PlugFlow

WoSC10

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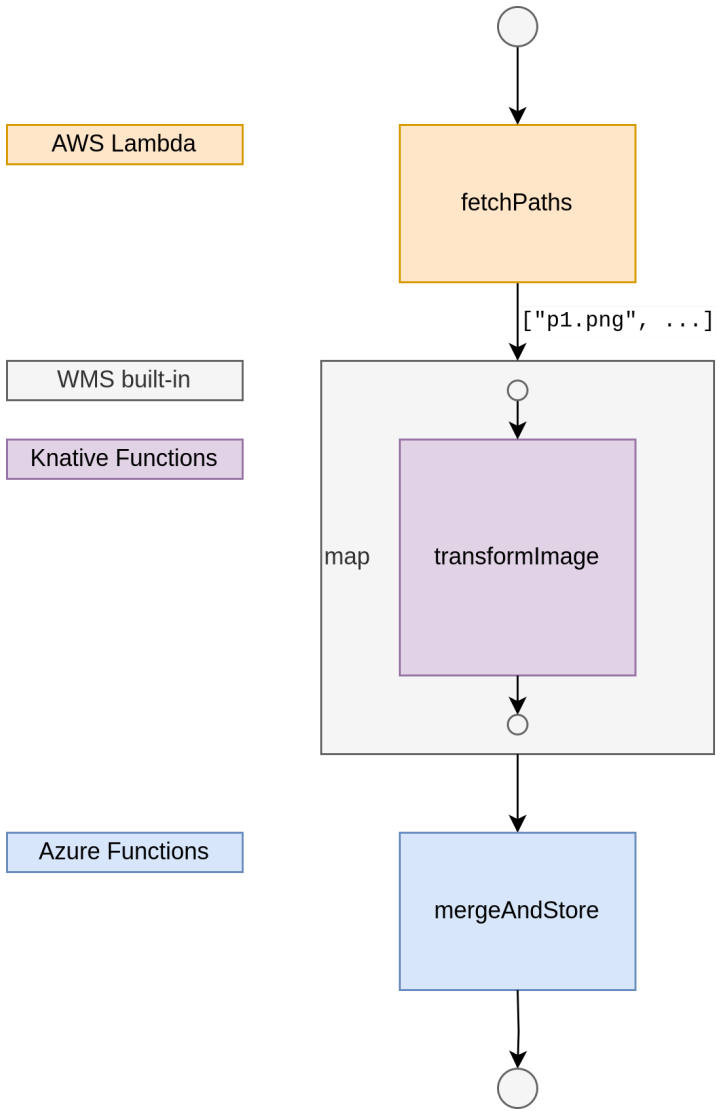
Workflows ...

Composed of serverless functions

- Written in different languages
- Deployed on different platforms
- Executed by a Workflow Management System (WMS)

Example: Map & Reduce



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Common issues

- Small functions come with the same **overhead** as large ones
  - *Dependency management, deployment, etc.*
- **Flow options are limited** to what the WMS supports
  - *Conditional branching*
  - *Parallelism, loops, etc.*

What if we let workflow developers …

1. **Plug** small **functions** directly **into the engine**?
2. **Create custom control flow elements** using such functions?
   - *Next to out-of-the-box ones like* `map`, `parallel`, *etc.*
3. **Encode** workflow logic **within functions** themselves?
   - *Functions decide what's next*

PlugFlow

A hybrid approach to composing and managing workflows.

