



/ICE

The *coolest*
tech team
on the planet

FOCUS - ACTING ON CLOUD IMPACT

A FinOps framework to optimize costs
and help reduce carbon footprint

ABOUT THE SPEAKER

- 20+ years of experience in IT, 16+ at Link
- Director of ICE, the coolest Tech Team on the planet!
- Areas of Expertise: Integration, Cloud and Experience Engineering
- Business-driven Solution Designer and Architect
- A keen speaker, loves to share his knowledge and make his teams thrive

<https://www.linkedin.com/in/joserodriguesbpm/>



LinkedIn



THE CHALLENGE

BUSINESS CHALLENGE

Who the hell knows what's inside a cloud provider invoice?

- The right answer is typically.... nobody!
- Cloud bills keep growing and growing, more recently fueled by the new/old gold rush – data.
 - It takes a lot of storage
 - It takes a lot of compute power
- It's ever-growing: compute is ephemeral but data.... data is what we keep!
- And then there's the magic sauce... Data transfer/Egress
- Cloud billing models are complex, with each service having its own metrics and ways to influence the overall cost.

Nº Descrição					Qtd	Preço Unitário	L.V.A	Total
Nº De Ordem De Compra								
Data Da Fatura								
Termino De Pagamento								
Número do plano								
Nº Fical Do Cliente								
Acordo								
Exigibilidade Do Imposto								
Cliente Final								

BUSINESS CHALLENGE

Who the hell knows what's inside a cloud provider invoice?

- Some cloud providers offer a somewhat simpler invoice structure, others offer more detail.
- But, they are typically different, and that:
 - Makes you need to understand different outputs and reports
 - Makes you deal with different names for the same thing
 - Makes it harder to automate and have a centralized approach
 - Makes it harder to manage a multi-cloud environment

