AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

CON202

Delivering code and architectures through AWS Proton and Git

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AWS

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AWS

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What is AWS Proton?

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What we want from an application



Administrators

Solves customer problems

No bugs

Performant and secure

Makes efficient use of our resources



Development teams

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Developer:
Deliver my application without delay

Is my application working as intended?

Do I need to fix any bugs?

Is it running smoothly?



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Administrator: Reliable and consistent infrastructure



Do services meet our cost and security needs?

Are dependencies up to date?

Is the infrastructure updated to our latest standards?

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Existing tools help ensure standards are met













Infrastructure as code
(AWS CloudFormation, Terraform)

Pipelines
(AWS CodePipeline, Jenkins, GitHub Actions)

Observability tools
(Amazon CloudWatch, Prometheus, Datadog)

aws

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But . . .

1. How do we ensure that all tools and templates are used as expected?

2. How do we give developers an easy path with few hoops?

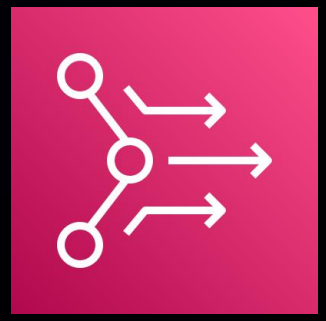
3. How do we ensure that our configurations and infrastructure stay up to date?

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AWS Proton



These are our standards



Here is my application code





Infrastructure as code
(CloudFormation, Terraform)

Pipelines
(CodePipeline, Jenkins, GitHub Actions)

Observability tools
(CloudWatch, Prometheus, Datadog)

aws

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Why use AWS Proton?

1



Self-service access
to approved templates

3



Keep infrastructure
consistent and updated

2



Single interface
for application delivery

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Use case: Keeping infrastructure updated

"How do I maintain my cluster and keep application versions under control?"

Customer

- US-based finance startup
- One-person platform team managing all microservices

Benefit

- Centralized interface for all services
- Single view to identify and update existing services

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Use case: Streamlined developer experience

"Not all developers have the same skillset"

Customer

- Japan-based technology provider
- 3-people platform team supporting multiple development teams
- Planning for growth – need to create standards now

Benefit

- All development teams have simplified access to infrastructure
- Advanced teams can see template details

aws

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Use case: Migrating my workloads

"How do I move my workloads to the cloud?"

Customer

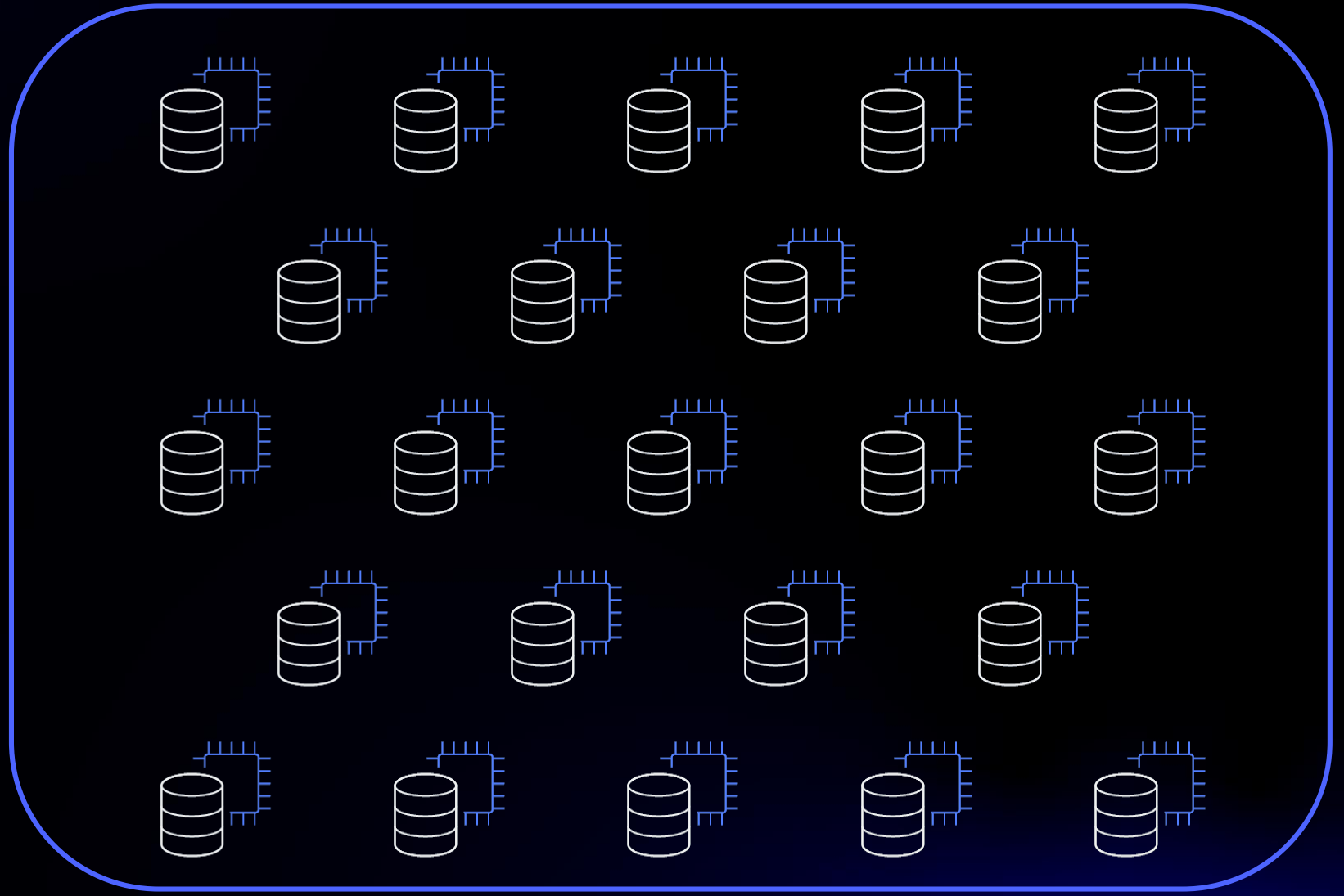
- International financial institution
- Large platform team supporting regulated workloads
- 50+ development teams working on premises, not containerized

Benefit

- Multi-layered templates that provide all aspects of cloud infrastructure step by step (e.g., compute, networking, observability)
- Teams can migrate at their own pace

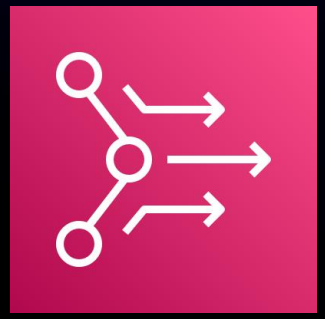
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Successful adoption