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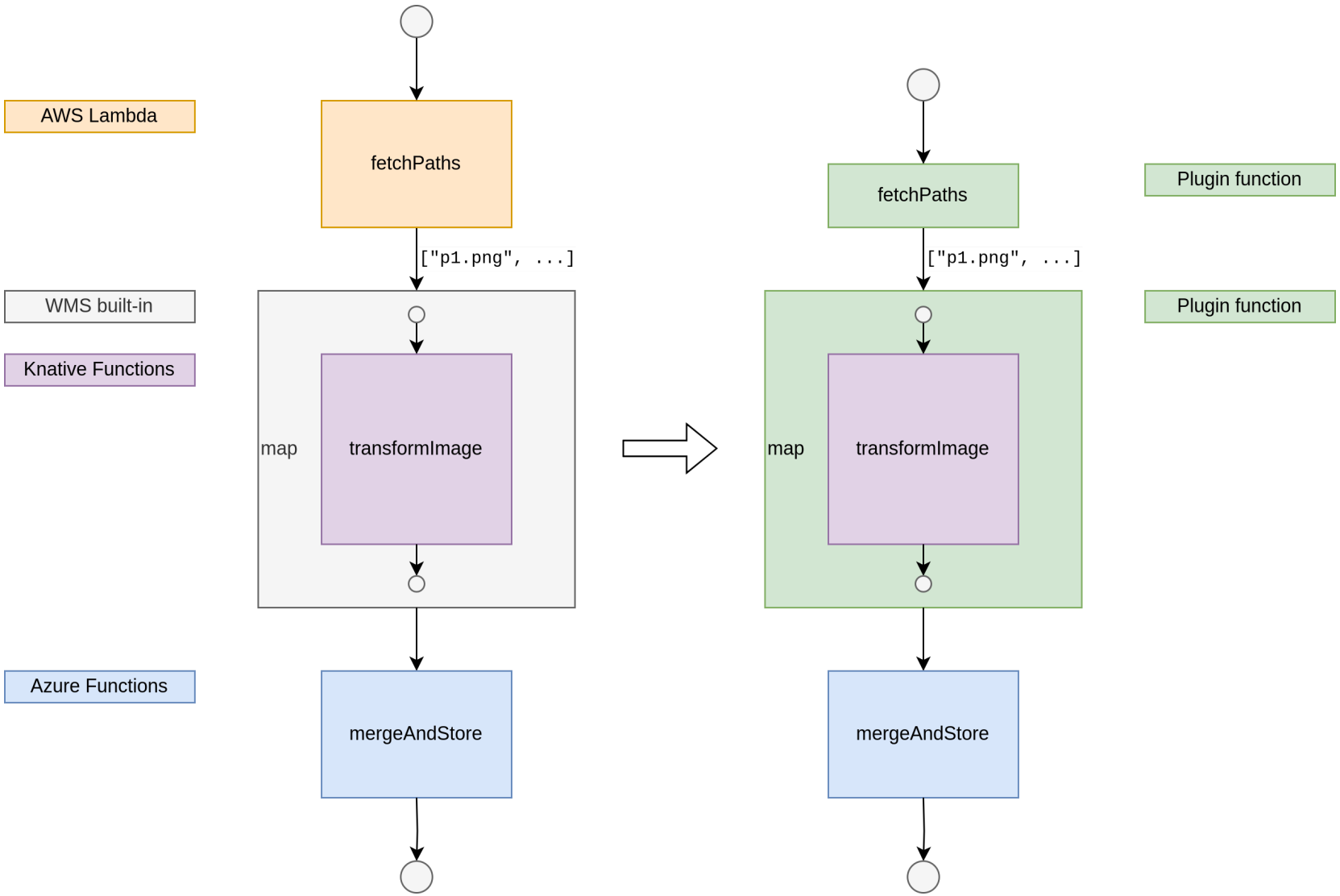
Using PlugFlow



