

Please

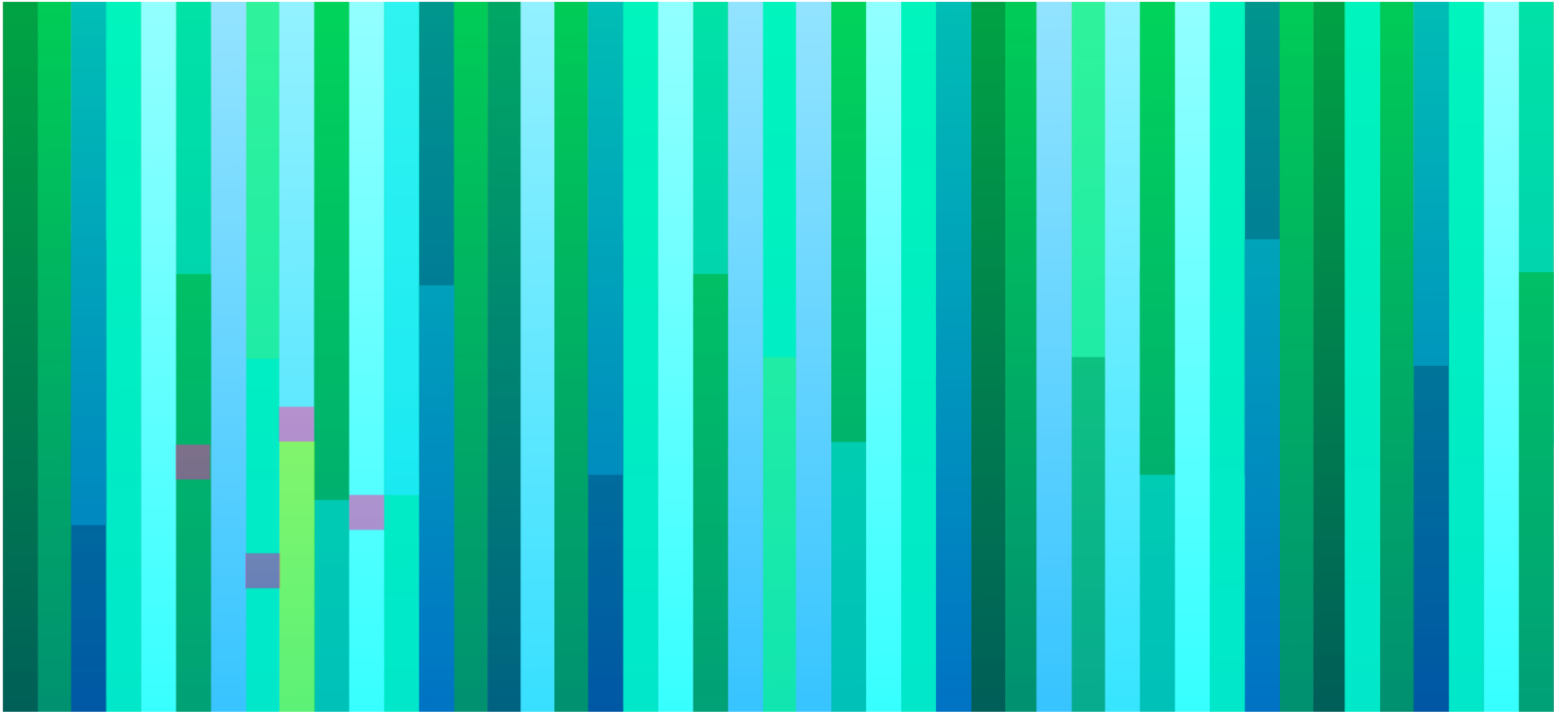
Ask questions
through the app



Rate Session

Thank you!





The State of Kubernetes Development Tooling
October 2019

garden

“ *Kubernetes the hard way* falsely implies that there's an easy way. ”

@pczarkowski

App Definition and Development

Database

Streaming & Messaging

Application Definition & Image Build

Continuous Integration & Delivery

Platform

Observability and Analysis

Orchestration & Management

Cloud-Native Storage

Container Runtime

Automation & Configuration

Public

Runtime

Container Registry

Security & Compliance

Key Management

Special

Cloud

Kubernetes Certified Service Provider

Kubernetes Training Partner

Monitoring

Logging

Tracing

Chaos Engineering

Serverless

Scheduling & Orchestration

Coordination & Service Discovery

Remote Procedure Call

Service Proxy

API Gateway

Service Mesh

Certified Kubernetes - Distribution

Certified Kubernetes - Hosted

Certified Kubernetes - Installer

PaaS/Container Service

Cloud Native Computing Foundation

Cloud Native Landscape

l.cncf.io

Cloud Native Computing Foundation

Cloud Native Landscape

l.cncf.io



This landscape is intended as a map through the previously uncharted terrain of cloud native technologies. There are many routes to deploying a cloud native application, with CNCF Projects representing a particularly well-traveled path



CLOUD NATIVE COMPUTING FOUNDATION



CLOUD NATIVE Landscape



Redpoint



Amplify

Who is this talk for?

Developers working on apps that...

- Run **on** Kubernetes.
- Are **not** Kubernetes itself. E.g. CRDs & operators.

Who is this talk for?

Developers looking to improve...

- Their **pre-commit** workflow.
- The part of their day where **code** gets written.

But not necessarily...

- Their CI/CD pipelines.
- Ops stuff not directly related to writing code.

“You put the whole app
in one container?!”

