The Fn Project

Open Source Serverless Computing

Democratising Serverless

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@thomleg

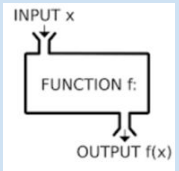
What is Serverless?

- **Serverless** is an abstraction of infrastructure and its operations including provisioning, scaling, patching, etc.
- **Serverless architecture** is when an app is built entirely on serverless components (compute, storage, networking).
- **FaaS** is the compute component in a serverless architecture.

Functions-as-a-Service

In mathematics, a **function** is a relation between a set of inputs and a set of permissible outputs with the property that each input is related to exactly one output.

Function (mathematics) - Wikipedia
https://en.wikipedia.org/wiki/Function_(mathematics)



- **Functions** are small bits of code that do one thing well and are easy to understand and maintain. (Not necessarily “pure” though.)
- **As a service** means no complicated plumbing, the system takes care of provisioning, scaling, patching, maintaining, etc. Each function scales independently.

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Why Serverless?

- **Easier:** Just think about your code, not infrastructure
- **Powerful:** Transparent and limitless scaling
- **Faster:** Deploy faster, iterate faster, innovate faster
- **Cheaper:** Only pay for what you use to the 100ms (never idle)

Containers vs Functions

Function is a container with a set of known traits:

- Short running
- Ephemeral
- Stateless
- Invoked
- Single purpose
- Self-contained

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Introducing the Fn Project

- Open-source serverless compute platform
- Can be deployed to any cloud and on-premise
- Simple, elegant, and extensible by design
- Containers are primitives
- Active w/ 2500+ commits across 50+ contributors
- Independently governed with plans for foundation
- Independent yet vendor backed
- Strong enterprise focus (security, scalability, observability, etc.)

For Developers

An Fn Function

- Small chunk of code wrapped into a container image
- Gets input via STDIN and environment
- Produces output to STDOUT
- Logs to STDERR

The Fn server handles everything else, like the API gateway, piping things around, storing logs, etc.

Fn CLI

- **fn init** --runtime go
- **fn run**
- **fn test**
- **fn deploy** --app myapp
- **fn call** myapp myfunc

→ http://localhost:8080/r/myapp/myfunc

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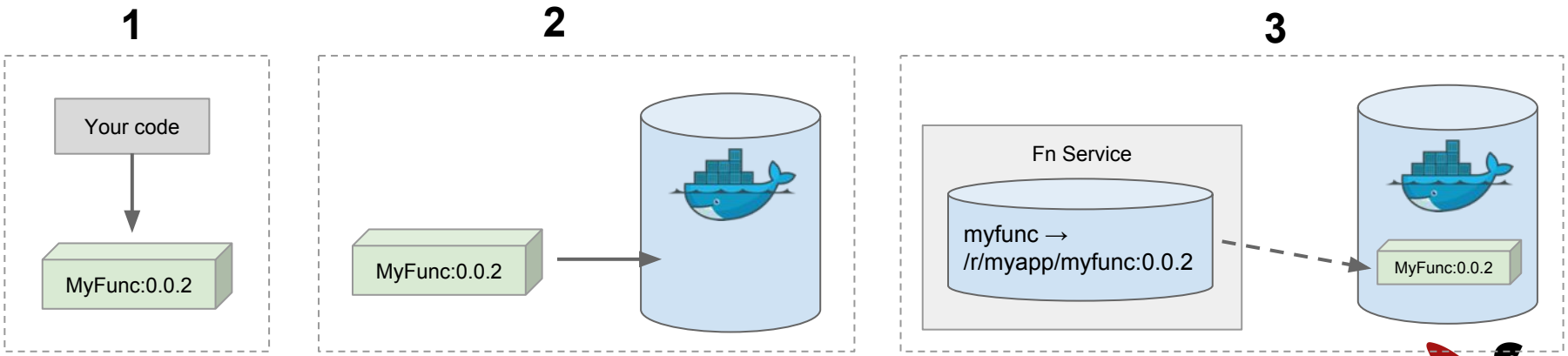
fn deploy details

1. Builds container (multi-stage) + bumps version
2. Pushes container to registry
3. Creates/updates function route (servers lazy load images)



