



COMMUNITY DAY

Mergulho em AWS CDK

Nível 200 | 2021-11-06



ibrahimcesar.cloud | @ibrahimcesar



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whoami 



Ibrahim Cesar



AWS
community
builder

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Fã de literatura russa e ficção científica
Entusiasta das relações sócio-tecnológicas

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AWS Cloud Development Kit

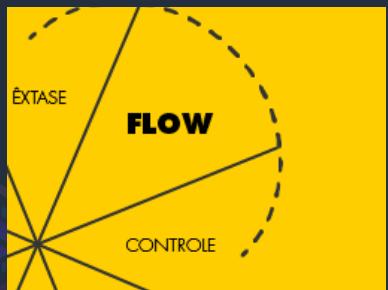
- Lançado em Julho 2019
- Open Source, escrito em TypeScript
- TypeScript || JavaScript || Python || Java || C# && .NET || Go
- Criar e provisionar infraestrutura como código na AWS
- cdkworkshop.com





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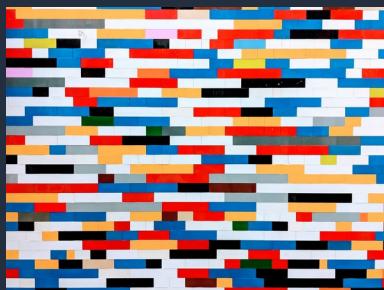
Sumário



Trade offs



Conceitos chave



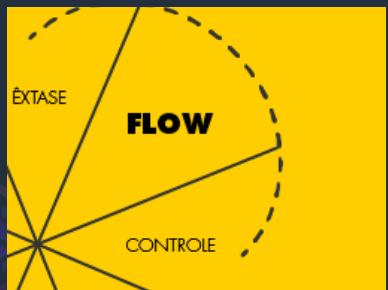
“Melhores Práticas”



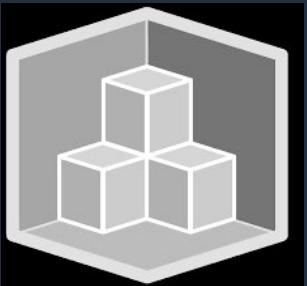
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Trade offs



Conceitos chave



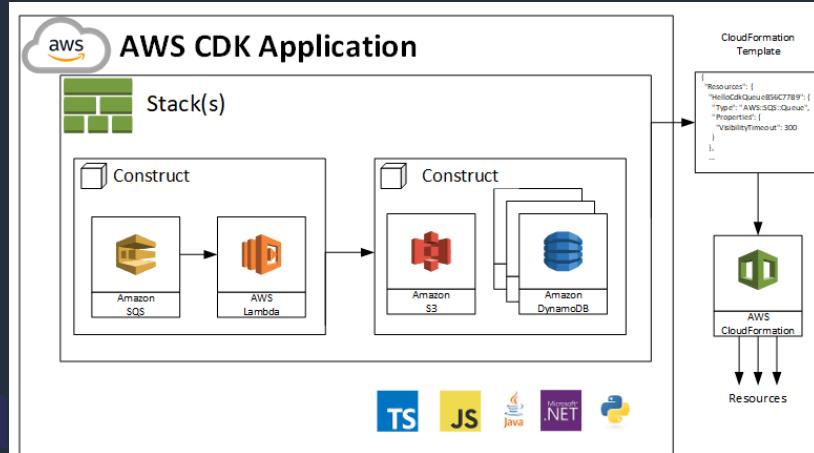
“Melhores Práticas”



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CONSTRUCT LIBRARY ✓

Níveis de abstração em linguagens de propósito geral, com ampla cobertura de *defaults*.



