Supporting the Fan-out Fan-in Pattern

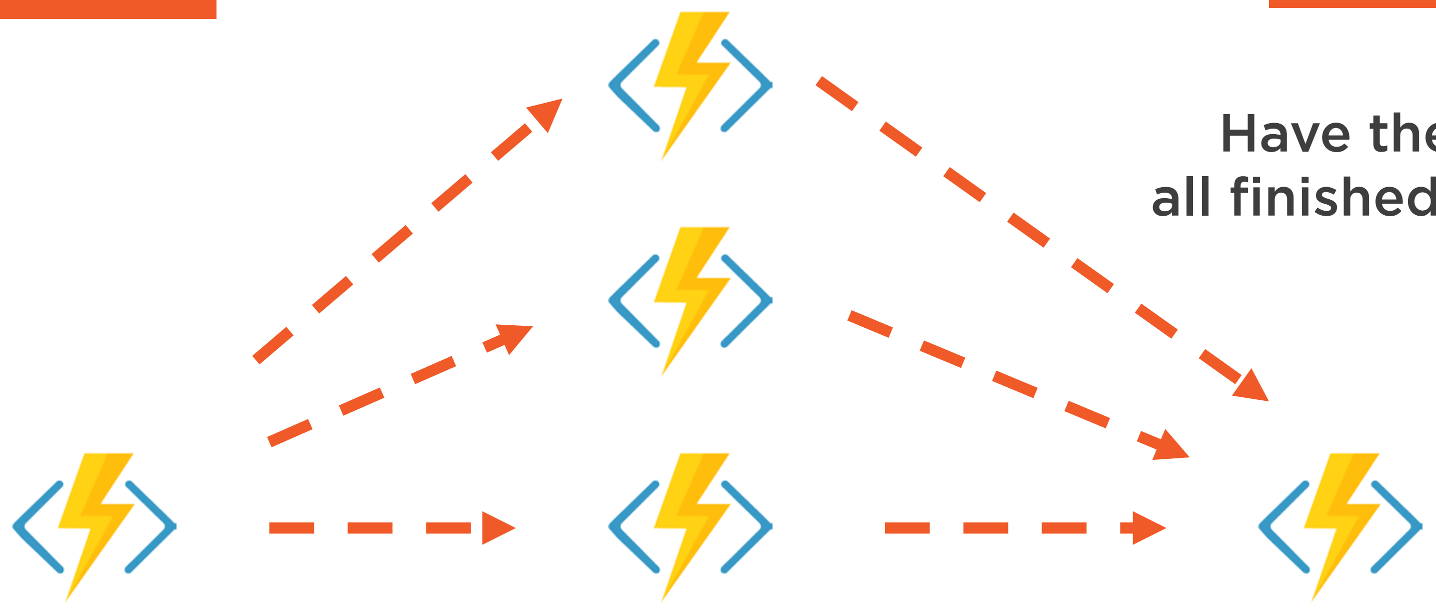
Mark Heath
MICROSOFT MVP

@mark_heath www.markheath.net

Fan-out Fan-in Pattern

“Map Reduce”

“Sub-Orchestrations”