Service Description	Unit Description	Units Consumed	Usage	Cost (€)	Resources (€)	Provisions and other (€)	Overhead (€)	Percentage of total (€)	Percentage of total (€)	Percentage of total (€)
Compute Engine	E2 Instance Core running in Frankfurt	8,182,809	hour	211.87	0	0	211.87	211.87	13%	13%
Compute Engine	Status IP Charge in London	13,062,527	hour	144.05	0	0	144.05	144.05	1%	1%
Compute Engine	Artifact Registry Storage	1,206,386	gigabyte month	138.08	0	0	138.08	138.08	1%	1%
Compute Engine	E2 Instance Ram running in Frankfurt	32,731,746	gigabyte hour	113.06	0	0	113.06	113.06	1%	1%
Networking	Network Cloud NAT IP usage	13,062,527	hour	69.3	0	0	69.3	69.3	0%	0%
Cloud SQL	Cloud SQL for MySQL: Zone1 - IP address reservation in EMEA	6,545	hour	69.3	0	0	69.3	69.3	0%	0%
Cloud SQL	Cloud SQL for SQL Server: Zone1 - IP address reservation in EMEA	6,545	hour	69.3	0	0	69.3	69.3	0%	0%
Networking	Network Cloud Armor Policy	6,786	month	43.27	0	0	43.27	43.27	0%	0%
Compute Engine	Storage PD Capacity in London	876,885	gigabyte month	39.62	0	0	39.62	39.62	0%	0%
Networking	Network Intelligence Center Topology and Google Cloud Performance Resource Hours	34,415	count	34.87	0	0	34.87	34.87	0%	0%
Networking	Network Intelligence Center Network Adapter Resource Hours	34,414	count	34.87	0	0	34.87	34.87	0%	0%
Networking	Network Intelligence Center Network Adapter Resource Hours	34,414	count	34.87	0	0	34.87	34.87	0%	0%
Networking	Network Cloud NAT Gateway Egress	26,187,067	hour	33.77	0	0	33.77	33.77	0%	0%
Networking	Network Intelligence Center Internet to Google Cloud Performance Resource Hours	34,415	count	26.36	0	0	26.36	26.36	0%	0%
Compute Engine	Balanced PD Capacity in Frankfurt	219,029	gigabyte month	24.75	0	0	24.75	24.75	0%	0%
Networking	Network Cloud Armor Rule	17,146	month	24.5	0	0	24.5	24.5	0%	0%
Compute Engine	Storage PD Capacity in Frankfurt	351,827	gigabyte month	15.83	0	0	15.83	15.83	0%	0%
Cloud SQL	Cloud SQL for SQL Server: Zone1 - Standard storage in EMEA	87,377	gigabyte month	14.03	0	0	14.03	14.03	0%	0%
Cloud SQL	Cloud SQL for MySQL: Zone1 - Standard storage in EMEA	87,377	gigabyte month	14.03	0	0	14.03	14.03	0%	0%
Artifact Registry	Artifact Registry Network Internet Egress Europe to Europe	105,059	gigabyte	10.22	0	0	10.22	10.22	0%	0%
Compute Engine	Balanced PD Capacity in Frankfurt	74,414	gigabyte month	9.39	0	0	9.39	9.39	0%	0%
Vertex AI	Genkit 1.5 Pro Text Input - Predictions	6,776,892	count	7.85	0	0	7.85	7.85	0%	0%
Cloud Storage	Standard Storage Europe Multi-region	243,146	gigabyte month	5.85	0	0	5.85	5.85	0%	0%
Compute Engine	SSD Network PD Capacity	35,187	gigabyte month	4.76	0	0	4.76	4.76	0%	0%
Compute Engine	External IP Charge on a Spot Preemptible VM	1,720,717	hour	3.87	0	0	3.87	3.87	0%	0%
Compute Engine	Spot Preemptible E2 Instance Core running in Frankfurt	438,179	hour	3.73	0	0	3.73	3.73	0%	0%
Vertex AI Search	Vertex AI Search Search API Request Count - Enterprise	937	count	3.44	0	0	3.44	3.44	0%	0%
Vertex AI Search	Vertex AI Search Search API Request Count - Enterprise	937	count	3.44	0	0	3.44	3.44	0%	0%
Compute Engine	Spot Preemptible E2 Instance Ram running in Frankfurt	1,720,717	gigabyte hour	2.89	0	0	2.89	2.89	0%	0%
Cloud DNS	Managed Zone	8.8	month	1.85	0	0	1.85	1.85	0%	0%
Cloud Storage	Standard Storage US Multi-region	26,051	gigabyte month	0.51	0	0	0.51	0.51	0%	0%
Cloud Run Functions	Cloud Run Functions (1st time) CPU Time	51,362,829	second	0.48	0	0	0.48	0.48	0%	0%
Compute Engine	E2 Instance Core running in EMEA	14,126	hour	0.32	0	0	0.32	0.32	0%	0%
App Engine	Cloud Firestore Entry Writes	306,586	count	0.29	0	0	0.29	0.29	0%	0%
Cloud Storage	Regional Standard Class & Operations	60,814	count	0.26	0	0	0.26	0.26	0%	0%
App Engine	Cloud Firestore Read Ops	2,498,382	count	0.24	0	0	0.24	0.24	0%	0%
Compute Engine	Cloud Storage E2 Instance Ram running in EMEA	65,005	gigabyte hour	0.17	0	0	0.17	0.17	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to EMEA	1,137	gigabyte	0.12	0	0	0.12	0.12	0%	0%
Cloud Storage	Network Data Transfer GCP Replication within Europe	6,136	gigabyte	0.12	0	0	0.12	0.12	0%	0%
Cloud Storage	Standard Storage Multi-region	5,721	gigabyte month	0.12	0	0	0.12	0.12	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to EMEA	1,137	gigabyte	0.11	0	0	0.11	0.11	0%	0%
Vertex AI	Model Data Transfer Out from Frankfurt to EMEA	0.012	GB month	0.1	0	0	0.1	0.1	0%	0%
Cloud Run Functions	Cloud Run Functions CPU Allocation Time in Europe (us-east-2)	3,877,009	second	0.09	0	0	0.09	0.09	0%	0%
Cloud Run Functions	Cloud Run Functions (1st time) CPU Time	6,776,892	second	0.09	0	0	0.09	0.09	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Asia (Excluding Korea and Indonesia)	6,786	gigabyte	0.08	0	0	0.08	0.08	0%	0%
Cloud Run Functions	Cloud Run Functions (1st time) CPU Time	29,064,781	second	0.08	0	0	0.08	0.08	0%	0%
Cloud Storage	Network Data Transfer - GCP Replication within Europe	4,81	gigabyte	0.07	0	0	0.07	0.07	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Americas	8,851	gigabyte	0.07	0	0	0.07	0.07	0%	0%
Compute Engine	External IP Charge on a Standard VM	6,545,471	hour	0.07	0	0	0.07	0.07	0%	0%
Cloud Storage	Standard Storage Multi-region	2,088	gigabyte month	0.05	0	0	0.05	0.05	0%	0%
App Engine	Cloud Firestore Read Ops (named databases)	82,734	count	0.03	0	0	0.03	0.03	0%	0%
Compute Engine	Generated Content output token count for Gemini 1.5 Flash when input is up to 128k tokens	42,823	count	0.04	0	0	0.04	0.04	0%	0%
Compute Engine	Generated Content output token count for Gemini 1.5 Flash when input is up to 128k tokens	42,823	count	0.04	0	0	0.04	0.04	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Asia (Excluding Korea and Indonesia)	128,267	count	0.04	0	0	0.04	0.04	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Asia (Excluding Korea and Indonesia)	128,267	count	0.04	0	0	0.04	0.04	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Asia (Excluding Korea and Indonesia)	128,267	count	0.04	0	0	0.04	0.04	0%	0%
Cloud Storage	Regional Standard Class & Operations	1,849	characters	0.03	0	0	0.03	0.03	0%	0%
Cloud Storage	Network Data Transfer - GCP Multi-region within Europe	138,757	count	0.03	0	0	0.03	0.03	0%	0%
Cloud Storage	Multi-Region Standard Class & Operations	2,722	count	0.03	0	0	0.03	0.03	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Americas	9,027	gigabyte	0.03	0	0	0.03	0.03	0%	0%
Cloud Storage	Standard Storage Belgium	9,049	gigabyte month	0.02	0	0	0.02	0.02	0%	0%
Cloud Run Functions	Cloud Run Functions (1st time) Memory Time (us-east-2)	5,147,820	gigabyte second	0.02	0	0	0.02	0.02	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Australia	9,049	gigabyte	0.02	0	0	0.02	0.02	0%	0%
Compute Engine	Generated Content output token count for Gemini 1.5 Flash when input is up to 128k tokens	3,912	count	0.01	0	0	0.01	0.01	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Africa	9,136	gigabyte	0.01	0	0	0.01	0.01	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Asia	9,061	gigabyte	0.01	0	0	0.01	0.01	0%	0%
Cloud Run Functions	Cloud Run Functions CPU Allocation Time in Europe (us-east-2)	5,136,820	gigabyte second	0.01	0	0	0.01	0.01	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to South America	9,072	gigabyte	0.01	0	0	0.01	0.01	0%	0%
Compute Engine	Licensing Fee for Cloud SQL Server 2017 Standard on VM with 1 to 4 vCPU	0.022	hour	0.01	0	0	0.01	0.01	0%	0%
App Engine	File Instance Core Hours EMEA	0.174	hour	0.01	0	0	0.01	0.01	0%	0%
App Engine	Cloud Firestore Entry Writes (named databases)	9,049	gigabyte	0.01	0	0	0.01	0.01	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Australia	9,047	gigabyte	0.01	0	0	0.01	0.01	0%	0%
App Engine	Cloud Firestore Entry Deletes	131,835	count	0.01	0	0	0.01	0.01	0%	0%
Cloud Storage	Network Data Transfer - GCP Pre-bundled Storage	25,176	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Generated Content output token count for Gemini 1.5 Flash when input is up to 128k tokens	482	count	0	0	0	0	0	0%	0%
App Engine	Cloud Firestore Read Ops	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to South America	9,049	gigabyte	0	0	0	0	0	0%	0%
App Engine	Cloud Firestore Read Ops	824,209	count	0	0	0	0	0	0%	0%
Networking	Network Cloud NAT Data Processing	9,049	gigabyte	0	0	0	0	0	0%	0%
Database	Database Firewall Processing (with SQL) in Frankfurt	35,187	count	0	0	0	0	0	0%	0%
Vertex AI	Image for Captioning (input)	3	image for caption	0	0	0	0	0	0%	0%
App Engine	Cloud Firestore Entry Writes (named databases)	9,049	count	0	0	0	0	0	0%	0%
App Engine	File Instance RAM EMEA	0.174	gigabyte hour	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Africa	9,136	gigabyte	0	0	0	0	0	0%	0%
Cloud Storage	Genkit 1.5 Flash Text Input - Predictions	9,734	count	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Africa	9,136	gigabyte	0	0	0	0	0	0%	0%
Cloud Storage	Multi-Region Standard Class & Operations	1,975	count	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Middle East	9,049	gigabyte month	0	0	0	0	0	0%	0%
Cloud Storage	Standard Storage Frankfurt	9,049	gigabyte month	0	0	0	0	0	0%	0%
Vertex AI	Genkit 1.5 Flash Text Output - Predictions	1,590	count	0	0	0	0	0	0%	0%
Cloud Run Functions	Cloud Run Functions CPU Allocation Time in Europe (us-east-2)	25,186	second	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Americas	9,013	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from Frankfurt to Africa	9,013	gigabyte	0	0	0	0	0	0%	0%
Cloud Storage	Download China	9,049	gigabyte	0	0	0	0	0	0%	0%
App Engine	Cloud Firestore Storage (named databases)	9,049	gigabyte month	0	0	0	0	0	0%	0%
Compute Engine	Network Inter Region Data Transfer Out from Frankfurt to Hong Kong	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Internet Data Transfer Out from EMEA to EMEA	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Inter Region Data Transfer Out from Frankfurt to APAC	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Data Transfer Out via Carrier Peering Network - EMEA Based	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Inter Region Data Transfer Out from Frankfurt to Singapore	9,049	gigabyte	0	0	0	0	0	0%	0%
Compute Engine	Network Inter Region Data Transfer Out from Frankfurt to Mumbai	9,049	gigabyte	0	0	0	0	0	0%	0%



