INTEGRATING DEVELOPER AND OPERATOR EXPERIENCE IN K8S

BRENDAN BURNS

VELOCITY – NYC - 2018

FIRST A QUESTION?

- Do you love your development environment?

FIRST A QUESTION? (OR TWO)

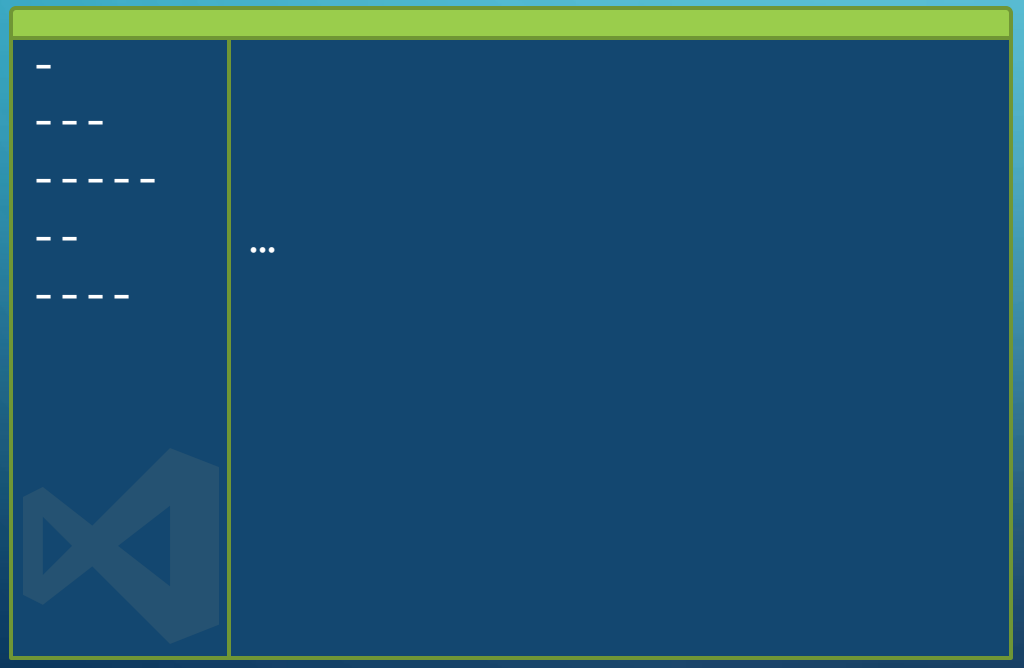
- Do you love your development environment?
- Does your development environment love you?

WHAT DO I MEAN?

- We're editing code in the cloud
- We're building code in the cloud
- We're deploying code in the cloud
- We're debugging code in the cloud

WHAT DO I MEAN?

- But our tools are tied to a single machine
- And often our tools are confined to a single persona



GOALS AND NON-GOALS

Goals:

- Make developing, testing, deploying and debugging seamless
- Build modular, composable tooling experiences

Non-goals:

- Develop an all-encompassing "railed" experience
- Assuming that everyone will use these tools (all or some)

