

BEYOND CONNECTIVITY

FULL Life-Cycle
Infrastructure Orchestration
and Cost Engineering

TASTE



CARE

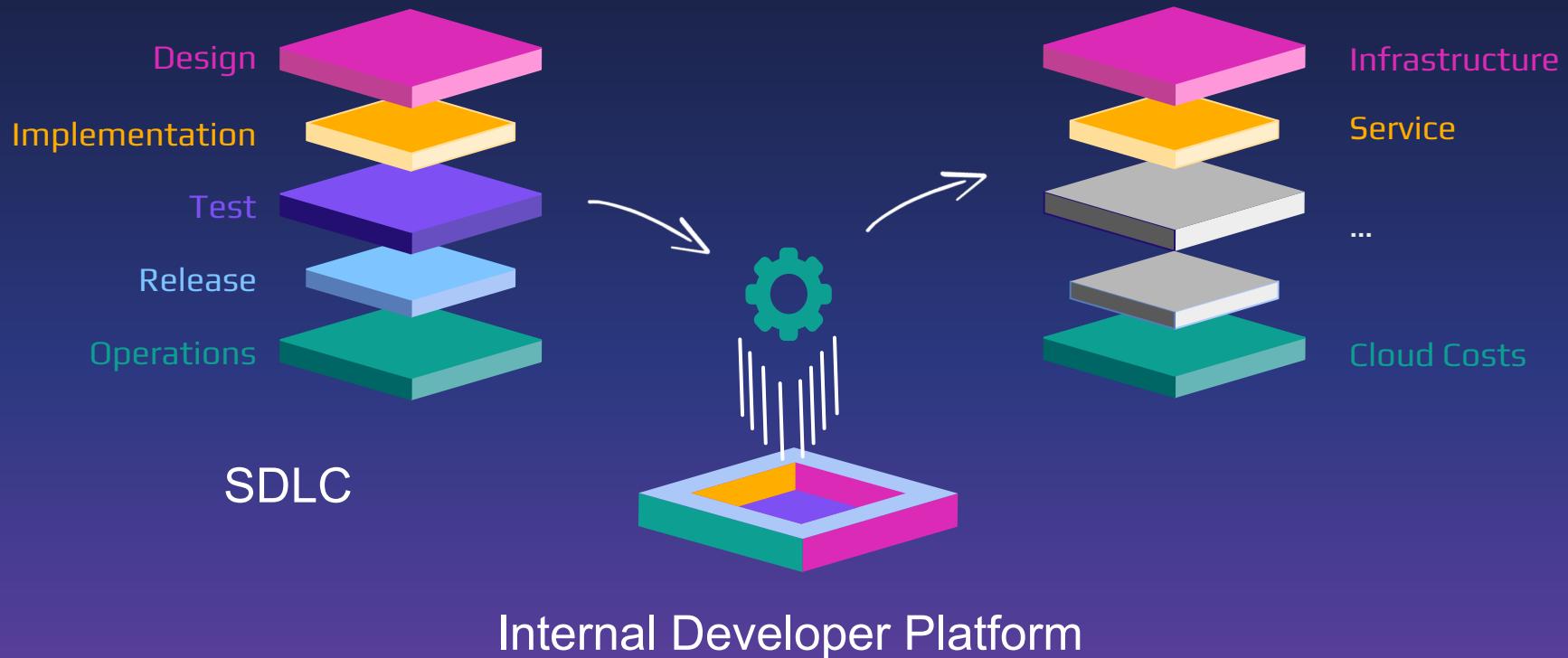


WELLBEING





Platform Engineering Team



Code

- Java 
- Python 
- Kotlin Multi-Platform 
- C# 
- Node.js 
- BitBucket 
- CircleCI 
- Jenkins 
- ArgoCD 
- Spinnaker 
- SonarQube 
-

Infra

- AWS 
- Azure 
- IBM 
- Google Cloud 
- Kubernetes 
- MongoDB 
- Postgres 
- Redis 
- Datadog 
- FireBase 
- Vault 
- Terraform 



ANYTHING FROM THE LIST?

DEVS

- Different tech stack
- Different tools
- Multi-cloud set up
- Outdated documentation
- Long waiting time
- Unclear process
- Restricted permissions

SRE

- Toil
- DMs/tickets
- Context switching
- Low-valuable meetings
- No time for development

New message in #sre

Hi SRE team!
could I ask to restart this prod deployment?

New message in #sre

Hi SRE team!
I am getting error when trying to apply terraform changes. Looks like I do not have access to autogenerated secrets. Could you apply the service below to staging EU?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12345](https://link/jira/infra-12345)

New message in #sre

Hello SRE team, I'm trying to access Datadog, but when I try to login using SSO, it tells me to wait for an email. The problem is that this email never arrives. So I think that my account has no permission to use it. Is there anything I should do?

New message in #sre

We have startup errors in staging when deploying service with below error. Looks like process which copies the contents from vault and creates secret folder is missing. Could you check ?