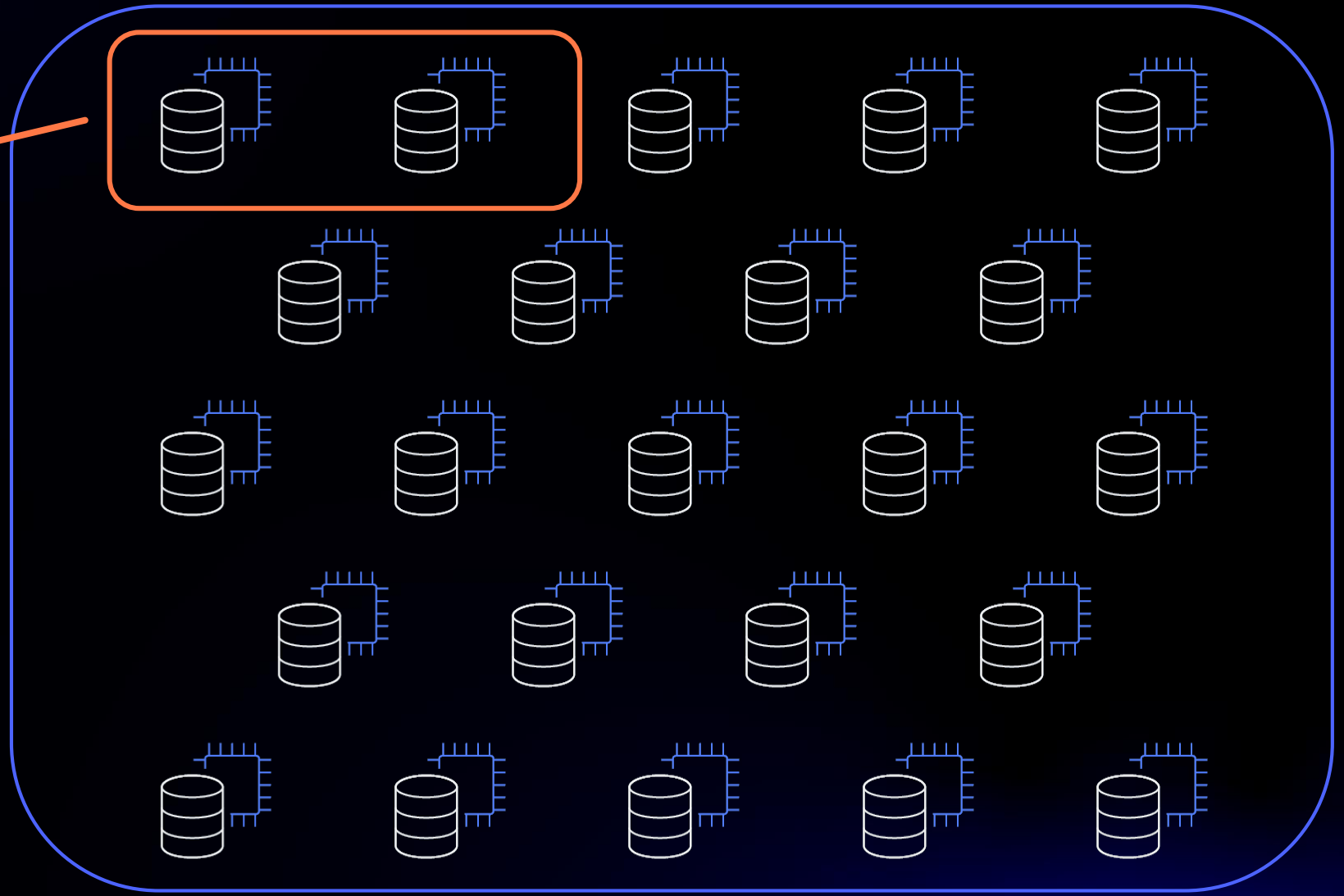


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Successful adoption

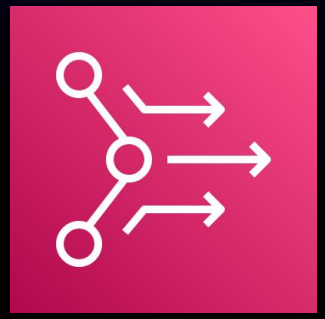


- Start small!
- Figure out what works
- Create templates

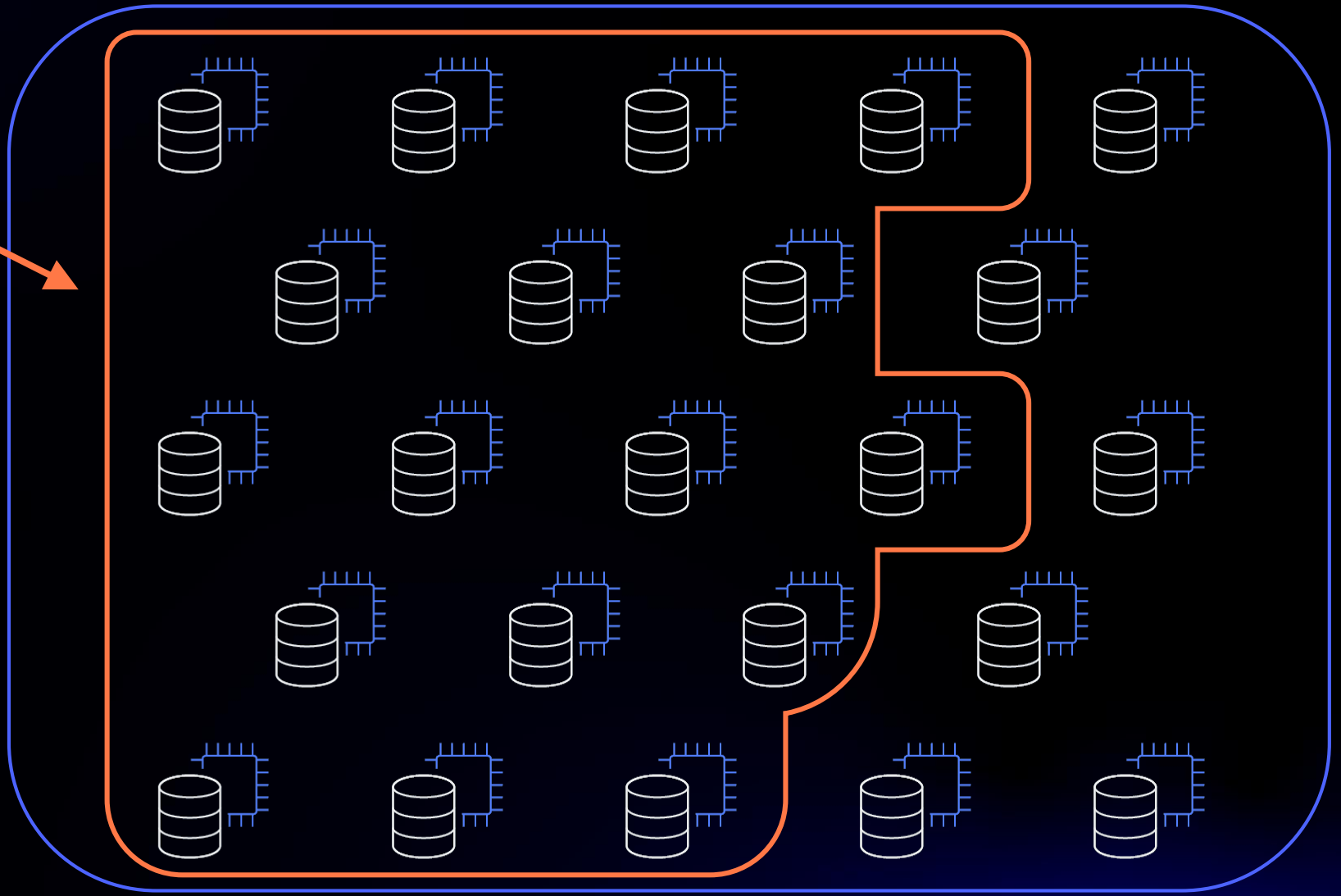


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Successful adoption



- Roll out
- Broaden existing templates



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Collaboration

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Tools of the trade



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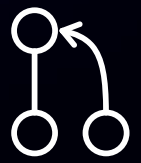
Tools of the trade



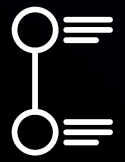
Standard for code collaboration

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Why Git?



Pull requests



Audit history



Awesome tooling

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GitOps

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TemplateOps



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Life before TemplateOps



Administrators

Find the template somewhere

Validate it

Upload it to Amazon S3 and register new version



Development teams

I want to use this new feature

Send a ticket or an email

Ping platform team

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Life with TemplateOps



Administrators

Template Git repo



Development teams



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Life with TemplateOps



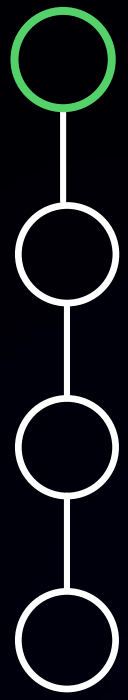
Administrators

Template Git repo



Development teams

Push a new template version to Git



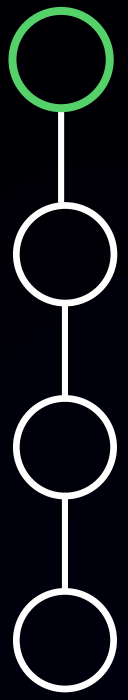
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Life with TemplateOps



Administrators

Template Git repo





Development teams

Hm, I heard about this cool new Amazon ECS feature, and I wish I could use it!

aws

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Life with TemplateOps



Administrators

Template Git repo





Development teams

Oh cool, it wasn't hard to add at all. I pushed it to my fork of the template repo and can create a pull request!

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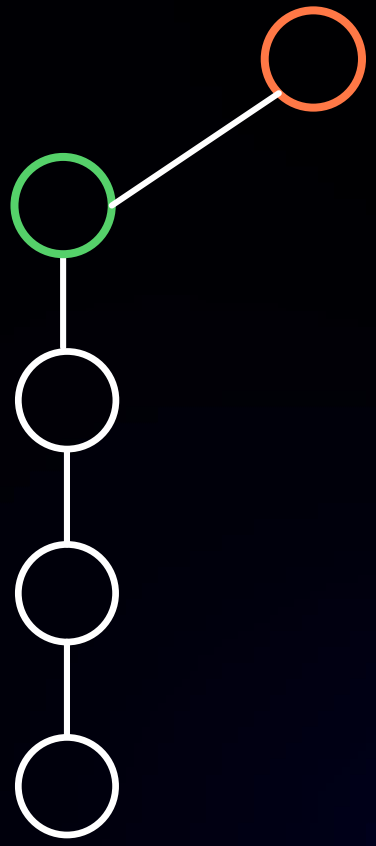
Life with TemplateOps



Administrators

Oh, this is a rad change! I'll suggest a few changes, and then merge it in!

Template Git repo





Development teams

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Life with TemplateOps



Administrators

Oh, this is a rad change! I'll suggest a few changes, and then merge it in!

Template Git repo





Development teams

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Life with TemplateOps



Administrators

AWS Proton syncs the new template version







Development teams

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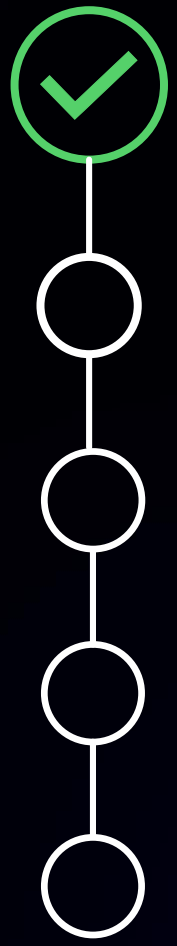
Life with TemplateOps



Administrators

Yay!

AWS Proton syncs the new template version





Development teams

Yay!

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Terraform

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How can we support Terraform users?

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What we heard from customers



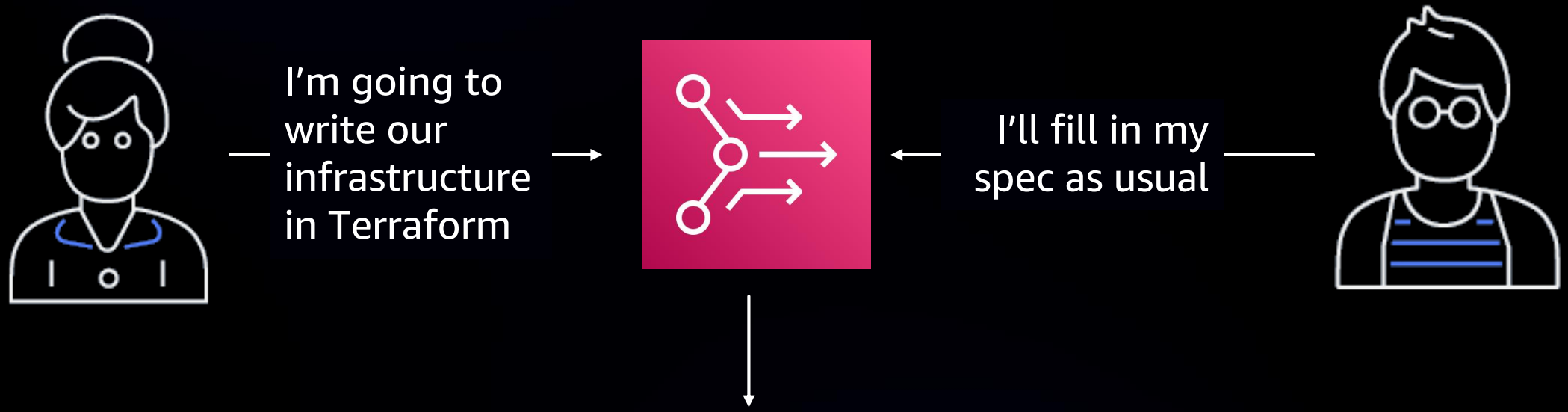
“I want to check the generated Terraform before it’s applied”