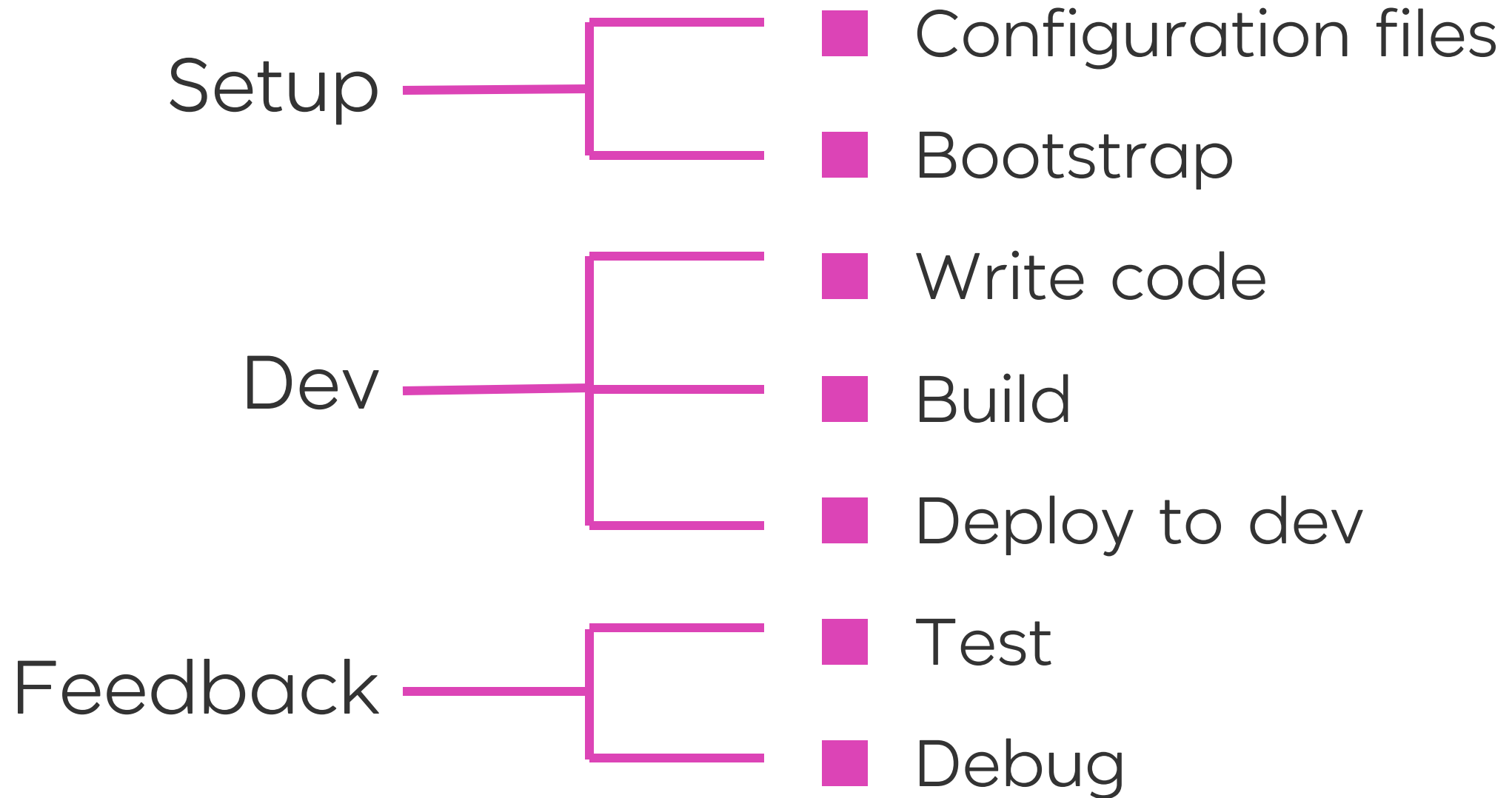
@7hunderbird

Development Cycle:

- Provisioning
- Configuration files
- Bootstrap
- Write code
- Build
- Deploy to dev
- Test
- Debug
- Git & CI
- Ship to prod. & CD
- Observability

Pre-Commit Stage:

- ~~Provisioning~~
- Configuration files
- Bootstrap
- Write code
- Build
- Deploy to dev
- Test
- Debug
- ~~Git & CI~~
- ~~Ship to prod. & CD~~
- ~~Observability~~



Wishlist

- Configuration files
 - Bootstrap
 - Write code
 - Build
 - Deploy to dev
 - Test
 - Debug
-
- Manageable size
 - Create them for me?

Wishlist

- Configuration files
 - Bootstrap
 - Write code
 - Build
 - Deploy to dev
 - Test
 - Debug
- Setup tasks
(like migrations)

Wishlist

- Configuration files
 - Bootstrap
 - Write code
 - Build
 - Deploy to dev
 - Test
 - Debug
 - Automate docker/kubectl cycle
 - Short feedback loop
 - Unobtrusive
 - Hot reload
 - Easy to on-board
 - Dependency-aware
- 

Wishlist

- Configuration files
 - Bootstrap
 - Write code
 - Build
 - Deploy to dev
 - Test
 - Debug
 - Do testing
 - Highlight failures
 - End-to-end tests
- 

Wishlist

- Configuration files
 - Bootstrap
 - Write code
 - Build
 - Deploy to dev
 - Test
 - Debug
 - Log streaming
 - Highlight issues
 - Allow breakpoints
 - Not tracing
- 
- A pink line starts from the right side of the 'Debug' item, extends horizontally to the right, then turns 90 degrees upwards, and finally turns 90 degrees to the right again, ending at the left side of the 'Log streaming' item.

“Maybe containers were
a mistake.”

@jessfraz

Categories

- Debug
- Connect
- Build & Deploy Cycle

Categories

- Debug
- Connect
- Build & Deploy Cycle

Tools

- | | |
|-------------|----------------|
| ■ Draft | ■ ksync |
| ■ Garden | ■ kubefwd |
| ■ Skaffold | ■ Okteto |
| ■ Tilt | ■ Telepresence |
| ■ Jenkins X | ■ inlets |
| ■ Forge | ■ Squash |
| ■ Helm | ■ Stern |

Others...

- kubectl
- yq
- kubectl
- kubens
- ytt
- kpxg
- kbld
- kapp
- kwt
- ...

Others...

Trivia:
Which of these
isn't a real tool?

- kubeval
- yq
- kubectl
- kubens
- ytt
- kpxg
- kbld
- kapp
- kwt
- ...

“Kubernetes:
complicating simple
things since 2014.”

@texmandie

Debug

- **kubectl**
- Squash
- Stern

Notes

- Easily shows you the status of your pods, deployments, services.
- Learn it.
- **kubectl logs --follow -n [namespace] [pod]**



Debug

 **kubectrl** **Squash** **Stern**

Tasks

- ▶ Install Tools
- ▶ Configure Pods and Containers
- ▶ Administer a Cluster
- ▶ Manage Kubernetes Objects
- ▶ Inject Data Into Applications
- ▶ Run Applications
- ▶ Run Jobs
- ▶ Access Applications in a Cluster
- ▼ Monitoring, Logging, and Debugging
 - Application Introspection and Debugging
 - Auditing
 - Debug Init Containers
 - Debug Pods and ReplicationControllers
 - Debug Services**
 - Debug a StatefulSet
 - Debugging Kubernetes nodes with crictl
 - Determine the Reason for Pod Failure
 - Developing and debugging services locally
 - Events in Stackdriver
 - Get a Shell to a Running Container
 - Logging Using Elasticsearch and Kibana
 - Logging Using Stackdriver
 - Monitor Node Health

Debug Services



An issue that comes up rather frequently for new installations of Kubernetes is that a **Service** is not working properly. You've run your **Deployment** and created a **Service**, but you get no response when you try to access it. This document will hopefully help you to figure out what's going wrong.

