



The Fn Project

Open Source Serverless Computing

Democratising Serverless

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What is Serverless?

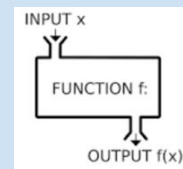
- **Serverless** is an abstraction of infrastructure and its operations including provisioning, scaling, patching, etc.
- **Serverless architecture** is when an app is built entirely on serverless components (compute, storage, networking).
- **FaaS** is the compute component in a serverless architecture.

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))

[https://en.wikipedia.org/wiki/Function_\(mathematics\)](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.

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



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

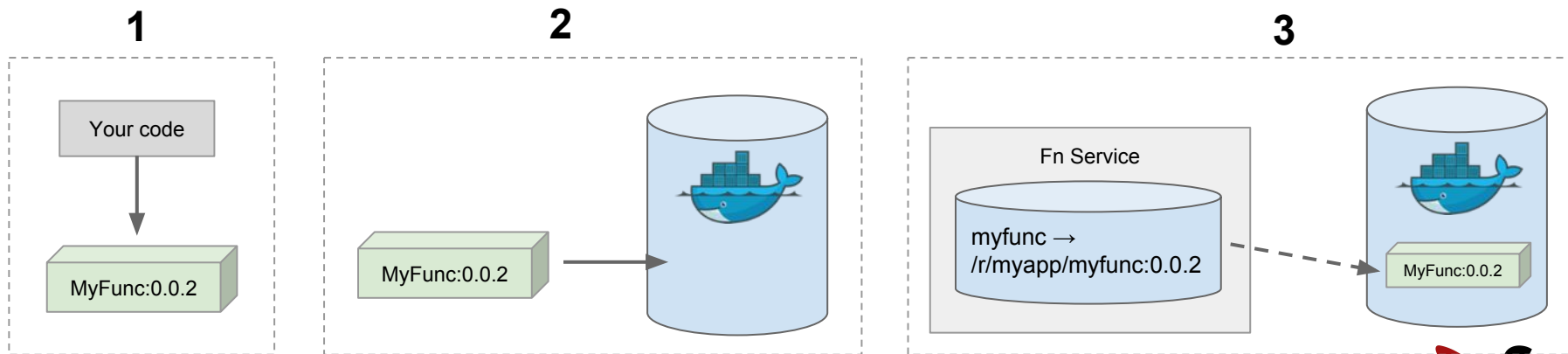
- **fn init** --runtime go
- **fn run**
- **fn test**
- **fn deploy** --app myapp
- **fn call** myapp myfunc

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



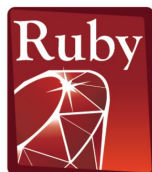
fn deploy details

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

The screenshot displays the Fn UI dashboard in a browser window. The browser title is "Functions UI" and the address bar shows "127.0.0.1:4000/#/". The dashboard includes a sidebar with navigation options: "Login" (with an "FN_TOKEN" field), "Quick Start", "Fn API", "Fn Github", and "Fn UI Github".

The main content area is titled "Dashboard" and features a "+ Create App" button. Below this is a table of "Applications":

Name	Actions
app2	Edit
app3	Edit
hello-async-app	Edit

Below the applications table is a "Statistics" section with an "Auto refresh" checkbox. It displays four metrics:

- Queued: 404
- Running: 8
- Completed: 170
- Failed: 1

Each metric is accompanied by a line or area graph showing the distribution of requests across different endpoints:

- Queued (404):** Line graph showing counts for /hello1: 191 (pink), /hello2: 144 (blue), and /hello3: 78 (yellow).
- Running (8):** Line graph showing counts for /hello1: 3 (pink), /hello2: 5 (blue), and /hello3: 0 (yellow).
- Completed (170):** Stacked area chart showing counts for /hello1: 102 (pink), /hello2: 47 (blue), and /hello3: 20 (yellow).
- Failed (1):** Stacked area chart showing counts for /hello1: 1 (pink), /hello2: 0 (blue), and /hello3: 0 (yellow).



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!

