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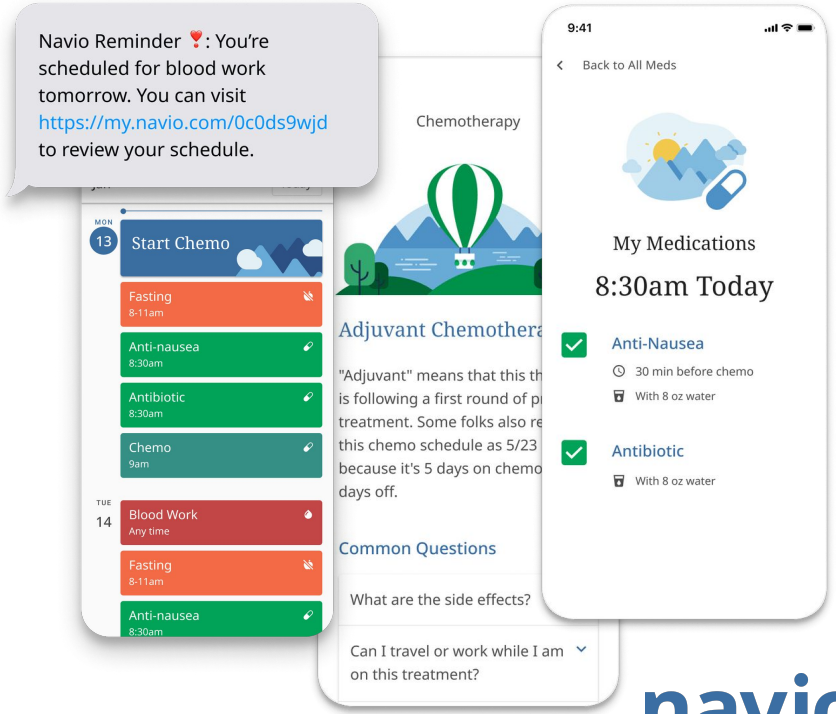
Sandbox Deploys...
not just for kids anymore

About Navio

Improving the outlook and quality of life for people living with cancer

- Navio makes tools that help cancer patients get better, more personal care.
- Navio's apps are deployed at AWS using terraform, ECS, and gitlab pipelines.
- Navio deals with critical health information.
- Because of this, Navio must test apps before release.
- This has cost us deployment velocity.



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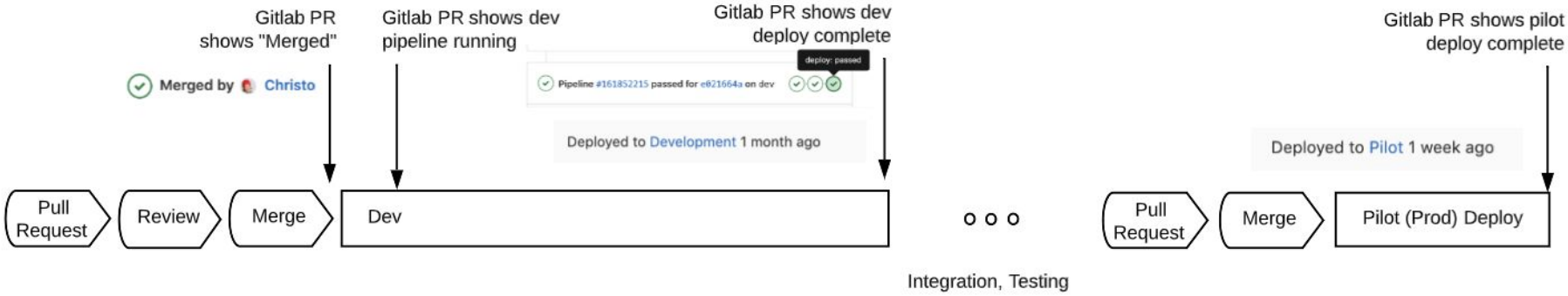
Navio's deployment process



[Gitlab Flow]

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Challenges

Email Feature

PR

PR

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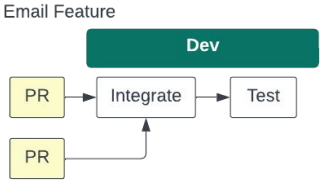
Challenges



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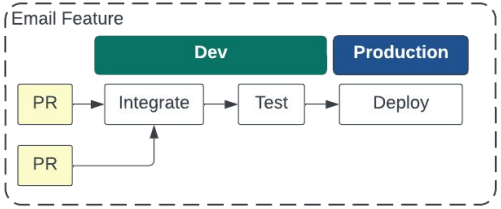
Challenges



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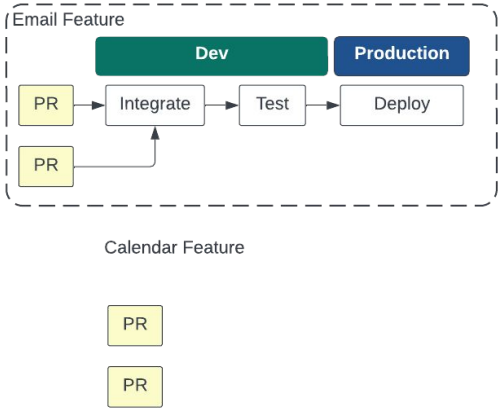
Challenges