New message in #sre

Hi #sre! We have a service called Care Advisor, which includes admin endpoints for R&D department to update the service's knowledge base. We need to provide them with API key values for all environments.

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12335](https://link/jira/infra-12335)

New message in #sre

Hi SRE team!
could I ask to restart this prod deployment?

New message in #sre

We have startup errors in staging when deploying service with below error. Looks like the process which copies the contents from vault and creates secret folder is missing. Could you check ?

New message in #sre

Hi, I am getting error when trying to apply terraform changes. Looks like I do not have access to autogenerated secrets. Could you apply the service below to staging EU?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-4321](https://link/jira/infra-4321)

New message in #sre

Hi SRE! I would need to add 3 new value to Vault on prod environment. Can somebody help me out with this?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12336](https://link/jira/infra-12336)

New message in #sre

Hi SRE! I have a question: If a pod start failed, will it be automatically restarted after a time, or we can manually delete the POD in ArgoCD so system will scale it up again, and a new pod will be started?

New message in #sre

Hi #sre . Can you help to create a IAM policy in ocp-staging?

New message in #sre

Hi SRE team!
We need your help again! Can somebody help us with the following points please...

New message in #sre

Hello #sre . Can you help to create a IAM policy in ocp-staging?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12346](https://link/jira/infra-12346)

New message in #sre

Hello #sre, there is one customer in Italy owning purifier bought on 27.03.2023. It is two days that it is OFFLINE in Google, while in the app it is online. Is there anything wrong in the system now?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12337](https://link/jira/infra-12337)

New message in #sre

Hey! Just realised that I lost the access for Appliances plugin. Should I create another ticket?

New message in #sre

Hi #sre Could you please work on this below ticket?
[/link/jira/infra-12338](https://link/jira/infra-12338)

New message in #sre

short call? I need you support regarding our future infrastructure set up?

New message in #sre

Hello SRE, I have an service running in OCP ([ocp-scheduler](#)) which requires to connect to MongoDB in ECP. Currently I am getting:

New message in #sre

Hi #sre . Can you help to create a IAM policy in ocp-staging?

New message in #sre

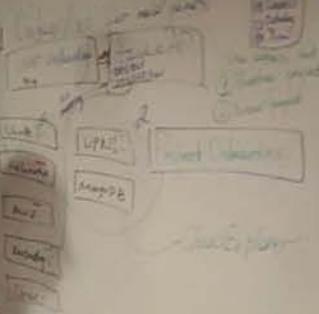
or when trying to apply terraform
I do not have access to
nets. Could you apply the service
EU?

New message in #sre

Hi #sre. I am trying to publish to the kafka topic that was provisioned earlier today.

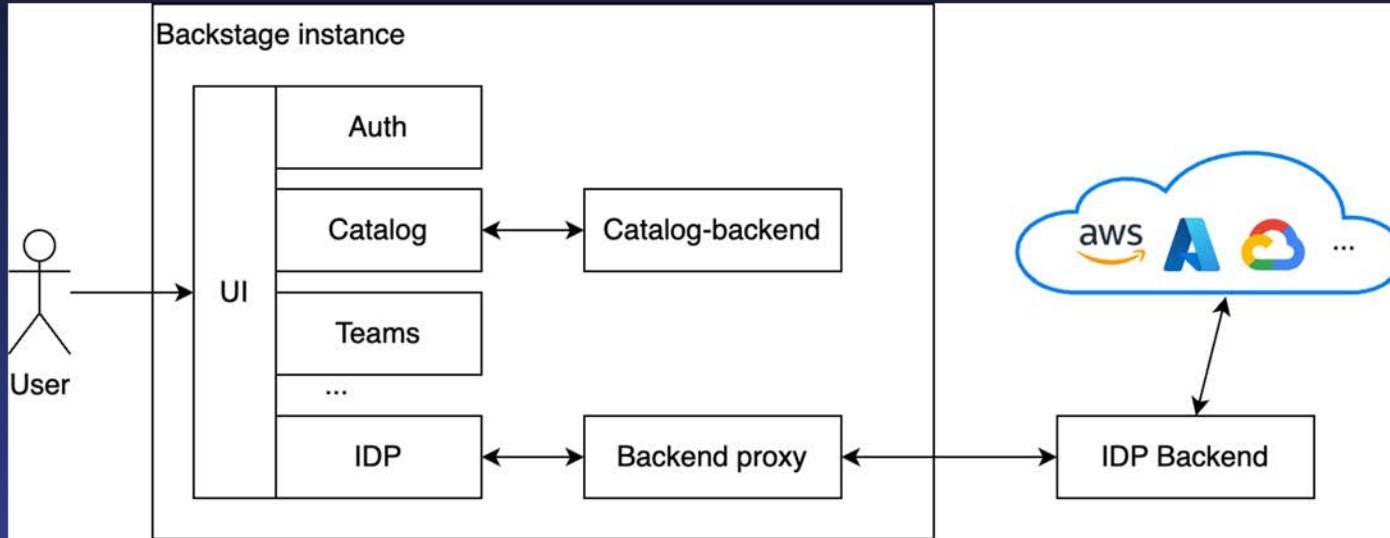
- 1 Design it for the user
- 2 Define the roles in the system
- 3 Planning in DB
- 4 Notifications
- 5 Code It & connect