YOU CAN'T MANAGE WHAT YOU CAN'T MEASURE

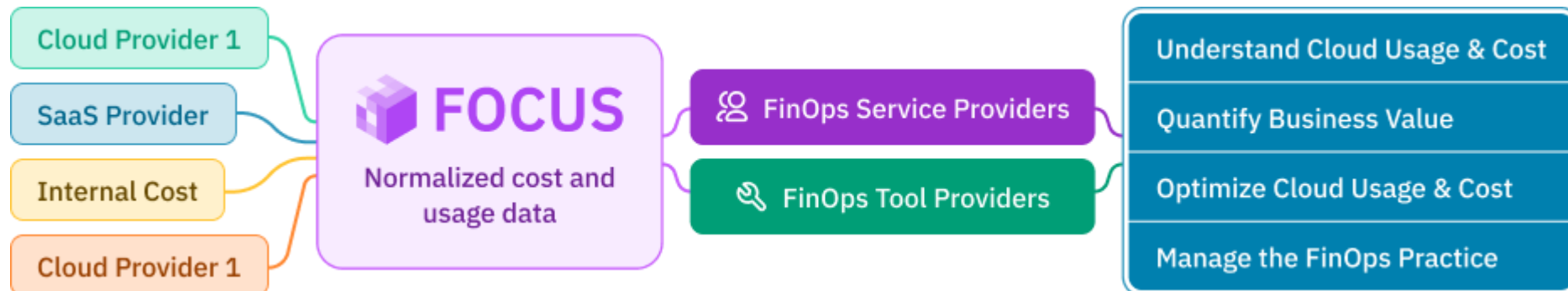
An old Adage that still holds true...

FOCUS – A FINOPS FRAMEWORK

(F)INOPS (O)PEN (C)OST & (U)SAGE (S)PECIFICATION






Open-Source project to produce FinOps-serviceable datasets.