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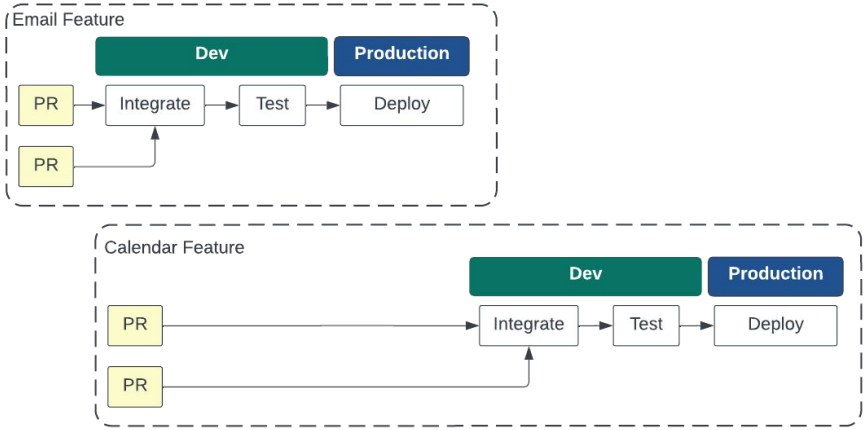
Challenges



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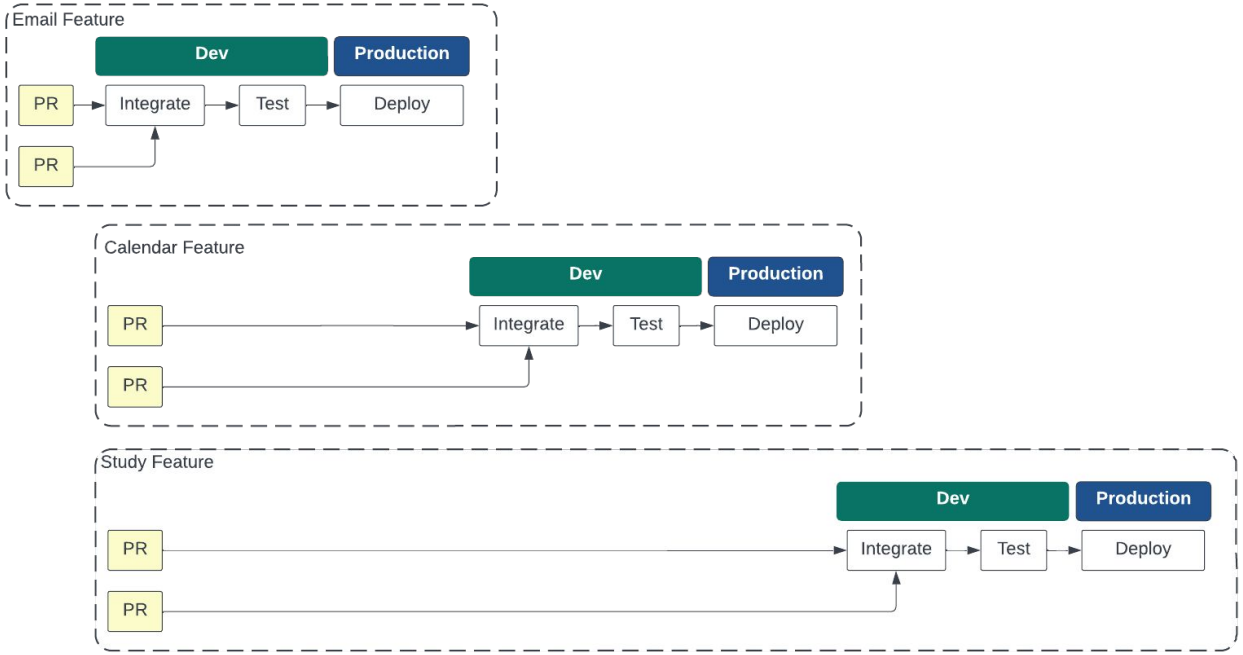
Challenges