SEC Ecosystem





Internal Developer Platform using Backstage

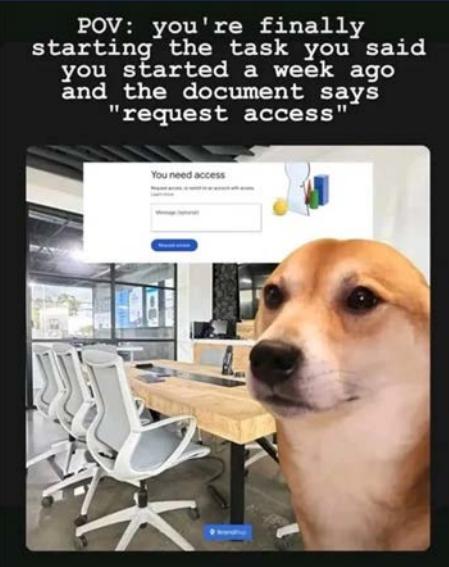


- Single entry for various platforms
- Unified UI
- Open for contributions from other teams

Ref: <https://backstage.io/docs/overview/architecture-overview>



User Onboarding





User Onboarding

A screenshot of the Electrolux User Onboarding interface. At the top left is a user profile card for 'Long Zhang' with a green circular icon containing 'LZ'. Below it is an email address 'long.zhang@electrolux.com' and a list of teams: 'dpo developers' and 'dpo-team-sre'. At the bottom is a 'Tools list (Beta)' section with a grid of icons for various Atlassian products: Atlassian, Slack, Atlas, Bitbucket, Jira, and Confluence. A black navigation bar at the very bottom contains a magnifying glass icon, a three-line menu icon, and a small user profile icon.

- Pre-defined access policies based on the org structure
- One page for configuring access to all tools



Two Different Kinds of Needs From Devs

**Cloud resources
are all I need**

Reuse the modules that adopt best practices and provision infrastructure with several clicks

**Infrastructure
customization**

Define my own modules that can be maintained via IDP



EKS Provisioning as an Example

Electrolux Catalog

CREATE SUPPORT

Kind	Component	System	Owner	Type	Lifecycle	Description	Tags	Actions
PERSONAL	aaec-api-postman-collections	aaec	APAC - API Economy	service	Autodiscovered		eks	
all	aaec-asir-user-validation-api	aaec	APAC - API Economy	service	Autodiscovered		eks	
ELECTROLUX	aaec-autodose-api	aaec	APAC - API Economy	service	Autodiscovered		eks	
All	aaec-care-advisor-orchestrator-service	aaec	APAC - API Economy	service	Autodiscovered		eks	
OWNER	aaec-drinks-chill-advisor-api	aaec	APAC - API Economy	service	Autodiscovered		eks	
LIFECYCLE	aaec-ip-to-location-api	aaec	APAC - API Economy	service	Autodiscovered		eks	
TAGS	aaec-lemongrass-cms	aaec	APAC - API Economy	service	Autodiscovered		eks	
create	aaec-translation-service-api	aaec	APAC - API Economy	service	Autodiscovered		eks	
	aaec-weather-advisor-api	aaec	APAC - API Economy	service	Autodiscovered		eks	

- Purely from UI
- Minimum input
- Follow standards



Infrastructure Provisioning & Orchestration

fdn-infrastructure / **terraform**

Name
..
api-gateway
backends
dns
internal-custom-domain
kubernetes
rest-api
transit-gateway

COMPONENT → SERVICE
fdn-infrastructure ☆

OVERVIEW REVISION LOG AUDIT

About Service

VIEW SOURCE DD LOGS

ORGANIZATION PROJECT NAME

DX Foundation (FDN) fdn-*

IDENTIFIER COMPONENT OWNER

fdn-infrastructure Service AA

DESCRIPTION FDN terraform infrastructure scripts

TEAMS ORG ADMIN TEAMS STATUS

dpo-team-sre dpo-team-sre Provisioned

ORG ADMINS STATUS

VS Provisioned

RESOURCE TAGS

No Tags

MERGED TAGS

organization: dx project: fdn

REQUESTER LANGUAGE

AA terraform

ENVIRONMENTS

fdn-dev-eu-north-1-fdn-dev-eu-north-1-b80

Tree view (Beta)

Show subcomponents

Execute Terraform Code (Beta)

- terraformer/api-gateway
- terraformer/backends
- terraformer/dns
- terraformer/internal-custom-domain
- terraformer/kubernetes
- terraformer/rest-api
- terraformer/transit-gateway

CANCEL



Infrastructure Provisioning & Orchestration

fdn-infrastructure / terraform

Name

..