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```
93 ApplicationDeploymentManagedPolicy:  
94   Type: "AWS::IAM::ManagedPolicy"  
95   Properties:  
96     Description: "Policy for application deployments"  
97     PolicyDocument:  
98       Version: "2012-10-17"  
99       Statement:  
100         - Effect: "Allow"  
101           Action:  
102             - "cloudformation:ValidateTemplate"  
103             - "events:PutEvents"  
104             - "events:Describe*"  
105             - "events:EnableRule"  
106             - "events:DisableRule"  
107             - "events:PutRule"  
108             - "events:DeleteRule"  
109             - "events:PutTargets"  
110             - "events>List*"  
111             - "events:TestEventPattern"  
112             - "events:RemoveTargets"  
113             - "iam:PassRole"  
114             - "logs:PutSubscriptionFilter"  
115             Resource: "*"  
116           Effect: "Allow"
```

NÃO É DECLARATIVA



Ian McKay

@iann0036

Em resposta a @_awsfm e @ben11kehoe

"It tends to be hard to write a CloudFormation template that does not do what you expect it to do, whereas that is the default state of a general-purpose programming language"

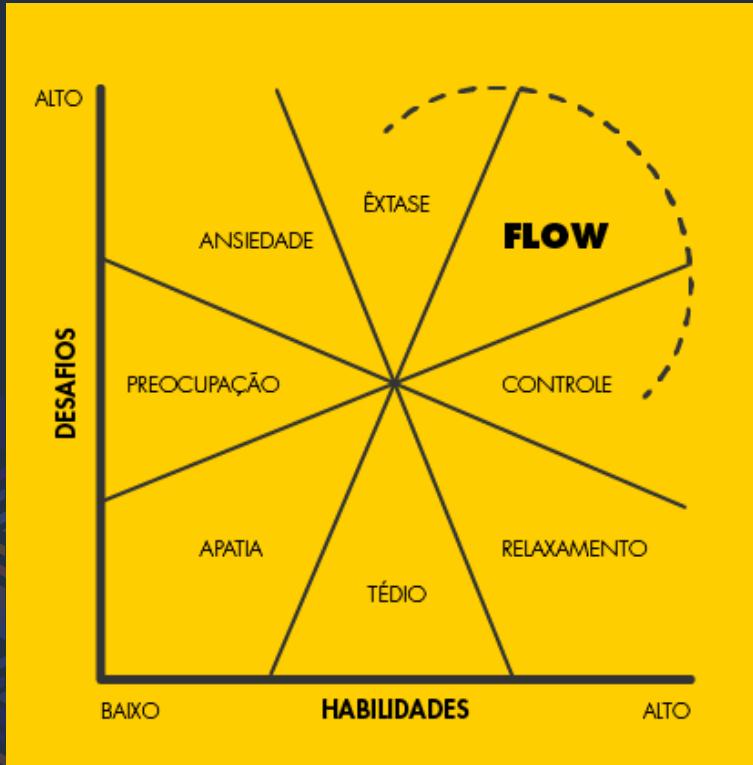
What amazing insights from @ben11kehoe 😍

Traduzido do Tweet

HCL (Hash Corp Language) como uma linguagem declarativa promete o "melhor dos dois mundos"



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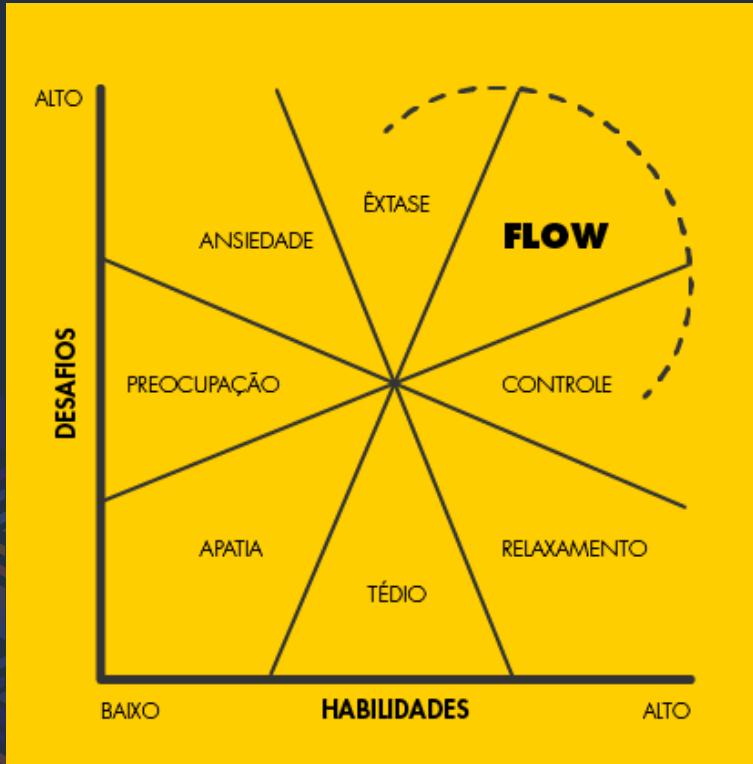


TROCA DE CONTEXTO