“We’d like to run our linter before our templates are executed”

“Our organization already has a deployment workflow for our Terraform templates, but we want to give an AWS Proton experience to our developers”

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Terraform support

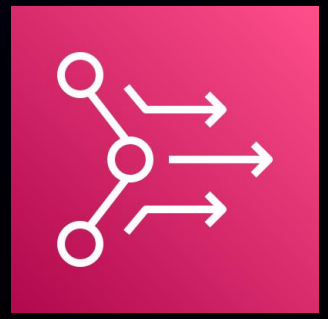


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Terraform support



I'll fill in my spec as usual

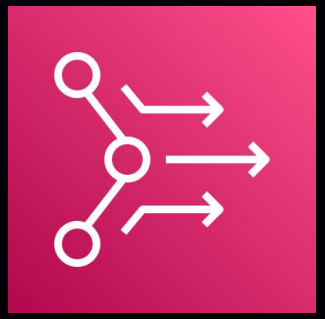


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Terraform support



I'll fill in my spec as usual



Renders the developer spec into the Terraform template



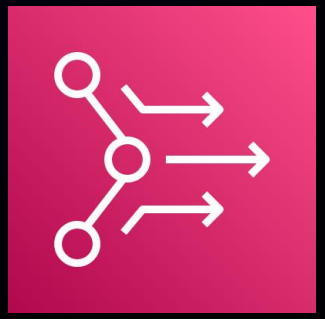
templates.tf

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Terraform support



I'll fill in my spec as usual

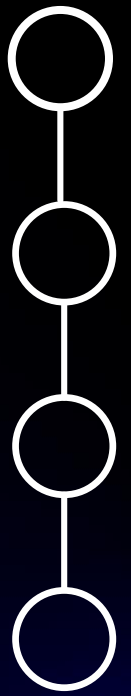


Renders the developer spec into the Terraform template



templates.tf

Terraform repo

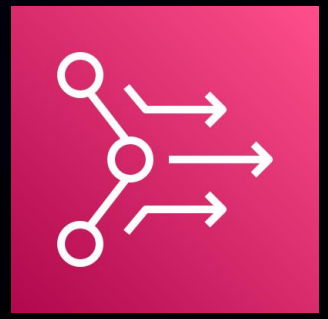


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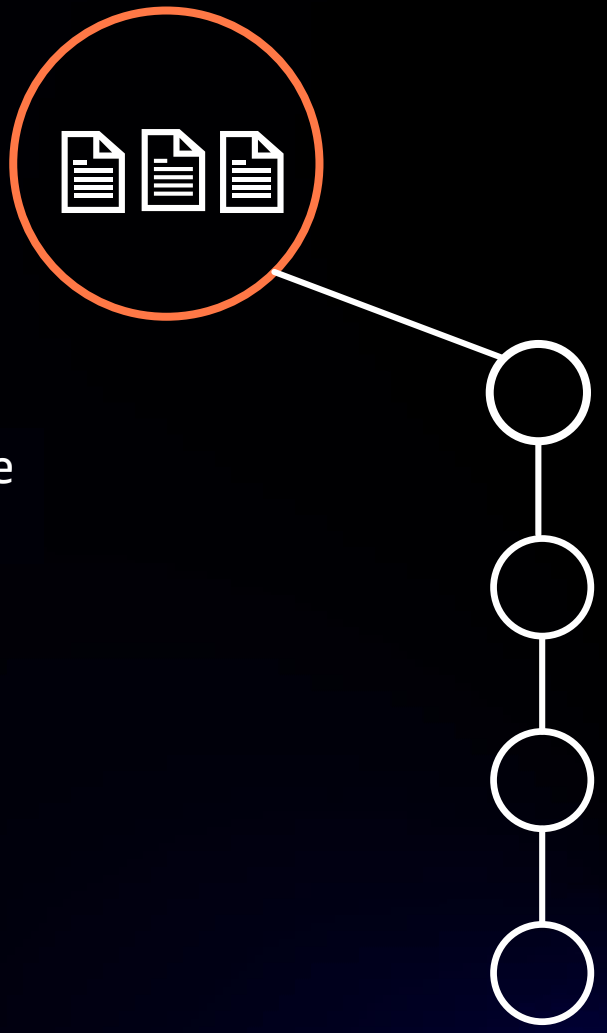
Terraform support



I'll fill in my spec as usual



Sends a pull request to the TF repository

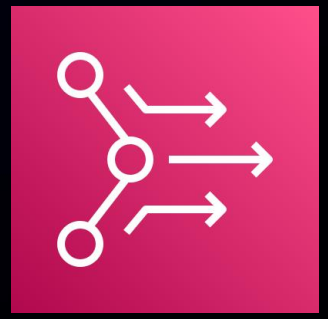


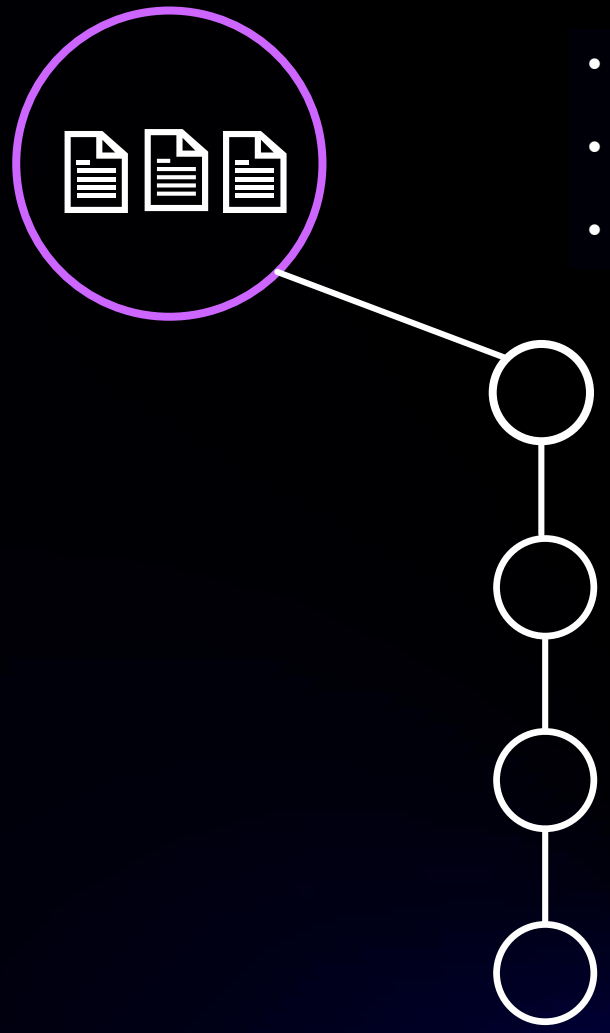
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Terraform support



I'll fill in my spec as usual





- Automated tests run
- Custom approvals
- Approved by platform team

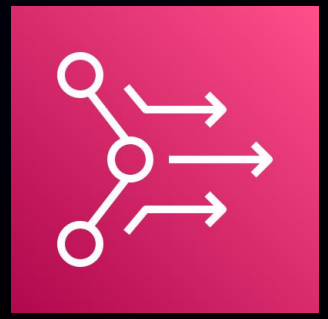
aws

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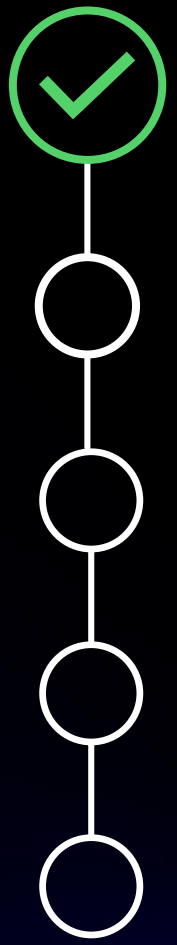
Terraform support



I'll fill in my spec as usual



Terraform repo



aws

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A day in the life

starring David and Rafa

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Rafa the Product Manager



David the Developer

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Rafa the ~~Product Manager~~
Administrator



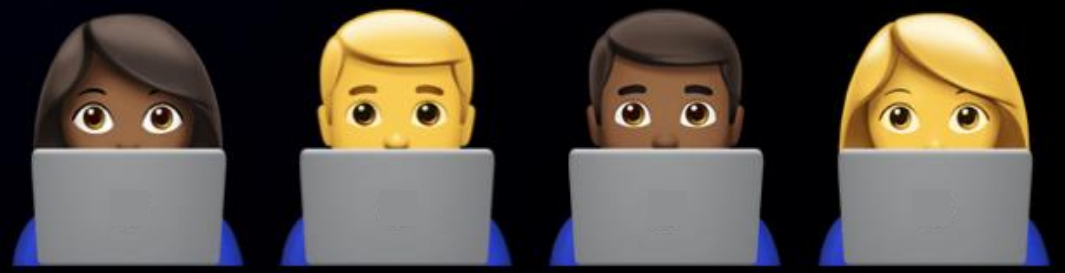
David the ~~Developer~~
Developer

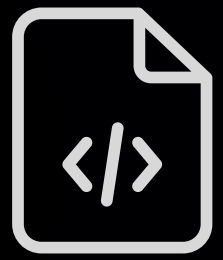
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My application is ready to go!

