplify complexity
- Enhanced Consistency
- Streamlined Process
- Vendor Agnostic

FinOps and DevOps Synergy

- Automatic Resource Allocation (Additional advantage: ABAC)
- Enhanced Collaboration
- Faster Innovation Cycles
- Cost Optimization Strategies

Current Assignment: Self-Service Portal

"The most successful FinOps practices decentralize using less (i.e., **avoiding costs**) and centralize paying less (i.e., **reducing rates**)."

And….

Has someone talked about Kubernetes ?

Kubernetes Costs

- **Compute**: Node Size and Instance Type, Pod Resource Requests and Limits, Namespaces Quotas, Number of Running Pods, Unnecessary Pods
- **Storage**: PV Size and Type, Object Storage, Storage Class Configuration, Data Retention Policies
- **Networking**: Ingress Controller Costs, Egress Traffic Charges, Network Policies and Security
- **Control Plane Costs**: According to CSP
- **Monitoring and Logging**: Consumption of Metrics Collector and Tracers, Alert Notification
- Idle Resources, Inefficient Resource Utilization and Over-Provisioning

WG Calculating Containers Costs [3 Phases on FinOps]

Using less
Paying less

Kubernetes Costs

Total Cluster Cost =

Cluster Overhead Costs	
Cluster Idle Costs	Workload Costs

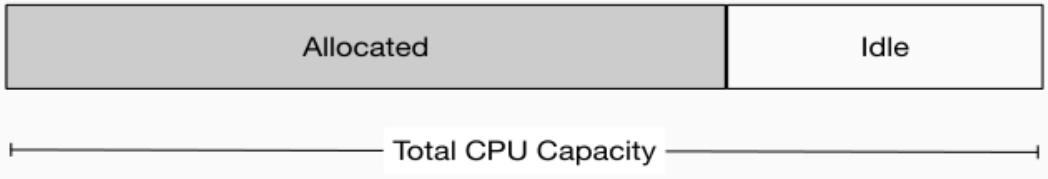
=

Cluster Overhead Costs	
Resource Allocation Costs	Resource Usage Costs

=

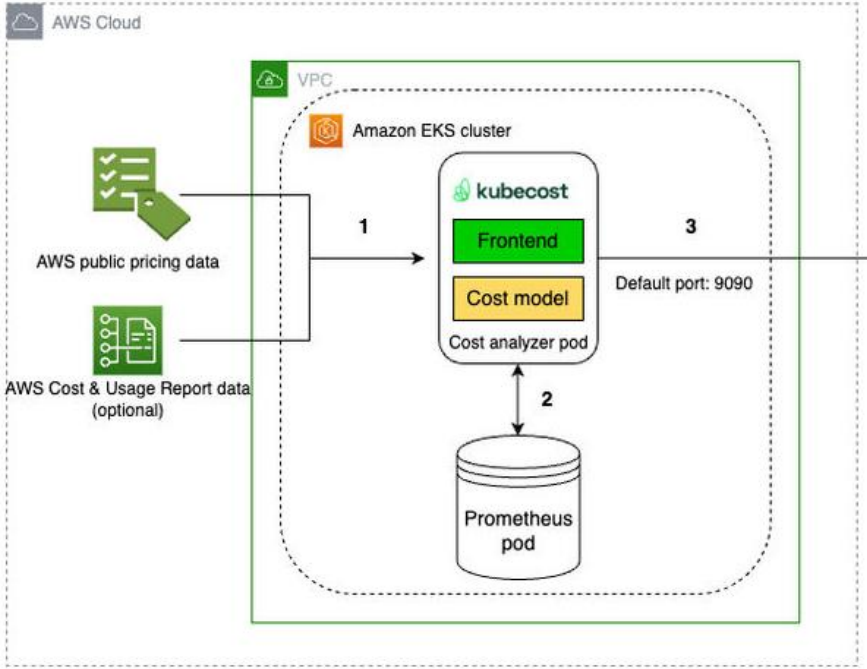
Cluster Management Fees		
Cluster Idle Costs	Allocated Costs	Usage Costs

Idle costs can be calculated at the Asset/Resource and at the Workload level.



OpenCost Kubernetes cost monitoring deep dive [CNCF]

Architecture: OpenCost and Kubecost



Kubecost reference architecture

The core components of Kubecost are:
- Frontend: runs Nginx, handles routing requests to cost-model, prometheus and shows data on Kubecost dashboard.
- Cost-model: back end for APi calls, read and write metrics to Prometheus, cost allocation calculations.
- Prometheus: scrape K8s metrics, time-series data store for cost & health metrics.

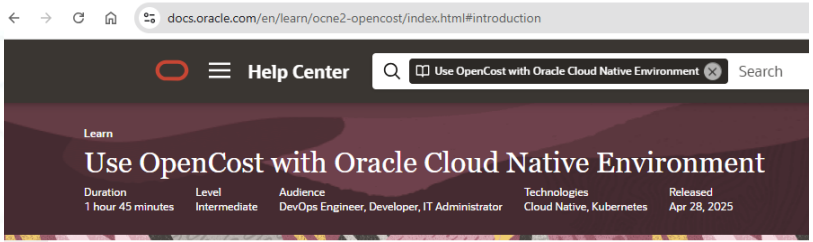
When Kubecost is deployed on Amazon EKS:
1. Cost-model retrieves public pricing data from AWS billing API and custom pricing data from AWS Cost & Usage Report data (optional).

2. Cost-model retrieves K8s metrics from Prometheus then perform cost allocation calculations and write all data back to Prometheus.

3. Frontend routes requests to cost-model to query cost allocation data then expose Amazon EKS cluster cost and efficiency on Kubecost's dashboard/UI.

