

fyne
conf
2022

Cross compiling in the cloud with kubernetes

Building for all platforms without the headache

The plan



- Who am I?
- What is fyne-cross?
- Difficulty of targeting all platforms
- Using a kubernetes cluster to run your build
- [Geoffrey.fynelabs.com](https://geoffrey.fynelabs.com)
- Future for fyne-cross

Who am I?



- Cedric Bail <cedric@fynelabs.com>
- Software developer in C, C++ and go lately
- CTO @ Fynelabs
- Trying to create useful products for Fyne ecosystem

The problem

- Each developer has one computer
- A very long list of possible computer for each user
- OS: Android, BSDs, MacOS, Linux, Windows, ...
- CPU: x86, x86_64, arm, arm64, ...

Solution: Cross compiling!

- go compiler does cross compile to all those OS
- you need a C cross compiler for each platform
- you need glfw for each platform

What if?



- we had containers with tools for each platform
- had a tool to do build in those container

fyne-cross!



- That's exactly what fyne-cross is!
- Cool, no? Thanks Luca Corbo for this!
- Container for each OS/CPU with everything you need
- Latest go and latest fyne available too
- Just need docker or podman

fyne-cross!

```
$ fyne-cross darwin
[i] Target: darwin/amd64
[i] Cleaning target directories...
[✓] "bin" dir cleaned: /app/fyne-cross/bin/darwin-amd64
[✓] "dist" dir cleaned: /app/fyne-cross/dist/darwin-amd64
[✓] "temp" dir cleaned: /app/fyne-cross/tmp/darwin-amd64
[i] Checking for go.mod: /tmp/nomad/go.mod
[✓] go.mod found
[i] Packaging app...
[i] Building binary...
[✓] Binary: /tmp/nomad/fyne-cross/bin/darwin-amd64/Nomad
[✓] Package: "/tmp/nomad/fyne-cross/dist/darwin-amd64/Nomad.app"
$
```


Difficulty of targeting all platforms



- Lots of storage for each platform for the container
- Time consuming to build for each platform
- Consume a lot of resource when using github action

Using a kubernetes cluster to run your build

- Company do have kubernetes cluster
- Use it now to offload your cross compilation
- As much build in parallel as your cluster can handle

fyne-cross kubernetes support



- Still in PR
- Refactored code to abstract logic to control containers
- Create/Control/Destroy kubertes pods
- Can be used from github action, drone deploy, ...