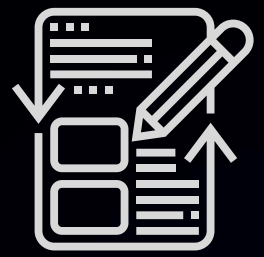


David

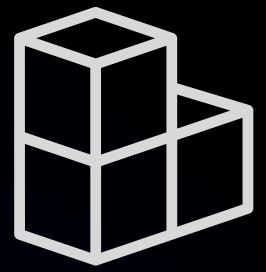




Code



Test



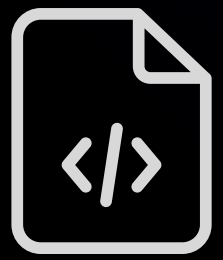
Container

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I need infrastructure to deploy it



David



Code





Amazon ECS

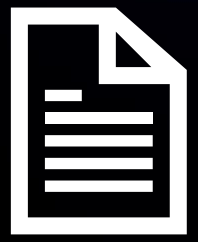
aws

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Here is a template that you can use



Rafa



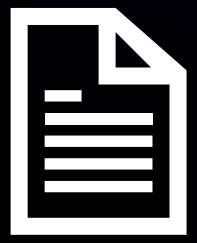
ECS_service.yaml

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Lots of words . . .



David



ECS_service.yaml

```
ContainerCpu:
  Type: Number
  Default: 256
  Description: How much CPU to give the container. 1024 is 1 CPU
ContainerMemory:
  Type: Number
  Default: 512
  Description: How much memory in megabytes to give the container
```

```
LowCpuUsageAlarm:
  Type: AWS::CloudWatch::Alarm
  Properties:
    Statistic: Average
    Period: 60
    EvaluationPeriods: 1
    Threshold: 20
    ComparisonOperator: LessThanOrEqualToThreshold
    AlarmActions:
```

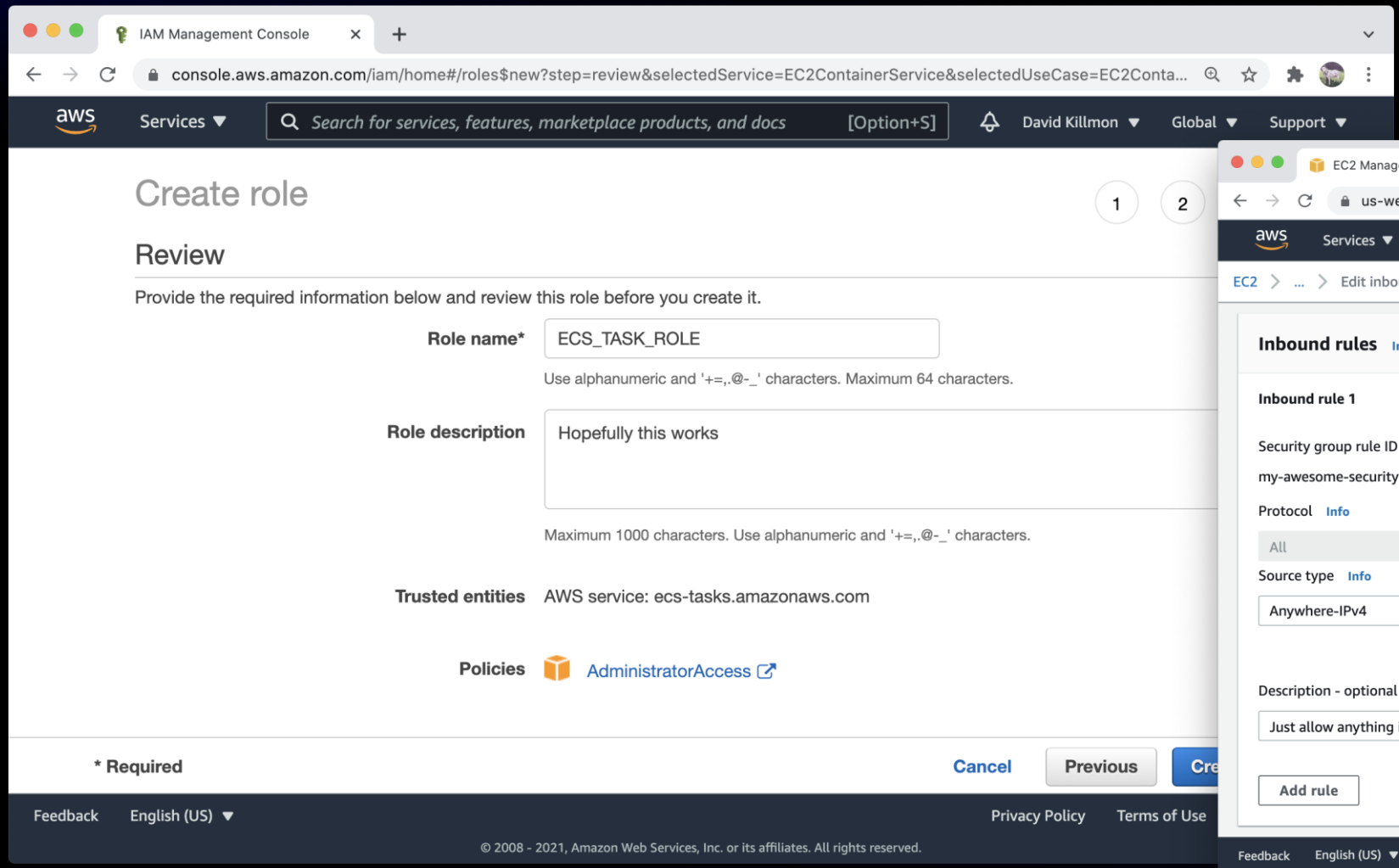
```
ExecutionRoleArn:
  Fn::ImportValue:
    !Join [':', [!Ref 'StackName', 'ECSTaskExecutionRole']]
```

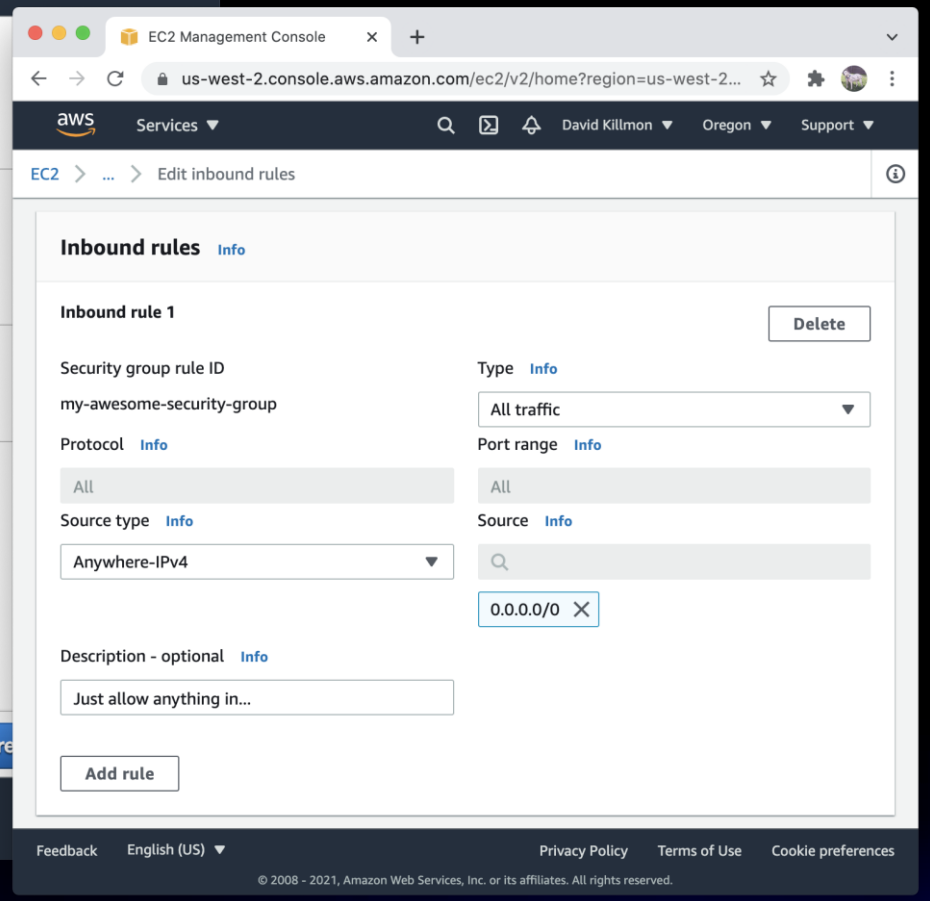
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I need permissions and networking



David





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Uh-oh . . .



That's a lot of stars in that IAM policy

You're allowing *all traffic* into your subnets?

How much CPU and memory are we using here?

You at least deployed to a test stage first, right?