COMPONENT → SERVICE
fdn-infrastructure ☆

OVERVIEW REVISION LOG AUDIT

About Service Tree view (Beta)

1998 12:32:21

1999 12:32:21 Apply complete! Resources: 2 added, 4 changed, 2 destroyed.

2000 12:32:21 Update task is done

2001 12:32:21 Workspace /tmp/tmpnw4kf85b is cleaned up

2002

KUBERNETES

rest-api

transit-gateway

RESOURCE TAGS
No Tags

MERGED TAGS
organization: dx project: fdn

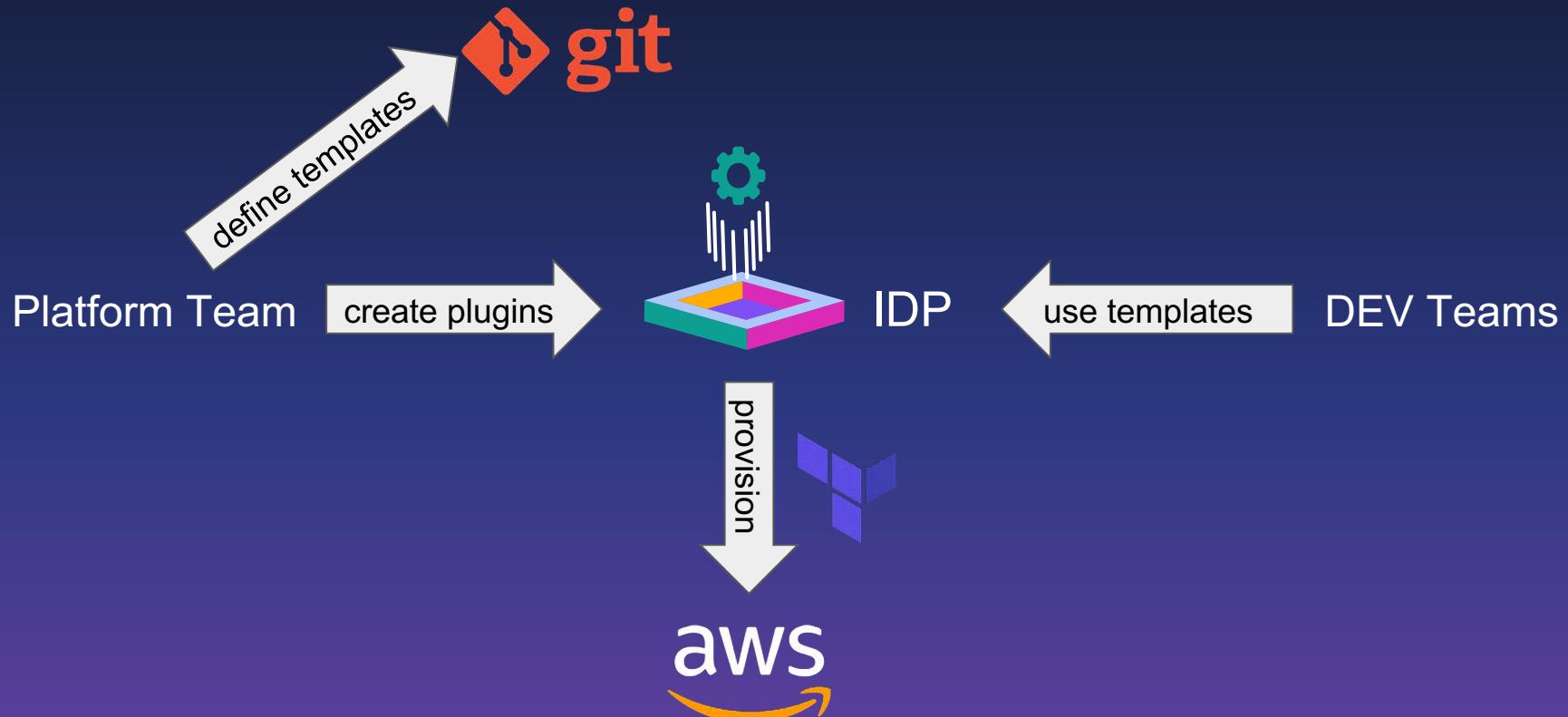
REQUESTER
AA

LANGUAGE
terraform

ENVIRONMENTS
fdn-dev-eu-north-1-fdn-dev-eu-north-1-b80



Infrastructure Management





Use Cases for Service Onboarding

The screenshot shows the Fdn UI interface for the service "fdn-auth". The main navigation bar includes tabs for OVERVIEW, CI/CD, VAULT, ECR, REVISION, LOO, KUBERNETES (which is selected), and AUDIT. The service name "fdn-auth" is displayed with a star icon. The "KUBERNETES" tab is active, showing a "Kubernetes deployments" section. A modal dialog titled "Manual deployment to fdn-dev-eu-north-1-infra-kitchen-dev" is open, prompting the user to select a service branch, image version, and values file. The selected values are "master", "1.0.8", and "values-dev.yaml". A note in the dialog states: "This feature relies on a manual deploy workflow in the service's CircleCI pipeline. Check the instructions [here](#) if you have not configured it yet." At the bottom of the dialog are "DEPLOY" and "CANCEL" buttons. The background of the main screen shows a list of labels for the service, such as app.kubernetes.io/component, app.kubernetes.io/instance, app.kubernetes.io/language, app.kubernetes.io/managed-by, app.kubernetes.io/name, app.kubernetes.io/part-of, app.kubernetes.io/version, git-revision, helm.sh/chart, and tags.datadoghq.com/env.