On OCI, Steps for OpenCost and KubeCost setup

OpenCost



- Install helm locally
- Install Prometheus, OpenCost UI
- Install krew locally
- Install OpenCost CLI Plugin

kubecost

APPTIO an IBM Company — Solutions — Products — Resourc

Before you begin

In order to deploy the Kubecost Helm chart, ensure the following is completed:

- Helm client (version 3.1+) installed
- Kubectl installed
- A supported Kubernetes cluster deployed

Step 1: Install Kubecost

Running the following command will also install Prometheus and Grafana in the namespace supplied. View install configuration options here.

```
helm install kubecost cost-analyzer \
--repo https://kubecost.github.io/cost-analyzer/ \
--namespace kubecost --create-namespace
```

Step 2: Enable port-forward

```
kubectl port-forward --namespace kubecost deployment/kubecost-cost-analyzer 9090
```

Having installation issues? View our Troubleshoot Install

Step 3: See the data!

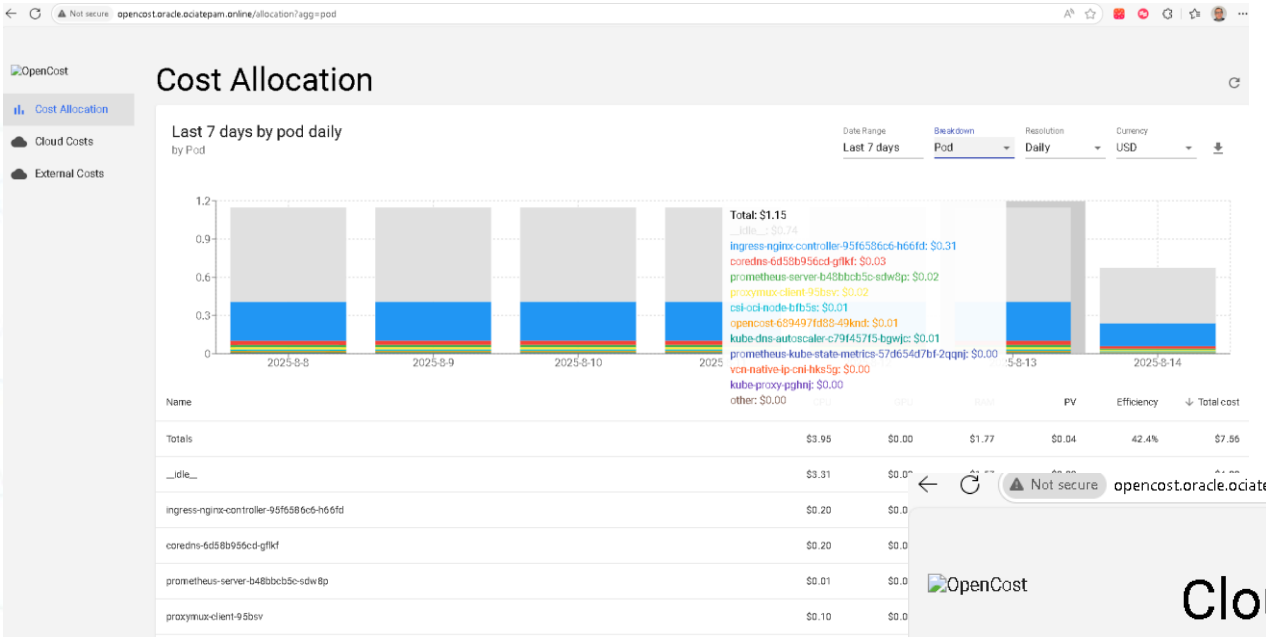
You can now view the deployed frontend by visiting the f

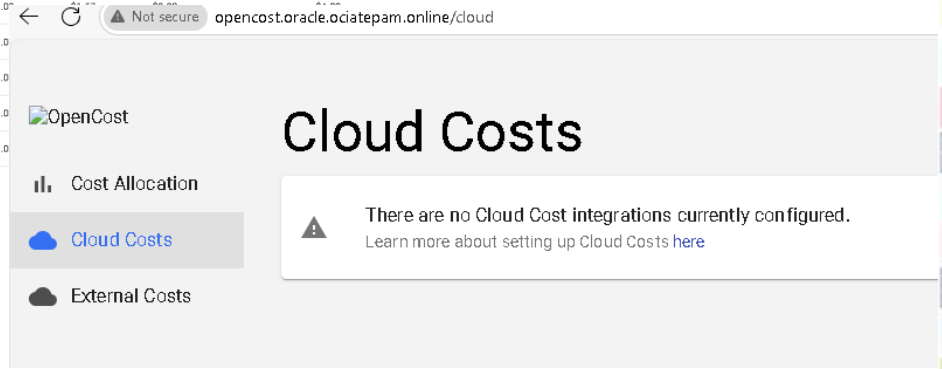
http://localhost:9090

With this newfound visibility, teams often start with 1) looking at cost allocation trends and 2) searching for quick cost savings or reliability improvements. View our Get information on product configuration and common initial actions