- **Conventions**
- **Running commands in a Pod**
- **Setup**
- **Does the Service exist?**
- **Does the Service work by DNS?**
- **Does the Service work by IP?**
- **Is the Service correct?**
- **Does the Service have any Endpoints?**
- **Are the Pods working?**
- **Is the kube-proxy working?**
- **Seek help**
- **What's next**

Conventions

Throughout this doc you will see various commands that you can run. Some commands need to be run within a **Pod**, others on a Kubernetes **Node**, and others can run anywhere you have **kubect1** and credentials for the cluster. To make it clear what is expected, this document will use the following conventions:



Debug

- kubectl
- **Squash**
- Stern

Notes:

- Steps and breakpoints on deployed containers!
- No more Printf debugging 🙌
- IDE or CLI
- Delve, gdb, Java, Node, Python
- Fun!



Debug

- kubectl
- Squash
- Stern



```

→ nn (ndnd-master) x squashctl
Attaching debugger
? Select a debugger [Use arrows to move, type to filter]
> dlv
  java
  java-port
  gdb
? Select a debugger dlv
? Select a namespace to debug [Use arrows to move, type to filter]
  default
  garden-system
  garden-system--metadata
> ndnd
  ndnd--metadata
  squash-debugger
? Select a namespace to debug ndnd
? Select a pod [Use arrows to move, type to filter]
  console-6496757557-wd7b9
  frontend-77b7d68bb4-znd5d
> nn-66bf544fd6-fz5jl
  normalize-d5855b6f4-7g47t
  tiller-deploy-6ffb5bfc5f-6rl6k
? Select a pod nn-66bf544fd6-fz5jl
? Going to attach dlv to pod nn-66bf544fd6-fz5jl. continue? Yes
Squash will create a debugger pod in your target pod's namespace.
Creating service account squash-plank in namespace squash-debugger

Creating cluster role squash-plank-cr

Creating cluster role binding squash-plank-crb

All squashctl permission resources created.

Pod creating
Forwarding from 127.0.0.1:37909 -> 42673
Forwarding from [::1]:37909 -> 42673
Handling connection for 37909
Type 'help' for list of commands.
(dlv) b nn
Breakpoint 1 set at 0x73c05b for main.nn() /go/src/app/main.go:462

```

Debug

- kubectl
- Squash
- **Stern**

Notes:

- Streams logs from multiple pods
- Color-coded
- Easy to filter
- It's the best
- I love it 💜
- Use it!

Debug

- kubectl
- Squash
- Stern



```

console-6496757557-cwzwn console 2019-06-19T15:00:31.529946667Z 2019/06/19 15:00:31 1
72.17.0.6:32794 304 GET /
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:31.537552186Z Connected!
console-6496757557-cwzwn console 2019-06-19T15:00:31.569155761Z 2019/06/19 15:00:31 1
72.17.0.6:32794 200 GET /auth_token.js
console-6496757557-cwzwn console 2019-06-19T15:00:31.572633237Z 2019/06/19 15:00:31 1
72.17.0.6:32804 304 GET /js/gotty.js
console-6496757557-cwzwn console 2019-06-19T15:00:31.641343394Z 2019/06/19 15:00:31 1
72.17.0.6:32806 304 GET /js/hterm.js
console-6496757557-cwzwn console 2019-06-19T15:00:31.663861678Z 2019/06/19 15:00:31 N
ew client connected: 172.17.0.6:32794
console-6496757557-cwzwn console 2019-06-19T15:00:31.704448626Z 2019/06/19 15:00:31 C
ommand is running for client 172.17.0.6:32794 with PID 42 (args=""), connections: 1
console-6496757557-cwzwn console 2019-06-19T15:00:31.70452047Z 2019/06/19 15:00:31 17
2.17.0.6:32794 101 GET /ws
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:32.746613773Z 0 cost: 0.033669, 0.500000
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:33.860414448Z 13 cost: 0.006140, 0.493539
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:34.777334223Z 26 cost: 0.006140, 0.487161
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:35.849927767Z 39 cost: 0.006140, 0.480866
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:36.77144575Z 52 cost: 0.006140, 0.474652
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:37.748666509Z 65 cost: 0.006140, 0.468518
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:38.750295572Z 78 cost: 0.006140, 0.462464
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:39.737346773Z 91 cost: 0.006140, 0.456488
nn-5bb4c94c66-pcrws nn 2019-06-19T15:00:40.750518139Z 104 cost: 0.006140, 0.450589
normalize-d5855b6f4-44skr normalize 2019-06-19T15:00:41.537877385Z 172.17.0.6:35894 n
ormal sent: ping
normalize-d5855b6f4-44skr normalize 2019-06-19T15:00:41.548921549Z 172.17.0.6:35894 n
ormal sent: ping

```

Connect

- **Forge**
- Helm
- inlets
- ksync
- kubefwd
- Okteto
- Telepresence

Notes:

- "[...] think of it as a very fancy shell script that does a docker build, docker push, kubectl apply [...]" — rdldw
- Builds and deploys! Doesn't watch.
- Requires YAML, Dockerfile, Forge config.
- Allows profiles e.g. dev/canary/production.
- Development seems stopped 🥲



FORGE

Connect

- Forge
- **Helm**
- inlets
- ksync
- kubefwd
- Okteto
- Telepresence

Notes:

- Package manager for Kubernetes application structure.
- Install and uninstall off-the-shelf apps. Think apt-get, brew, npm, pip, gem.
- App lifecycle management. Deploy a service's new version, roll back, delete.
- Omnipresent: Haven't used it? You will.
- Pro & con: Go templating on configs.