Infrastructure Management



Cloud data synchronization



Version management and auditing



Cost observability



Approval flow

RESOURCES - EKS

fdn-dev-eu-north-1-demo-eks-ebd ★

OVERVIEW METADATA METRICS COST REVISION LOG AUDIT

About EKS

ORGANIZATION: DX IDENTIFIER: demo-eks COMPONENT: EKS DESCRIPTION: Demo eks TEAMS: dpo-team-sre ORG ADMIN TEAMS: dpo-team-sre APPROVAL REQUESTS: 0

REQUEST APPROVAL

Do you want to approve the request?

APPROVE DECLINE

REGION: eu-north-1 STATUS: Provisioning (Pending for approval)

Tree view (Beta)

Show subcomponents

COLLAPSE ALL MARK AS BLUEPRINT

demo-eks

Dashboard

Catalog

Components

Integrations

Tasks

Configs

Versions

Resources

Aws Account

Aws Environment

Aws VPC

Aws Redis

Aws K8s

K8s namespace

<input type="checkbox"/>	Identifier	Description	Component	Created at	Updated at
<input type="checkbox"/>	Aws Account		aws_account	27/08/2024	27/08/2024
<input type="checkbox"/>	Aws Environment		aws_environment	27/08/2024	27/08/2024
<input type="checkbox"/>	Aws VPC		aws_vpc	27/08/2024	27/08/2024
<input type="checkbox"/>	Aws Redis		aws_redis	28/08/2024	28/08/2024
<input type="checkbox"/>	Aws K8s		aws_k8s	28/08/2024	28/08/2024
<input type="checkbox"/>	K8s namespace		k8s_namespace	28/08/2024	28/08/2024

Rows per page: 10 ▾ 1-6 of 6

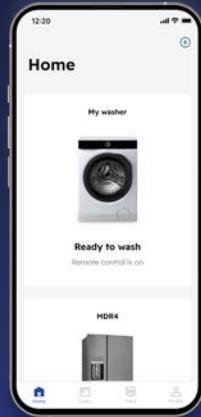


Summary - Infrastructure Orchestration

- To be dependency free from your infrastructure team
- Modules are fundamental and the engine does the magic
- Self-manageable infrastructure is much more efficient



Infrastructure/Service Burns Money?



\$\$\$



\$\$\$



\$\$



Two Different Kinds of Needs for Costs

From management

- What is the total cost of project X?
- What is the trend?
- How to optimize cloud costs?
- ...

From developers

- How much does my service cost?
- What is the correlation between usage and cost?
- ...



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Two Different Kinds of Needs for Costs

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From developers

- How much does my service cost?
- What is the correlation between usage and cost?
- ...



Cost Engineering

Multi-cloud cost aggregation

- Many third-party solutions in the market
- Might be overwhelmed by the features
- The subscription might not be cheap while you only need several key features



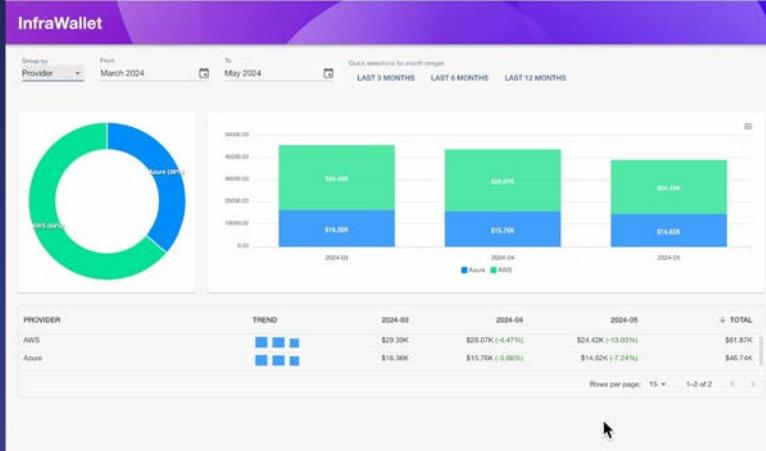
Fine-grained cost breakdown

- Cloud providers usually provide nice tools
- One provider, several dashboards
- Users have to switch among dashboards when they have multi-cloud costs