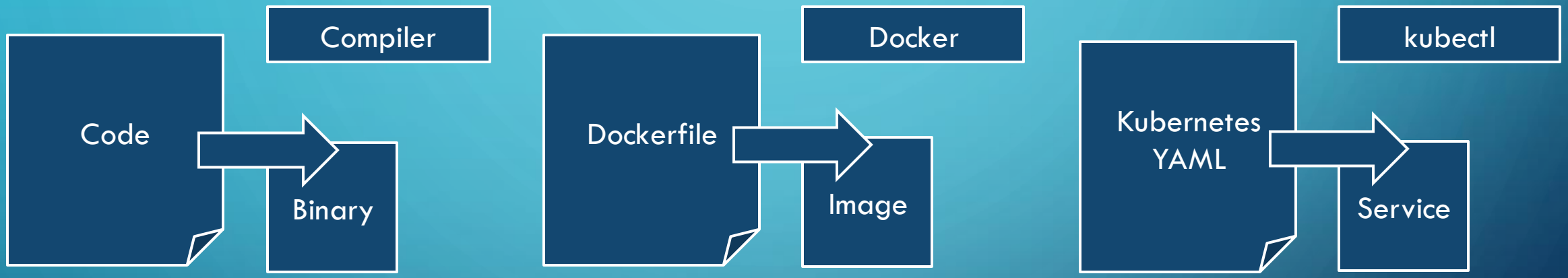
A QUICK WORD FROM OUR SPONSORS…

- J/K

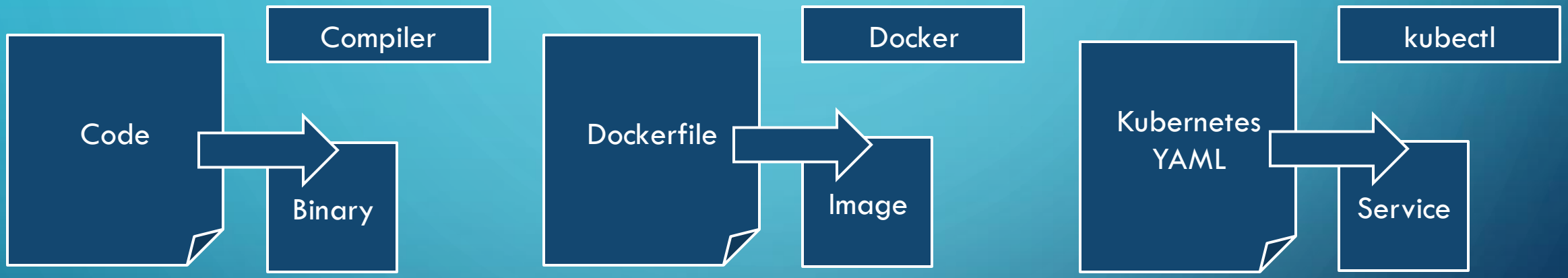
THE 'I' IN 'IDE' IS FOR INTEGRATION

- Code doesn't run in a vacuum
- Most of the things our code 'integrates' with don't live on our machine
- Some of this we're somewhat good at:
  - Git
- Most of it, we're pretty bad at:
  - Services, Replication, Logs, ….
- And even the things that are on the machine often aren't great…

GETTING STARTED (WITH K8S)



GETTING STARTED (WITH K8S)



But tools can help!

FIRST THINGS FIRST, A PLACE TO DEPLOY…

- The deployment environment for code used to be implicit.
- Not anymore.
- But tools can help with that too…

AND THEN THERE'S THAT WHOLE DOCKERFILE AND YAML THING…

- Three files
- Three tools
- Three syntaxes

- Just to deploy one app!