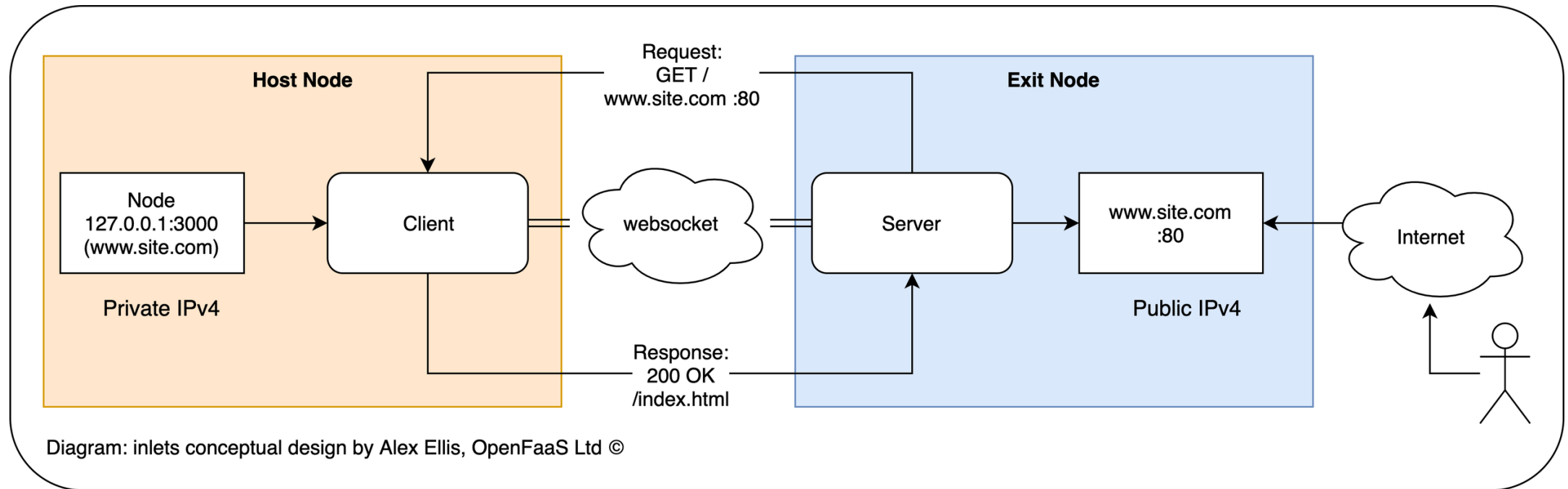
Connect

- Forge
- Helm
- **inlets**
- ksync
- kubefwd
- Okteto
- Telepresence

Notes:

- Reverse proxy & websocket tunnel to expose internal endpoints to the internet.
- Similar to ngrok or Argo Tunnel, but free and open source.
- Has a Kubernetes operator so you can seamlessly expose a local Kubernetes cluster.
- Use it to share works in progress, set up webhooks in development, and so on.
- **ACHTUNG!** You're exposing internals to the internet. Be mindful of security.

■ inlets



Connect

- Forge
- Helm
- inlets
- **ksync**
- kubefwd
- Okteto
- Telepresence

Notes:

- Watches your file system
- Syncs local files with files in your cluster
- Straight forward and easy to use
- Built on top of Syncthing
- You do need a watcher inside the container to act on the updated files!

Connect

- Forge
- Helm
- inlets
- ksync
- **kubefwd**
- Okteto
- Telepresence

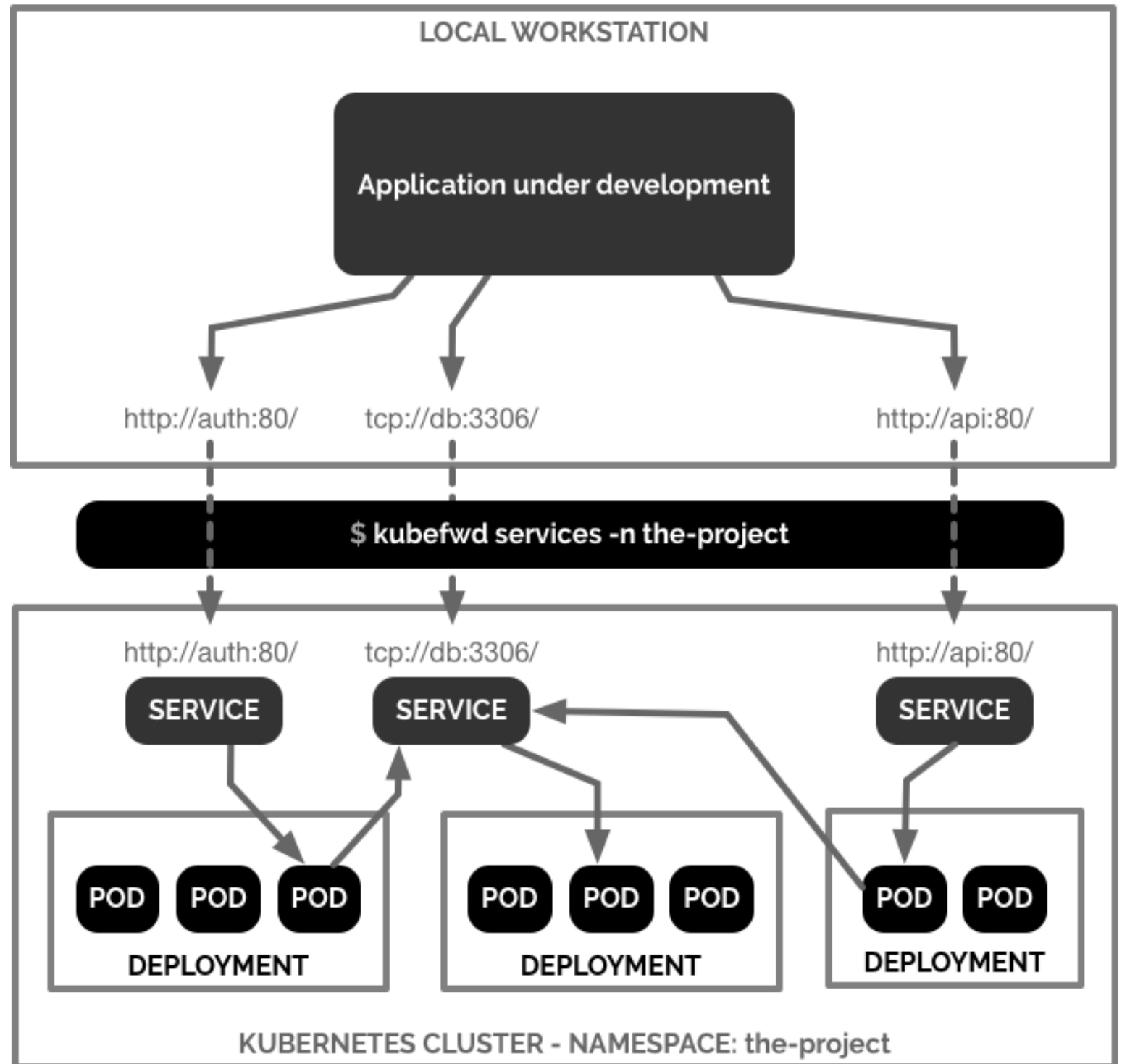
Notes:

- Forward all possible ports—as opposed to kubectl which forwards individual ports.
- Access any service locally like a pod in the cluster
- Easy! Fun! ~~Buy it now! (Just kidding.)~~



Connect

- Forge
- Helm
- inlets
- ksync
- **kubefwd**
- Okteto
- Telepresence



Connect

- Forge
- Helm
- inlets
- ksync
- kubefwd
- **Okteto**
- Telepresence

Notes:

- Swaps a deployment for a development environment.
- Syncs & watches files, gives you a remote terminal, does port forwarding.
- Ideal to build admission controllers, operators, things deeply integrated with k8s.
- One service at a time.