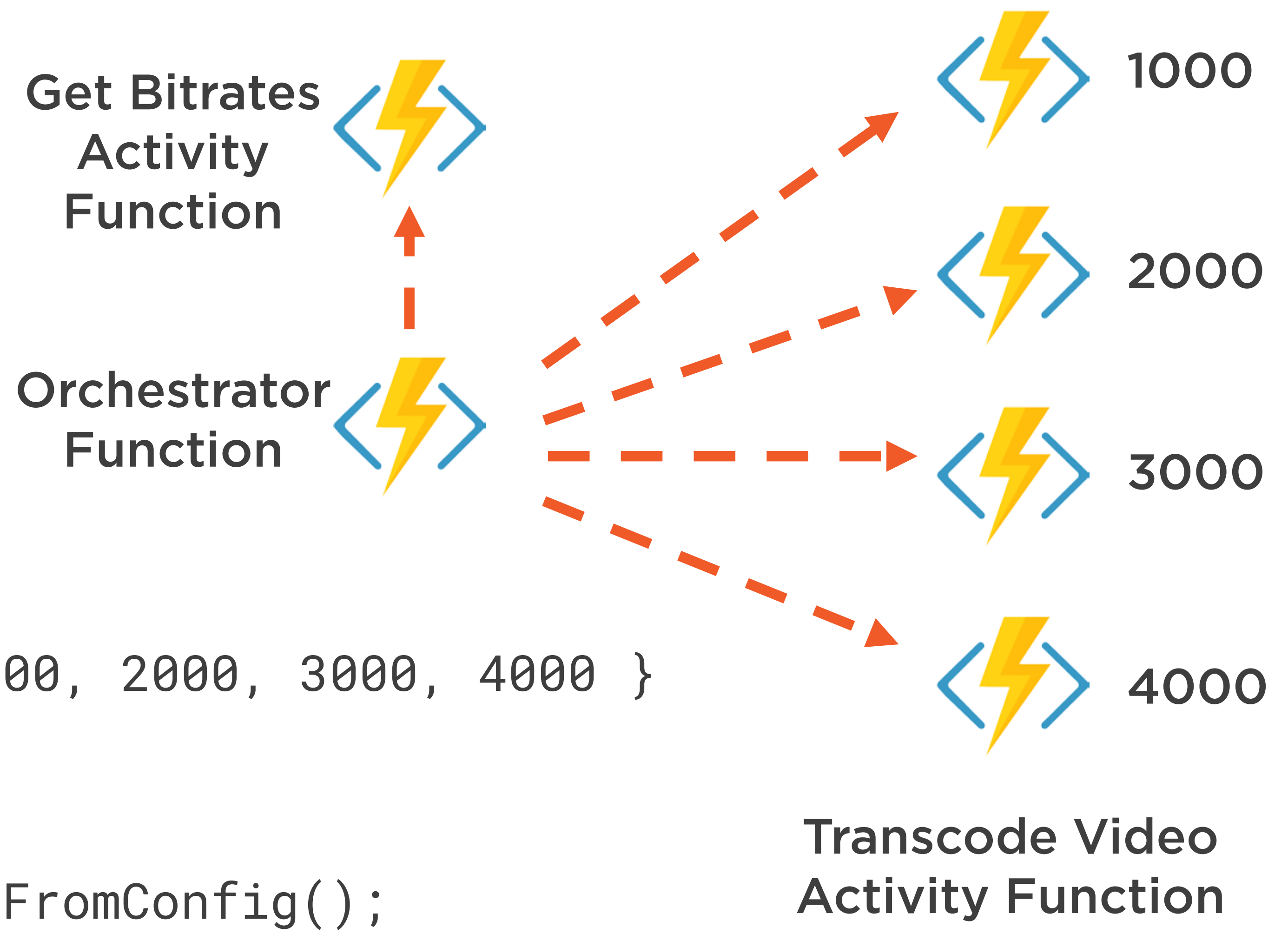


Demo

Implement "fan-out fan-in"

- Transcode activity takes bitrate input
- Orchestrator function calls activity with multiple bitrates
- Orchestrator waits for all transcodes to finish

Getting Bitrates from Config


Get Bitrates Activity Function
Orchestrator Function
1000
2000
3000
4000
Transcode Video Activity Function

```
var bitrates =
    new [] { 1000, 2000, 3000, 4000 }
```

```
var bitrates =
    GetBitratesFromConfig();
```

Not deterministic!

Demo

Getting list of bitrates from config

- Create an activity function to return bitrates

Demo

Creating sub-orchestrations

- Call an orchestrator from another orchestration
- Create a sub-orchestration for transcode step only