- It's a specification to perform typical FinOps operations:
 - cost-allocation
 - Chargeback
 - Forecasting and budgeting
- Vendor-independent, with the possibility to add SaaS providers and even On-premise costs.
- Main vendors adopting
- The secret sauce is the common data and lexicon specification: The FOCUS Datasets



FOCUS MAIN ELEMENTS





Principles

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

Domains & Capabilities








Understand Cloud Usage & Cost

-  Data Ingestion
-  Allocation
-  Reporting & Analytics
-  Anomaly Management









Quantify Business Value

-  Planning & Estimating
-  Forecasting
-  Budgeting
-  Benchmarking
-  Unit Economics

Optimize Cloud Usage & Cost

-  Architecting for Cloud
-  Rate Optimization
-  Workload Optimization
-  Cloud Sustainability
-  Licensing & SaaS

Manage the FinOps Practice

-  FinOps Practice Operations
-  Cloud Policy & Governance
-  FinOps Assessment
-  FinOps Tools & Services
-  FinOps Education & Enablement
-  Invoicing & Chargeback
-  Onboarding Workloads
-  Intersecting Disciplines

Core Personas

-  Engineering
-  FinOps Practitioner
-  Finance
-  Leadership
-  Procurement
-  Product




Allied Personas

-  ITAM
-  ITFM
-  ITSM
-  Security
-  Sustainability

Phases



Maturity

-  Crawl
-  Walk
-  Run

Use of this requires attribution to the FinOps Foundation under the cc by 4.0 license

FINOPS PRINCIPLES

Act as a North Star, guiding the FinOps practice



Teams need to collaborate

- Finance, technology, product, and business teams work together in near real time as the cloud operates on a per-resource, per-second basis.
- Teams work together to continuously improve for efficiency and innovation.



Decisions are driven by business value of cloud

- Unit economic and value-based metrics demonstrate business impact better than aggregate spend.
- Make conscious trade-off decisions among cost, quality, and speed.
- Think of cloud as a driver of innovation.



Everyone takes ownership for their cloud usage

- Accountability of usage and cost is pushed to the edge, with engineers taking ownership of costs from architecture design to ongoing operations.
- Individual feature and product teams are empowered to manage their own usage of cloud against their budget.
- Decentralize the decision making around cost-effective architecture, resource usage, and optimization.
- Technical teams must begin to consider cost as a new efficiency metric from the beginning of the software development lifecycle.



FinOps data should be accessible and timely

- Process and share cost data as soon as it becomes available.
- Real-time visibility autonomously drives better cloud utilization.
- Fast feedback loops result in more efficient behavior.
- Consistent visibility into cloud spend is provided to all levels of the organization.
- Create, monitor, and improve real-time financial forecasting and planning.
- Trending and variance analysis helps explain why costs increased.
- Internal team benchmarking drives best practices and celebrates wins.
- Industry peer-level benchmarking assesses your company's performance.



A centralized team drives FinOps

- The central team encourages, evangelizes, and enables best practices in a shared accountability model, much like security, which has a central team yet everyone remains responsible for their portion.
- Executive buy-in for FinOps and its practices and processes is required.
- Rate, commitment, and discount optimization are centralized to take advantage of economies of scale.
- Remove the need for engineers and operations teams to think about rate negotiations, allowing them to stay focused on usage optimization of their own environments.



Take advantage of the variable cost model of the cloud.

- The variable cost model of the cloud should be viewed as an opportunity to deliver more value, not as a risk.
- Embrace just-in-time prediction, planning, and purchasing of capacity.
- Agile iterative planning is preferred over static long-term plans.
- Embrace proactive system design with continuous adjustments in cloud optimization over infrequent reactive cleanups.

FINOPS MATURITY LEVEL

- Evaluation of current level is highly recommended.
- There's an assessment tool available at: <https://www.finops.org/wg/finops-assessment/>



Crawl

Maturity Level Characteristics

- Very little reporting and tooling
- Measurements only provide insight into the benefits of maturing the capability
- Basic KPIs set for the measurement of success
- Basic processes and policies are defined around the capability
- Capability is understood but not followed by all the major teams within the organization
- Plans to address "low hanging fruit"

Sample goals/KPI from [the FinOps Community \(data.finops.org\)](https://data.finops.org)

- Should be able to allocate at least 50%
- Resource-based commitments discount target coverage of approximately 60%
- Forecast spend to actual spend accuracy variance is 20%



Walk

Maturity Level Characteristics

- Capability is understood and followed within the organization
- Difficult edge cases are identified but decision to not address them is adopted
- Automation and/or processes cover most of the Capability requirements
- Most difficult edge cases (ones that threaten the financial well-being of the organization) are identified and effort to resolve has been estimated
- Medium to high goals/KPIs set on the measurement of success

Sample goals/KPI from [the FinOps Community \(data.finops.org\)](https://data.finops.org)

- Should be able to allocate at least 80%
- Resource-based commitments discount target coverage is approximately 70%
- Forecast spend to actual spend accuracy variance is 15%



Run

Maturity Level Characteristics

- Capability is understood and followed by all teams within the organization
- Difficult edge cases are being addressed
- Very high goals/KPIs set on the measurement of success
- Automation is the preferred approach

Sample goals/KPI from [the FinOps Community \(data.finops.org\)](https://data.finops.org)

- Greater than 90% of spend can be allocated
- Resource-based commitments discount target coverage is approximately 80%
- Forecast spend to actual spend accuracy variance is 12%