Cost Engineering

Multi-cloud cost aggregation

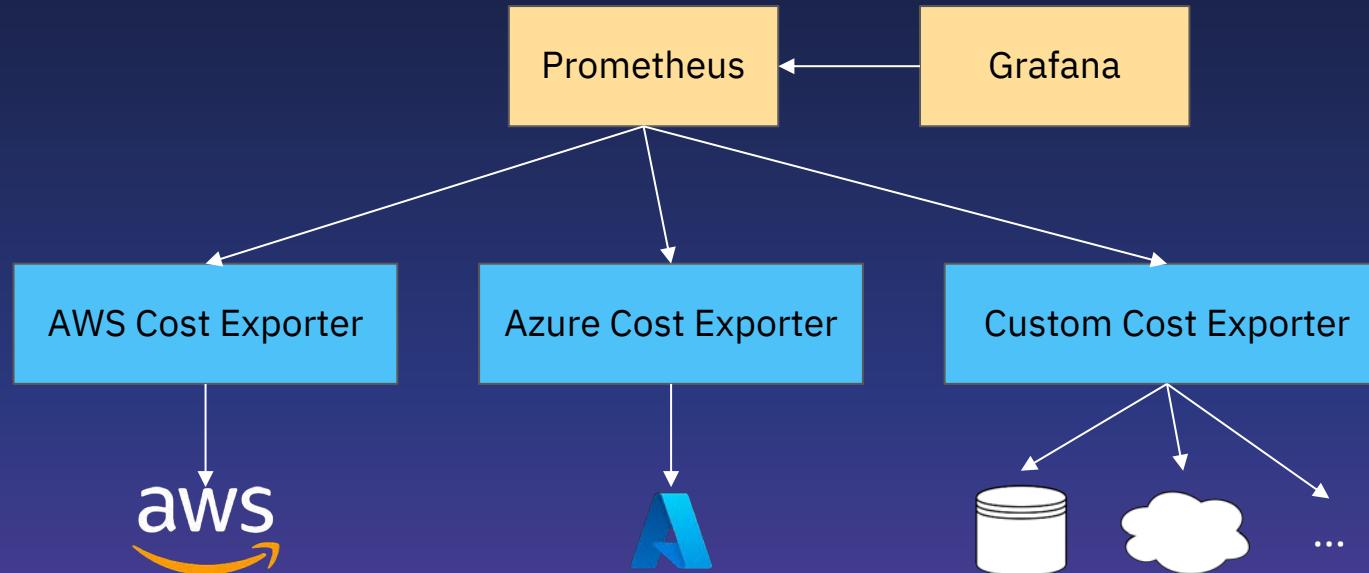


Fine-grained cost breakdown





Cost Metric Exporters



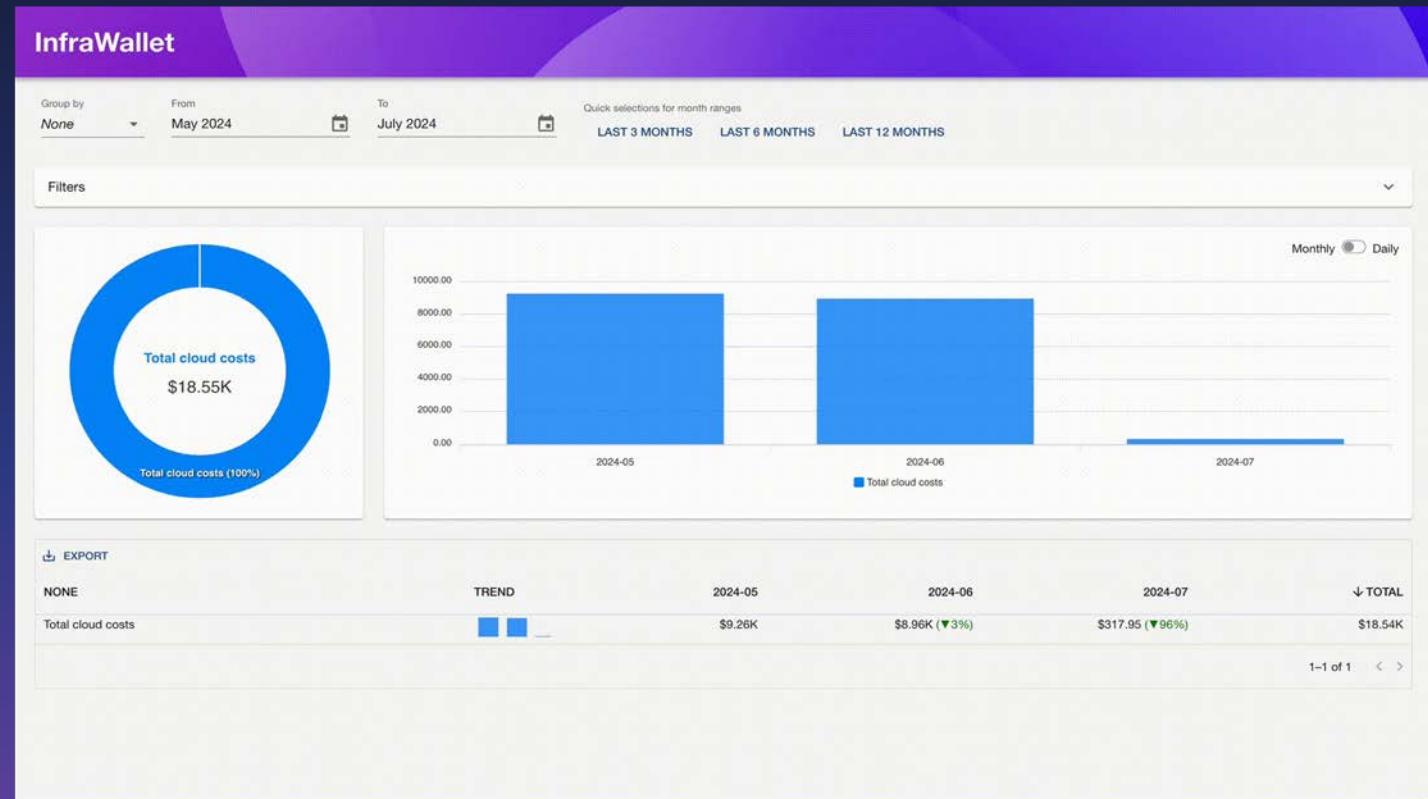
- Vendor-neutral
- Extensible
- Scalable