Flow: The Psychology of Optimal Experience de Mihaly Csikszentmihalyi explora o estado de "flow". Mudança de contexto mata a produtividade.



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TROCA DE CONTEXTO

Flow: The Psychology of Optimal Experience de Mihaly Csikszentmihalyi explora o estado de “flow”. Mudança de contexto mata a produtividade.

SPACE, Nicole Forsgren:

- Satisfação e bem-estar;
- Performance
- Atividade
- Comunicação e Colaboração
- Eficiência e *flow*



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Tags	
v1.130.0	...
⌚ 7 days ago	→ 9c094ae
zip	tar.gz
Notes	Downloads
v2.0.0-rc.27	...
⌚ 10 days ago	→ 435e6f6
zip	tar.gz
Notes	Downloads
v2.0.0-rc.26	...
⌚ 11 days ago	→ 0da627f
zip	tar.gz
Notes	Downloads
v2.0.0-rc.25	...
⌚ 15 days ago	→ ff95549
zip	tar.gz
Notes	Downloads
v1.129.0	...
⌚ 15 days ago	→ fb43f89
zip	tar.gz
Notes	Downloads
v1.128.0	...
⌚ 23 days ago	→ 1d3883a
zip	tar.gz
Notes	Downloads
v2.0.0-rc.24	...
⌚ 23 days ago	→ 91f2ec1
zip	tar.gz
Notes	Downloads
v1.127.0	...
⌚ 28 days ago	→ 0ea309a
zip	tar.gz
Notes	Downloads
v1.126.0	...
⌚ on 5 Oct	→ f004e1a
zip	tar.gz
Notes	Downloads

VERSIONAMENTO X

v1.130.0

15 dias atrás: 1.129.0

23 dias atrás: 1.128.0

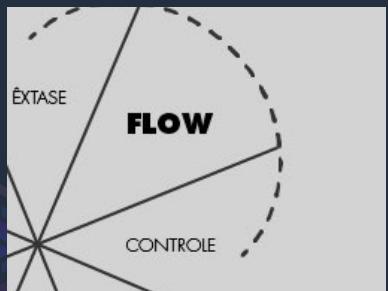
28 dias atrás: 1.127.0

Release Candidate 27 v2.0.0

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Trade offs



Conceitos chave



“Melhores Práticas”

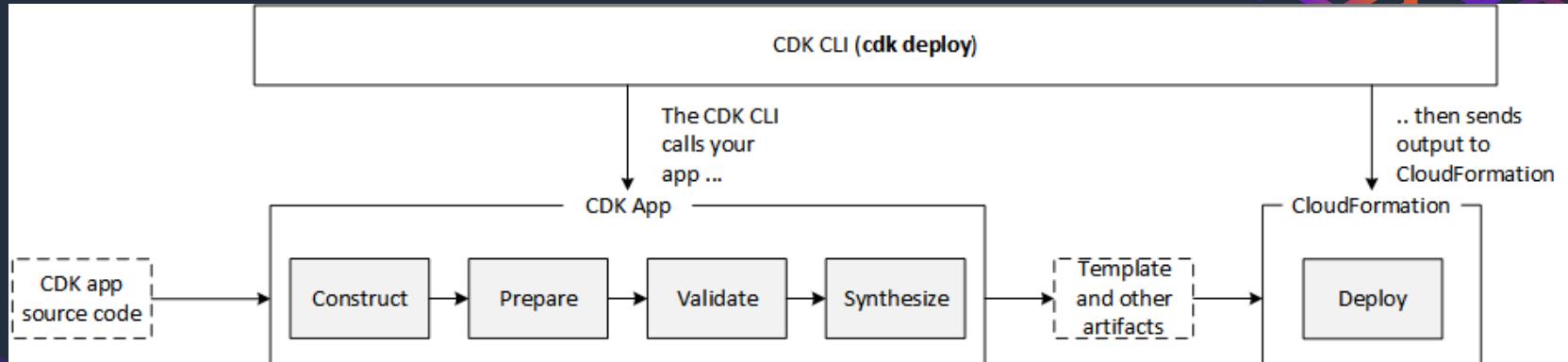


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APP 🎁