FINOPS DOMAINS

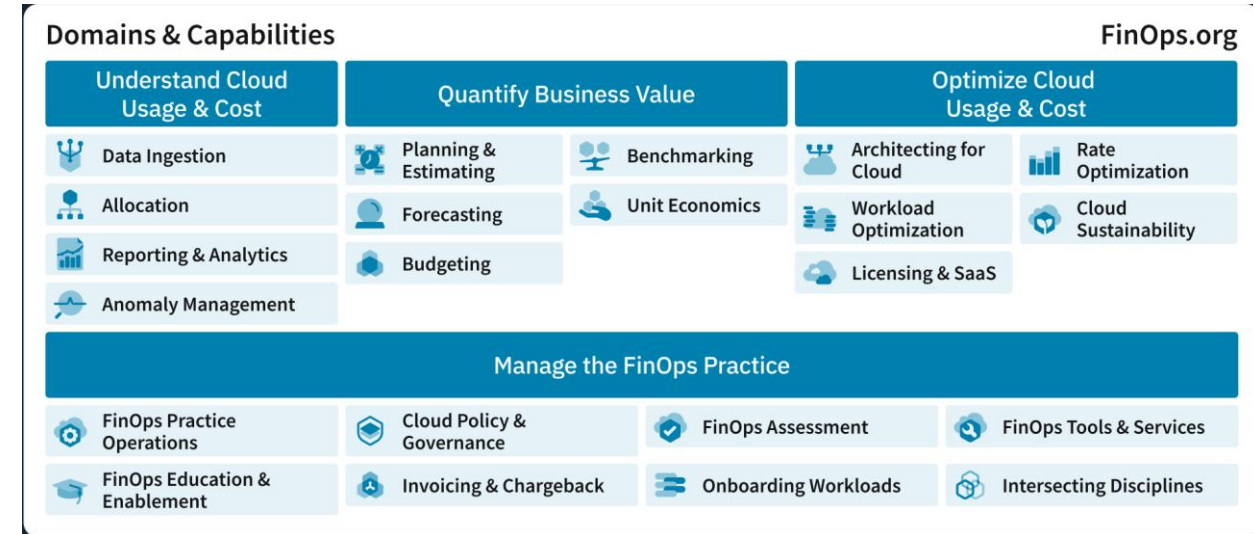
Understand Cloud Usage & Cost

The outcome of this Domain is **better understanding of an organization's use of the cloud.**

Within this Domain, organizations work to **gather all the information required to perform FinOps.**

This includes direct and imputed **cloud cost, cloud usage, observability, utilization, and sustainability data**, and other datasets required by any FinOps Domain.

Activities in this Domain also define the **organizational metadata to categorize, allocate and summarize cloud cost and usage, and define the reporting and analytics processes** making that data available for use by all FinOps Personas.

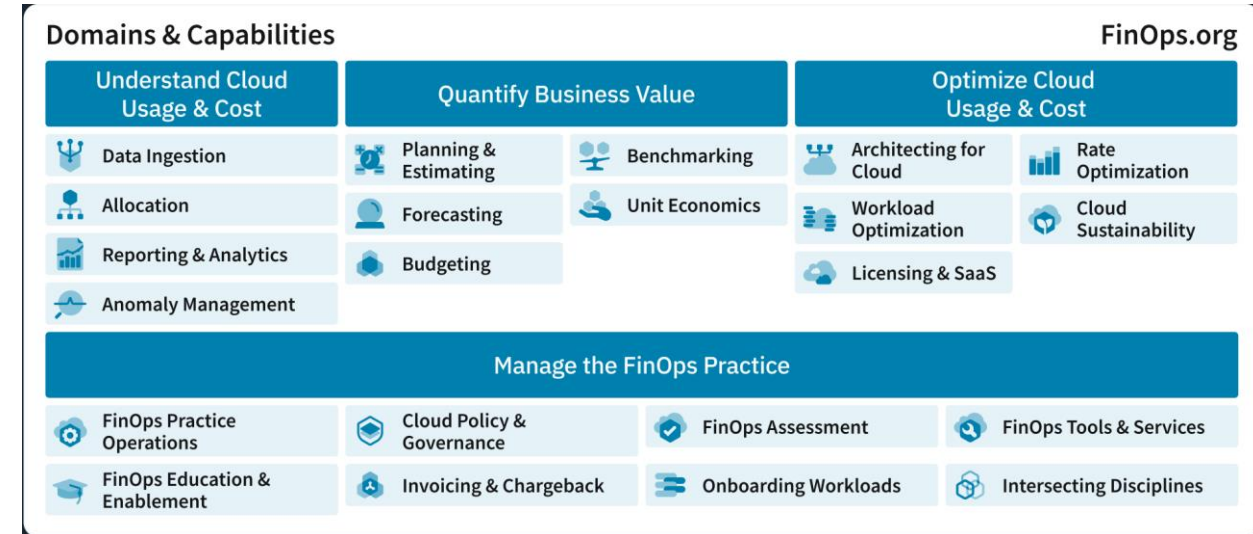


FINOPS DOMAINS

Quantify Business Value

Organizations develop Capabilities in this Domain to **connect the usage and cost data with the business value it creates**, helping ensure value is **transparent** and **within expectations**.

Within this Domain, organizations **map monetary and non-monetary cloud costs to budgets**, use **historical** information and future plans to **forecast**, **establish and measure technical and organizational KPIs**, and perform **benchmarking** across teams, business units and with other organizations.