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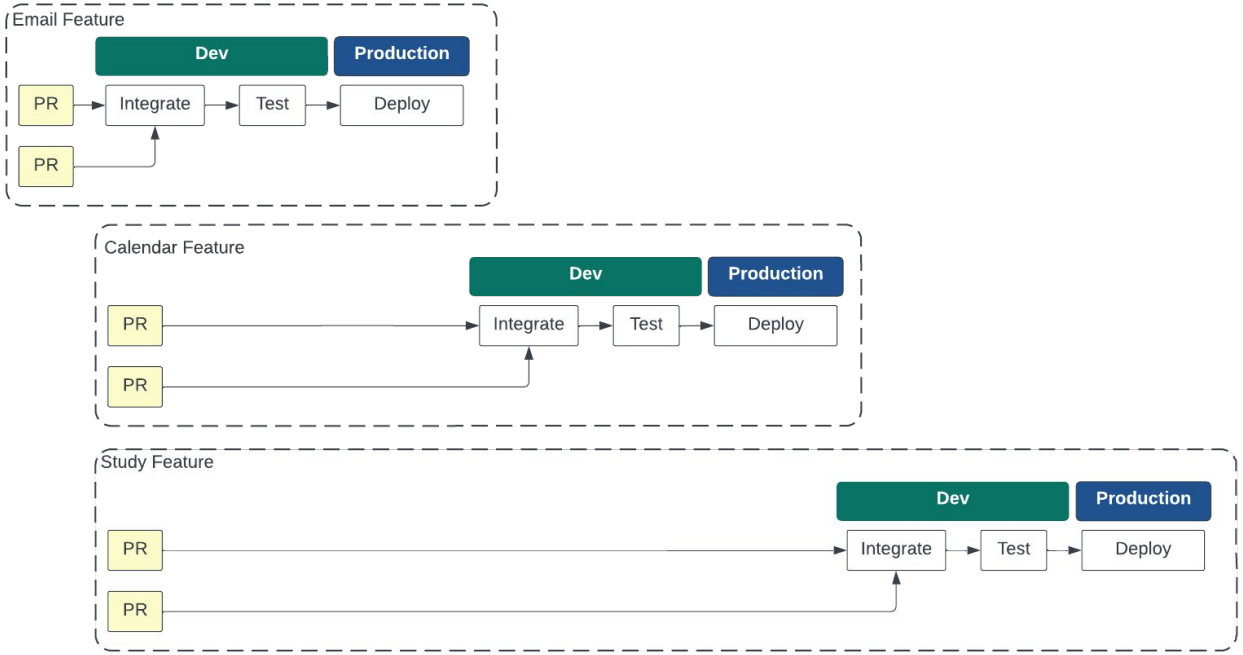
Challenges



ooo

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Sandboxes to the rescue

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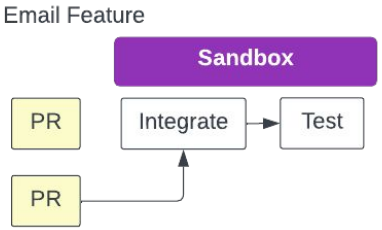
Challenges



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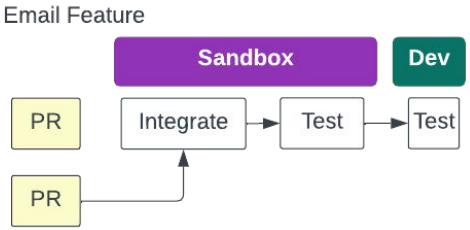
Challenges



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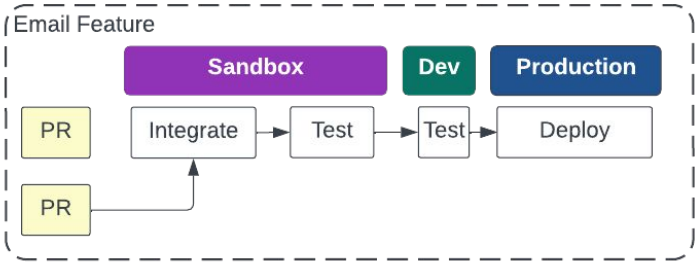
Challenges



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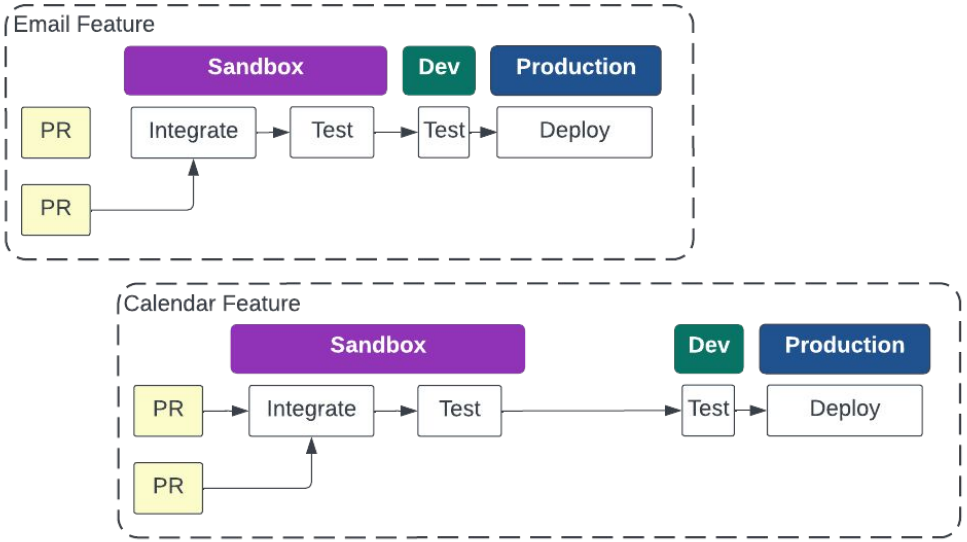
Challenges