Connect

- Forge
- Helm
- inlets
- ksync
- kubefwd
- Okteto
- **Telepresence**

Notes:

- Hot swaps a running pod and creates a local shell where the network is proxied into the cluster.
- Run app locally; it acts as if in the cluster.
- Use local IDE, debugger, etc.
- Vs. Squash: Single instance. Might cause conflicts like env vars and docker version.
- Vs. Okteto: Local machine pretends to be a node vs. moving dev into the cluster.



TELEPRESENCE

Build & Deploy

- **Draft**
- Garden
- Jenkins X
- Skaffold
- Tilt

Notes:

- Generates config files: Great if you're new to containers or Kubernetes! Helm based.
- Supports bootstrapping tasks.
- Works per-service: You must "draft up" for every service.
- "The team originally working on Draft have to put it on the backburner while focusing on efforts like Brigade, Helm 3, and CNAB."
- No hot reload!



Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt

```
bash-3.2$ ls
glide.yaml main.go
bash-3.2$ draft create -a understanding-turkey
--> Draft detected the primary language as Go with 100.000000% certainty.
--> Ready to sail
bash-3.2$ ls
Dockerfile chart draft.toml glide.yaml main.go
bash-3.2$ draft up
Draft Up Started: 'understanding-turkey'
understanding-turkey: Building Docker Image: SUCCESS ⚓ (11.0049s)
understanding-turkey: Pushing Docker Image: SUCCESS ⚓ (16.0054s)
understanding-turkey: Releasing Application: SUCCESS ⚓ (0.5202s)
understanding-turkey: Build ID: 01BV21PKV1MXS9P9SJYGW XV94M
bash-3.2$ draft connect &
[1] 4255
bash-3.2$ Connecting to your app...SUCCESS...Connect to your app on localhost:54997
Starting log streaming...
+ exec app

bash-3.2$ curl localhost:54997
Hello World, I'm Draft!
```

Build & Deploy

- Draft
- **Garden**
- Jenkins X
- Skaffold
- Tilt

Notes:

- No Kubernetes manifests required. (Unless you want to!)
- Allows in-cluster builds. Local Kubernetes, Docker, minikube not required.
- Project awareness: It tracks build and deploy dependencies.
- Tests are first-class citizens. Locally & CI.
- Pluggable: Custom module types for e.g. OpenFaaS, Java, Terraform. (Soon also Go!)

Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



```
14:23 $ garden dev

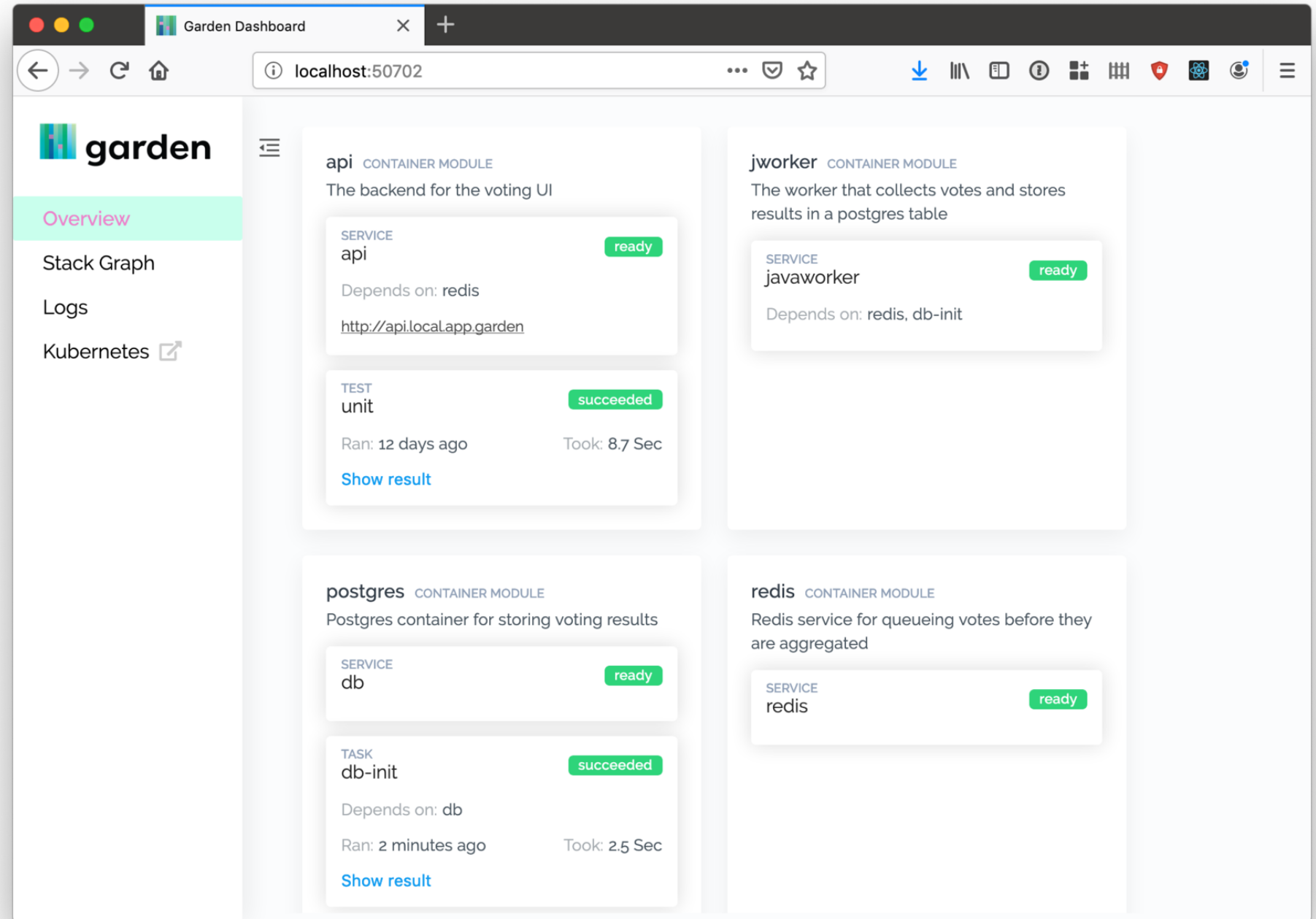
Good afternoon! Let's get your environment wired up...

✓ providers          → Getting status... → Ready
✓ api                → unit tests → Already passed
✓ result             → integ tests → Already passed
✓ vote               → unit tests → Already passed
✓ api                → Getting build status... → Done (took 1.4 sec)
✓ redis              → Getting build status... → Done (took 0.4 sec)
✓ postgres            → Getting build status... → Done (took 0.6 sec)
✓ result             → Getting build status... → Done (took 1.2 sec)
✓ vote               → integ tests → Already passed
✓ redis              → Checking status... → Version v-a106ed4d8d already deployed
✓ db                  → Checking status... → Version v-bf0bdee1bc already deployed
✓ jworker            → Getting build status... → Done (took 0.7 sec)
✓ api                → Checking status... → Version v-477d1dd04e already deployed
  → Ingress: http://api.local.app.garden
✓ vote               → Getting build status... → Done (took 0.6 sec)
✓ db-init             → Running → Done (took 2.7 sec)
✓ vote               → Checking status... → Version v-556ac5004d already deployed
  → Ingress: http://vote.local.app.garden
✓ result             → Checking status... → Version v-fede947a2a already deployed
  → Ingress: http://result.local.app.garden
✓ javaworker         → Checking status... → Version v-d9467a3eb8 already deployed

🕒 Waiting for code changes
🌻 Garden dashboard and API server running on http://localhost:50702
```