FINOPS DOMAINS

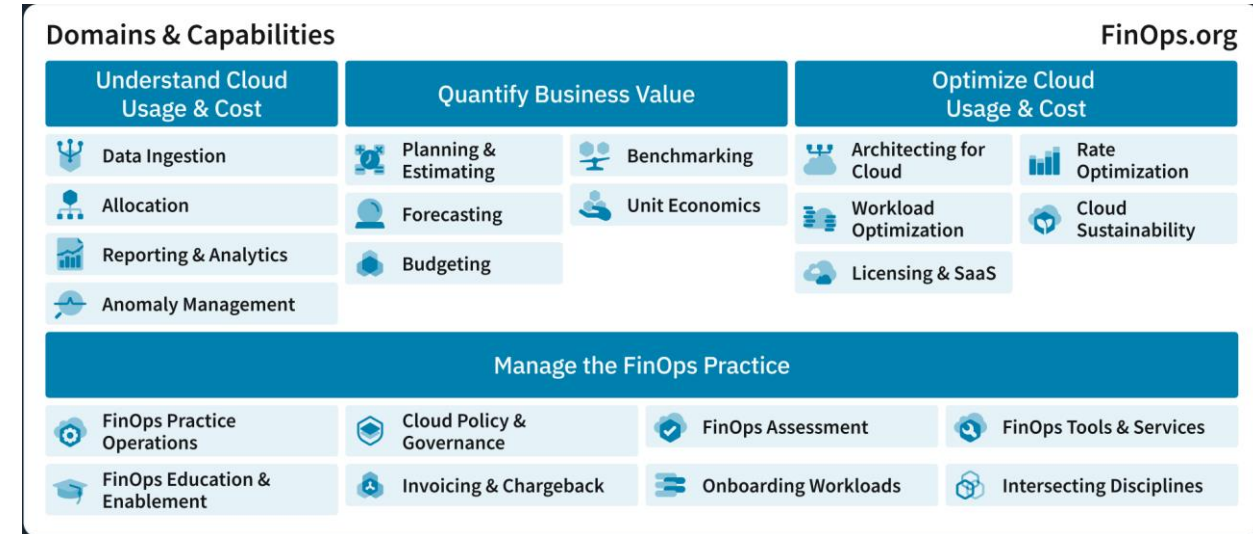
Optimize Cloud Usage & Cost

This Domain focuses on **cloud efficiency**, ensuring organizations **only use the resources when they provide value to the organization**; and that resources used are purchased **at the lowest acceptable cost and impact** to meet the organization's goals.

Organizations will **measure efficiency** in a variety of ways, including **monetary cost, carbon usage**, or more traditional IT operational efficiency measures.

Capabilities in this Domain allow the organization to **manage the types, timing and amounts of cloud resources used, and the rates** that are paid for those resources.

Capabilities here also address **architecture modernization, sustainability** considerations for FinOps teams, and the use of licensed and consumption-based SaaS products.

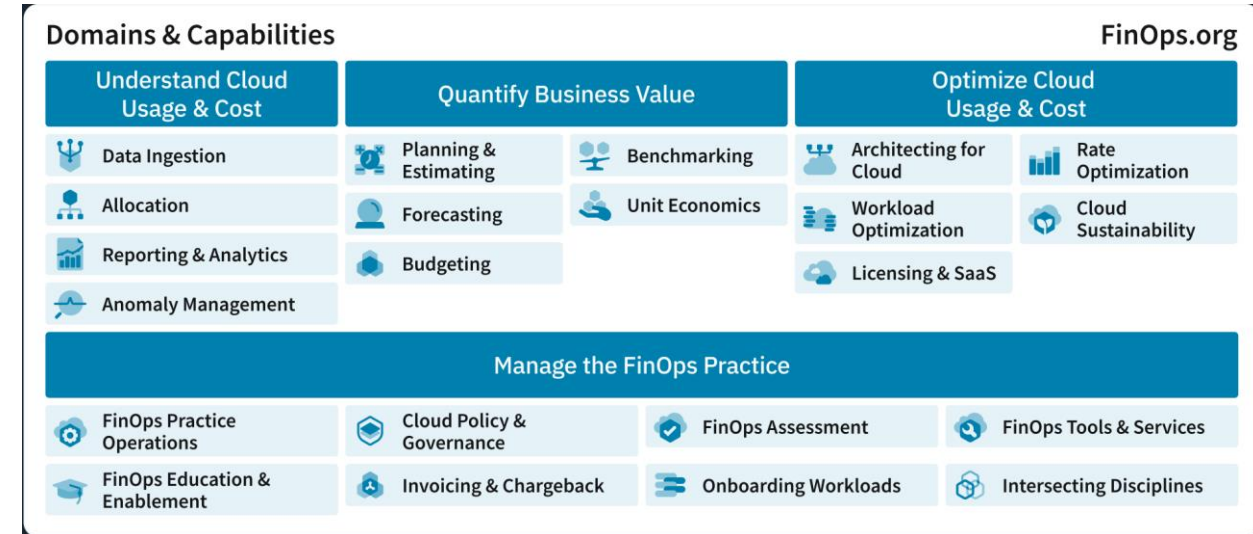


FINOPS DOMAINS

Manage the FinOps Practice

This Domain enables **continuous improvement** to change and **align the entire organization** - its people, processes and technology - **to adopt FinOps** and use cloud in ways that **create value** for the company.

Capabilities here are centered on **effective FinOps operation, enablement** of the whole organization, **improved interaction** with all other personas and business functions to support and represent cloud use more effectively.



FINOPS CAPABILITIES

What and how-to (fast)

Each Capability is defined and explained, with a clear description of

- What is expected of it per maturity level.
- What is expected per persona involved.
- Reference KPIs and Measures of Success
- Outputs and Inputs

This allows for a very concrete and defined understanding of what is done, what needs to be done and who to involve.

It also features a set of accelerators for adoption and control of the capability



Anomaly Management

Framework / Domains / Understand Cloud Usage & Cost / Anomaly Management

Detect, identify, alert and manage unexpected or unforecasted cloud cost and usage irregularities in a timely manner to lower risk in cost-effective cloud operations.