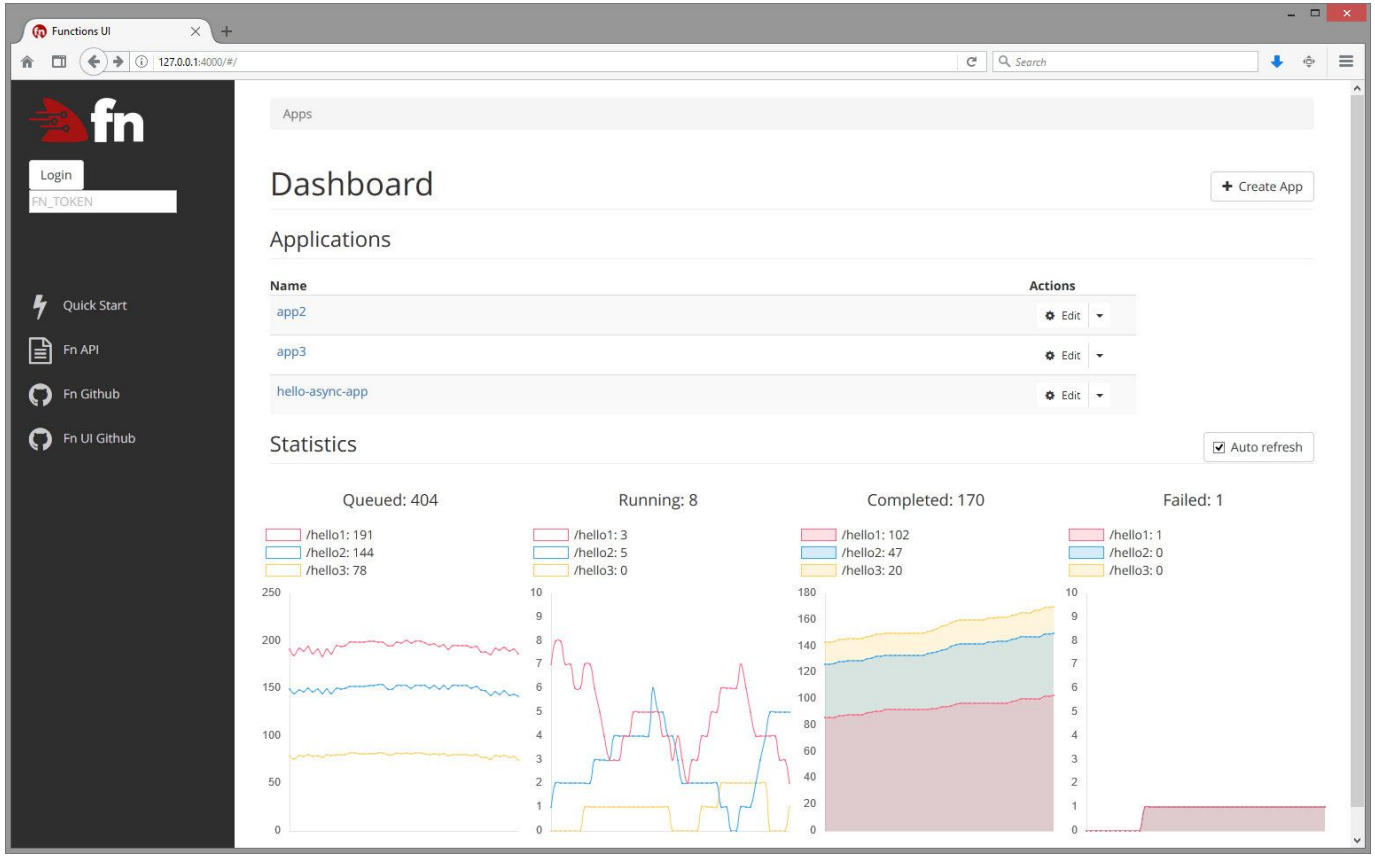
Function Development Kits (FDKs)

- Used to help with parsing input and writing output
- Familiar syntax for Lambda developers
- Simply write a `handler` function that adheres to the FDK's interface and it will parse STDIN and provide the input data to your function and deal with writing the proper output format.
- Makes it a lot easier to write hot functions


Debugging

- **fn calls list** myapp
- **fn calls get** myapp <call-id>
- **fn logs get** myapp <call-id>
- Metrics created using OpenTracing w/ initial collectors and extensions for Prometheus, ZipKin, and soon Jaeger