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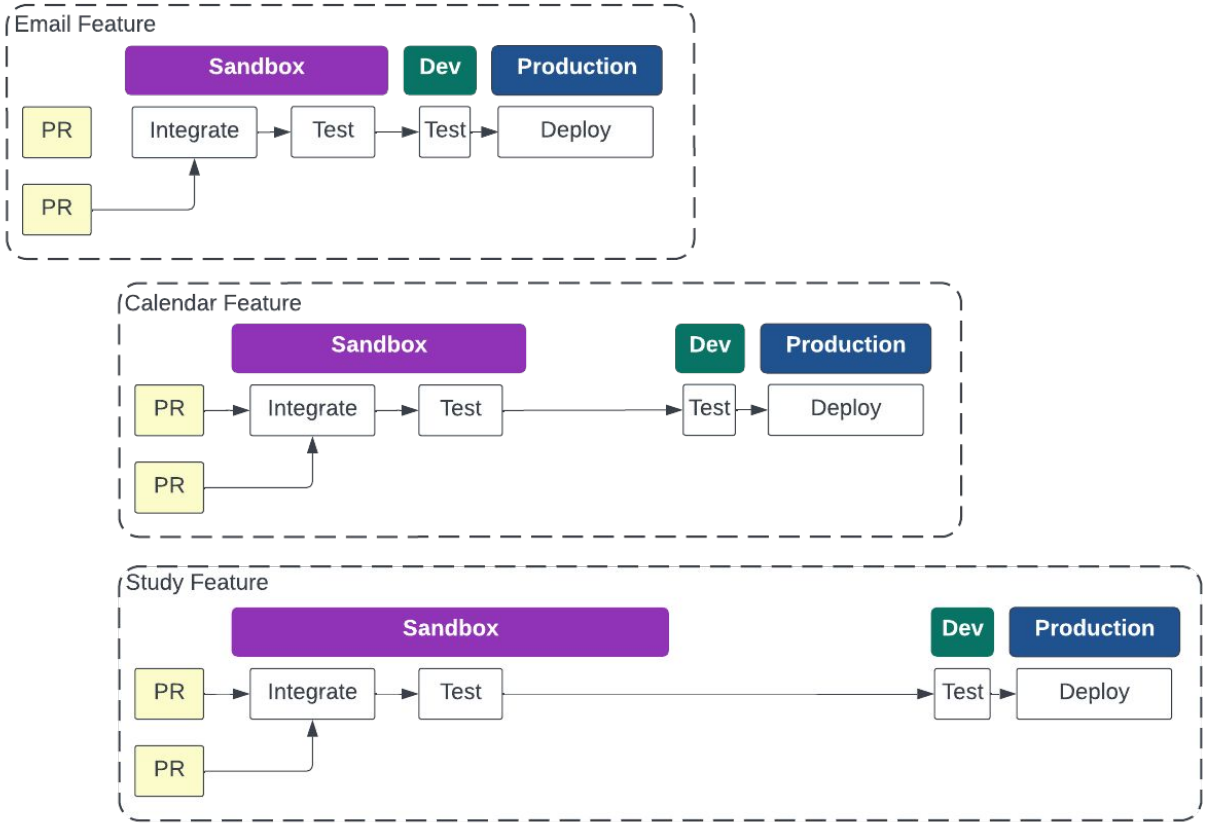
Challenges



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What is a sandbox?

- A **partially isolated installation** of our application:
  - **installation** – Complete-enough environment for testing
  - **isolated** – Application state is separated (one install doesn't interfere with another)
  - **partial** – Some underlying AWS resources are shared, for cost reasons

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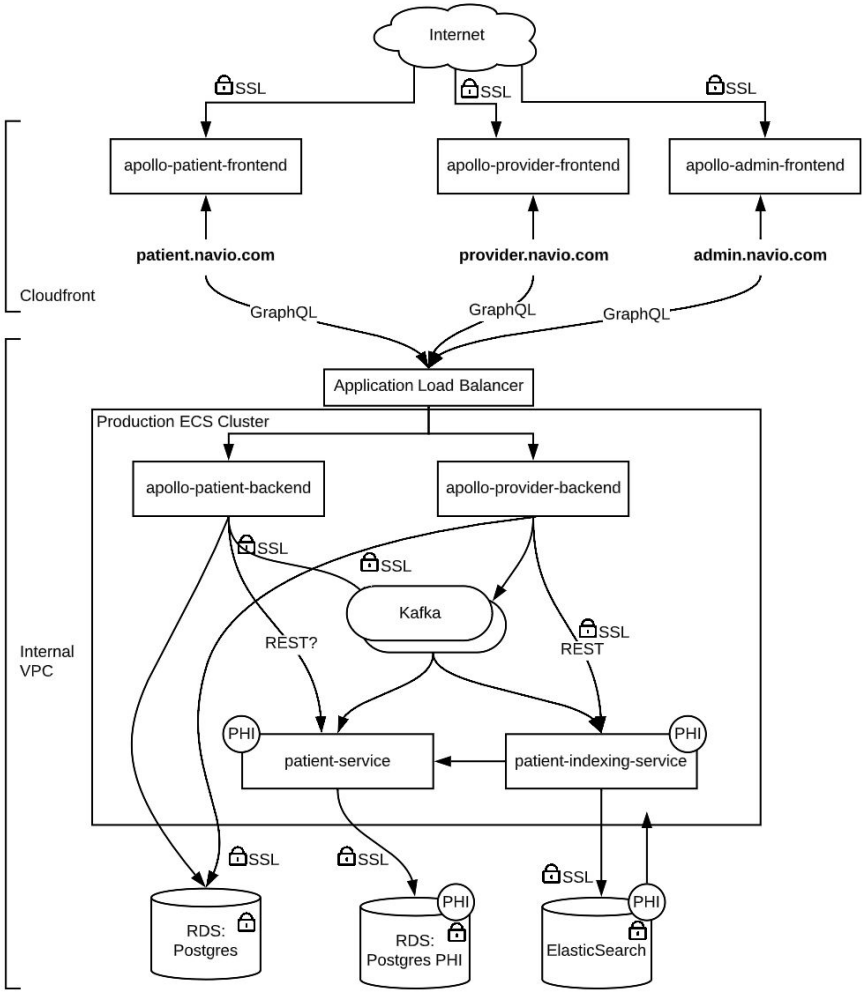
Navio's AWS Infrastructure