Detect anomalies

- Define the tools we use to detect anomalous spending
- Identify and document how alerts are created and logged
- Identify and document how responsible parties are identified
- Set mechanisms to alert appropriate parties timely using appropriate channels

Enable anomaly detection

- Define information required for effectiveness, send back to Data Ingestion
- Create policies with respect to anomaly management










Manage anomalies

- Analyze reported anomalies
- Categorize, manage false positives, investigate
- Document anomalies and their resolutions

Table of Contents

- Definition
- Maturity Assessment
- Functional Activities
- Measures of Success & KPIs
- Inputs & Outputs

Related Assets

-  Managing Cloud Cost Anomalies
-  Managing Anomalies Story Collection
-  FinOpsPod 22: Strategies for Troubleshooting Cost Anomalies & Trends
-  FinOpsPod 29: Cloud Cost Anomalies: How to Detect and Manage Them
-  Anomaly Detection at Multi-Million Dollar Cloud Spend Scale
-  How Anomaly Detection and Unit Economics Fuel Growth at Palo Alto Networks
-  Strategies for Troubleshooting Cost Anomalies & Trends (Under Armour)
-  Tackling Anomalous, Runaway Data Analysis Costs
-  Measuring Anomaly-Detected Cost Avoidance Playbook

Let's look at an example:

<https://www.finops.org/framework/capabilities/anomaly-management/>

FINOPS USE CASES

Frequent “how to do” FinOps

There’s a series of typical FinOps use-cases, situations or challenges that the personas involved in FinOps may find recurrent in their work.

There are approx. 40 now available, with the number increasing regularly.

As the FOCUS dataset is standardized, a FOCUS-enabled SQL Query is also made available.

Report spending across billing periods for a provider by service category

[Asset Library / FinOps Use Cases](#) / Report spending across billing periods for a provider by service category

Context

Understanding costs across providers, billing periods, billing accounts, and service categories (Analytics, Compute, Database, Storage, etc.) provides valuable insight into total costs and can be used by Procurement to focus negotiations for specific providers with details on the billing accounts that are driving costs. to focus negotiations toward highest costing items.

FOCUS Columns

Provider
Billing Account ID
Billing Account Name
Billing Currency
Billed Cost
Billing Period Start
Service Category
Service Name

FOCUS SQL Query

```
SELECT
  ProviderName,
  BillingAccountName,
  BillingAccountId,
  BillingCurrency,
  BillingPeriodStart,
  ServiceName,
  SUM(BilledCost) AS TotalBilledCost
FROM focus_data_table
WHERE ChargePeriodStart >= ? and ChargePeriodEnd < ?
AND ProviderName = ?
GROUP BY
  ProviderName,
  BillingAccountName,
  BillingAccountId,
  BillingCurrency,
  BillingPeriodStart,
  ServiceCategory,
  ServiceName
ORDER BY TotalBilledCost DESC
```

Related Personas

Procurement

Related Capabilities

Reporting & Analytics

Let’s look at an example:

<https://www.finops.org/assets/use-cases/report-spending-across-billing-periods-by-service-category/>

FINOPS PLAYBOOKS

Community-based how-to's to address specific needs

Besides the actual official framework documents, the community is also invited to participate, adding ways to address everyday FinOps challenges in organizations.

These pre-made solutions are called playbooks, and there's a ton of them available, with some fairly simple, and some others highly detailed.

Identify how many hours the resource is billed

To identify the duration for which a resource is billed, query the CUR data in Athena. Use the below query:

```
SELECT
sum(duration_diff('hour', time_item_usage_start_date, time_item_usage_end_date))
FROM <cur_database>.<cur_table>
WHERE
time_item_product_code = '<product_code>'
AND resource_tag_user_customer_tag_key = '<customer_tag_value>'
AND product_product_family = '<product_family>'
AND time_item_usage_start_date >= timestamp '<start_date>'
AND time_item_usage_end_date <= timestamp '<end_date>'
```

Note: the query can be changed based on how to identify the resource(s) in an organization.

Replace <cur_database> with the CUR Database, <cur_table> with CUR table name, <product_code> with the value of line_item_product_code of the resource for which this is being calculated like 'AmazonRDS', <customer_tag_key> with the key of the tag used for identification of resource, <customer_tag_value> with the value of the key, <product_family> with the family of product (e.g. Database Instance, Compute Instance, etc), <start_date> with the start date of period of billing, <end_date> with the end date of the period of billing. The <start_date> and <end_date> should be of the format YYYY-MM-DD.

Additional WHERE clause columns could be - product_region, line_item_usage_account_id, etc.

The above query will give you the number of hours for which the resource was billed in a period.

Calculate the hours for which a resource must be running within a period

Taking an example, an RDS instance is required to be stopped over the weekends from Saturday 12 AM UTC to Monday 12 AM UTC.

The total number of hours it needs to be stopped is 48 hrs in a week as per the power schedule.

Consider the month of August 2023: there are 4 weekends so total number of hours the RDS instance is supposed to be stopped = 4 x 48 = 192 hours.

Total number of hours (in August) = 31(number of days) X 24(number of hours in a day) = 744 hours.

Total number of hours the RDS is required to run = 744 - 192 = 552 hours.

Calculate the KPI for each resource in scope

Formula

$$\text{Power Schedule Adherence Rate} = \frac{\text{Time(in hours) for which resource is required to run for a period}}{\text{Time(in hours) for which resource is billed for a period}}$$

OR

$$\text{Power Schedule Adherence Percentage} = \frac{\text{Time(in hours) for which resource is required to run for a period}}{\text{Time(in hours) for which resource is billed for a period}} \times 100$$

Consider the example in step 3, assuming the RDS instance was billed for 600 hours in August 2023, the calculation will look like:

$$\text{Power Schedule Adherence Rate} = \frac{552}{600} = 0.92$$

OR

$$\text{Power Schedule Adherence Percentage} = \frac{552}{600} \times 100 = 92\%$$

Table of Contents

- Prerequisites
- Instructions for All Clouds
- Outcomes and Indicators of Success
- Related Resources
- Acknowledgments

Did you find this useful?