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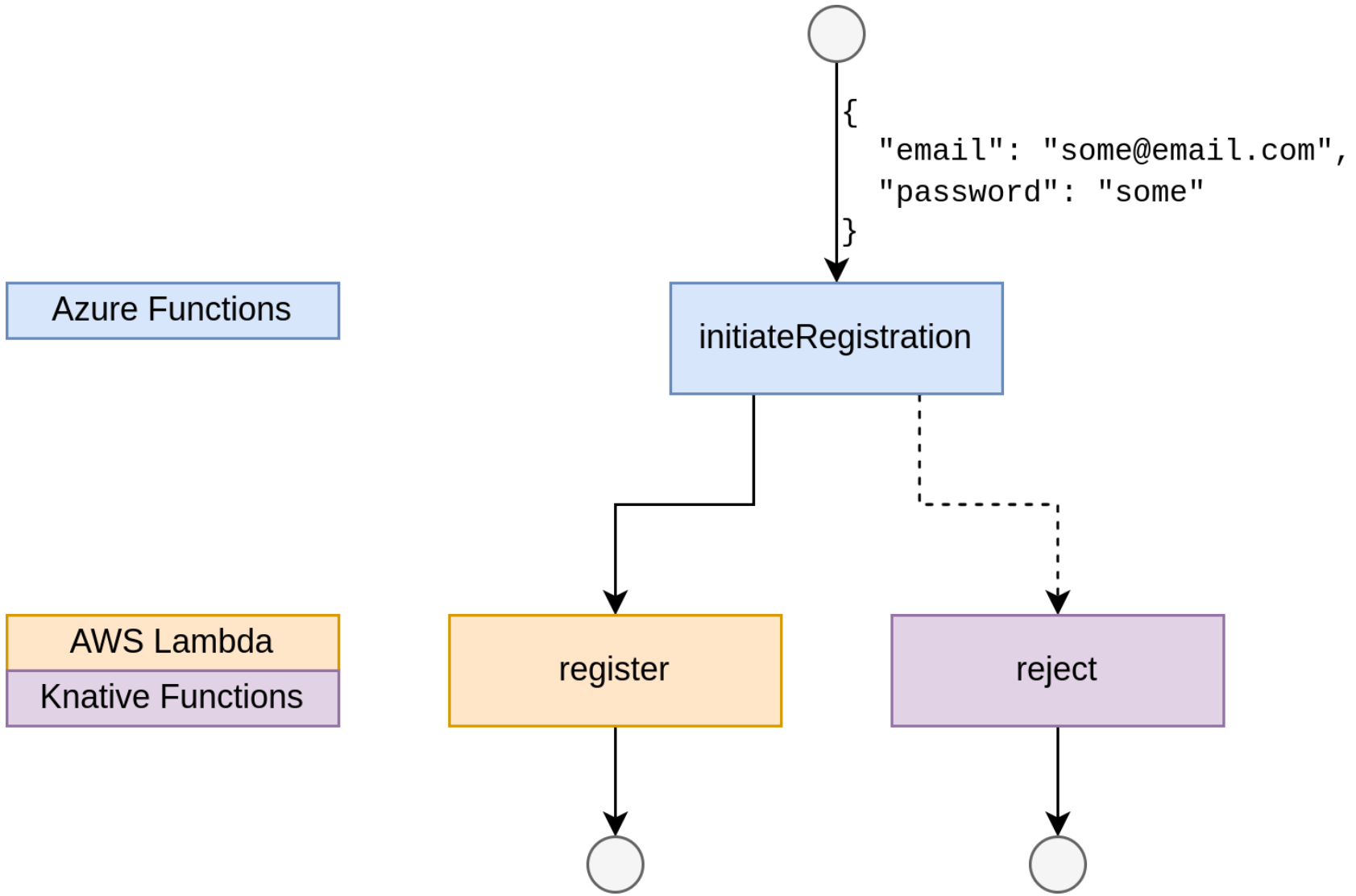
Functions decide what's next