Fn UI


Functions UI
127.0.0.1:4000/#/
Search
fn
Login
FN_TOKEN
Quick Start
Fn API
Fn Github
Fn UI Github
Apps
Dashboard
+ Create App
Applications
Name
Actions
app2
Edit
app3
Edit
hello-async-app
Edit
Statistics
Auto refresh
Queued: 404
/hello1: 191
/hello2: 144
/hello3: 78
Running: 8
/hello1: 3
/hello2: 5
/hello3: 0
Completed: 170
/hello1: 102
/hello2: 47
/hello3: 20
Failed: 1
/hello1: 1
/hello2: 0
/hello3: 0

Fn Flow

Fn Flow

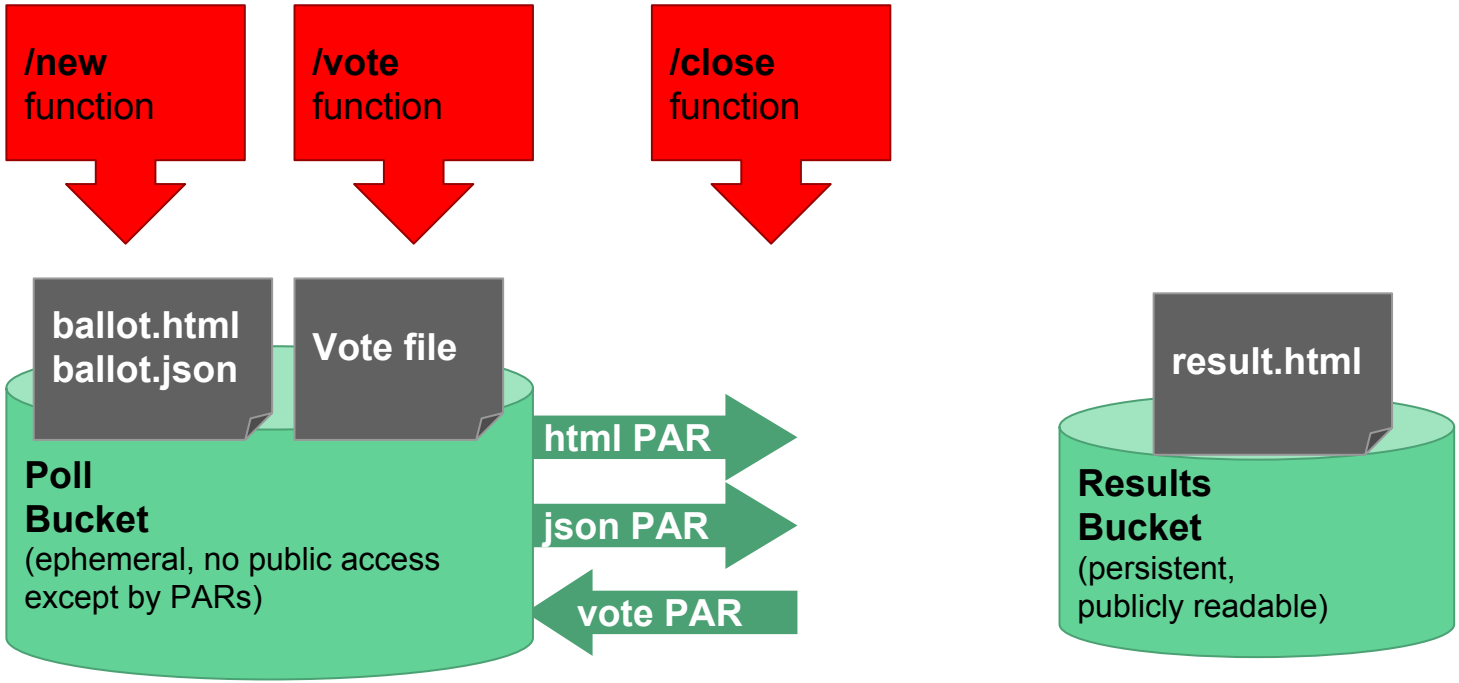
- Build long-running, reliable, scalable functions with rich sets of language-specific primitives including fork-join, chaining, delays and error handling
- Supports complex parallel processes that are readable and testable (including unit tests) with standard programming tools
- Java support using CompletableFuture API from Java 8 with JS, Python, Go language support on the way!