Rafa

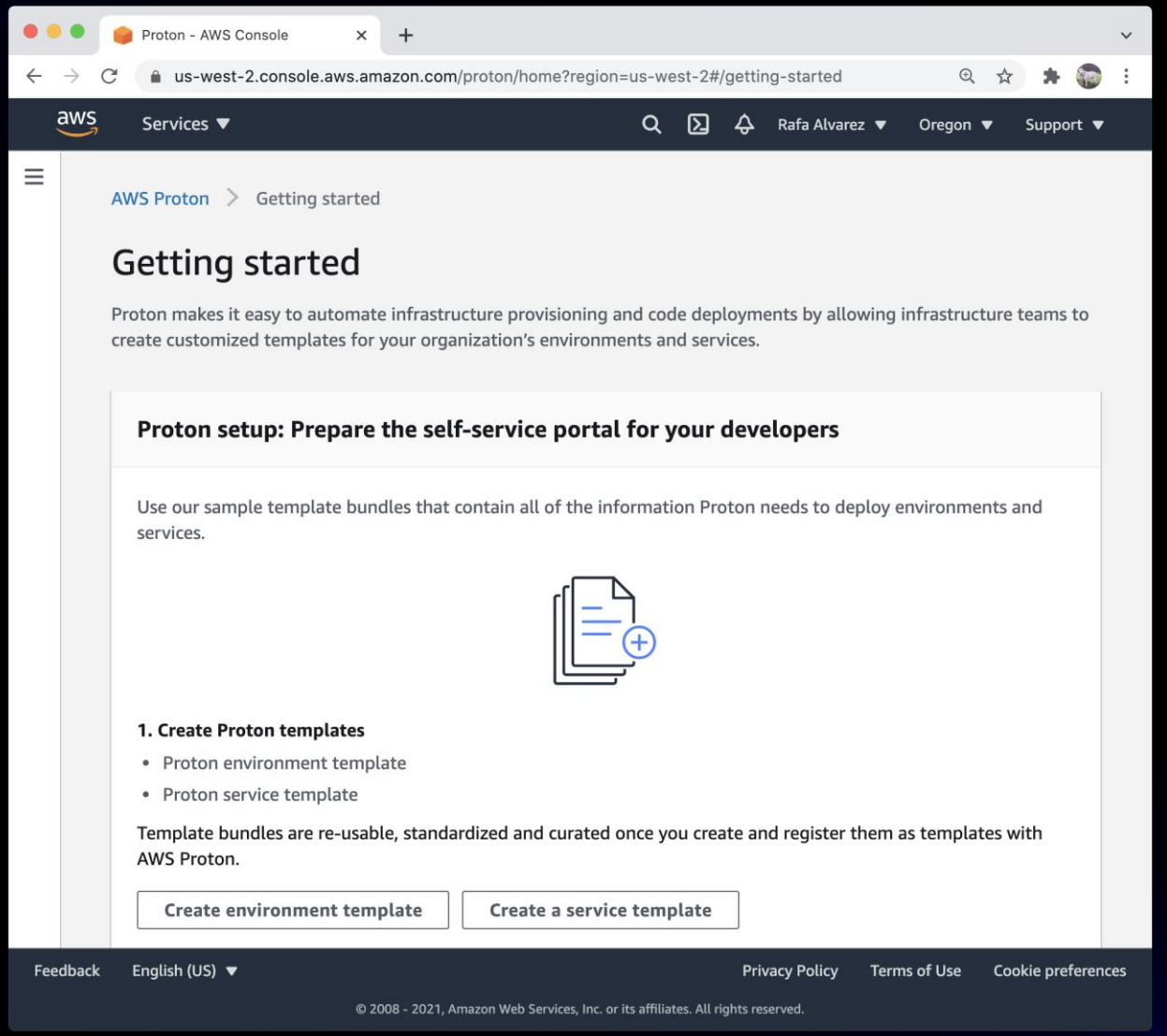
aws

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Let’s use AWS Proton instead



Rafa

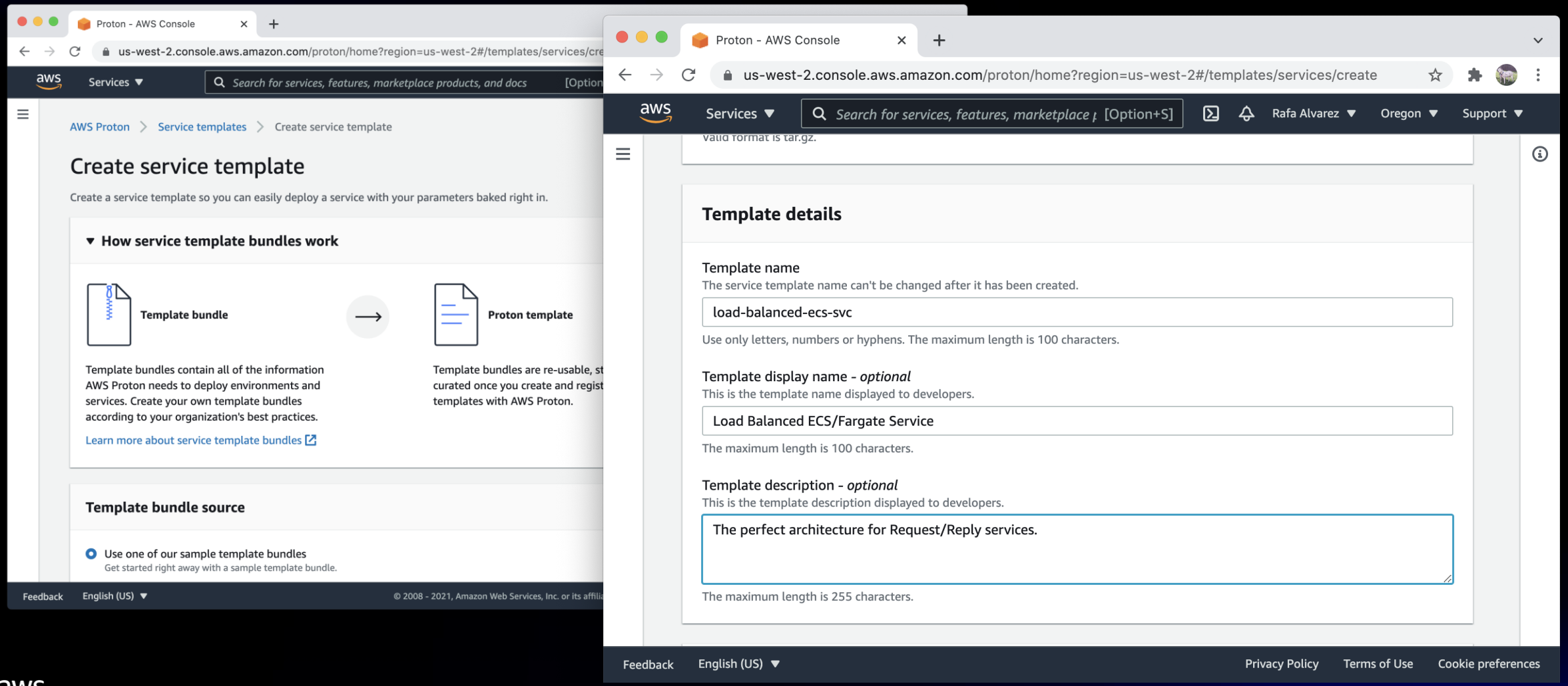


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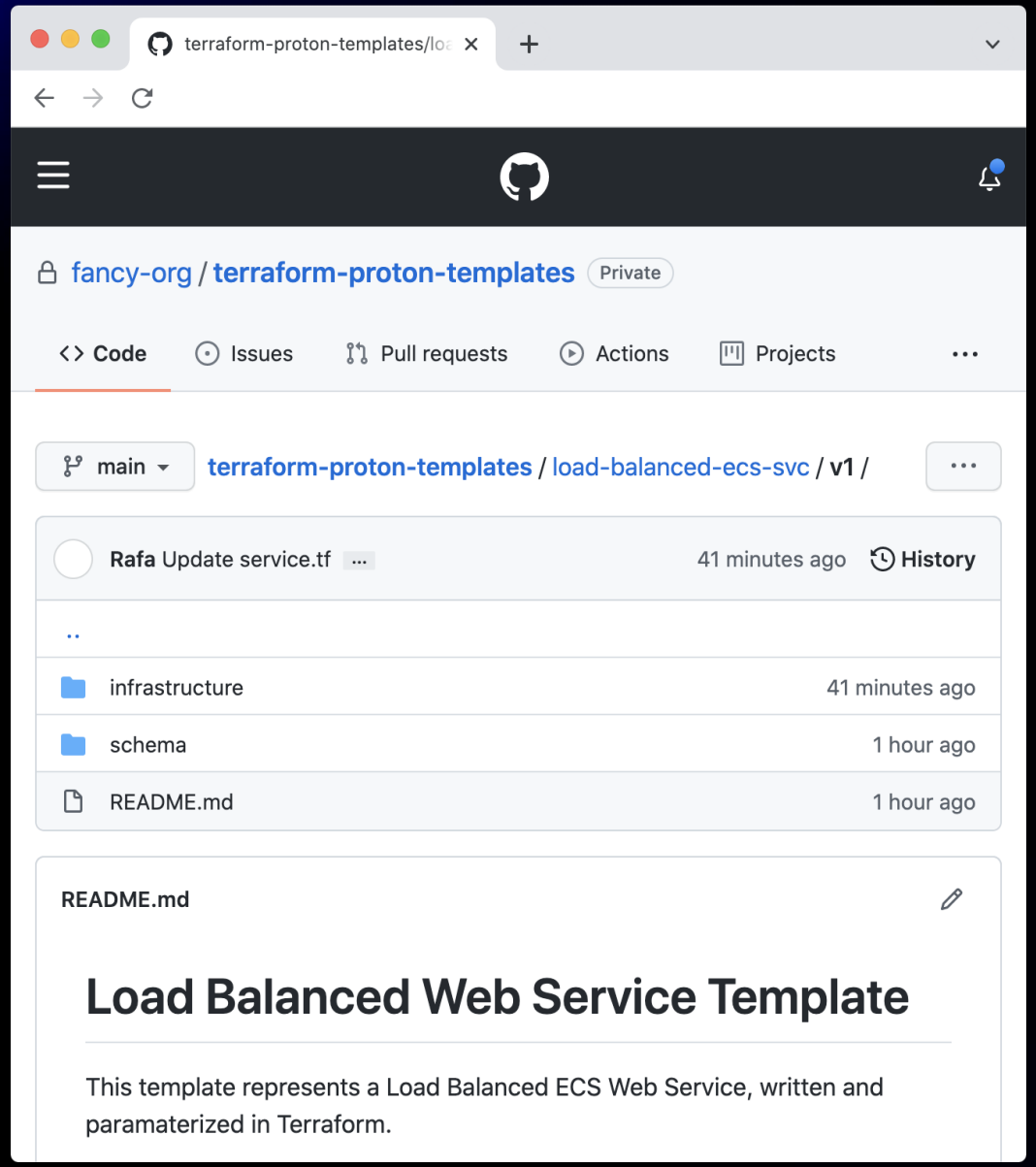
A service template for standard infrastructure