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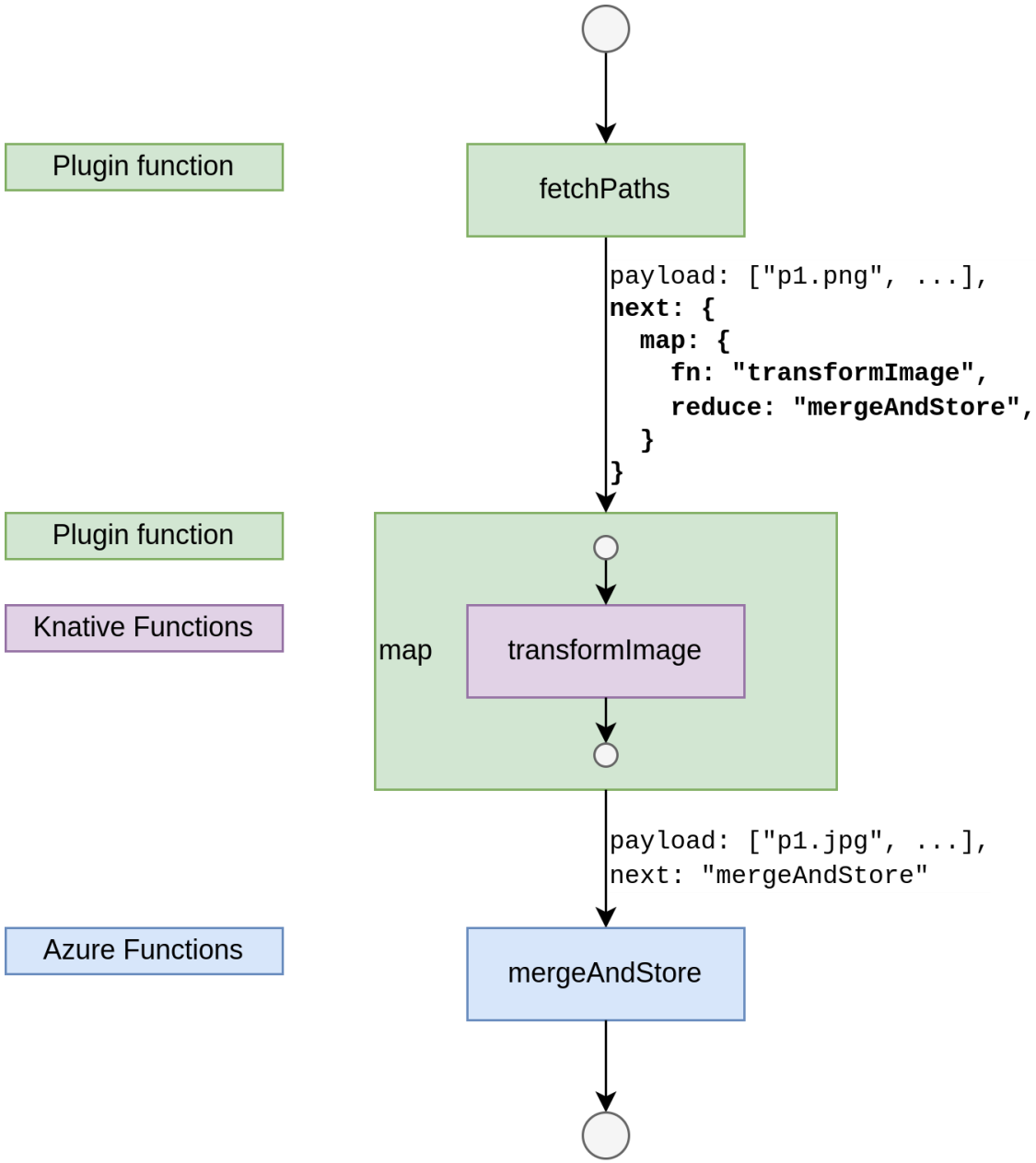
initiateRegistration:

```
export default async (requestBody: RequestBody): Promise<ResponseBody> => {

  const user = requestBody.payload;
  const email = user.email;
  const password = user.password;

  return {
    payload: user,
    next: !email.includes(password) ? "register" : "reject"
  };
};
```

Plugin functions as control flow elements



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Plugin `map`

- Has **access to parameters** passed as part of the `next` field:

```
const { fn, reduce } = requestBody.context.params;
// -> { fn: "transformImage", reduce: "mergeAndStore" }
```

- **Invokes** `fn` for each element in the payload:

```
const promises = requestBody.payload.map((element) => {
  return context.run(fn, element);
});
```

- Will **forward** the result to the `reduce` function:

```
return {
  payload: await Promise.all(promises),
  next: reduce
};
```

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Demo

Via CLI

Deploy:

```
cli/deploy.ts --workflow-directory workflows/demo --deployment-name demo
```

Run:

```
cli/run.ts --deployment-name demo --entrypoint fetchPaths --payload '{}'
```

Output:

```
Result: [ "p1.jpg", "p2.jpg" ]
Workflow: demo 1603ms
+ fetchPaths 9ms {}
| map 843ms ["p1.png","p2.png"]
  + transformImage 833ms "p1.png"
  + transformImage 825ms "p2.png"
| mergeAndStore 706ms ["p1.jpg","p2.jpg"]
```

Via Web UI

PF

Dashboard Deployments Runs

Run #48

Deployment: demo

Entrypoint: fetchPaths

Input:

```
{}
```

Output:

```
[
  "p1.jpg",
  "p2.jpg"
]
```

Stack:

```
Workflow: demo (12:23:40.393Z) (12:23:41.996Z) 1603ms
+ fetchPaths (12:23:40.416Z) (12:23:40.425Z) 9ms {}
| map (12:23:40.429Z) (12:23:41.272Z) 843ms ["p1.png","p2.png"]
  + transformImage (12:23:40.434Z) (12:23:41.267Z) 833ms "p1.png"
  + transformImage (12:23:40.437Z) (12:23:41.262Z) 825ms "p2.png"
| mergeAndStore (12:23:41.277Z) (12:23:41.983Z) 706ms ["p1.jpg","p2.jpg"]
```

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Thank you!

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