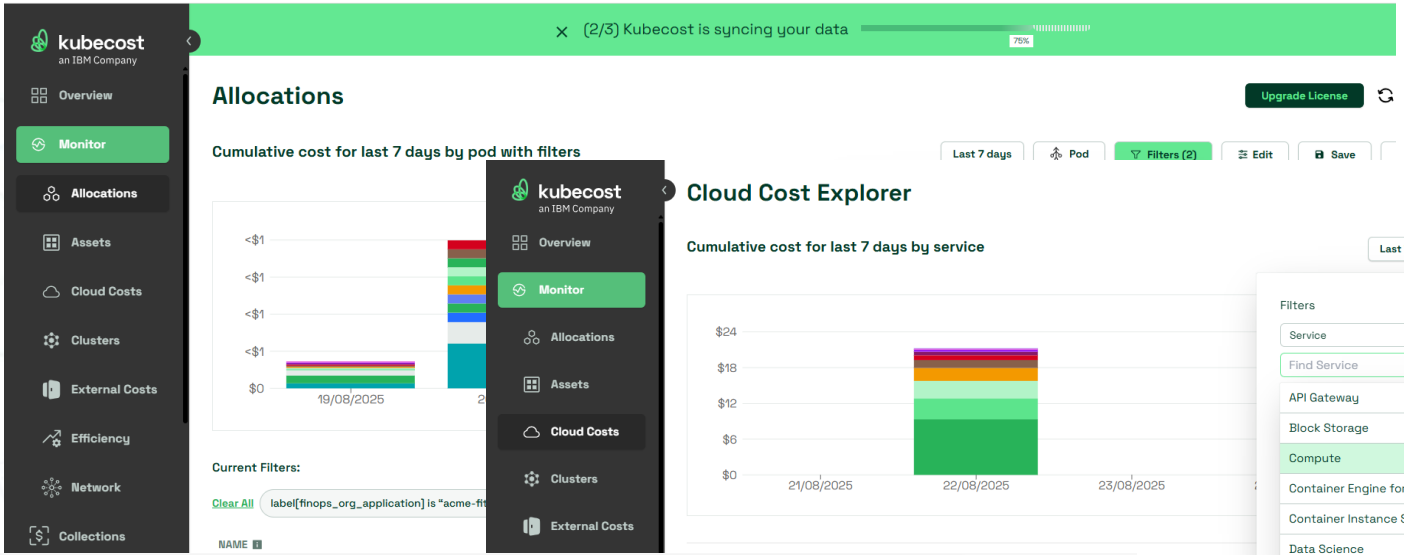
This 2 Steps and values for credentials for OCI User on the helm