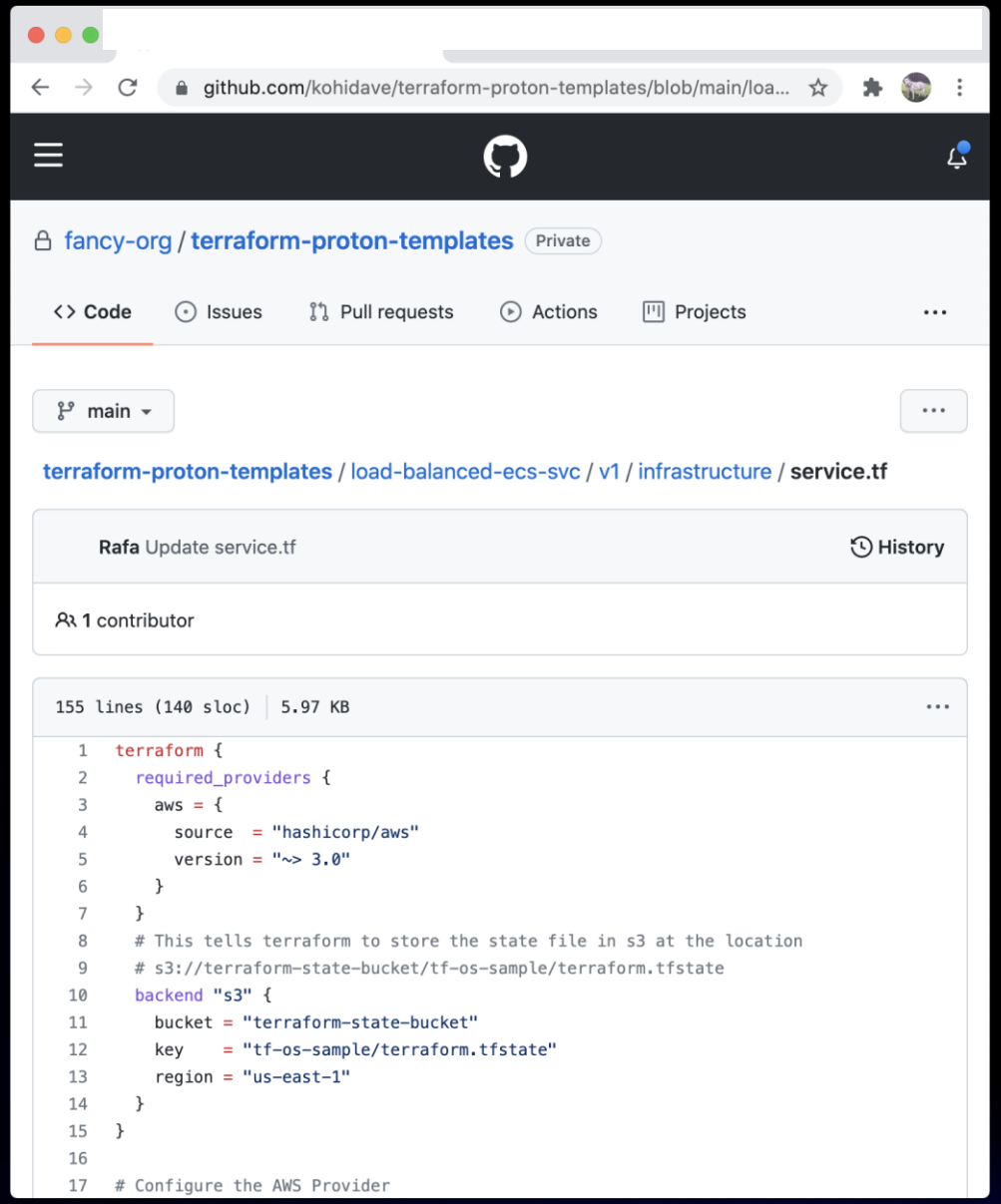


Rafa



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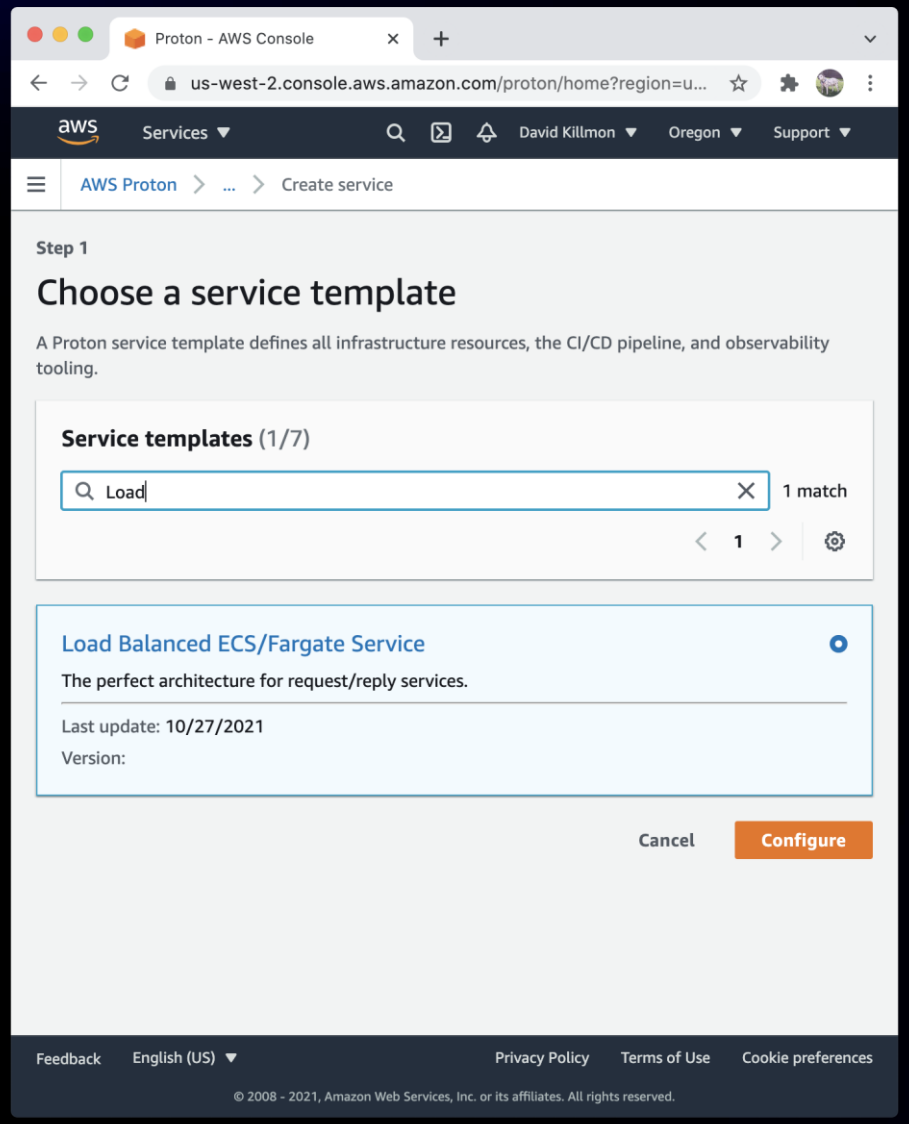


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Let’s try to deploy the service now

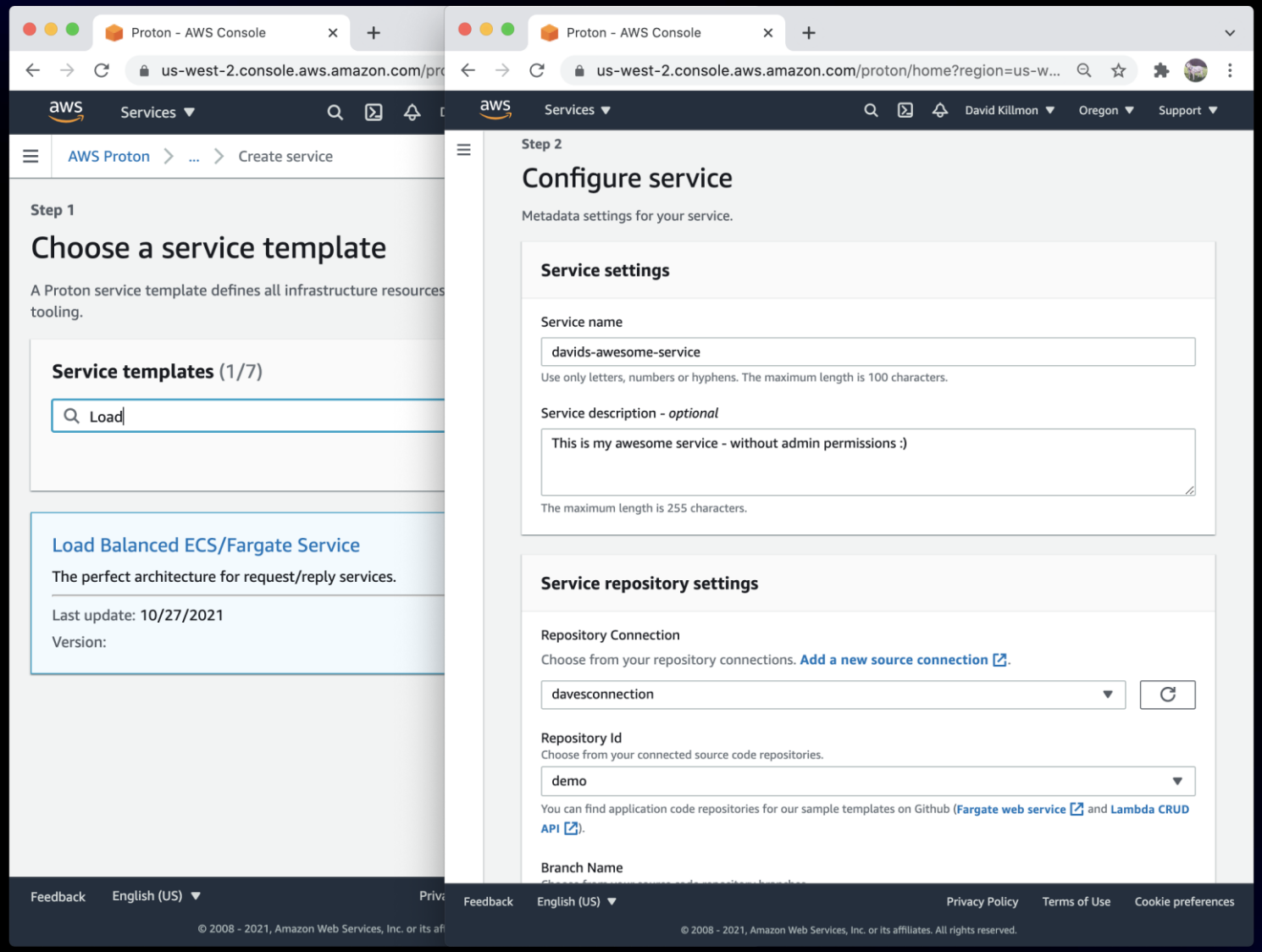


David



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Let’s try to deploy the service now