fyne-cross

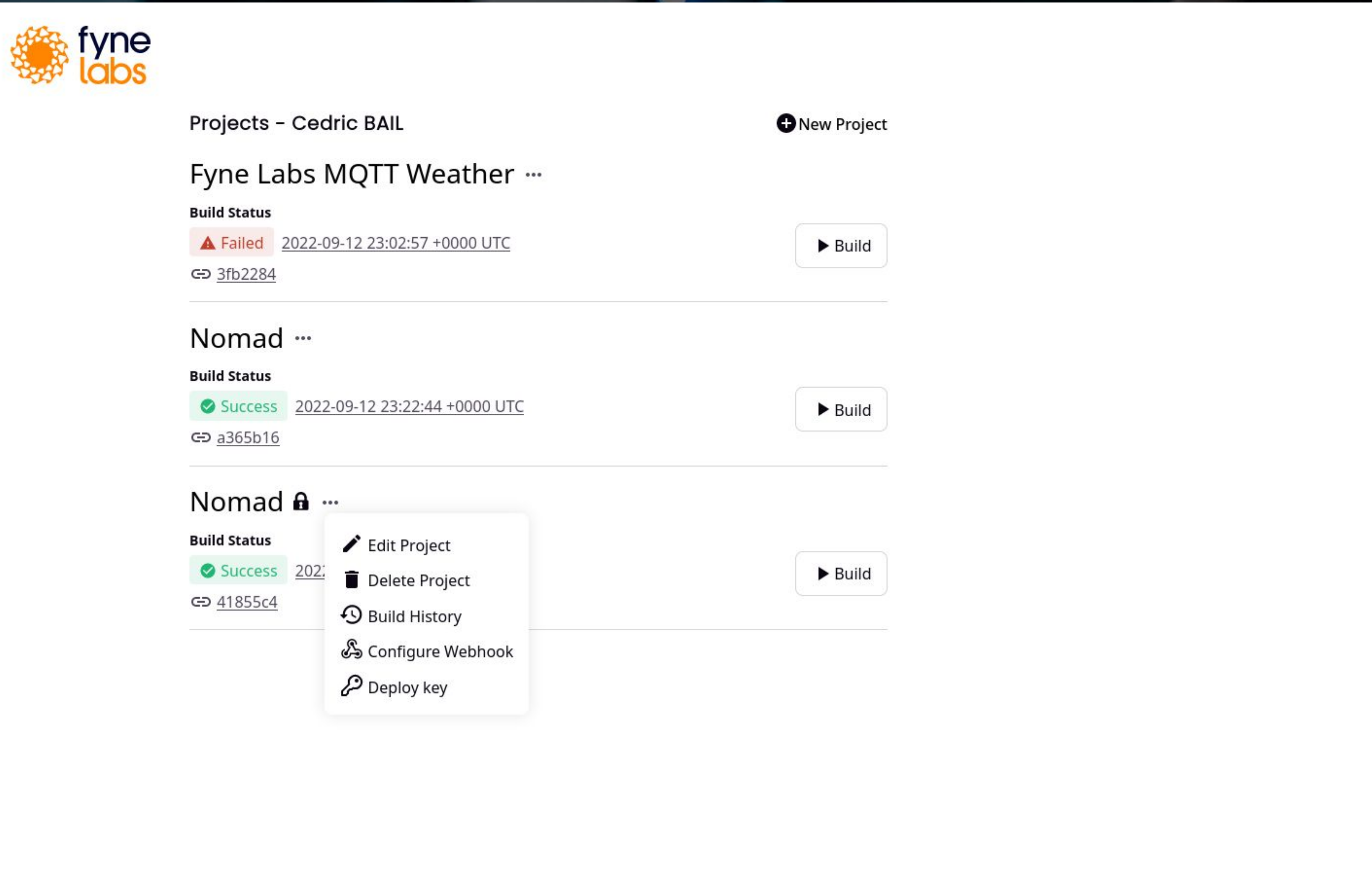



```
$ fyne-cross linux -engine kubernetes
[i] Target: linux/amd64
Uploading project to S3
Uploading directory /tmp/nomad compressed to //project.tar.zstd.
Downloading project content from S3 into Kubernetes cluster
Downloading //project.tar.zstd to /app
[...]
Download cached data if available from S3 into Kubernetes cluster
Downloading //cache-linux-amd64.tar.zstd to /go
[...]
[i] Cleaning target directories...
[✓] "bin" dir cleaned: /app/fyne-cross/bin/linux-amd64
[✓] "dist" dir cleaned: /app/fyne-cross/dist/linux-amd64
[✓] "temp" dir cleaned: /app/fyne-cross/tmp/linux-amd64
[i] Checking for go.mod: /tmp/nomad/go.mod
[✓] go.mod found
[i] Building binary...
go: downloading fyne.io/fyne/v2 v2.2.3
go: downloading fyne.io/x/fyne v0.0.0-20220714170908-eb9ddd6f06fd
go: downloading github.com/Bluebugs/go-unsplash v0.0.0-20220525000733-ea882dd1d0c0
go: downloading github.com/oliamb/cutter v0.2.2
go: downloading github.com/tidwall/cities v0.1.0
go: downloading github.com/zsefvlool/timezonemapper v1.0.0
go: downloading github.com/fsnotify/fsnotify v1.5.4
go: downloading github.com/godbus/dbus/v5 v5.1.0
go: downloading golang.org/x/sys v0.0.0-20220412211240-33da011f77ad
go: downloading github.com/yuin/goldmark v1.4.12
go: downloading github.com/nfnt/resize v0.0.0-20180221191011-83c6a9932646
go: downloading golang.org/x/image v0.0.0-20220601225756-64ec528b34cd
go: downloading github.com/google/go-querystring v1.1.0
go: downloading github.com/fredbi/uri v0.0.0-20181227131451-3dcfdacbaaf3
go: downloading fyne.io/systray v1.10.1-0.20220621085403-9a2652634e93
go: downloading github.com/fyne-io/image v0.0.0-20220602074514-4956b0afb3d2
go: downloading github.com/go-gl/glfw/v3.3/glfw v0.0.0-20211213063430-748e38ca8aec
go: downloading github.com/srwiley/oksvg v0.0.0-20220128195007-1f435e4c2b44
go: downloading github.com/srwiley/rasterx v0.0.0-20220128185129-2efea2b9ea41
go: downloading github.com/goki/freetype v0.0.0-20220119013949-7a161fd3728c
go: downloading github.com/go-gl/gl v0.0.0-20211210172815-726fda9656d6
go: downloading github.com/jsummers/gobmp v0.0.0-20151104160322-e2ba15ffa76e
go: downloading golang.org/x/net v0.0.0-20220520000938-2e3eb7b945c2
go: downloading golang.org/x/text v0.3.7
[✓] Binary: /tmp/nomad/fyne-cross/bin/linux-amd64/Nomad
[i] Packaging app...
[...]
Downloading result package to /tmp/nomad/fyne-cross/dist/linux-amd64/Nomad.tar.xz.
[✓] Package: "/tmp/nomad/fyne-cross/dist/linux-amd64/Nomad.tar.xz"
$
```