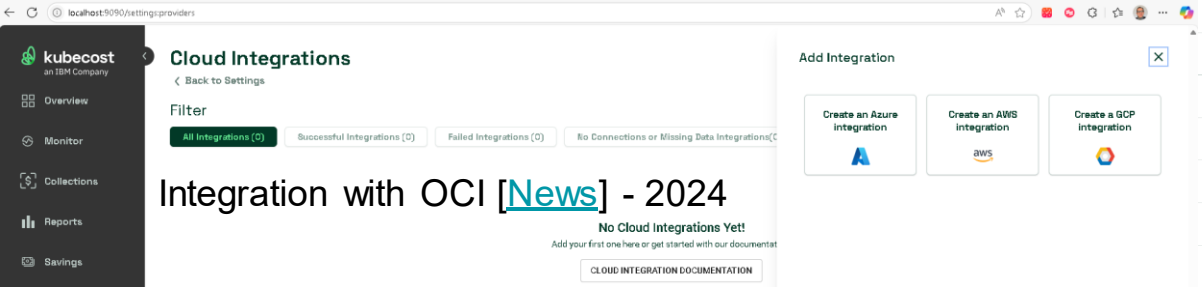
On Oracle Cloud, OpenCost





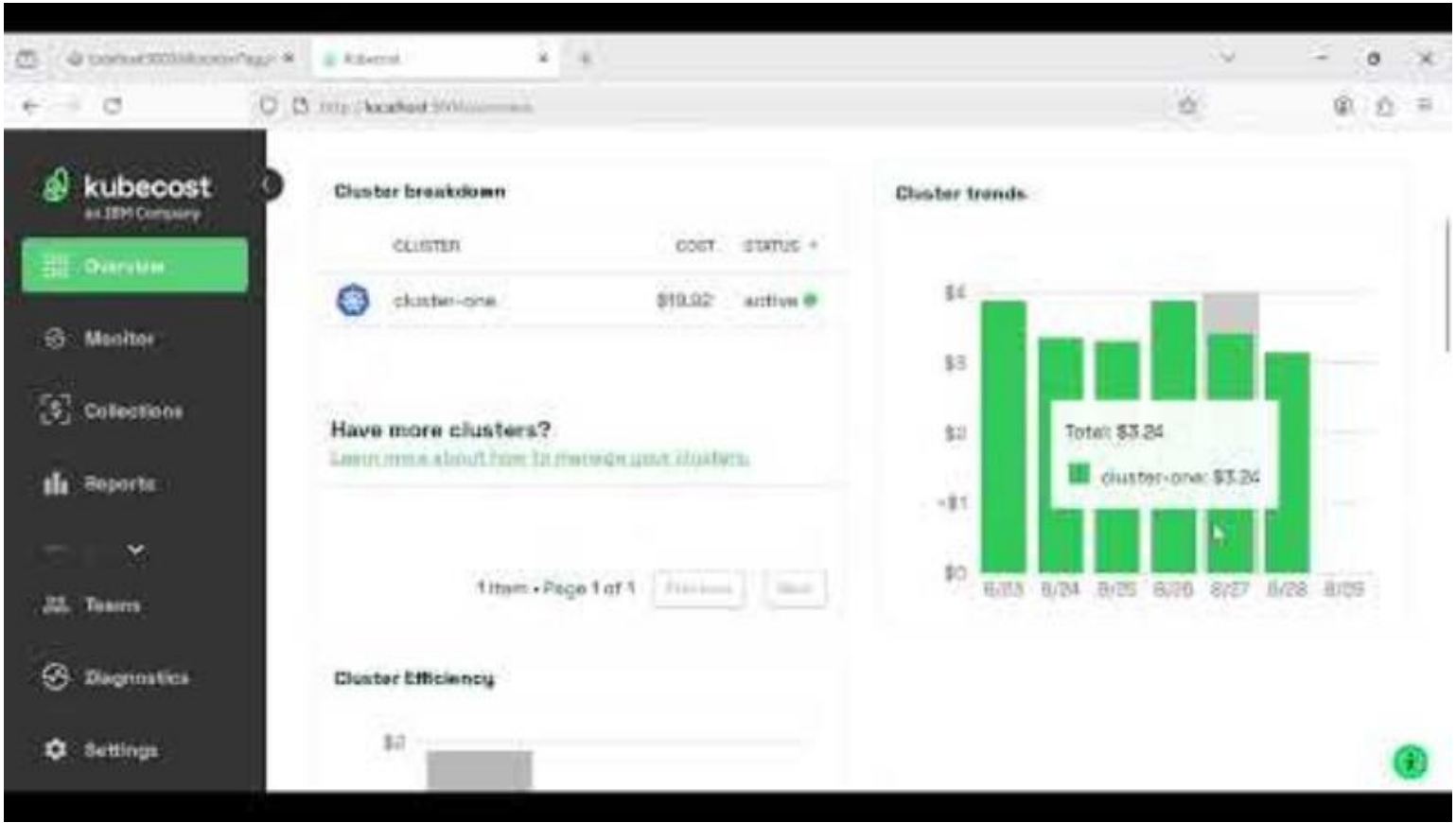
On Oracle Cloud, Kubecost



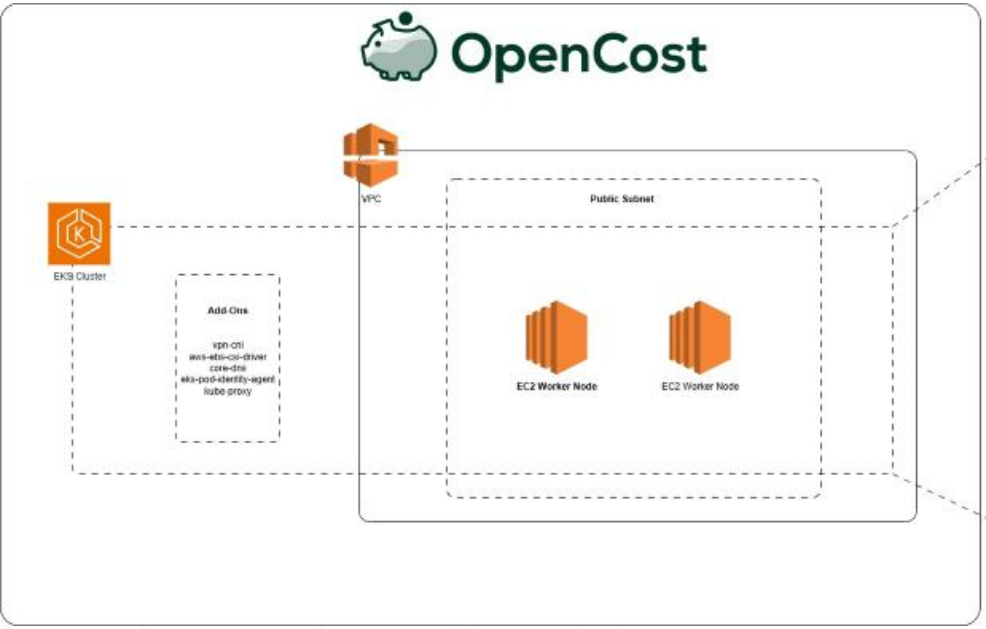


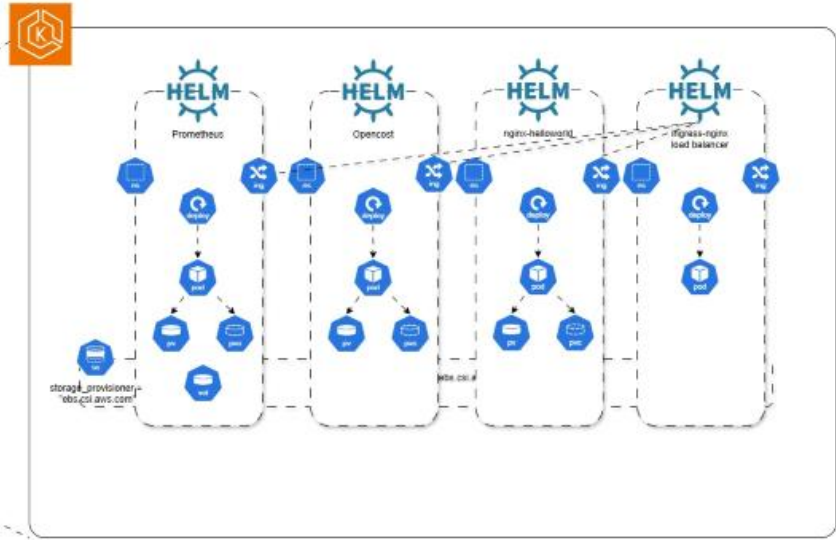
Integration with OCI [News] - 2024

On Oracle Cloud, OpenCost and Kubecost

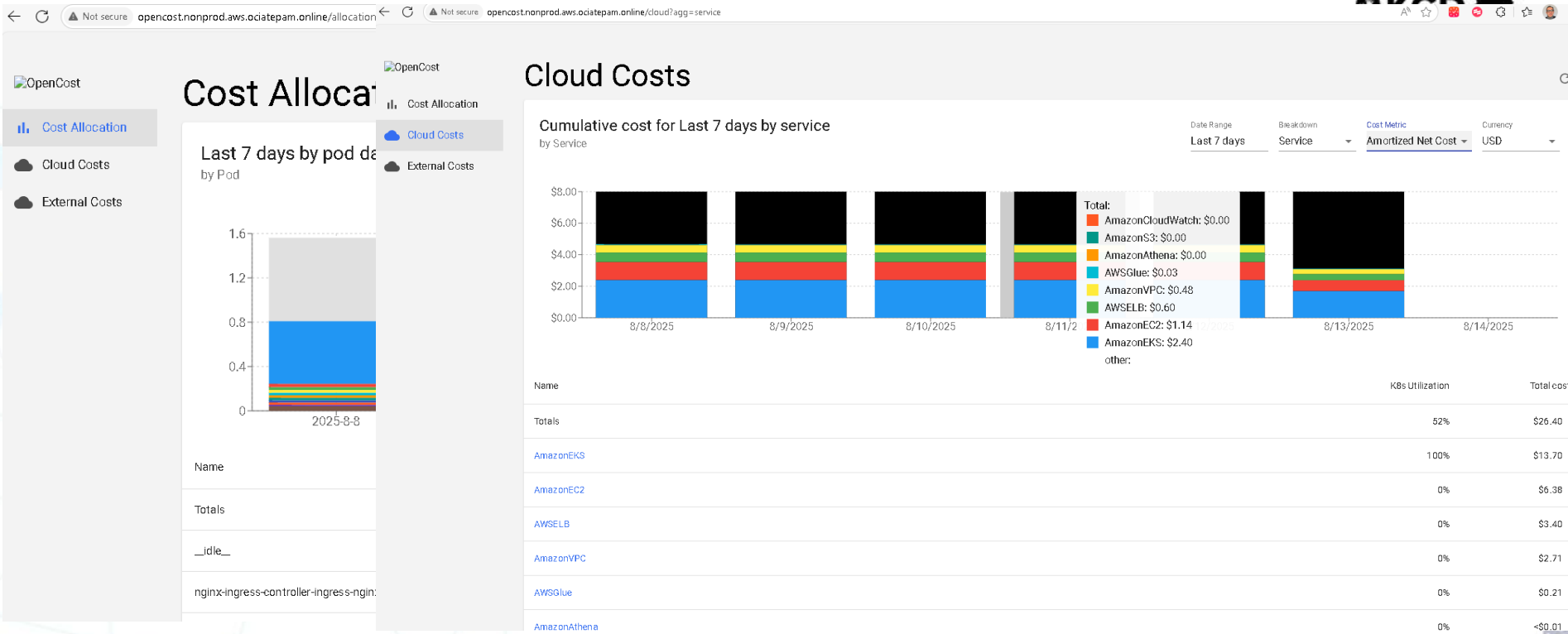


On AWS, Open Cost





On AWS, Open Cost



On AWS, Kubecost

Cumulative cost for today by pod with filters

kubecost
an IBM Company

- Reports
- Savings
- Alerts
- Govern
- Teams
- Diagnostics
- Settings

Cluster Details

cluster-one

Upgrade License

Last 7 days

Provider	AWS	Nodes	3	Total Cost	<$0.01
Version	1.33	Namespaces	7	Estimated Monthly Savings	$27.83
Region	us-east-1	Pods	30	Workload Efficiency	13.46%
Health Score	N/A	Controllers	17	Spending Trend	N/A