Build & Deploy

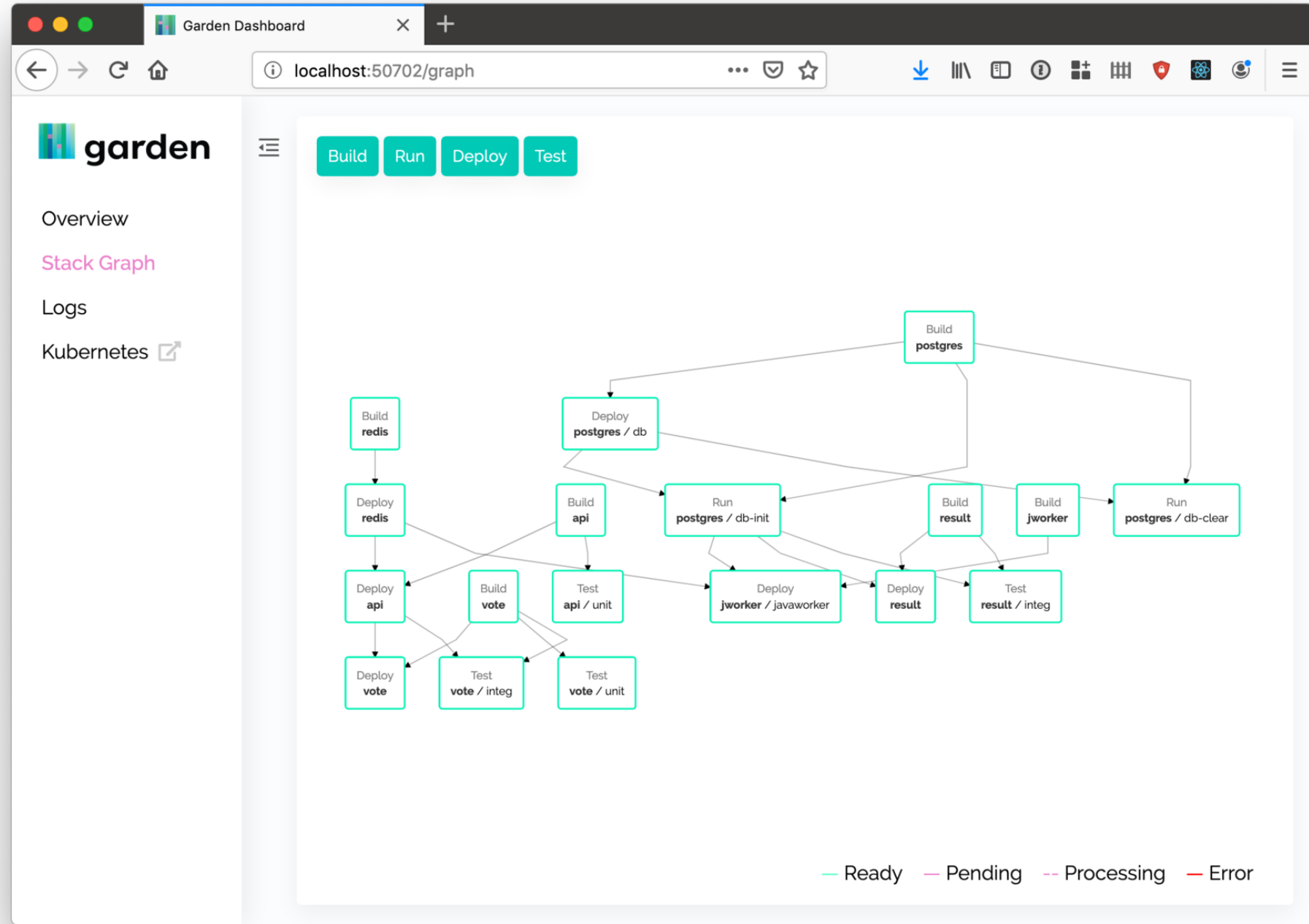
- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt

A screenshot of the Garden Dashboard web application. The browser address bar shows "localhost:50702". The dashboard has a sidebar on the left with the "garden" logo and navigation links: "Overview" (highlighted in pink), "Stack Graph", "Logs", and "Kubernetes" with an external link icon. The main content area displays four container modules in a 2x2 grid. Each module has a title, description, and a list of services or tasks with their status.