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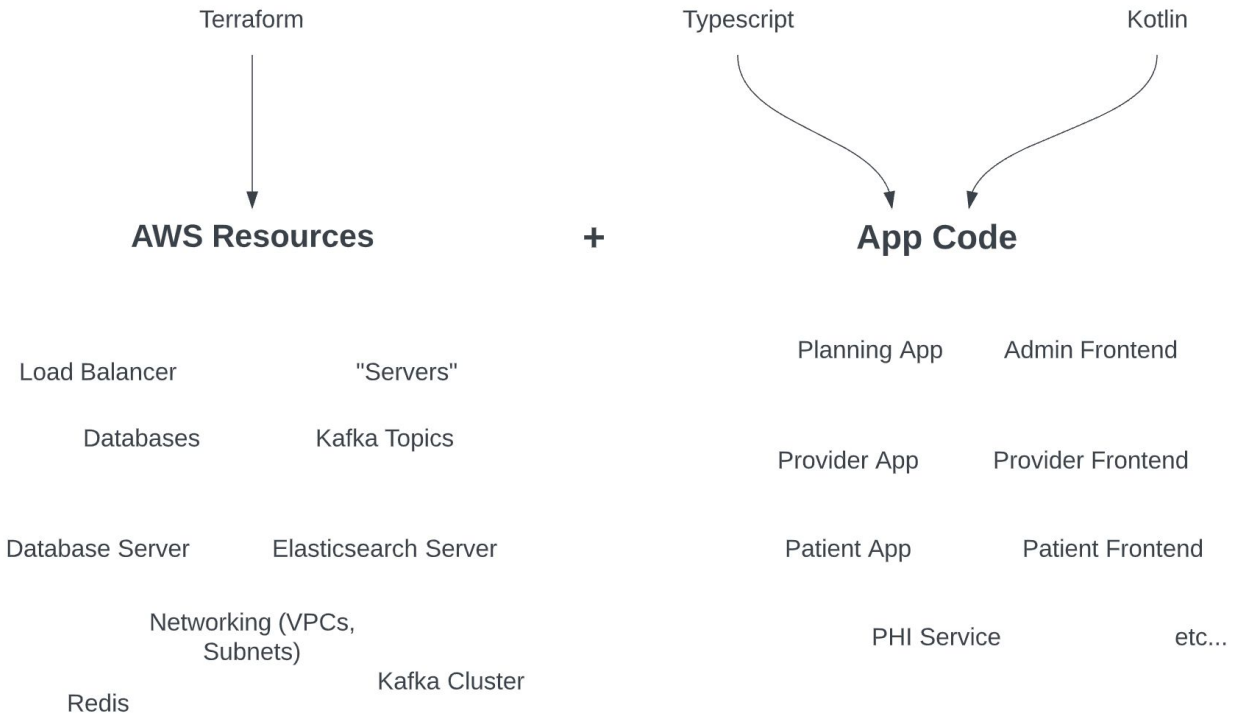
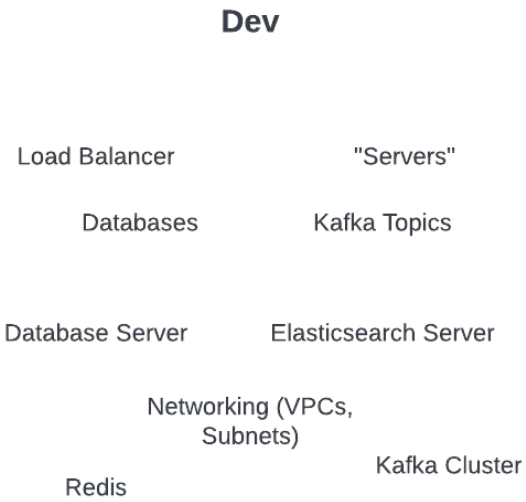
What’s in an environment? How does it come to exist?



Could we make more dev environments?