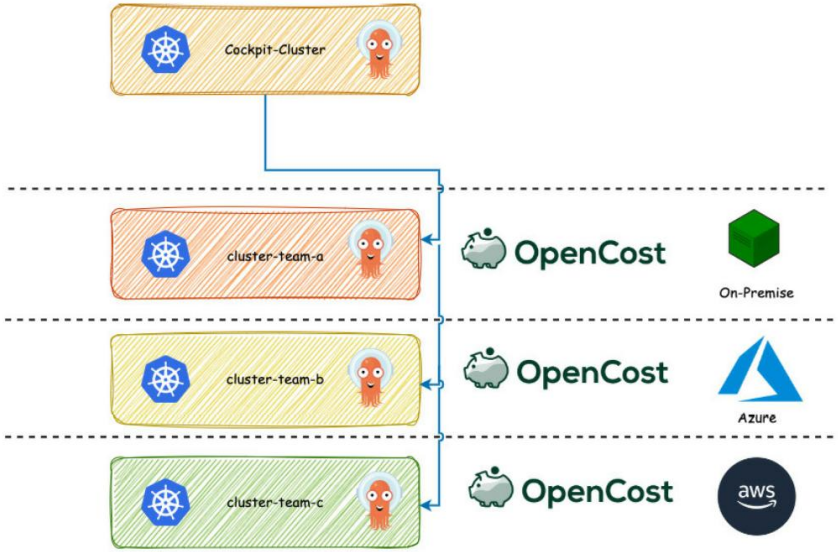
No Budget Set

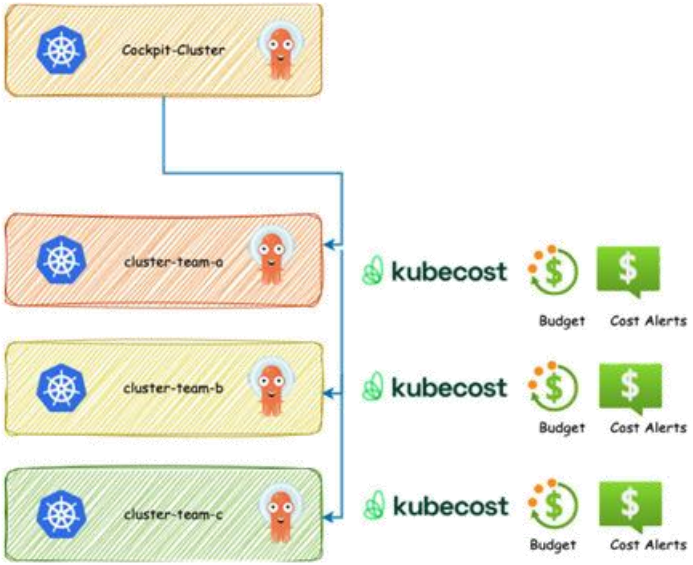
Add a New Budget

Efficiency

NAME	REQUESTED · USAGE
CPU	3% Efficiency
RAM	95% Efficiency

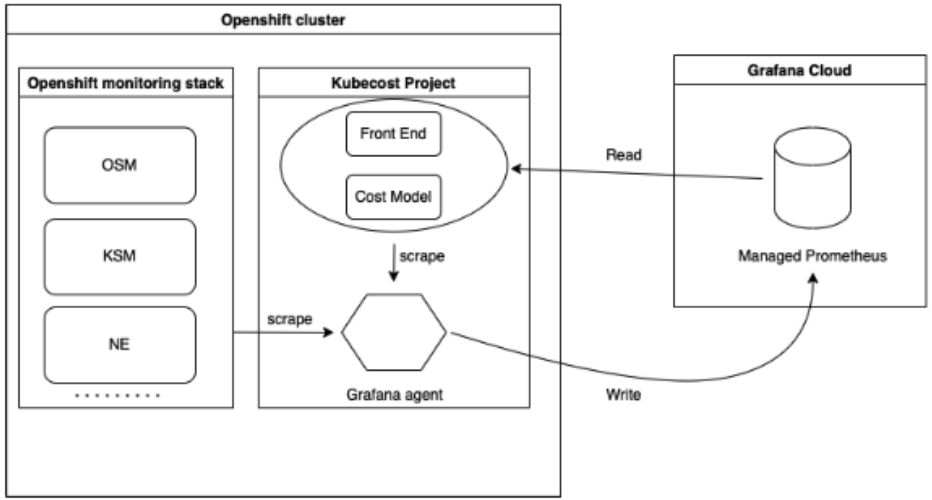
OpenCost and Kubecost on Multisite/Multicloud