Even easier!



- Fynelabs is using fyne-cross
- Easy and fast build system to easily deliver application








 Projects - Cedric BAIL + New Project

Fyne Labs MQTT Weather ...
Build Status
▲ Failed [2022-09-12 23:02:57 +0000 UTC](#) ▶ Build
[3fb2284](#)

Nomad ...
Build Status
✓ Success [2022-09-12 23:22:44 +0000 UTC](#) ▶ Build
[a365b16](#)

Nomad 🔒 ...
Build Status
✓ Success [2022-09-12 23:22:44 +0000 UTC](#) ▶ Build
[41855c4](#)

-  Edit Project
-  Delete Project
-  Build History
-  Configure Webhook
-  Deploy key

geoffrey.fynelabs.com



New Project

GitHub URL

`https://github.com/fynelabs/nomad`

Email Address

We'll use this for important notifications about your project

`cedric@fynelabs.com`

Platforms

Popular Mobile Desktop **All**

- Android Options ▾
- BSD Options ▾
- Linux Options ▾
- MacOS Options ▾
- Windows Options ▾

 Save Project



Build Results

Nomad

Build Status

✓ Success 2022-10-12 22:16:13 +0000 UTC

🔗 Publish

Android

✓ Success



↓ Universal

Linux

✓ Success

↓ Arm64

↓ Amd64

↓ Arm

↓ 386

Windows

✓ Success

↓ 32 bit

↓ 64 bit

Geoffrey



- Adding selfupdate right now
- Adding application store delivery
- Hosted portal

- Get in touch!

fyne-cross engine interface

```
type containerEngine interface {
    createContainerImage(arch Architecture, OS string, image string) containerImage
}

type containerImage interface {
    Run(vol volume.Volume, opts options, cmdArgs []string) error
    Prepare() error
    Finalize(packageName string) error

    Architecture() Architecture
    OS() string
    ID() string
    Target() string
    Env(string) (string, bool)
    SetEnv(string, string)
    SetMount(string, string, string)
    AppendTag(string)
    Tags() []string

    Engine() containerEngine
}
```