```
const app = new App();
new AWSCommunityStack(app, 'cdk-2021');
app.synth();
```



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CONSTRUCTS

AB
CD

L1

Mapeamento 1x1 de recursos do CloudFormation. Seguem a convenção do sufixo Cfn* (e.g., *CfnBucket*)

```
const bucket = new s3.CfnBucket(this, 'uploads-bucket');
```

L2

Nível maior de abstração com acesso a métodos de auxílio e vários valores padrões.

```
const myVpc = new ec2.Vpc(this, 'my-vpc', {  
  cidr: '10.0.0.0/16'  
});
```

L3

Mais específicos e opinados, servem para casos de uso específicos, com muito menos código.

```
const lambdaRestApi = new apigateway.LambdaRestApi(this,'lambda-rest-api',{  
  handler: lambdaFunction  
});
```



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STACKS



```
const app = new App();

new FirstStack(app, 'stack-1');
new SecondStack(app, 'stack-2');

app.synth();
```



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AWS CDK CLI



This deployment will make potentially sensitive changes according to your current security approval level (`--require-approval broadening`).
Please confirm you intend to make the following modifications:

IAM Statement Changes

Resource	Effect	Action	Principal	Condition
+ \${EC2-Key-Pair-Manager-Role.Arn}	Allow	sts:AssumeRole	Service:lambda.amazonaws.com	
+ \${ec2Role.Arn}	Allow	sts:AssumeRole	Service:ec2.amazonaws.com	
+ arn:\${AWS::Partition}:s3:::\${AssetParameters}13138ebff2da51426144f6f5f4f0ad197787f52aad8b6ceb26ecff68d33cd2b7853Bucket8BF32734 arn:\${AWS::Partition}:s3:::\${AssetParameters}13138ebff2da51426144f6f5f4f0ad197787f52aad8b6ceb26ecff68d33cd2b7853Bucket8BF32734}/*	Allow	s3:GetBucket* s3:GetObject* s3>List*	AWS:\${ec2Role}	
+ arn:\${AWS::Partition}:s3:::\${AssetParameters}3887b777b1ab7247eaaf6dc4647f03f9fc1c8f0da685460f489ec8f2106d480d53BucketBAAEF59 arn:\${AWS::Partition}:s3:::\${AssetParameters}3887b777b1ab7247eaaf6dc4647f03f9fc1c8f0da685460f489ec8f2106d480d53BucketBAAEF59}/*	Allow	s3:GetBucket* s3:GetObject* s3>List*	AWS:\${ec2Role}	