Dev

Load Balancer

"Servers"

Databases

Kafka Topics

Database Server

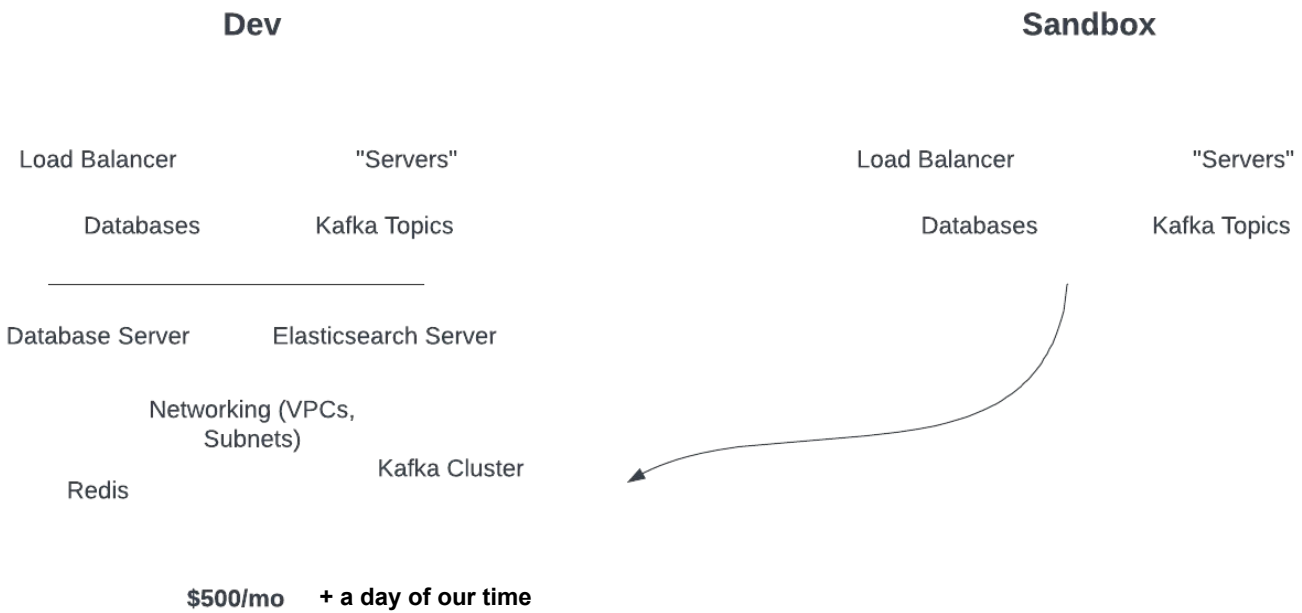
Elasticsearch Server

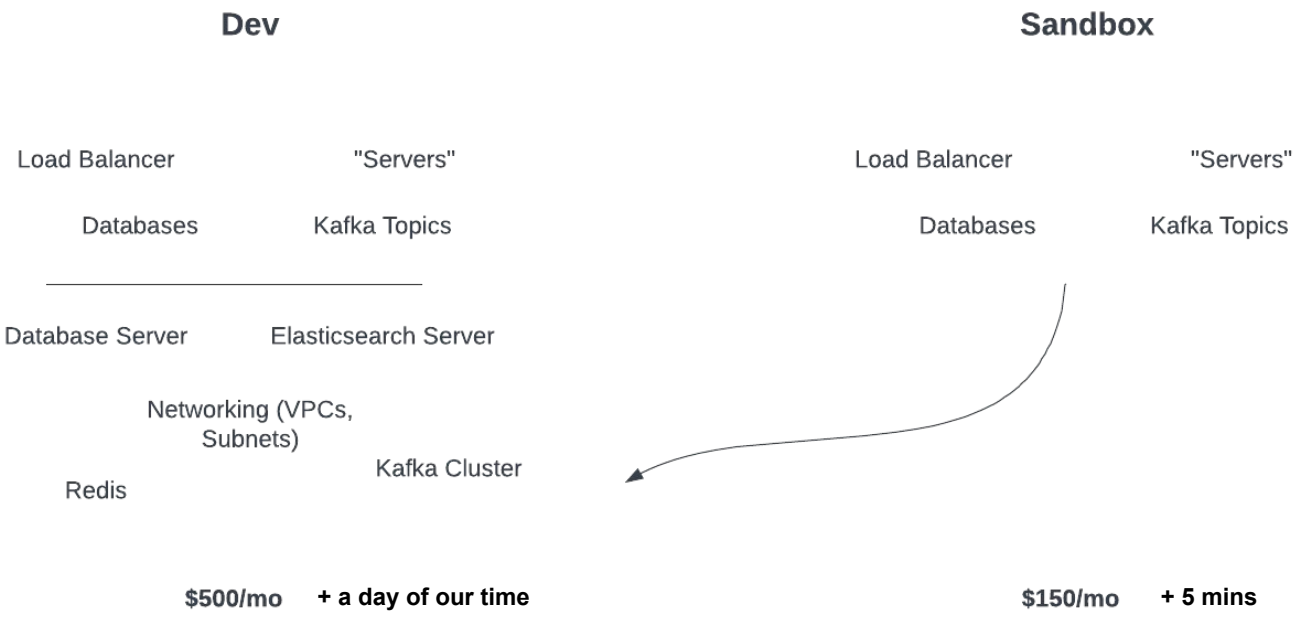
Networking (VPCs, Subnets)

Kafka Cluster

Redis

$500/mo **+ a day of our time**


Dev
Load Balancer
"Servers"
Databases
Kafka Topics
Database Server
Elasticsearch Server
Networking (VPCs, Subnets)
Kafka Cluster
Redis
$500/mo
+ a day of our time
Sandbox
Load Balancer
"Servers"
Databases
Kafka Topics


Dev
Load Balancer
"Servers"
Databases
Kafka Topics
Database Server
Elasticsearch Server
Networking (VPCs, Subnets)
Kafka Cluster
Redis
$500/mo
+ a day of our time
Sandbox
Load Balancer
"Servers"
Databases
Kafka Topics
$150/mo
+ 5 mins

How are sandboxes made?

