Hands-on Besom: Infrastructure as Code & Scala 3

VIRTUS LAB

About me

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I HAVE NO
IDEA WHAT
I'M DOING

Agenda

- What is Pulumi?
- How one uses it?
- Why should you care about it?
- Let’s deploy something live and see what breaks
- Sorry for the above
- But first, let me take a selfie!

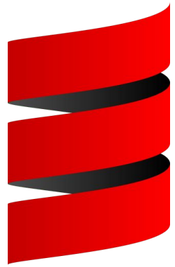
Pulumi

What's Pulumi?

*"Using Pulumi, you author cloud programs using **your favorite language**, spanning low-level infrastructure-as-code to highly productive and modern container- and serverless-powered applications."*

- Joe Duffy, ex-MS-Midori, CEO of Pulumi

Favorite languages?



How does it look?

```
import besom.*
import besom.api.aws
import besom.api.aws.ec2.inputs.*

@main def main = Pulumi.run {

  val ami = aws.ec2.getAmi(GetAmiArgs(
    filters = Seq(
      GetAmiArgsFilter(
        name = "name",
        values = Seq("amzn-ami-hvm-*-x86_64-ebs")
      )
    ),
    owners = Seq("137112412989"), // Amazon
    mostRecent = true
  )).id
```

How does it look?

```
val group = aws.ec2.SecurityGroup("web-secgrp", SecurityGroupArgs(
  ingress = Seq(
    SecurityGroupIngressArgs(
      protocol = "tcp",
      fromPort = 22,
      toPort = 22,
      cidrBlocks = Seq("0.0.0.0/0"),
    ),
    SecurityGroupIngressArgs(
      protocol = "tcp",
      fromPort = 80,
      toPort = 80,
      cidrBlocks = Seq("0.0.0.0/0")
    )
  )
))
```

How does it look?

```
val size = "t2.micro"

val userData =
  """#!/bin/bash
    |sudo apt update -y
    |sudo apt install apache2 -y""".stripMargin


val server = aws.ec2.Instance("web-server-www", InstanceArgs(
  tags = Map("Name" -> "web-server-www"),
  instanceType = size,
  // reference the group object above
  vpcSecurityGroupIds = Seq(group.id),
  ami = ami,
  userData = userData // install apache web server
))
```

How does it look?

```
  Stack.exports(
    "publicIp" = server.publicIp,
    "publicHostName" = server.publicDns
  )

} // end Pulumi.run
```

Wait, what?

Anatomy of a Pulumi program

- Stacks
  - a Pulumi program is a blueprint
  - instance of the blueprint is a stack

- Resources & Inputs:

```
val catsBucket = aws.s3.Bucket("cats", BucketArgs(
  acl = "public-read" // << this is an Input!
)) : Output[s3.Bucket]
```

- Outputs:

```
Stack.exports(
  catsUrl = catsBucket.websiteEndpoint
)
```

A small example

```
import besom.*
import besom.api.aws

@main def main = Pulumi.run {
  val catsBucket = aws.s3.Bucket("cats", BucketArgs(
    acl = "public-read"
  ))

  val dogsBucket = aws.s3.Bucket("dogs", BucketArgs(
    acl = "public-read"
  ))

  Stack.exports(
    catsUrl = catsBucket.websiteEndpoint,
    dogsUrl = dogsBucket.websiteEndpoint
  )
} // end Pulumi.run
```

Cool stuff about Pulumi

- Pulumi is composable on multiple levels:
  - Stacks can depend on other Stacks via stack references
  - Users can define their own custom components which aggregate resources usually used together (e.g. EKS)
  - Components can be published as libraries to be used from other languages

Cool stuff about Pulumi

- Pulumi can be embedded in other apps via Automation API to control infrastructure programmatically (Besom #336)