IAM Policy Changes

Resource	Managed Policy ARN
+ \${EC2-Key-Pair-Manager-Role}	\${EC2-Key-Pair-Manager-Policy}
+ \${EC2-Key-Pair-Manager-Role}	arn:\${AWS::Partition}:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole
+ \${ec2Role}	arn:\${AWS::Partition}:iam::aws:policy/AmazonSSMManagedInstanceCore

Security Group Changes

Group	Dir	Protocol	Peer
+ \${SecurityGroup.GroupId}	In	TCP 22	Everyone (IPv4)
+ \${SecurityGroup.GroupId}	In	TCP 80	Everyone (IPv4)
+ \${SecurityGroup.GroupId}	Out	Everything	Everyone (IPv4)

(NOTE: There may be security-related changes not in this list. See <https://github.com/aws/aws-cdk/issues/1299>)

Do you wish to deploy these changes (y/n)?



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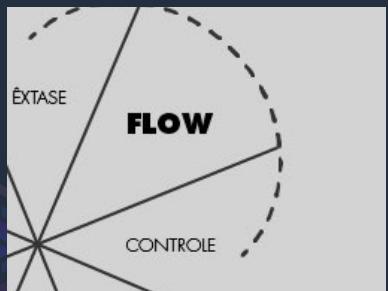
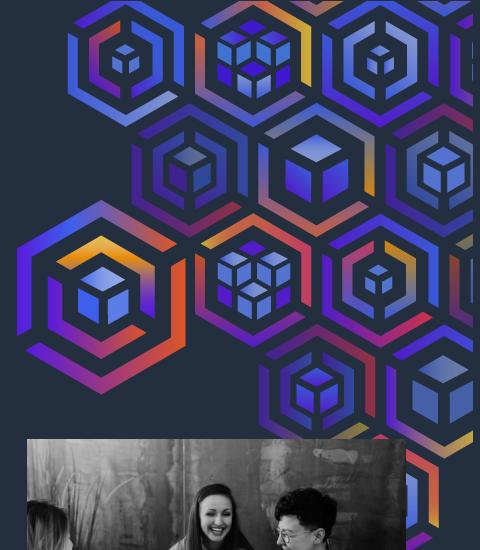
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CDK v2

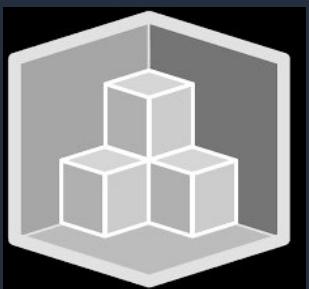
```
import { Construct } from 'constructs';
import { App, Stack } from 'aws-cdk-lib';
import { aws_s3 as s3 } from 'aws-cdk-lib';
import * as codestar from '@aws-cdk/aws-codestar-alpha';
```



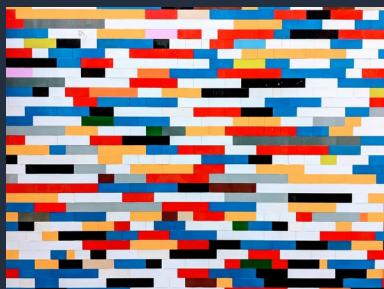
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Trade offs



Conceitos chave



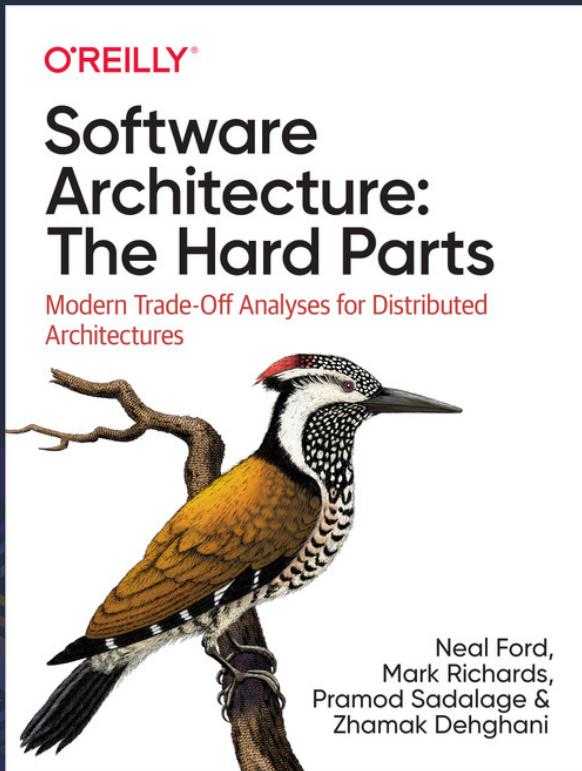
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[...] “best” implies that an architect has managed to maximize all the possible competing factors within the design. [...]



TIP

Don’t try to find the *best* design in software architecture; instead strive for the *least worst* combination of trade-offs.



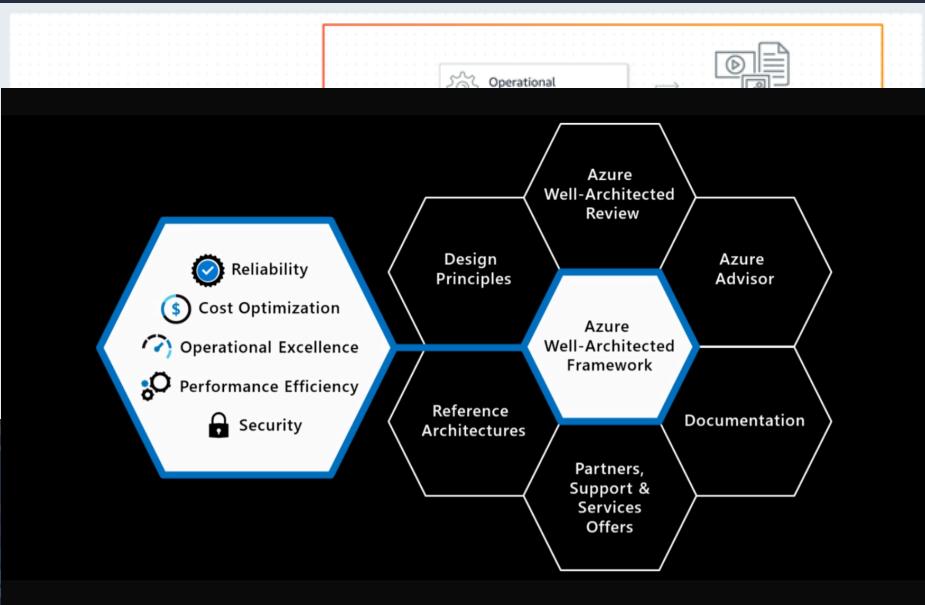
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Well-Architected Framework desde o dia 0.



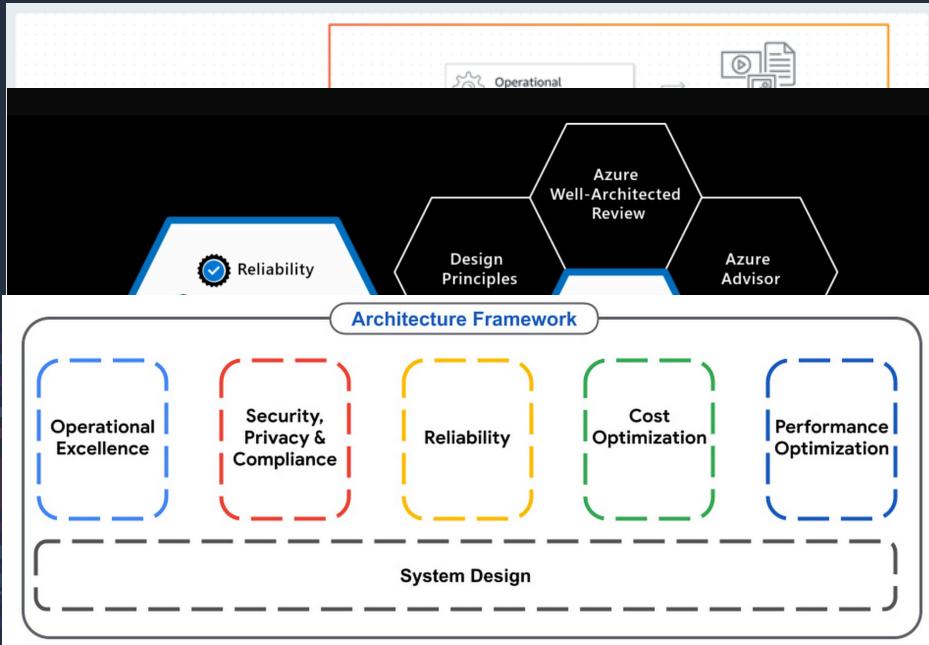
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Well-Architected Framework desde o dia 0.