Using Terraform, of course

- Sandboxes are created via **`terraform apply`**
- Sandbox AWS resources are isolated in a **separate Terraform workspace** but with the **same Terraform code**
- Sandbox resources have names or ids that include sandbox name
- Some resources are shared by exporting them as outputs from “lower level” terraform “stacks”

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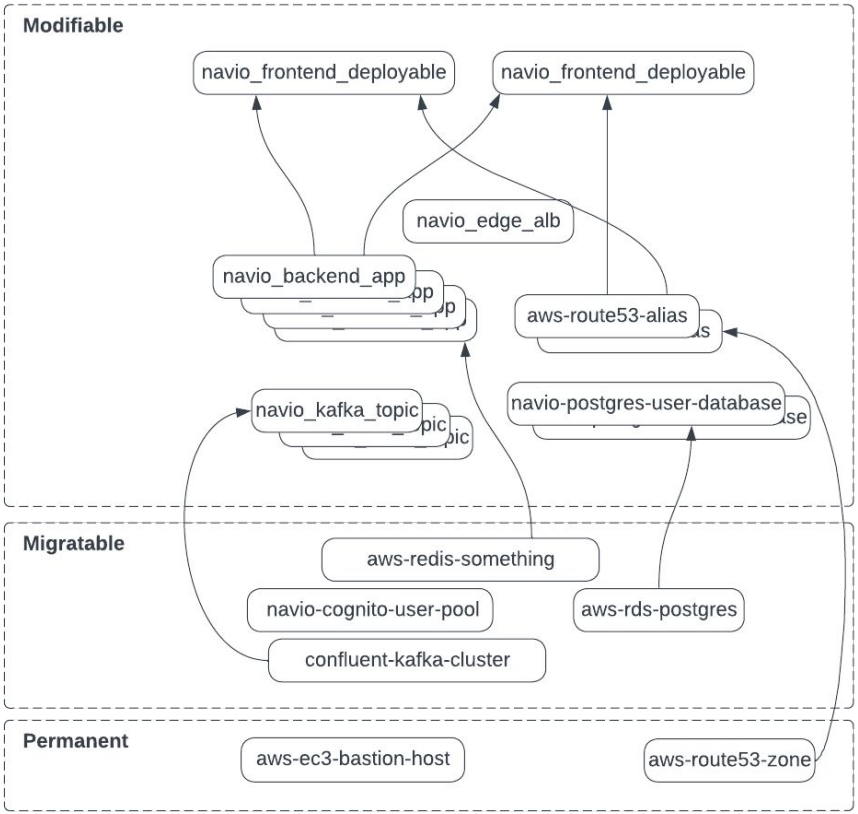
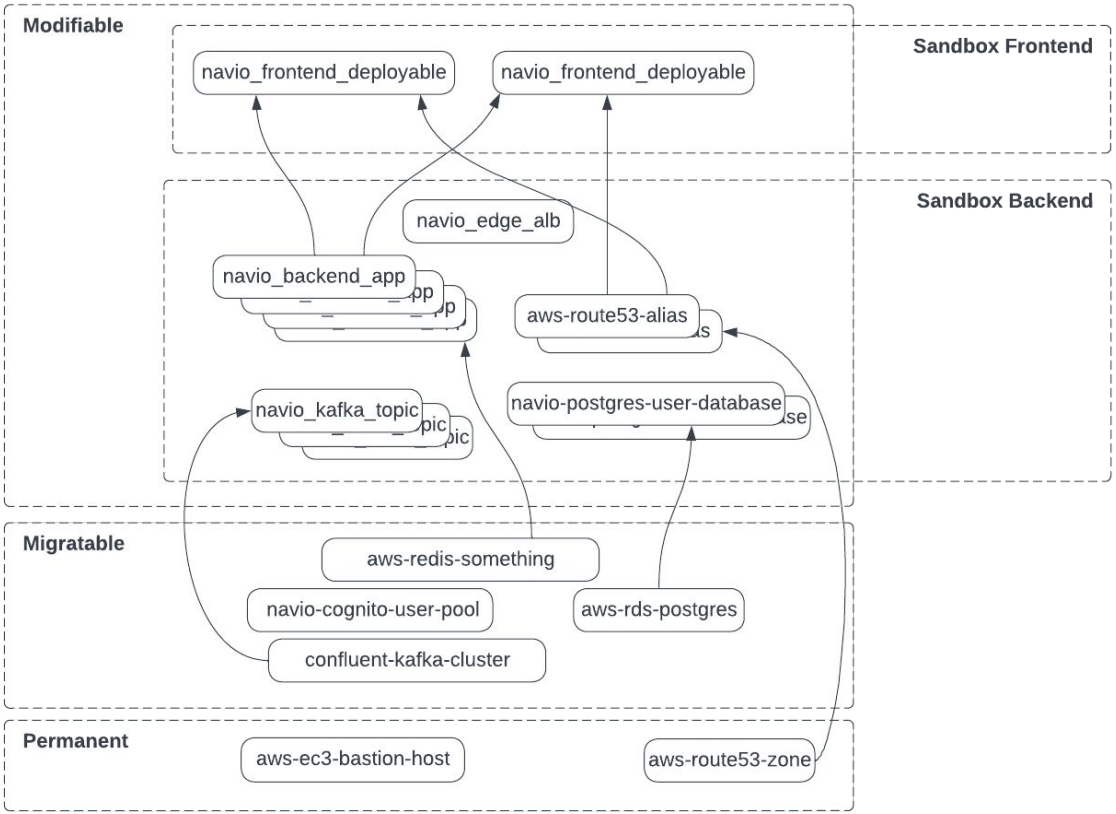
Terraform “Stacks”