fyne-cross kubernetes prepare

```
for _, mountPoint := range append(i.mount, i.cloudLocalMount...) {
    mount = append(mount, cloud.Mount{
        Name:          mountPoint.name,
        PathInContainer: mountPoint.inContainer,
    })
}

env := []cloud.Env{
    {Name: "CGO_ENABLED", Value: "1"}, // enable CGO
    {Name: "GOCACHE", Value: i.runner.vol.GoCacheDirContainer()}, // mount GOCACHE to reuse cache
between builds
}
env = appendKubernetesEnv(env, i.runner.env)
env = appendKubernetesEnv(env, i.env)

// This allow to run more than one fyne-cross for a specific architecture per cluster namespace
var unique [6]byte
rand.Read(unique[:])

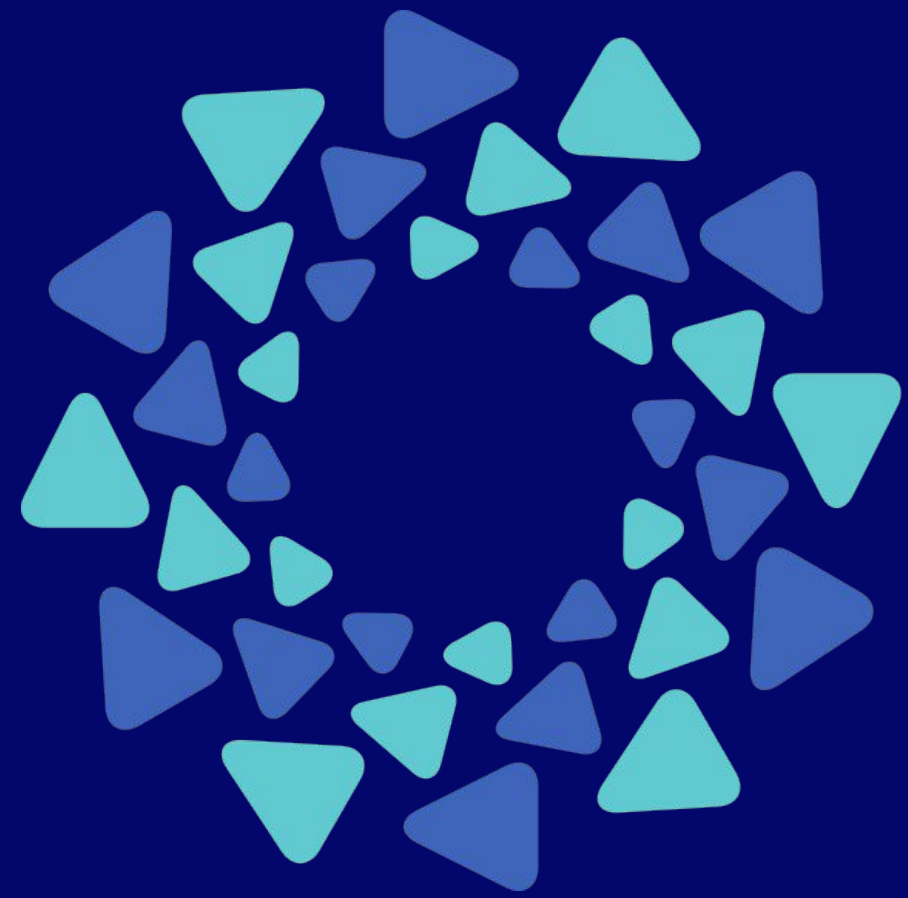
name := fmt.Sprintf("fyne-cross-%s-%x", i.ID(), unique)
namespace := i.runner.namespace

i.pod, err = i.runner.client.NewPod(context.Background(),
    name, i.DockerImage, namespace,
    i.runner.storageLimit, i.runner.vol.WorkDirContainer(), mount, env)
```

fyne-cross future



- Amazing tool!
- More cross compilation support (zig?)
- Refactor command line arguments
- Add to fyne as a new command
- Automatically detect if fyne should use fyne-cross



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conf
2022

Reach out on slack *cedric* or discord *bluebugs*