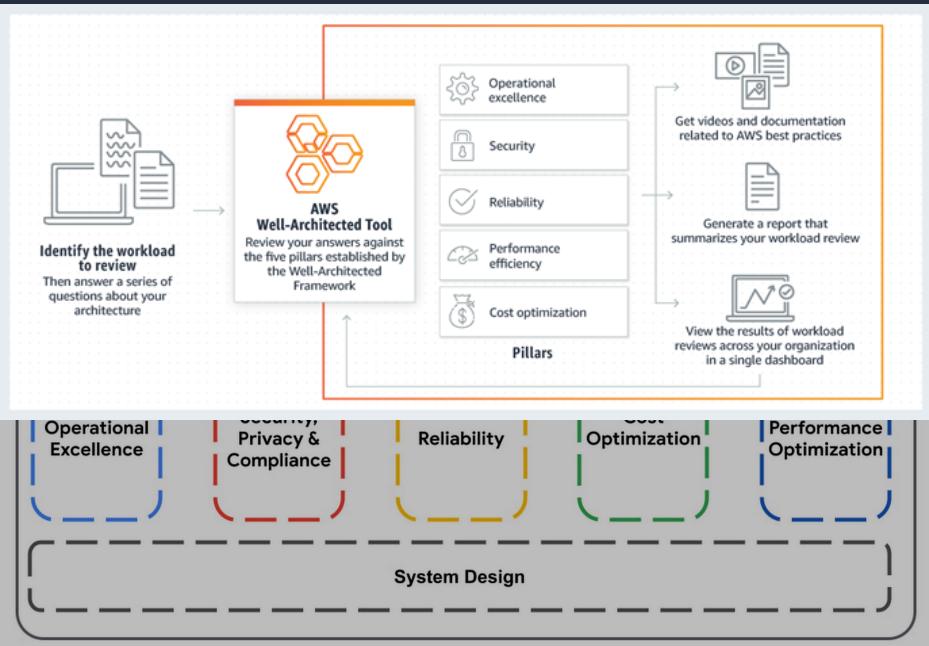
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Well-Architected Framework desde o dia 0.



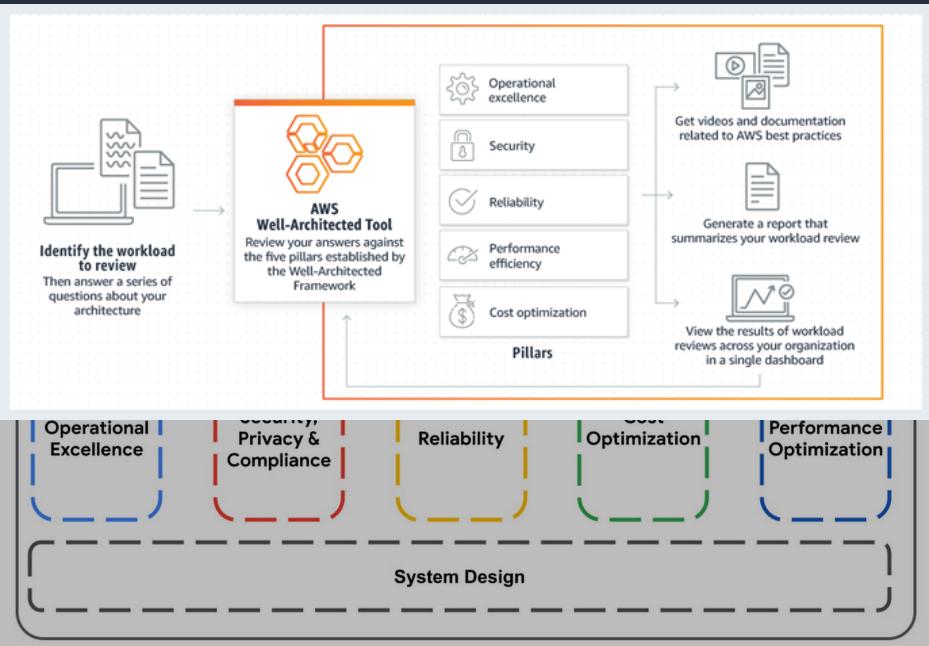
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Well-Architected Framework define *componente* como o código, configuração e recursos da AWS que juntos entregam um requerimento. Um componente é muitas vezes a unidade de propriedade técnica e é descolada de outros componentes. O termo carga de trabalho (*workload*) é usado para identificar um conjunto de componente que juntos entregam valor ao negócio. Uma carga de trabalho é geralmente o nível de detalhe em que negócios e líderes técnicos se comunicam.



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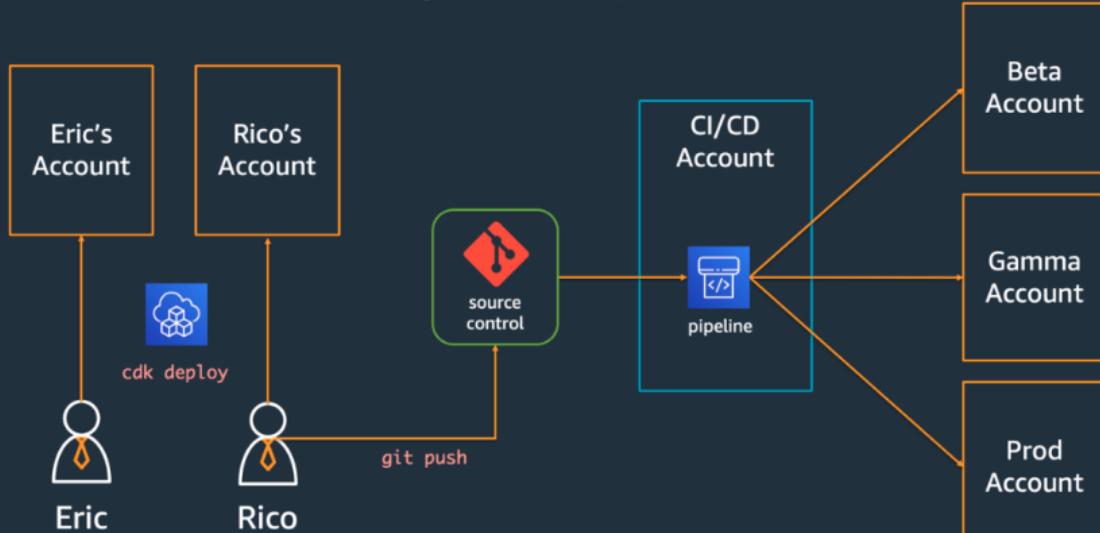
Um *app* no AWS CDK mapeando-se para um *componente*.

Crie e compartilhe componentes como bibliotecas de código através de repositórios de artefatos como AWS CodeArtifact.



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TRABALHANDO EM TIMES





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MODELANDO

Modele sua aplicação em unidades lógicas de domínios baseados em *Constructs*, não *Stacks*. *Stacks* são uma unidade de deploy, e tendem a serem orientadas a aplicações específicas.



Construir com base em *Constructs* confere mais flexibilidade.

Use *Stacks* para isolar unidades de deploys, como:

- DevStack
- StagingStack
- ProdStack



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CONFIGURAÇÃO E SEGURANÇA

- Empregue *Least Privilege* desde o início;
- Evite variáveis de ambiente. Utilize Secrets Management System (SSM)
- Não mude o ID lógico de recursos com estado!
 - Farão ser substituídos
 - Aplique proteções de delete sempre que possível
 - O ID lógico é derivado do `id` especificado ao instanciar o construct e sua posição na arvoredo constructs
 - Entenda como Identificadores (Identifiers) funcionam!