Ref: <https://prometheus.io/docs/instrumenting/exporters/#finops>



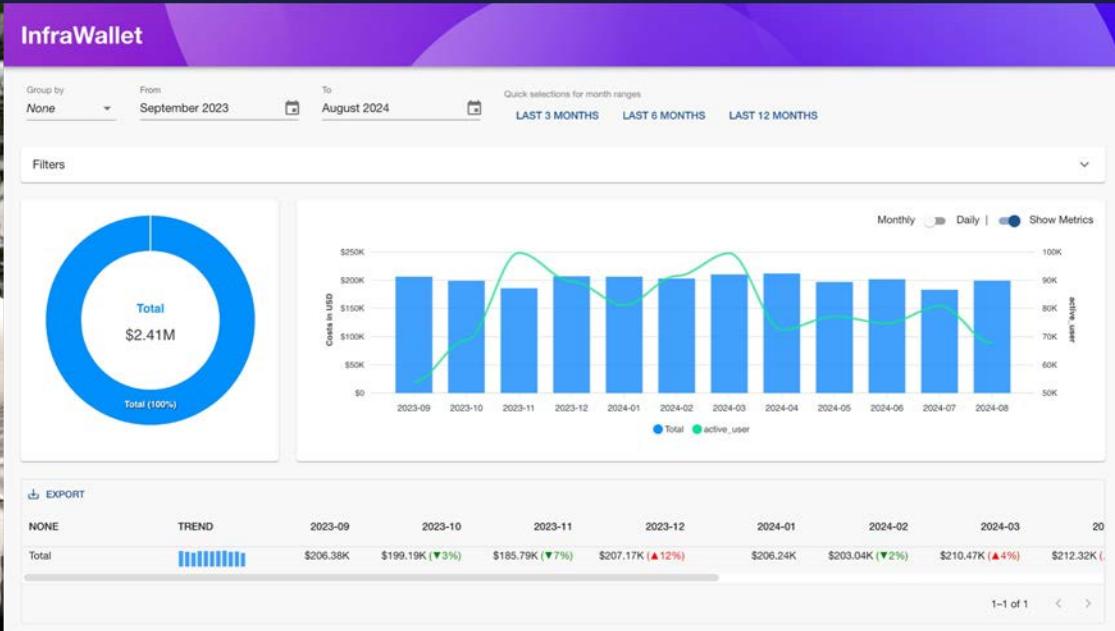
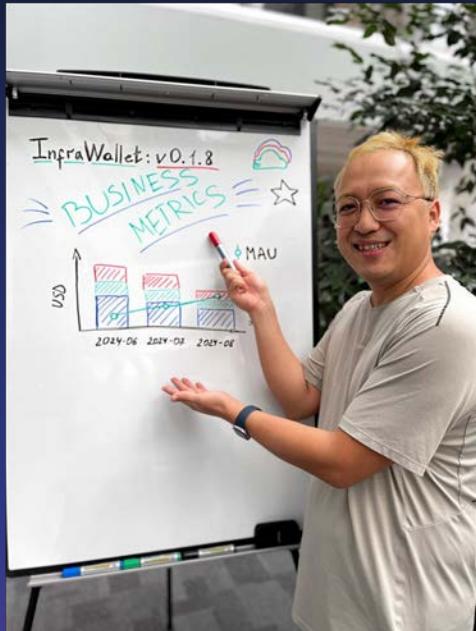
Cost Engineering for Managers

```
backend:  
  infraWallet:  
    integrations:  
      azure:  
        - name: <unique_name_of_this_account>  
          subscriptionId: ...  
          tenantId: ...  
          clientId: ...  
          clientSecret: ...  
        - name: <unique_name_of_this_account>  
          subscriptionId: ...  
          tenantId: ...  
          clientId: ...  
          clientSecret: ...  
      aws:  
        - name: <unique_name_of_this_account>  
          accountId: '<12-digit-account-ID_as_string>'  
          assumedRoleName: ...  
          accessKeyId: ...  
          accessKeySecret: ...  
        - name: <unique_name_of_this_account>  
          accountId: '<12-digit-account-ID_as_string>'  
          assumedRoleName: ...  
          accessKeyId: ...  
          accessKeySecret: ...
```