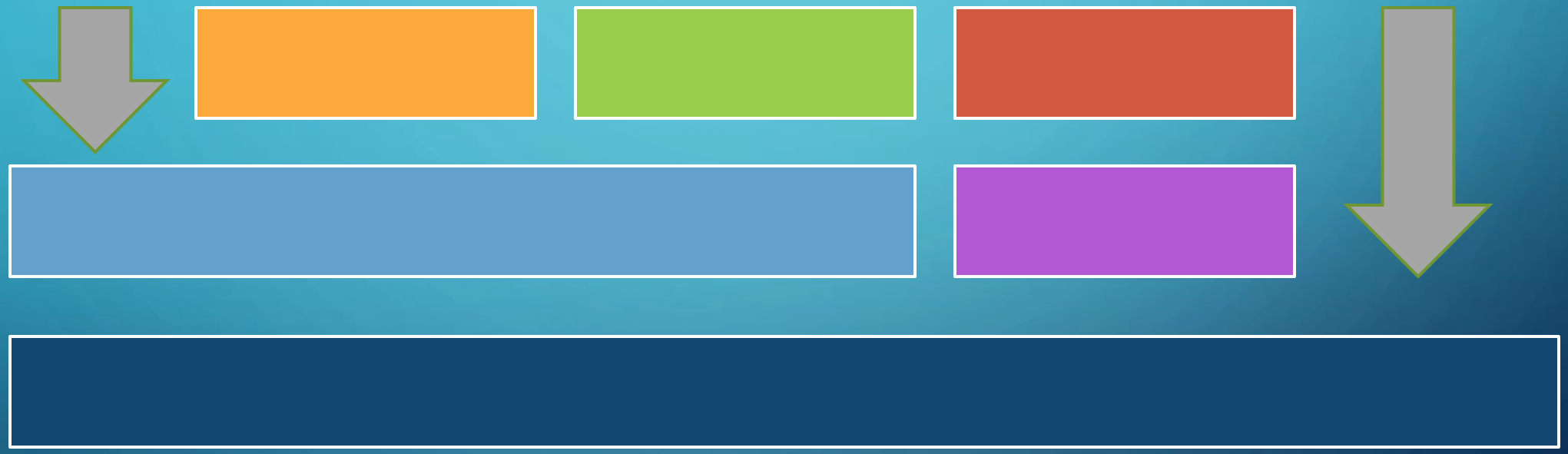
DRAFT DEMO

- https://draft.sh

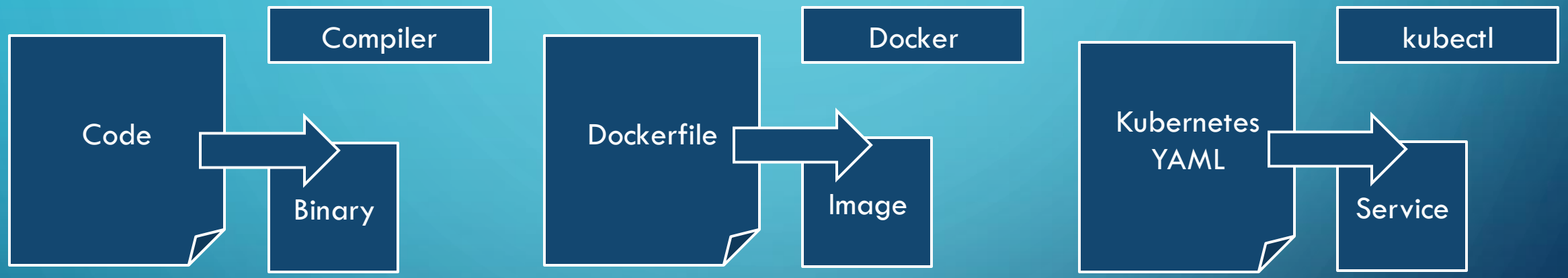
BUILDING MODERN TOOLS

BUILDING MODERN TOOLS

BUILDING MODERN TOOLS



BUILDING AND DEPLOYING IMAGES



BUILDING AND DEPLOYING WITH DRAFT

VISIBILITY (OR THE LACK THERE-OF)

EXPLORING YOUR CLUSTER

- Connect the development and deployment environment together
- Browse your cluster
- Visualize service health
- Don't learn 'awk' (yet)

CONNECTING TO YOUR APPLICATION

- My code's in the cloud… Now what?

EXPLORING YOUR PODS (AND CONTAINERS)

- Integrating Pod logs
- Integrating Pod terminal

```
-
---
-----
--
----
```

```
apiVersion: v1
kind: Pod
metadata:
        name: foo
…
```

```
Hello world!
Request handled
…
```

```
logs pods/foo
```

DEBUGGING YOUR CODE

- Bringing your services to a local proxy

DEBUGGING YOUR CODE

- Synchronizing external state to your local repository

```
-
---
-----
--
----
```

```
func main() {
    http.ListenAndServe(:80)
}
```

```
git checkout <hash>
```

UPGRADING YOUR JOBS

- Edit and visual diff.

UPGRADING YOUR JOBS

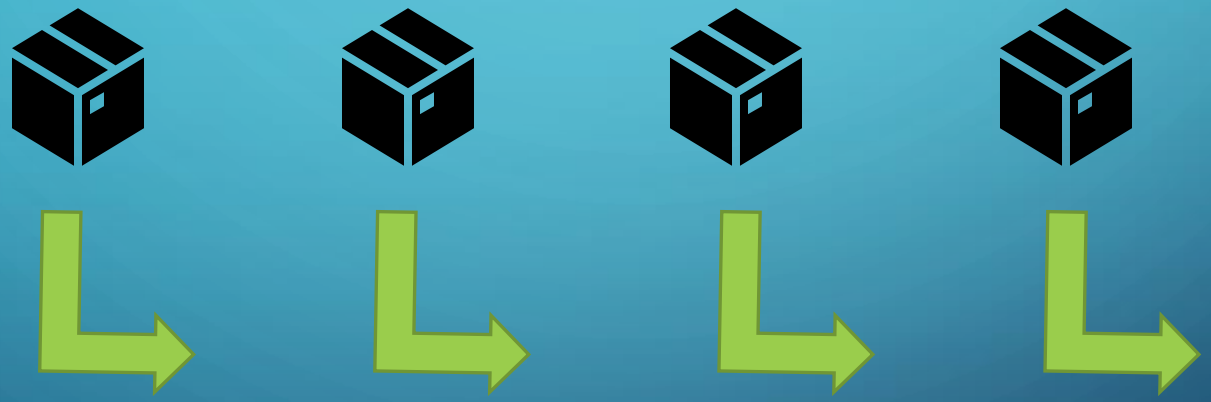
- Making the changes in a principled way

LOOKING FORWARD

- Cloud state and cloud experiences.

LOOKING FORWARD

- Merging logs from many different sources…



```
-
---
-----
--
----
```

```
apiVersio
kind: Pod
metadata:
        na
…
```

```
Hello wor
Request h
…
```

```
{ app: frontend, stage: production }
```

LOOKING FORWARD

Cloud-idiomatic code

LOOKING FORWARD

```
const server = http.createServer((request, response) => {
  console.log(request.url);
  response.end(`Hello World: hostname: ${os.hostname()}\n`);
});

mp.containerize(
  { repository: 'docker.io/docker-user-goes-here', },
  () => { server.listen(port,
      (err) => {
            if (err) { return console.log('server startup error: ', err); }
            console.log(`server up on ${port}`);
      });
   }
);
```

https://metaparticle.io

LOOKING FORWARD

```
from metaparticle import containerize
class MyHandler(SimpleHTTPServer.SimpleHTTPRequestHandler):
  …

@containerize(
      'docker.io/your-docker-user-goes-here', options={'name': 'my-image',
'publish': True})

def main():
  Handler = MyHandler
  httpd = socketserver.TCPServer(("", port), Handler) httpd.serve_forever()
  if __name__ == '__main__':
    main()
```

https://metaparticle.io

CONTRIBUTIONS NEEDED

- What about monitoring?
- What about collaboration?
- Configuration languages?

- https://github.com/Azure/vscode-kubernetes-tools
- https://github.com/helm/helm