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TESTES



- **Testes de Snapshots** testam o template sintetizado do AWS CloudFormation contra um template de baseline previamente salvos.
- **Asserções específicas** testa aspectos específicos, testes unitários de valores esperados ou ter certeza de que funcionalidades existentes não foram alteradas.
- **Testes de validação** ajudam a “falhar rápido” ao exibir erros antes mesmo de seu envio.

CDK possui bibliotecas de teste: **assert** e **expect**.

Preferencialmente um. Teste deve testar *um e apenas um comportamento*.



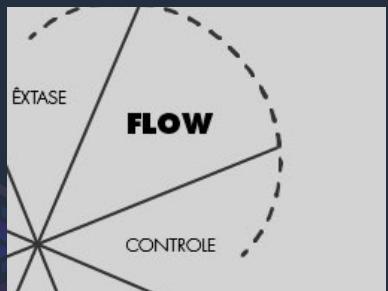
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OUTRAS SUGESTÕES GERAIS

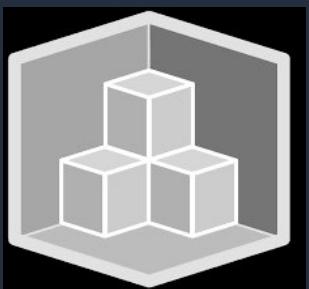
- Empregue os nomes gerados para recursos, não nomes físicos. Cada nome pode ser usado apenas uma vez em uma conta — este é um erro muito comum.
- Defina políticas de remoção e retenção de logs sempre que possível.
- Use *cdk.context.json* para evitar comportamentos não-determinístico.
- Empregue o AWS CDK para gerenciar roles e grupos de segurança (eg., *grantRead()*)



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Trade offs



Conceitos chave



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CDK Patterns

This is intended to be a repo containing all of the official AWS Serverless architecture patterns built with AWS CDK for developers to use.

Follow [@CdkPatterns](#) for live discussion / new pattern announcements. I plan to add a new pattern weekly so check back regularly!

You can also check out our [Deconstructing CDKPatterns](#) YouTube channel for in depth walk throughs of the patterns.

Note, this is maintained by [@nideveloper](#) not AWS. For my motivation, please read this [blog post](#)

New to AWS CDK?

- To learn more visit the [AWS getting started guide](#)
- To do a workshop on CDK visit [cdkworkshop.com](#)
- Visit the [Hey CDK "How To" series](#) for some detailed answers