Module	Component	Status	Details
api (CONTAINER MODULE) The backend for the voting UI	SERVICE api	ready	Depends on: redis http://api.local.app.garden
	TEST unit	succeeded	Ran: 12 days ago Took: 8.7 Sec Show result
jworker (CONTAINER MODULE) The worker that collects votes and stores results in a postgres table	SERVICE javaworker	ready	Depends on: redis, db-init
postgres (CONTAINER MODULE) Postgres container for storing voting results	SERVICE db	ready	
	TASK db-init	succeeded	Depends on: db Ran: 2 minutes ago Took: 2.5 Sec Show result
redis (CONTAINER MODULE) Redis service for queueing votes before they are aggregated	SERVICE redis	ready	

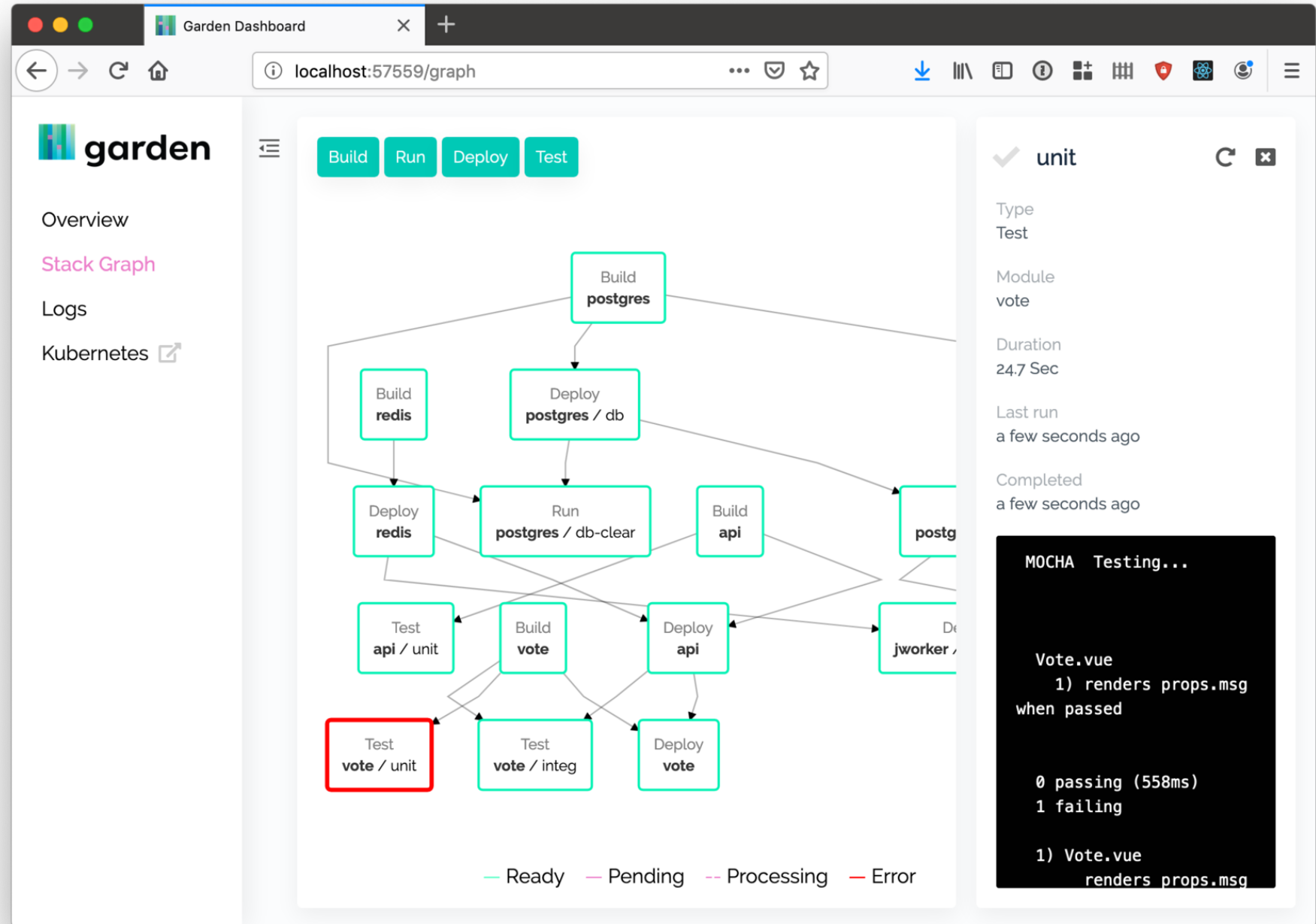
Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



Build & Deploy

- Draft
- Garden
- **Jenkins X**
- Skaffold
- Tilt

Notes:

- Something about provisioning.
- Something about CI.
- Uses Skaffold and ksync in the background.
- Has build packs that generate config files similarly to Draft! 😊



Build & Deploy

- Draft
- Garden
- Jenkins X
- **Scaffold**
- Tilt

Notes:

- Automatically builds & deploys!
- For those already familiar with k8s, it doesn't require learning new concepts.
- Requires k8s manifests! Not for beginners.
- Easy set up if you already have them.
- No support for dependencies, tests, or bootstrapping.



Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



```
→ getting-started (skaffold→master) skaffold dev --default-repo master
Generating tags...
- master/gcr_io_k8s-skaffold_skaffold-example -> master/gcr_io_k8s-skaffold-skaffold-example:v0.32.0-28-g6bd1d50a
Tags generated in 15.581571ms
Starting build...
Found [minikube] context, using local docker daemon.
Building [master/gcr_io_k8s-skaffold_skaffold-example]...
Sending build context to Docker daemon 3.072kB
Step 1/6 : FROM golang:1.12.5-alpine3.9 as builder
----> c7330979841b
Step 2/6 : COPY main.go .
----> Using cache
----> 4a407d68d98b
Step 3/6 : RUN go build -o /app main.go
----> Using cache
----> 9a5ab26344e5
Step 4/6 : FROM alpine:3.9
----> 055936d39205
Step 5/6 : CMD ["/app"]
----> Using cache
----> a70bbd56d26a
Step 6/6 : COPY --from=builder /app .
----> Using cache
----> dc6de832b819
Successfully built dc6de832b819
Successfully tagged master/gcr_io_k8s-skaffold_skaffold-example:v0.32.0-28-g6bd1d50a
Build complete in 61.458378ms
Starting test...
Test complete in 5.089µs
Starting deploy...
kubectl client version: 1.14
pod/getting-started created
Deploy complete in 320.901518ms
Watching for changes every 1s...
[getting-started] Hello world!
[getting-started] Hello world!
[getting-started] Hello world!
```