☐ Yes ☐ No

Let's look at examples:

<https://www.finops.org/wg/how-to-measure-power-schedule-adherence-rate-percentage/>

<https://www.finops.org/wg/percent-commitment-based-discount-waste-playbook/>

LET'S LOOK AT A SCENARIO

A sample question from the FOCUS Analyst Certification Exam

You've been asked to optimize your organization's cloud costs.

You have a FOCUS dataset at hand and start to analyse it. You find this line which seems interesting.

Block & Fractional Block Pricing

In block pricing, a block is purchased (e.g. 1 block = 2000 hours) and in fractional block pricing, fractions of a block can be purchased (e.g. 2.2 blocks = 2200 hours).

Considering the item is a Fractional Block Pricing one, with fractional block pricing increments of 0.5, what would be the best optimization strategy to follow?

Pricing Strategy	Item Description	Charge Category	Pricing Quantity	Pricing Unit	List Unit Price	List Cost	Contracted	Contracted Cost	Billed Cost	Effective Cost	Consumed Quantity	Consumed Unit
Fractional Block Pricing	AI Tokens	Usage	1,5	1000 Tokens	1,00	1,50	0,90	1,35	1,35	1,35	1005	Tokens

- a) Propose finding ways to reduce the effective cost of this item
- b) Propose a way to increase the number of fractional blocks from 1.5 to 2.0
- c) Propose finding ways to reduce usage slightly to avoid paying for the additional 0.5 block
- d) Propose finding ways to reduce the contracted rate for this item

CROSSING FINOPS DATA WITH CARBON FOOTPRINT

GETTING THE CARBON DATA

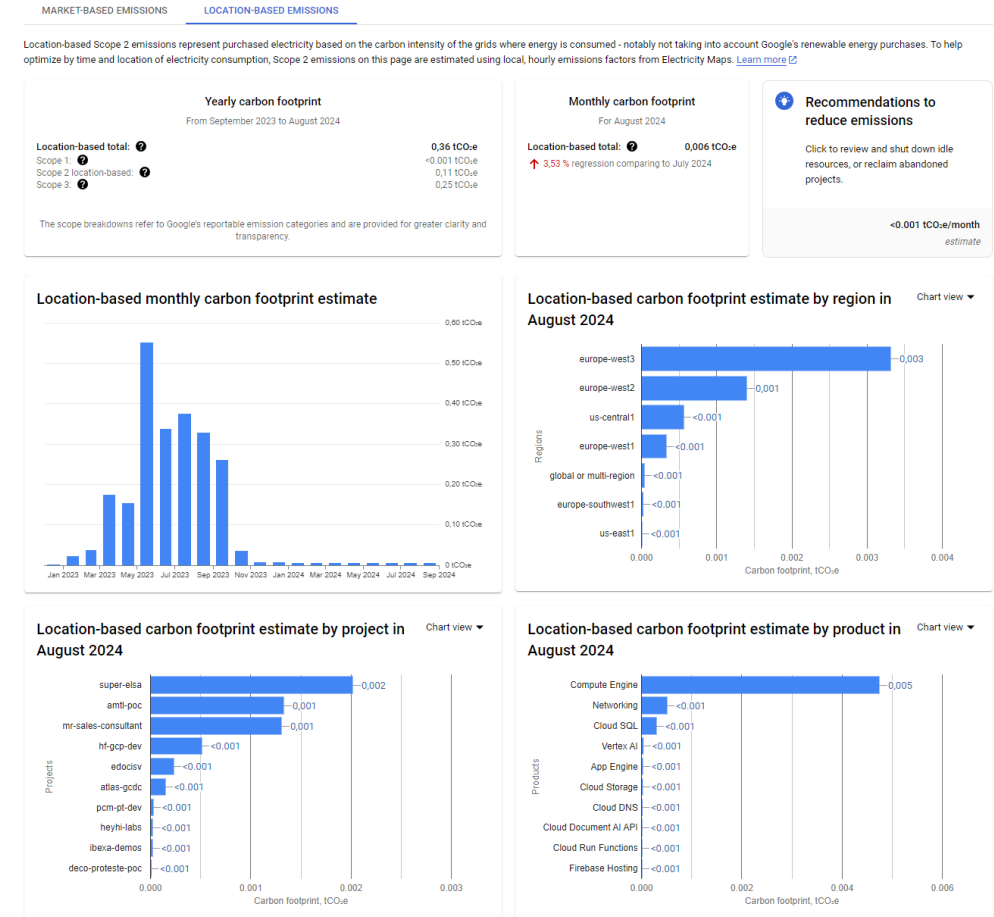
As provided by the cloud vendors

- All main cloud vendors are now providing carbon-related data, so that companies can measure and act upon to achieve their sustainability goals.
- Very soon, it will be mandatory to have all this data to help with the sustainability reports.
- Google: <https://console.cloud.google.com/carbon>
- Microsoft: <https://www.microsoft.com/en-in/sustainability/emissions-impact-dashboard> (has an API still in preview mode)
- AWS: <https://aws.amazon.com/aws-cost-management/aws-customer-carbon-footprint-tool/>
- Oracle: <https://docs.oracle.com/en-us/iaas/Content/General/Tasks/carbon-analysis-viewreports.htm>

It's possible to generate Carbon-Impact datasets, per service, per location and per project.

Crossing FOCUS datasets with carbon-impact datasets allows for workload carbon-impact reporting and analysis.

Link is currently working on an accelerator to have this fully integrated on a single report, with multi-cloud vendor sources.





IT'S NOT JUST NICE... IT'S ICE!

José Rodrigues

Director of ICE [Integration, Cloud and Experience]

jose.Rodrigues@linkconsulting.com

+351 969 441 364



LinkedIn