- Check out [Awesome CDK](#) for a curated list of awesome projects related to CDK

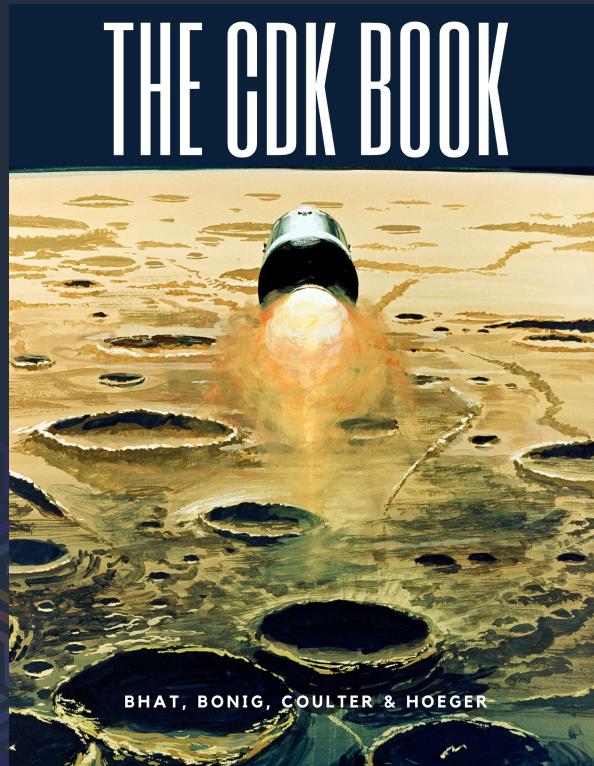
cdkpatters.com



Matt Coulter
@NIDeveloper



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thecdkbook.com



Matthew Bonig



Thorsten Höger



Sathyajith Bhat



Matt Coulter

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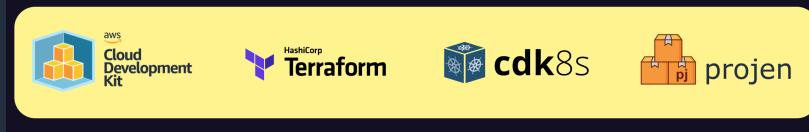




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A Cloud Development Kit (CDK) is a developer tool built on the open source Constructs model. We now have multiple CDKs:



cdkday.com



[@ibrahimcesar](http://ibrahimcesar.cloud)



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Killer App ★



Web



jQuery



S3



Lambda





COMMUNITY DAY

Killer App ★



Web



jQuery



S3



Lambda





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Web



jQuery



S3



Lambda





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Killer App ★



Web



jQuery



S3



Lambda



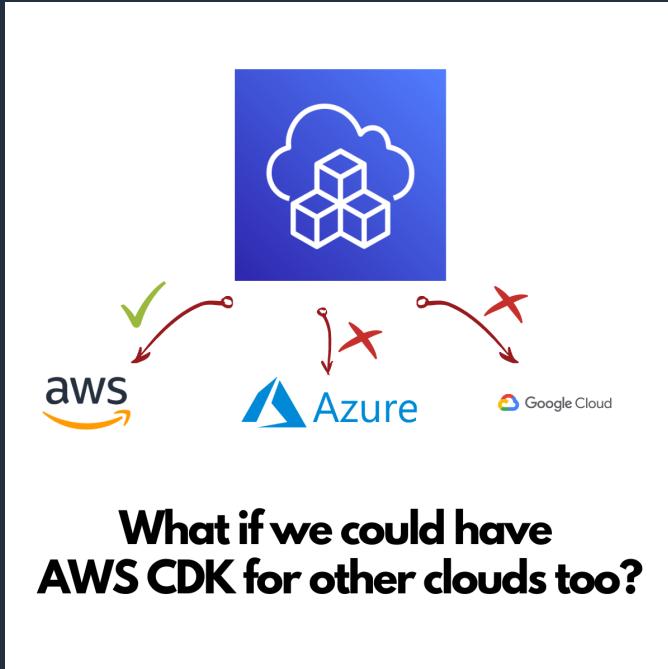


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Killer App ★



Cloud Development Kit





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Killer App ★



Cloud Development Kit

#CDKDay

Microsoft

Azure

Prototyping a CDK for Azure

Andreas Heumaier
@aheumaier

30.09.2020



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Killer App ★



Cloud Development Kit

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Microsoft

Azure

Prototyping a CDK for Azure

Matthew (@mattbong)

Marek (@marekq)

Andreas Heumaier
@aheumaier

0:00 / 8:36

JSii



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Killer App ★



Cloud Development Kit

Faster deployments with CDK Pipelines!

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bit.ly/cdk-refs





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TALK_COMPLETE
const greet:always = 'Obrigado!';