Terraform “Stacks”



Ok, show me some damn shell already

c. Run terraform init:

```
aws-vault exec navio -- terraform init
```

d. Create a new terraform workspace for the sandbox:

```
aws-vault exec navio -- terraform workspace new sandbox-be.sandbox-name
```

substituting your chosen sandbox name for `sandbox-name`.

e. Apply the terraform:

```
aws-vault exec navio -- chamber exec tf/env/dev -- tfenv terraform apply
```

Some other interesting parts

- Separate backend and frontend sandbox terraform: Can **share same backend** sandbox among multiple frontend sandboxes.
- Use **AWS Gravitron in ECS Fargate** to avoid having to manage EC2 fleet (new as a part of this project).
- Each **feature branch can be deployed** to one or more separate sandboxes.
- These **sandbox deploys happen automatically** via Gitlab pipelines when devs push to those branches.

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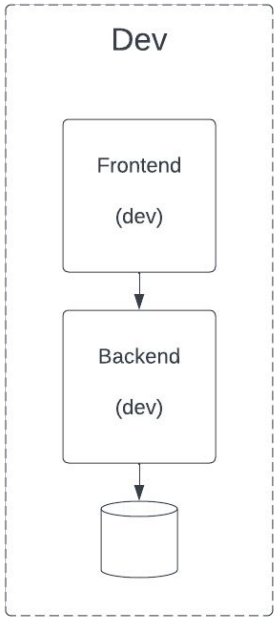
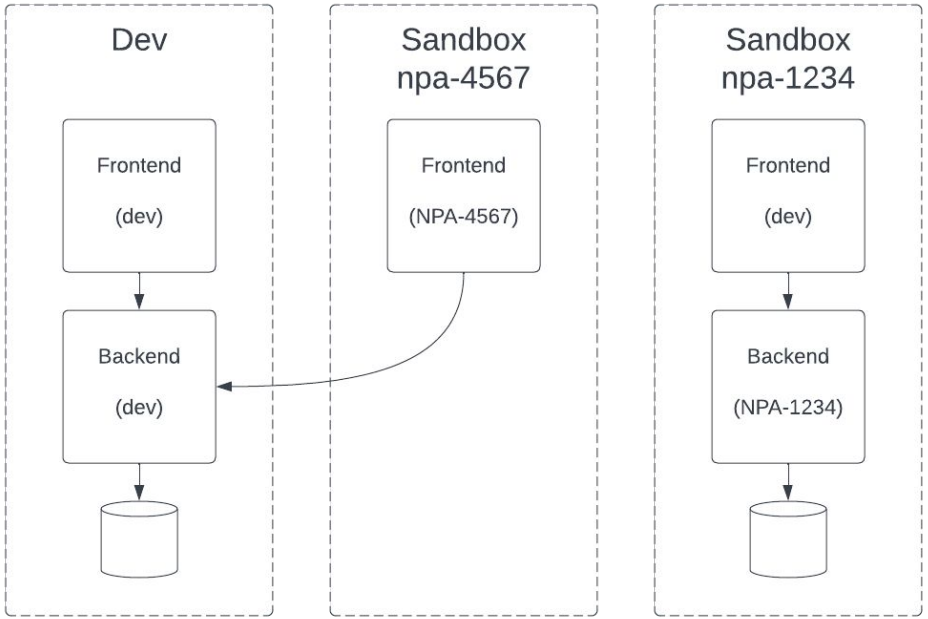
Backend and Frontend Sandboxes



Backend and Frontend Sandboxes

Backend and Frontend Sandboxes



Challenges and Opportunities

- Requires someone with terraform apply permissions: should have a way for devs to **create their own sandboxes** (slack bot maybe?).
- Can use same backend docker containers as dev when spinning up a new sandbox, don't have same option for frontend; **want to "clone" a frontend install** (s3 bucket copy isn't quite enough).
- Somewhat different terraform code for sandbox vs dev: would want to **unify dev and sandbox terraform**. Does use a lot of the same underlying modules.

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Thank you