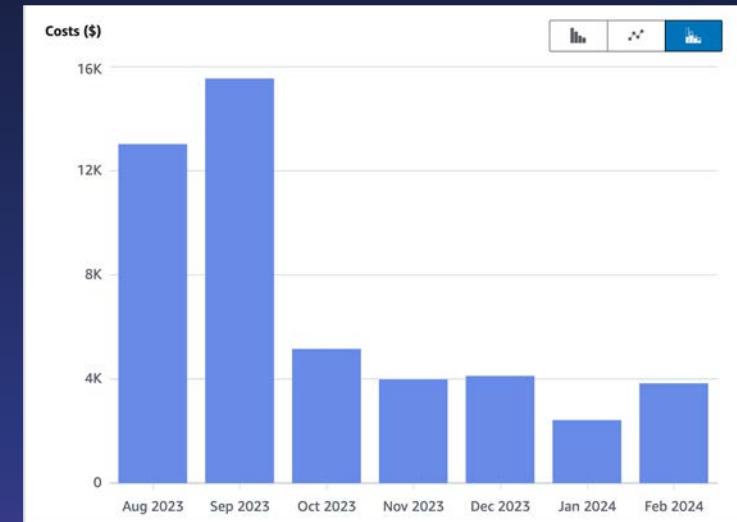
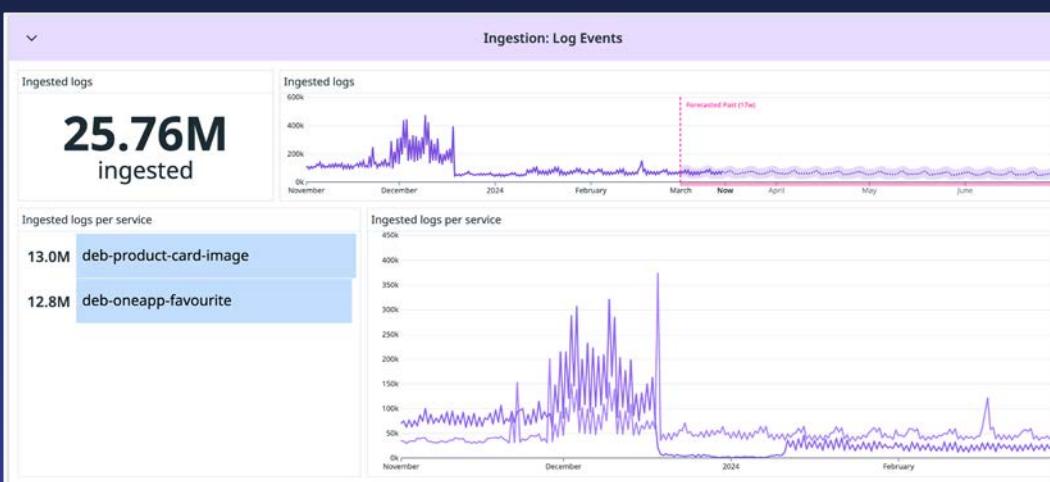


Cost Engineering for Managers



- Unit economics: a crucial metric to understand the business efficiency
- Business metric examples: MAU, transactions, connected devices, etc.

From Cost Observability to Cost Optimization





CLOUD SAVINGS



DATABASE

STORAGE

MESSAGING

LOGS

APM

METRICS

CI/CD

TOTAL
\$32'101/month



Summary - Cost Engineering

- From cost awareness to cost efficiency
- Follow FOCUS™ and make it vendor-neutral
- Not only about techniques, but also about culture (e.g., a cost optimization program)

Ref: <https://focus.finops.org/#specification>

ANYTHING FROM THE LIST?

DEVS

Different tech stack
Different tools
Multi-cloud set up
Outdated documentation
Long waiting time
Unclear process
Restricted permissions

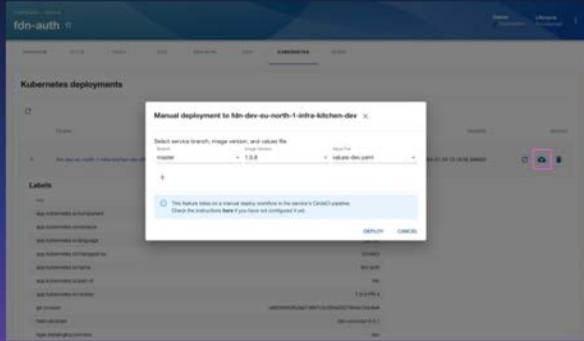
SRE

Toil
DMs/tickets
Context switching
Low-valuable meetings
No time for development

Infrastructure Management



Use Cases for Service Onboarding



Cost Engineering



Opensource



<https://github.com/electrolux-oss>