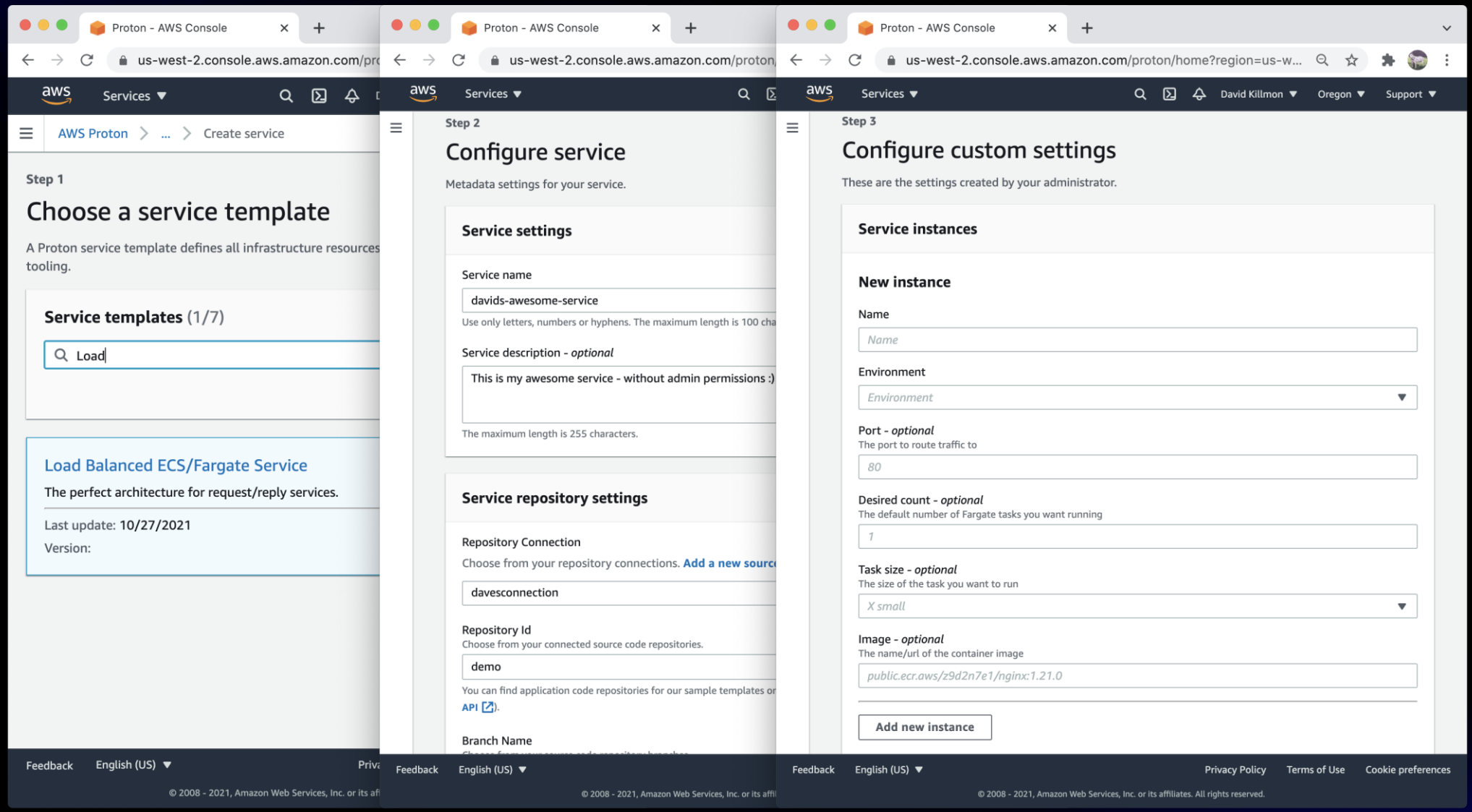
David

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Let’s try to deploy the service now



David



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Done!



David

Done!



Rafa

Proton - AWS Console

us-west-2.console.aws.amazon.com/proton/home?region=us-west-2#/services/detail/davids-awe...

aws Services Search for services, features, marketplace products, and docs [Option+S] David Killmon Oregon Support

Successfully created service davids-awesome-service.

AWS Proton > Services > davids-awesome-service

davids-awesome-service Info

Edit Actions

Overview | Pipeline

Service details Info

Service name
davids-awesome-service

Service description
This is my awesome service - without admin permissions :)

Pipeline option
Includes a pipeline

ARN
arn:aws:proton:us-west-2:00000000000:service/davids-awesome-service

Service template
Load Balanced ECS/Fargate Service

Service status
Create in progress

Pipeline provisioning status
In progress

Pipeline run status
-

Created
10/27/2021 5:51 PM

Service instances (1) Info

Last fetched 30 seconds ago | Create service

Search by keyword

1

Name	Service ...	Template ...	Template ve...	Deployment status	Deployment status mess
beta	davids-awe...	load-balance...	-	In progress	-

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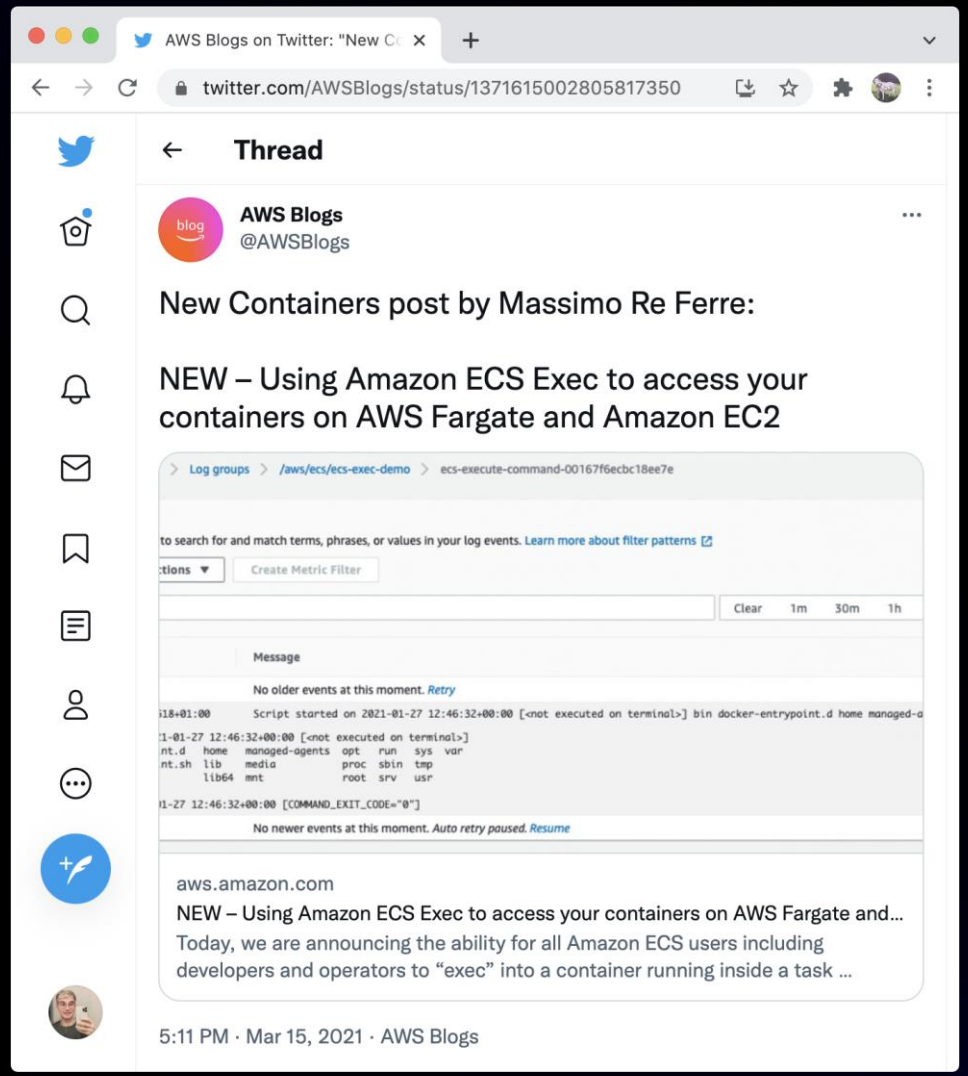
aws

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This could be useful for debugging!



David



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I'm going to update the template



David

feat: enable ECS Exec by kohid

github.com/kohidave/terraform-proton-templates/pull/1

fancy-org / terraform-proton-templates Private

Unwatch 1

Code Issues Pull requests 1 Actions Projects Security Insig

feat: enable ECS Exec #1

Open **kohidave** wants to merge 1 commit into `main` from `kohidave-patch-1`

Conversation 0 Commits 1 Checks 0 Files changed 1

kohidave commented 28 seconds ago

This feature allows us to add ECS Exec to our services!

Update service.tf Verified 5b7ebc4

Add more commits by pushing to the **kohidave-patch-1** branch on **kohidave/terraform-proton-templates**.

Continuous integration has not been set up
GitHub Actions and several other apps can be used to automatically catch bugs and enforce style.

This branch has no conflicts with the base branch
Merging can be performed automatically.

Merge pull request

You can also open this in GitHub Desktop or view command line instructions.