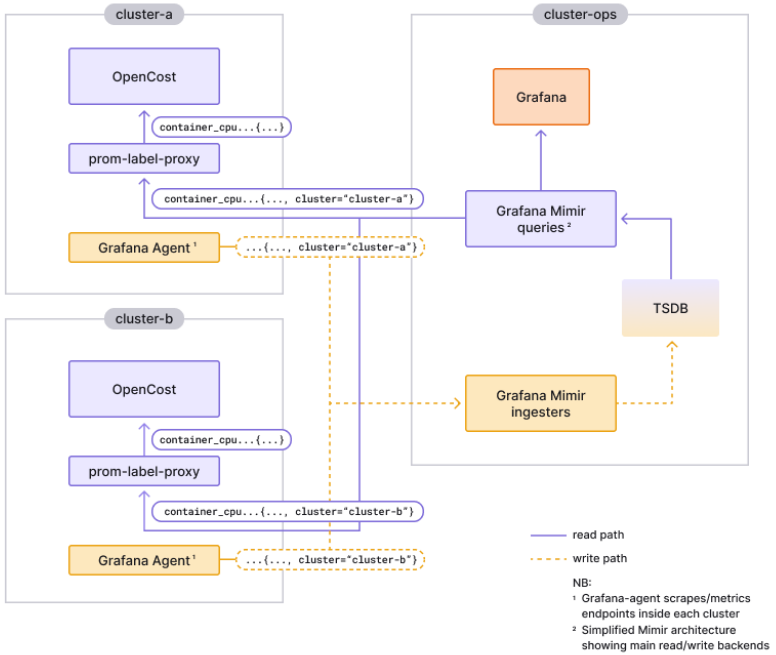


OpenCost and Kubecost on Multisite/Multicloud

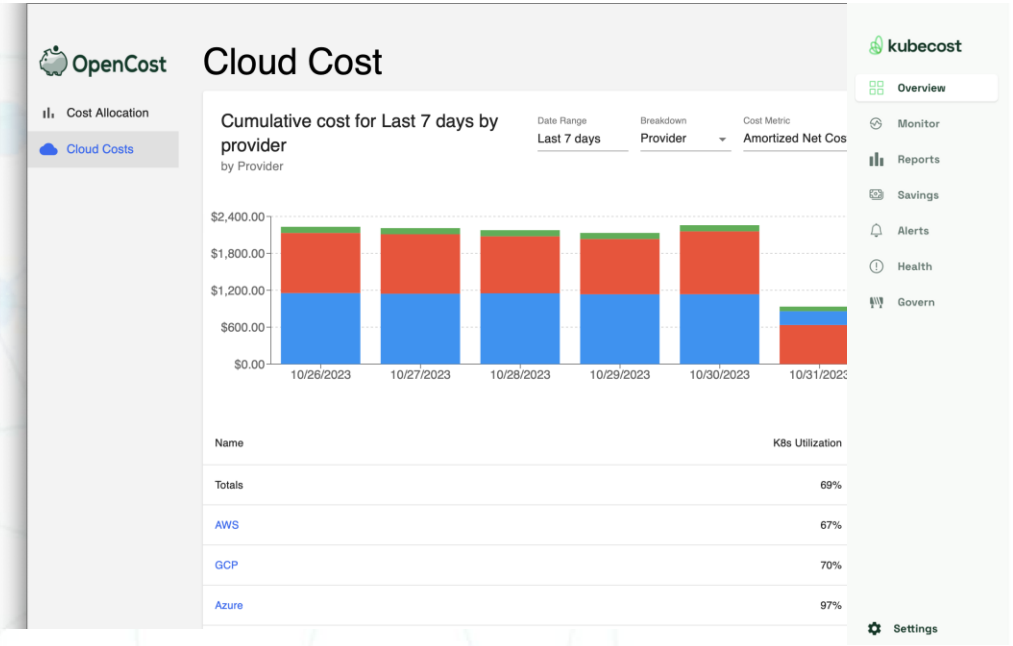
Example from RedHat OpenShift

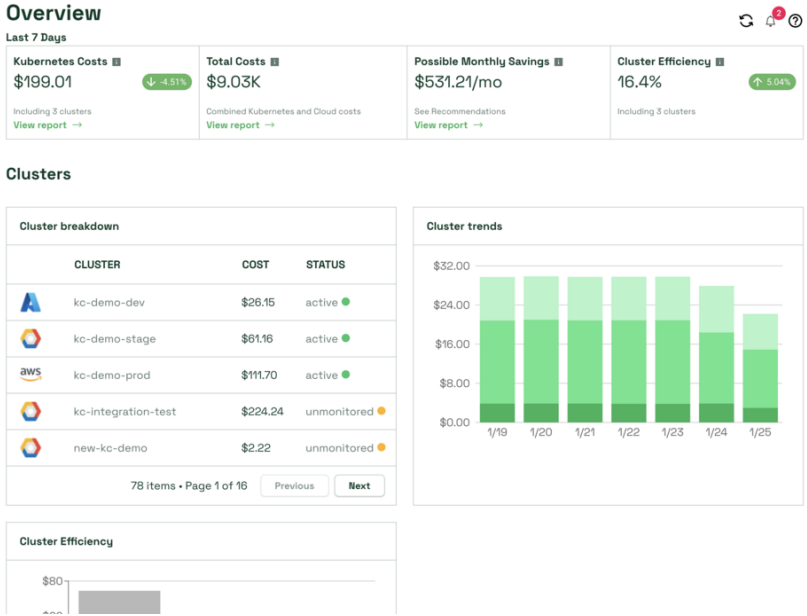


Example from Grafana Labs



Multicloud about OpenCost and Kubecost





Comparison OpenCost and Kubecost

kubecost

Description	Lightweight, focused on cost monitoring	Large Cluster with scaling, ETL and dashboards. Use opencost for allocation only.
Type	Open Source/Apache 2	Free and Enterprise (SaaS) Option.
# of cores	Unlimited	250 (Free), Unlimited (Ent)
Deployment	Helm, Prometheus and kube-state-metrics	Helm, Prometheus and Grafana
Retention	by Prometheus Env.	15d (Free), Obj. storage (Ent)
Support/Consulting	Community	Professional (Free?)
Custom Pricing Model	Intermediate	Advanced (Reconciling bill)
Cost Allocation	Basic	Advanced
Analyze and optimize resource utilization	No	Yes
Cost Trend Analysis/Predict Cost	No	Yes
Custom Alerts and Reports	No	Yes
Integrations	AWS, Azure, GCP. No OCI	AWS, Azure, GCP, OCI

Comparison from Kubecost [here] and from Opencost (here)

Other Tools for Infrastructure and FinOps Certified

- **Sustainability** (Avoiding costs):

Kube-green and Armada (CNCF Incubation project) 2 (P. 663 & 673)

- **Observability using IA**:

Robusta.dev (Prometheus & ChatGPT) and iitsAI (Distributed RAG on Kubernetes)

- **By Cloud:** 3 (P. 34-46)

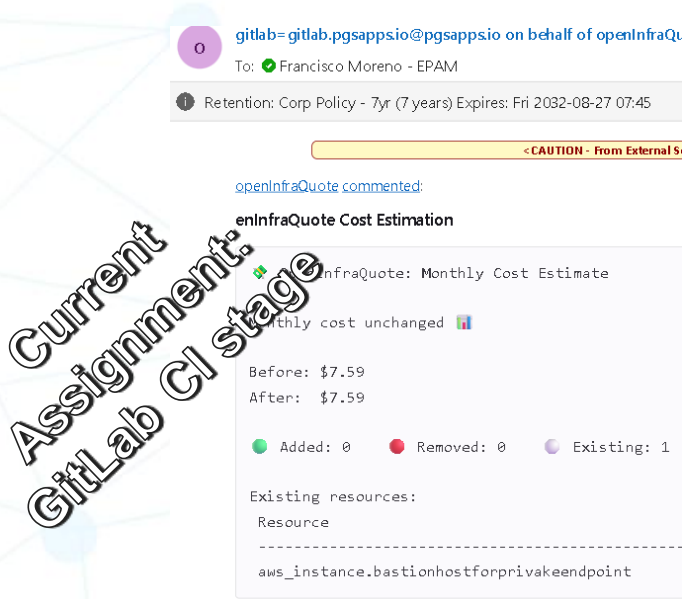
AWS: AWS Cost Explorer, AWS Cost and Usage Reports (CUR), AWS Trusted Advisor
Azure: Azure Advisor, Azure Cost Management,
GCP: GCP Cloud Billing Reports (See CUD Analysis Report), GCP Recommender, Exporting GCP Cloud Billing data to BigQuery
OCI: Cost Analysis, Cost and Usage Report, Cloud Advisor and Oracle FinOps Hub

- **Commercials:**

VMware Tanzu CloudHealth, NetApp Spot, Apptio Cloudability, CloudPouch (Focus on AWS), Turbo360 (Focus on Azure), Infracost (Focus on TF), CastAI (Former Ex-Oracle)