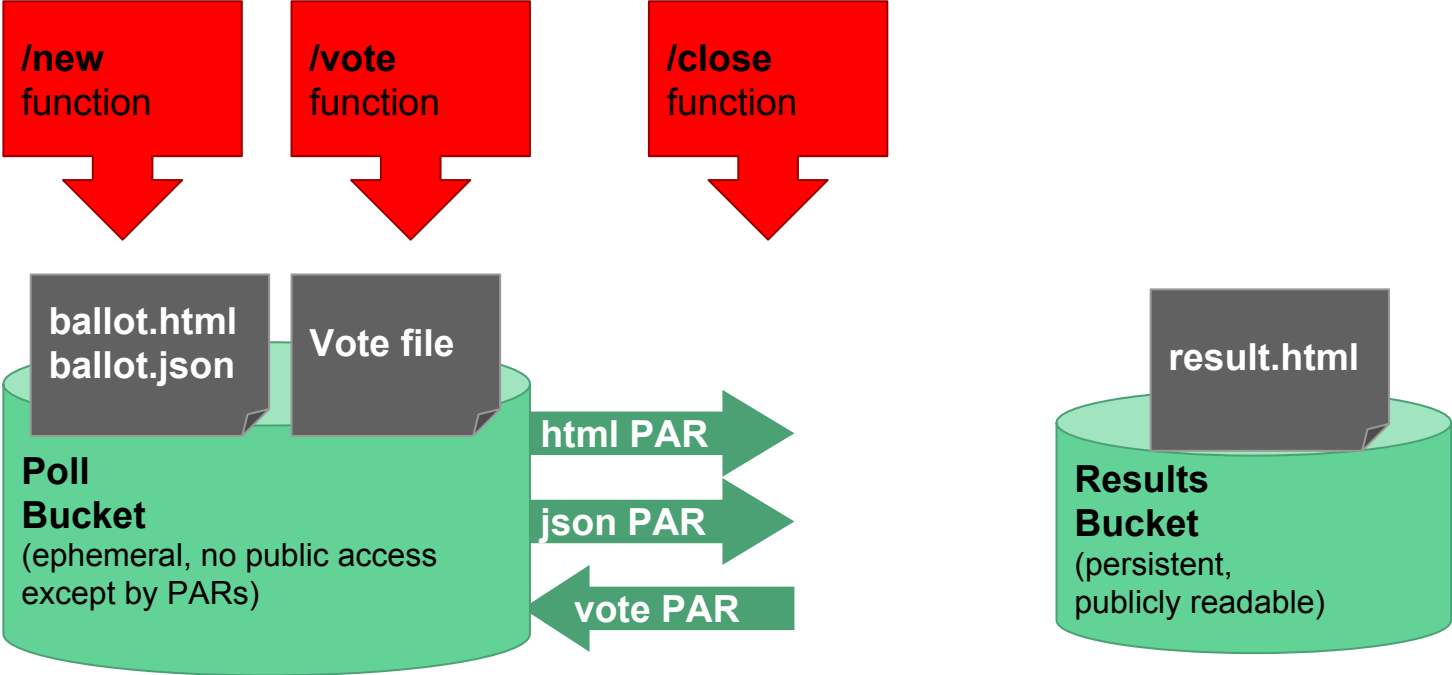


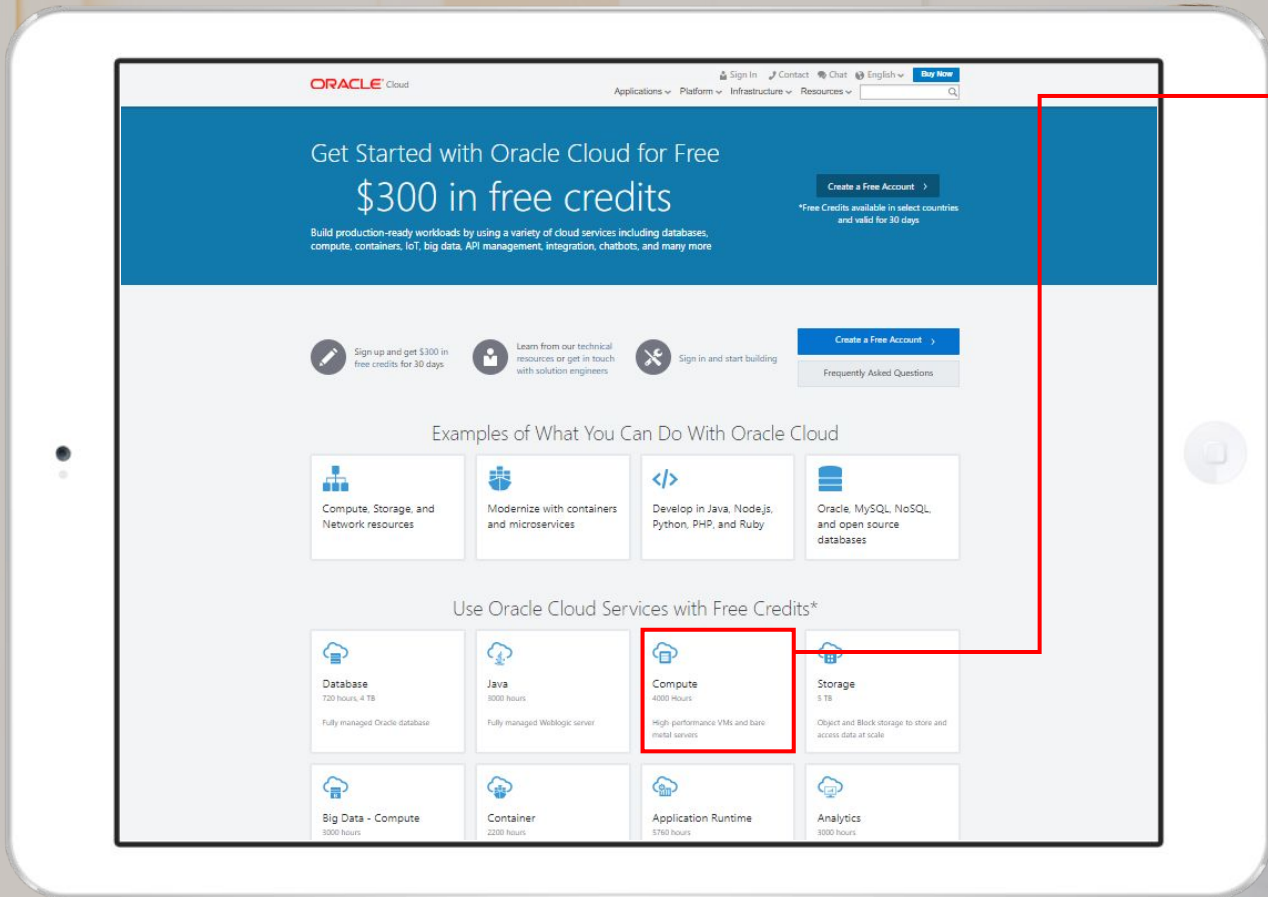

Fn Demo

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




Compute
4000 Hours
High-performance VMs and bare metal servers



Container
2200 hours
Deploy apps as Docker containers



Application Runtime
5760 hours
Container-based cloud runtime for Java, Node.js, Python, PHP, and Ruby apps

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Thank you!

Thom Leggett

Engineering, Oracle Functions

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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:
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