Reviewers No reviews

Assignees No one—as

Labels None yet

Projects None yet

Milestone No milestor

Linked issu Successfull close these None yet

github.com/kohidave/terraform-proton-templates/.../fil...

feat: enable ECS Exec by kohid

github.com/kohidave/terraform-proton-templates/pull/1/files

fancy-org / terraform-proton-templates Private

Unwatch 1 Star 0 Fork 0

Code Issues Pull requests 1 Actions Projects Security Insights

feat: enable ECS Exec #1

Edit Code

Open **kohidave** wants to merge 1 commit into `main` from `kohidave-patch-1`

Conversation 0 Commits 1 Checks 0 Files changed 1 +1 −0

File filter Conversations Jump to 0 / 1 files viewed Review changes

1 load-balanced-ecs-svc/v1/infrastructure/service.tf Viewed

```
@@ -118,6 +118,7 @@ resource "aws_ecs_service" "service" {
118     deployment_maximum_percent         = var.deployment_maximum_percent
119     health_check_grace_period_seconds  = var.environment.outputs.lb_arn
120     wait_for_steady_state              = var.wait_for_steady_state
121 +   enable_execute_command             = true
122
123     network_configuration {
124       subnets          = var.environment.outputs.private_subnet_ids
```

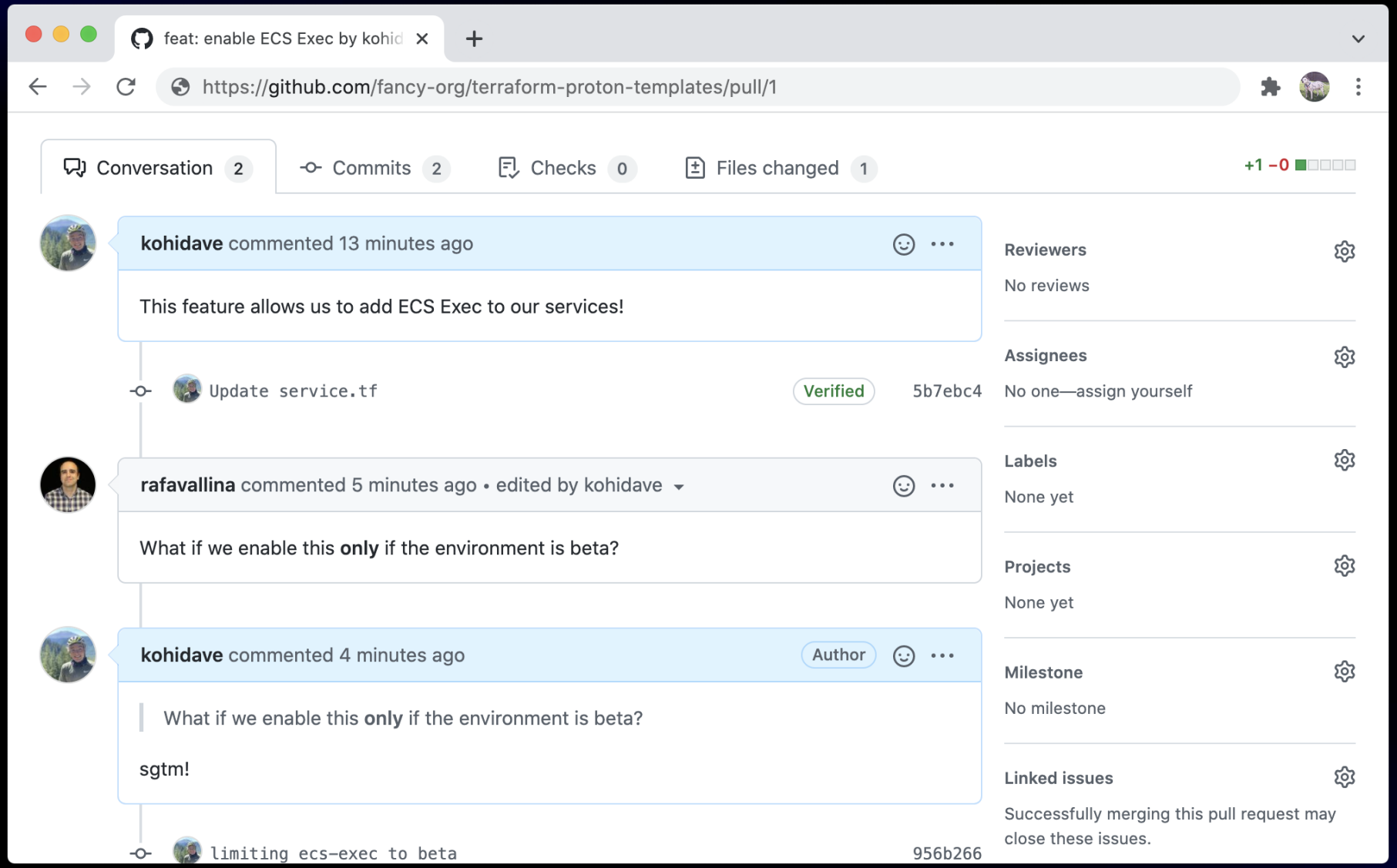
https://github.com/kohidave/terraform-proton-templa...

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Let's have a look . . .



Rafa

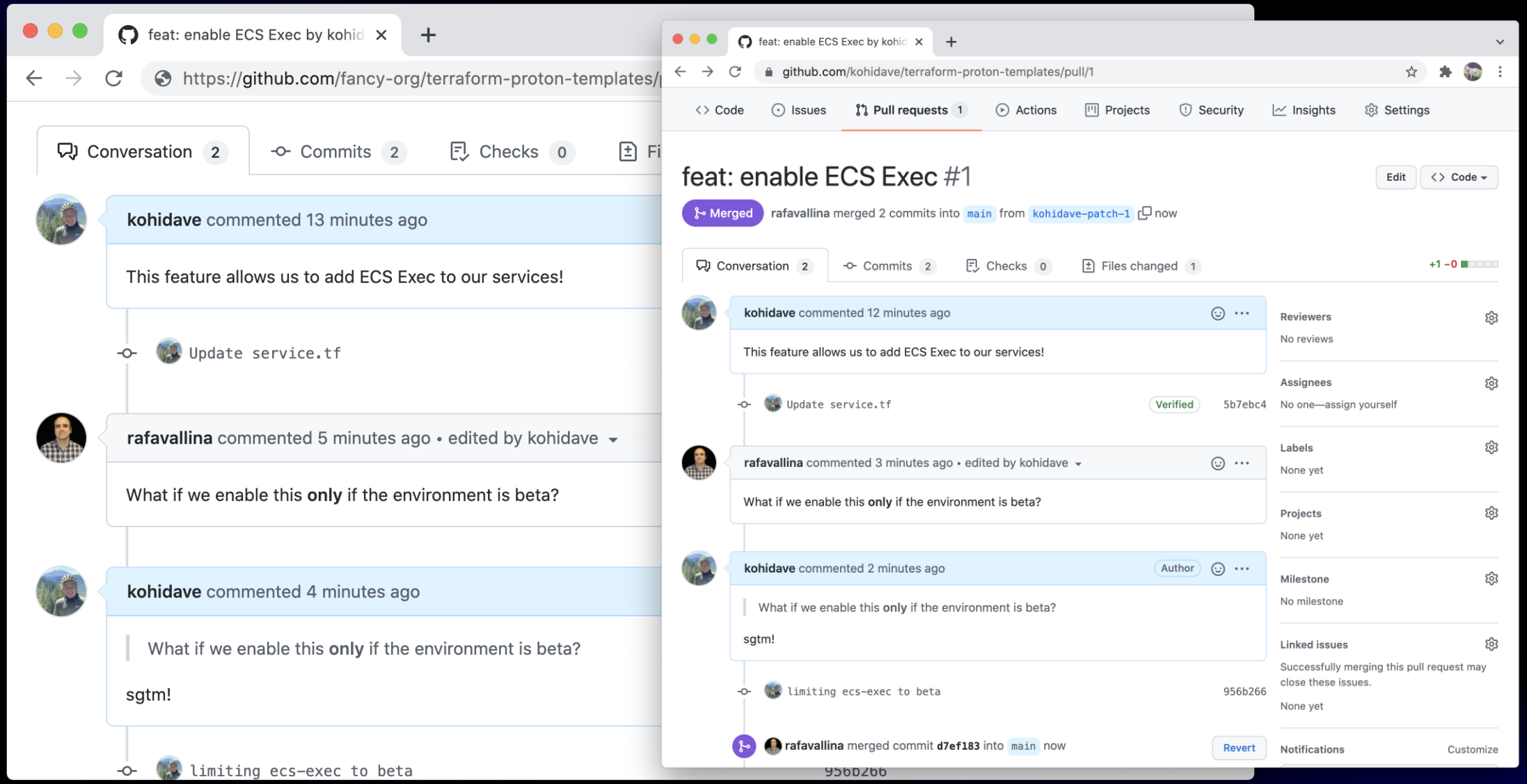


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Let's have a look . . . This works!



Rafa



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Done!



David

Done!



Rafa

Proton - AWS Console

us-west-2.console.aws.amazon.com/proton/home?region=us-west-2#/templates/services/detail/load-...

aws Services Search for services, features, marketplace products, and docs [Option+S] David Killmon Oregon Support

load-balanced-ecs-svc Info

Delete Edit

Service template details

Service template display name
Load Balanced ECS/Fargate Service

Service template name
load-balanced-ecs-svc

Service template description
The perfect architecture for request/reply services.

ARN
arn:aws:proton:us-west-2:0000000000:service-template/load-balanced-ecs-svc

Compatible environment templates
fargate-env-tmpl

Recommended version
-

Created
10/27/2021 5:47 PM

Last modified
10/27/2021 5:47 PM

Don't forget to publish
Minor version 1.1 is in a 'draft' status. To make it visible to your developer teams you will need to publish it. Note that only minor versions are published.

Publish v1.1

Template versions (1/2) Info

Last fetched 50 seconds ago | Delete | Publish | Create new version

Search by keyword

1

	Template version	Description	Created	Last modified
◉	1.1	[d7ef183b] enabling ECS Exec	10/27/2021 6:13 PM	10/27/2021 6:
○	1.0	The perfect architecture for request/reply services.	10/27/2021 5:47 PM	10/27/2021 5:

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aws

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Let’s update our other services



Rafa

fargate-instance Info

Edit | Actions

- Update to latest minor version
- Update to latest major version
- Cancel deployment

Service instance details

Service instance name fargate-instance	Environment Fargate-environment	Deployment status Succeeded	Created 12/4/2020 2:51 PM
Service name fargate-first-service		Deployment status message -	Last successful deployment 12/4/2020 2:51 PM
ARN arn:aws:proton:us-east-1:1234567890:service/fargate-first-service/service-instance/fargate-instance		Template Fargate-sample-template	Last deployment attempt 12/4/2020 2:51 PM
		Template version 1.0	

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What next?

Visit our roadmap (github.com/aws/aws-proton-public-roadmap)

- Even more Git integration and goodies
- More templating languages
- More deployment targets
- Customizable CI/CD

Try out AWS Proton (aws.amazon.com/proton)

Sample templates at github.com/aws-samples/aws-proton-sample-templates

Embark on your proof of concept and initial team adoption

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Thank you!

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Rafa Alvarez
twitter.com/rafavallina

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