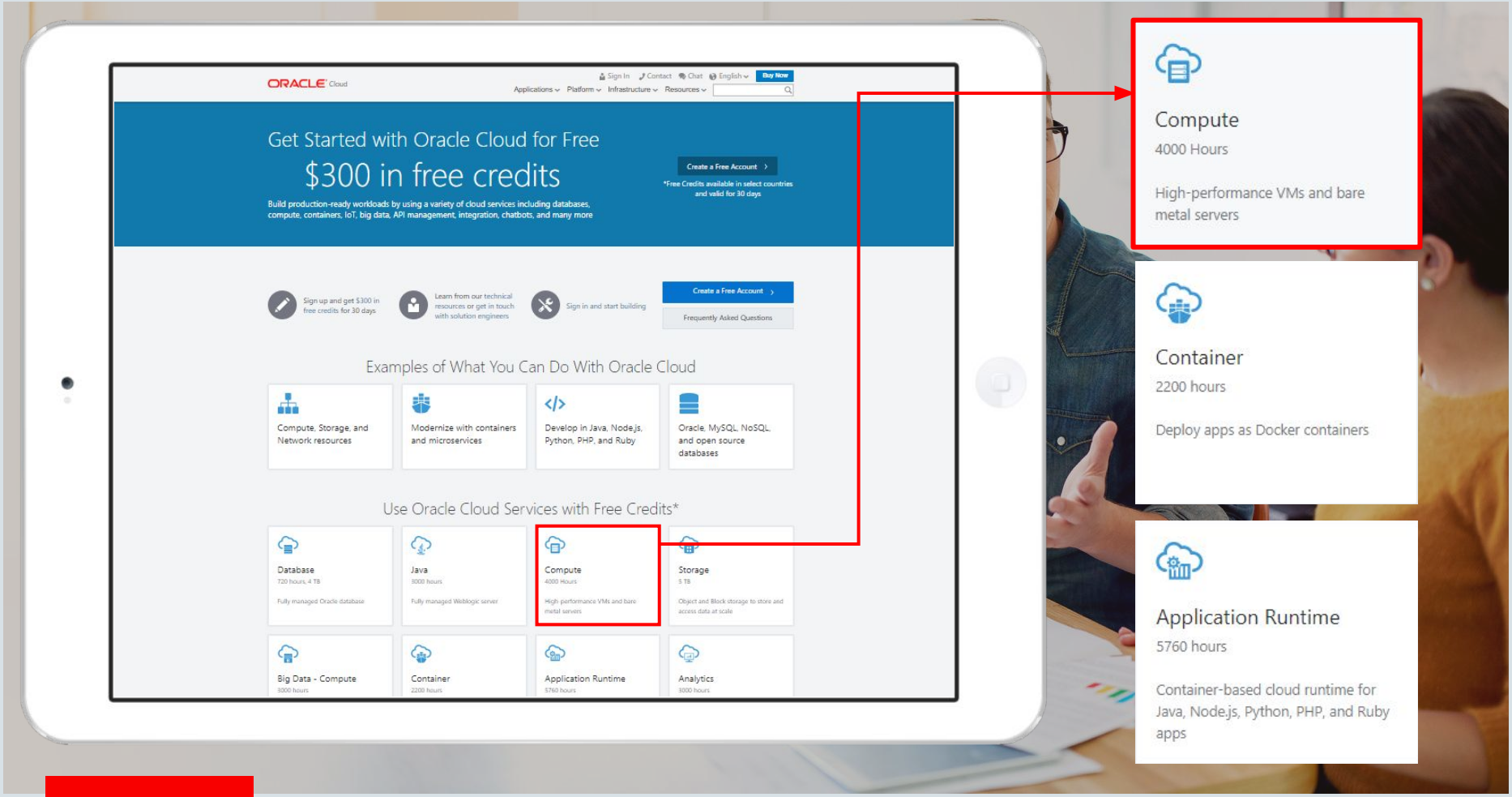
Fn Demo

Fn Democracy

- A demo app for Fn project and serverless architecture on OCI.
- Implement a simple public poll.
- Datensparsamkeit principles.
- Multi-language: Python and Java.
- Includes an Fn Flow.
- Available on GitHub: https://github.com/tteggel/fn-democracy

Fn Democracy Architecture





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Thank you!

Thom Leggett
Engineering, Oracle Functions
@thomleg

Get Involved

1. Star the project: **github.com/fnproject/fn**
2. Join the conversation: **slack.fnproject.io**
3. Learn more: **fnproject.io**
4. We're hiring engineers and evangelists: **chad.arimura@oracle.com**