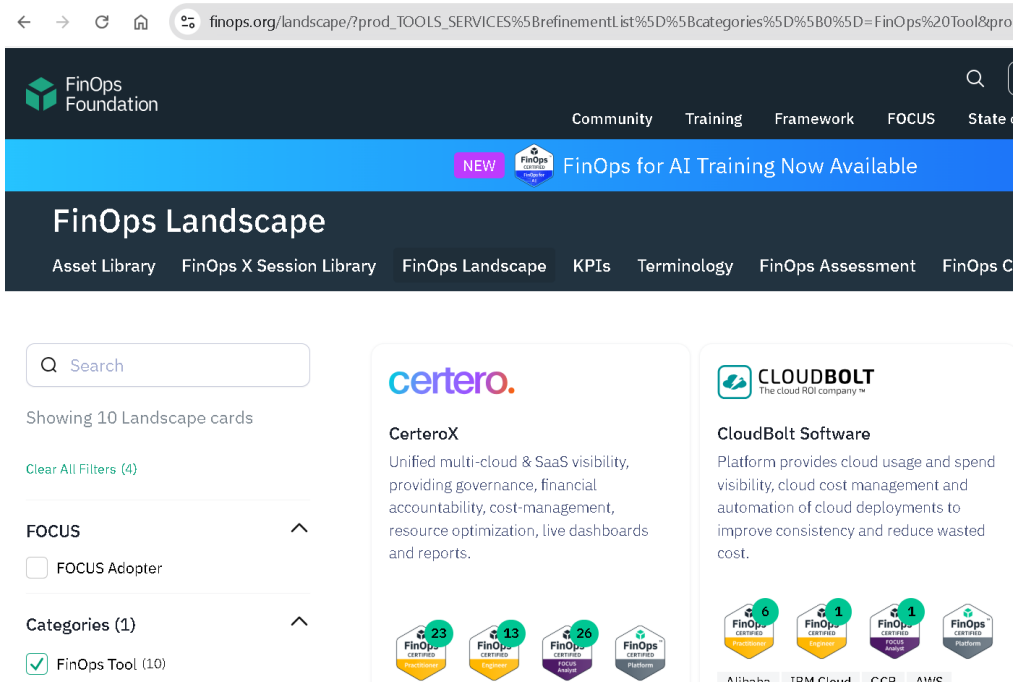
Other Tools for Infrastructure and FinOps Certified

OpenInfraQuote (Showback)

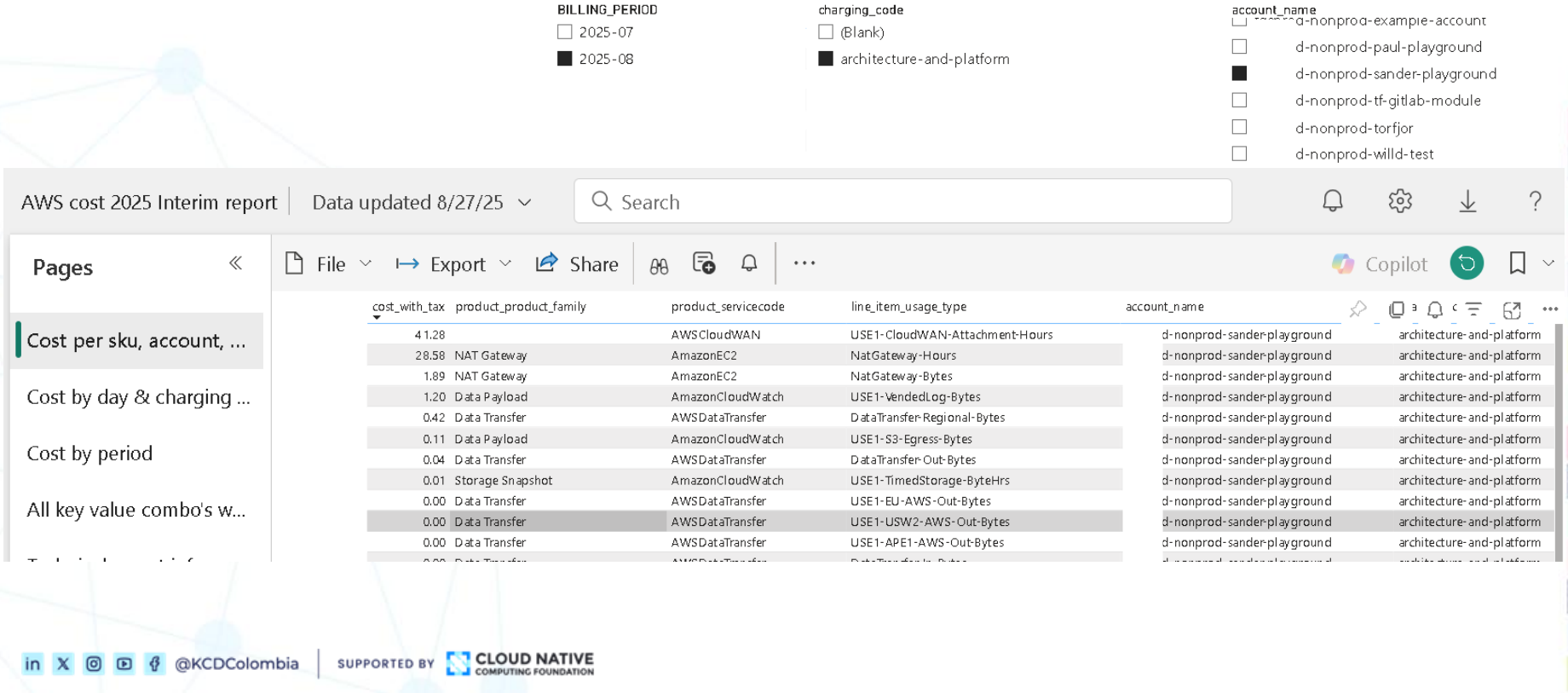


Current Assignment: GitLab CI stage

FinOps Certified Platforms



Current Assignment: FinOps report for Multicloud LZ



Conclusions

1. Rethink the value of the spending, and other ways to redirect it.
2. Understand the idiosyncrasy of your company, before of use any framework/tool: Think of your customer, when you design tag structure because the report takes information from there.
3. Every cloud has its DNA, try to use industry standards (FOCUS specs) or cloud-agnostic tools.
4. Before of spending time on any tool, it is better think of flexibility, costs, learning curve. Check reviews, experiences and go deep on a PoC.

Questions ?