- Pulumi CrossGuard can enforce policies for all managed resources

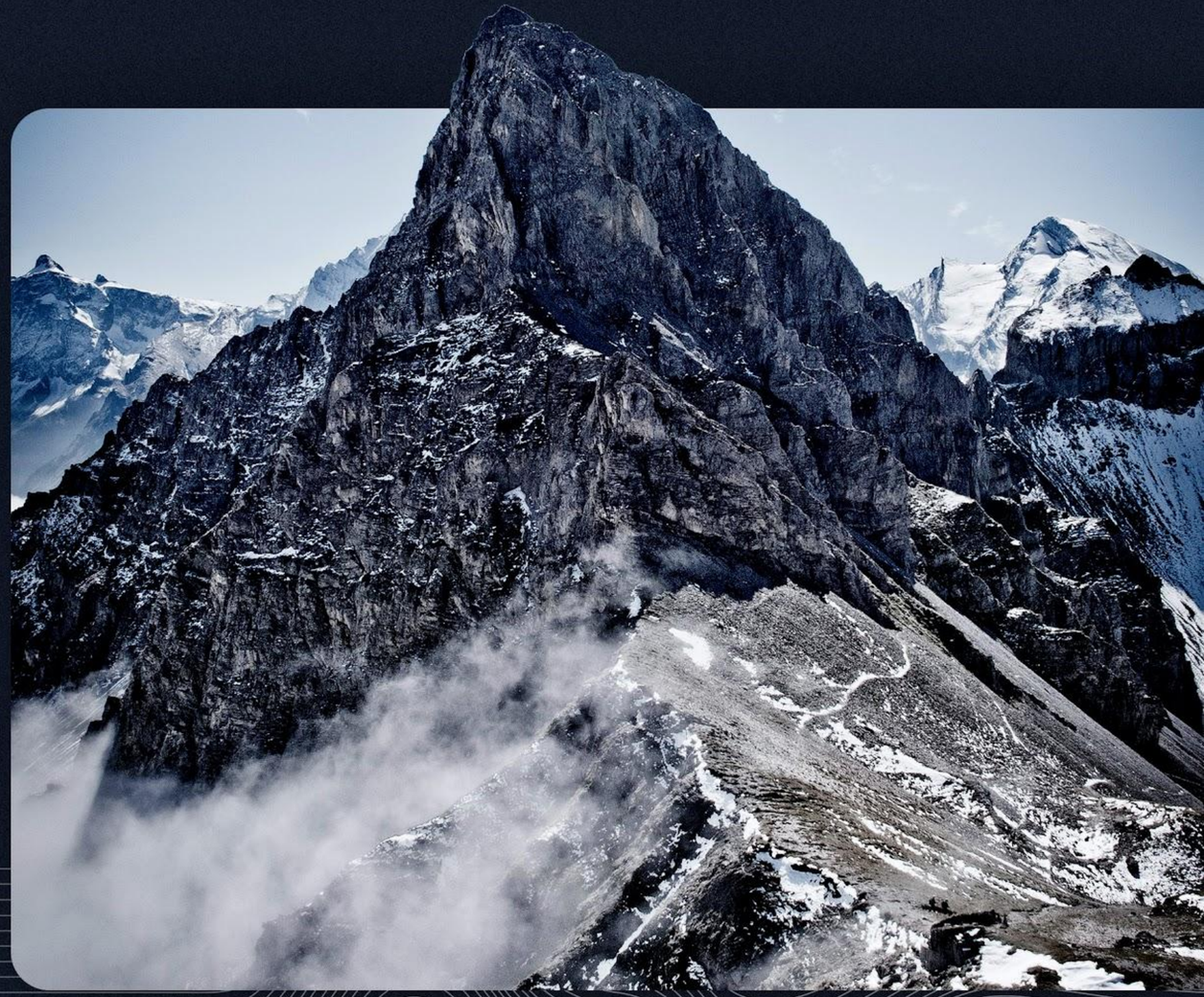
Let’s build something!

We used Scala ONLY to build everything!

Links!

- **https://virtuslab.github.io/besom/**
- **https://github.com/VirtusLab/besom**
- **https://www.pulumi.com/**

Thank you



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