Build & Deploy

- Draft
- Garden
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- Tilt



```
[getting-started] Hello world!
[getting-started] Hello world!
Generating tags...
- master/gcr_io_k8s-skaffold-skaffold-example -> master/gcr_io_k8s-skaffold-skaffold-
example:v0.32.0-28-g6bd1d50a-dirty
Tags generated in 45.095825ms
Starting build...
Found [minikube] context, using local docker daemon.
Building [master/gcr_io_k8s-skaffold-skaffold-example]...
Sending build context to Docker daemon 3.072kB
Step 1/6 : FROM golang:1.12.5-alpine3.9 as builder
----> c7330979841b
Step 2/6 : COPY main.go .
----> 6ec58eeadbdb
Step 3/6 : RUN go build -o /app main.go
----> Running in 154f95e0cab2
Removing intermediate container 154f95e0cab2
----> 7cb3b1cd4e40
Step 4/6 : FROM alpine:3.9
----> 055936d39205
Step 5/6 : CMD ["/app"]
----> Using cache
----> a70bbd56d26a
Step 6/6 : COPY --from=builder /app .
----> 5f7022e1c5a3
Successfully built 5f7022e1c5a3
Successfully tagged master/gcr_io_k8s-skaffold-skaffold-example:v0.32.0-28-g6bd1d50a-d
irty
Build complete in 1.222589614s
Starting test...
Test complete in 4.015µs
Starting deploy...
kubectl client version: 1.14
pod/getting-started configured
Deploy complete in 253.558502ms
Watching for changes every 1s...
[getting-started] Hello world!!
[getting-started] Hello world!!
```

Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- **Tilt**

Notes:

- Like Skaffold: Requires k8s manifests; easy set up if you already have them.
- Gorgeous UI, dashboard, and logging.
- Vs. Skaffold? Skaffold's concepts map almost directly into Tilt.
- Starlark configs!



Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



```
RESOURCE NAME                                CONTAINER • UPDATE STATUS • AS OF
▶ ● (Tiltfile) ----- N/A • <30s ago
● fe ----- Running • OK (5.2s) • <15s ago
● vigoda ----- Running • OK (2.2s) • <15s ago
● snack :: ----- ContainerCreating • OK (2.5s) • <5s ago
● doggos :: ----- Pending • In prog. (2.6s) • -
● fortune ----- Pending • Pending • -
● hypothesizer ----- Pending • Pending • -
● spoonerisms ----- Pending • Pending • -
● emoji ----- Pending • Pending • -
● words ----- Pending • Pending • -
● secrets ----- Pending • Pending • -
● echo-hi ----- Completed • OK (1.8s) • <15s ago
● sleep ----- Pending • Pending • -
● hello-world ----- Running • OK (0.5s) • <15s ago
1: ALL LOGS | 2: build log | 3: pod log | X: expand ↑

| Tarring context...
| Created tarball (size: 4.6 kB)
| Building image
vigoda | 2019/05/19 17:40:41 Starting Vigoda Health Check Service on :8081
vigoda | 2019/05/19 17:40:43 Server status: All good
✓ OK

Browse (↓ ↑), Expand (→) | (enter) log, (b)rowser | (ctrl-C) quit
```

Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt

The screenshot displays the Tilt UI interface. The main panel shows the 'LOGS' tab with the following content:

```
Step 1 - 3.253s
Step 2 - 0.000s
Step 3 - 0.331s
Done in: 3.585s

—| Building: vigoda |—————
STEP 1/3 - Building Dockerfile: [docker.io/library/vigoda]
Building Dockerfile:
  FROM golang:1.10

  ADD . /go/src/github.com/windmilleng/servantes/vigoda
  RUN go install github.com/windmilleng/servantes/vigoda

  ENTRYPOINT /go/bin/vigoda

| Tarring context...
| Created tarball (size: 8.7 kB)
| Building image
```

On the right side, there is a list of services under the 'ALL' tab:

Service	Status	Time
(Tiltfile)	Running	<15s
fe	Running	<5s
vigoda	Running	—
snack	Running	—
doggos	Running	—
fortune	Running	—
hypothesizer	Running	—
spoonerisms	Running	—
emoji	Running	—
words	Running	—
secrets	Running	—
echo-hi	Running	<15s
sleep	Running	—

At the bottom, a status bar indicates: 0 errors, 0 warnings, Updating vigoda..., LAST EDIT: —, 4/16 running.



garden

Build & Deploy

- Draft
- Garden
- Jenkins X
- Skaffold
- Tilt



garden

LOGS
PREVIEW
ALERTS 1

snack <5s

```

| [3/3] RUN go install github.com/windmilleng/servantes/snack
| → # github.com/windmilleng/servantes/snack
src/github.com/windmilleng/servantes/snack/main.go:23:15: syntax error: unexpected
newline, expecting comma or }

| ERROR IN: [3/3] RUN go install github.com/windmilleng/servantes/snack
ERROR: ImageBuild: executor failed running [/bin/sh -c go install
github.com/windmilleng/servantes/snack]: exit code: 2

```

ALL

● (Tiltfile)	59m
● fe	59m
● vigoda	59m
● snack 1	<30s
● doggos	58m
● fortune	17m
● hypothesizer	58m
● spoonerisms	58m
● emoji	58m
● words	58m
● secrets	58m
● echo-hi	59m
● sleep	58m
● hello-world	59m
● tick	59m
● k8s_yaml	59m
» COLLAPSE	

1 error
0 warnings
Build failed: snack
LAST EDIT: snack ▶ main.go
15/16 running

Toolchains:

Omnipresent:

- Helm
- kubectl

Connect:

- Forge 💀
- inlets
- ksync
- kubefwd
- Okteto
- Telepresence

Build&Deploy Cycle:

- Draft 💀
- Garden
- Jenkins X
- Skaffold
- Tilt

Debug:

- kubefwd
- Squash
- Stern

“It works on my cluster...”

@maeddes

Still missing:

- Better docs!
- Consistent naming for things across different tools.
- Better support for tests!
- `(ls *.go | entr -r ./mytest.sh)`
- Beginner friendliness.
- **Clarity. A cohesive story.**



Links:

- Draft → draft.sh
- entr → eradman.com/entrproject/
- Forge → forge.sh
- Garden → garden.io
- Helm → helm.sh
- inlets → github.com/inlets/inlets & [inlets-operator](https://github.com/inlets/inlets-operator)
- Jenkins X → jenkins-x.io
- ksync → github.com/vapor-ware/ksync
- kubectl 'Debug Services' → kubernetes.io/docs/tasks/debug-application-cluster/debug-service/
- kubefwd → kubefwd.com
- Okteto → okteto.com
- Skaffold → skaffold.dev
- Squash → github.com/solo-io/squash
- Stern → github.com/wercker/stern
- Telepresence → www.telepresence.io
- Tilt → tilt.dev

“ You can't have a
clusterf!\$& without a ”
cluster.

@krisnova

ellen körbes

- developer relations
- `ellen@garden.io`
- `@ellenkorbes`
- `#garden@slack.k8s.io`
- `they/them`



garden

ellen@garden.io | [@ellenkorbes](https://twitter.com/ellenkorbes)

Please

**Remember to
rate this session**

Thank you!