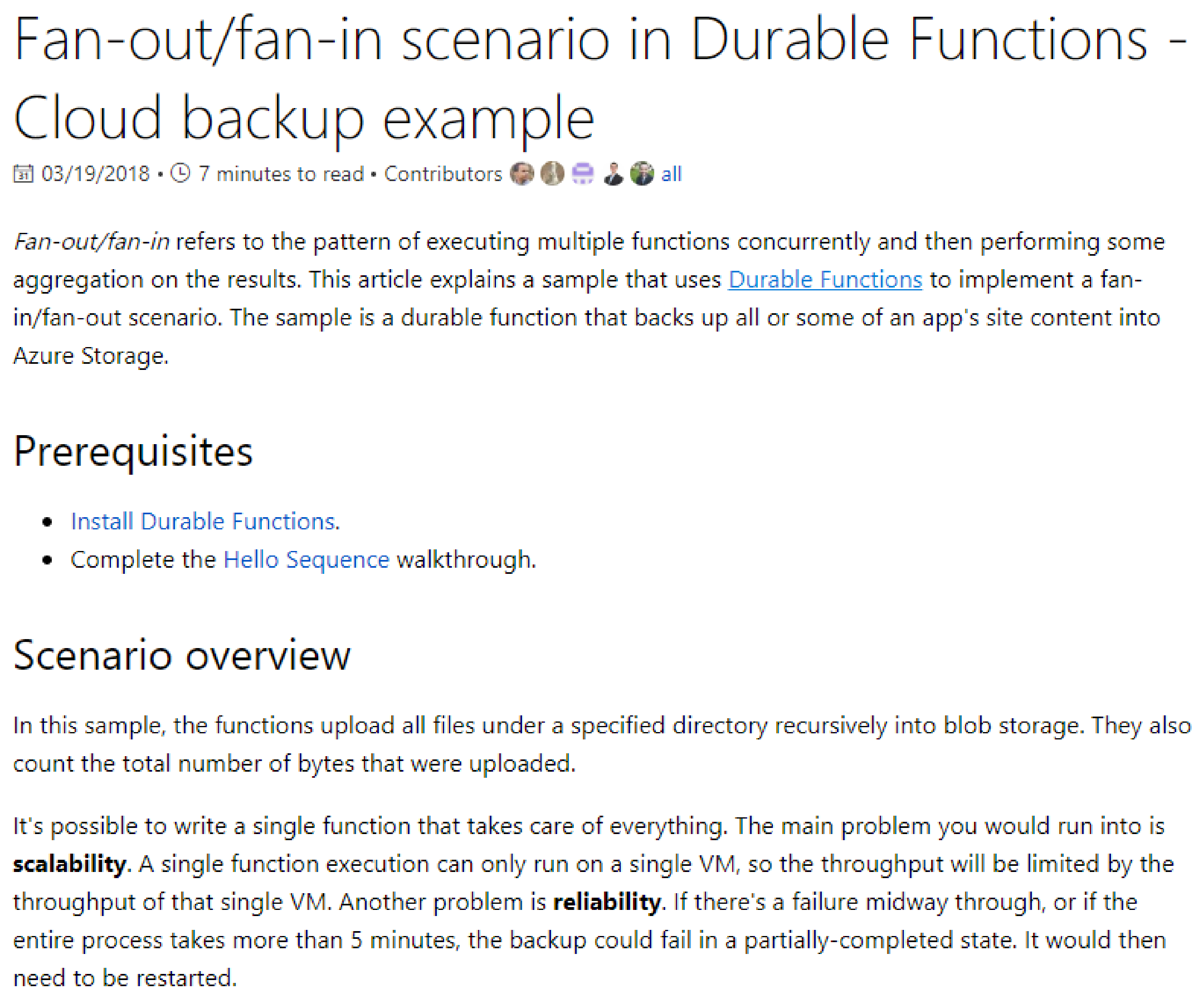
Summary

Implement “fan-out fan-in” pattern easily

- Build a list of tasks
- Wait with Task.WhenAll
- Activity to generate task input data

Sub-orchestrations

- Extract smaller workflow sections into their own orchestrator function



Fan-out/fan-in scenario in Durable Functions - Cloud backup example

03/19/2018 • 7 minutes to read • Contributors all

Fan-out/fan-in refers to the pattern of executing multiple functions concurrently and then performing some aggregation on the results. This article explains a sample that uses Durable Functions to implement a fan-in/fan-out scenario. The sample is a durable function that backs up all or some of an app's site content into Azure Storage.

Prerequisites

- Install Durable Functions.
- Complete the Hello Sequence walkthrough.

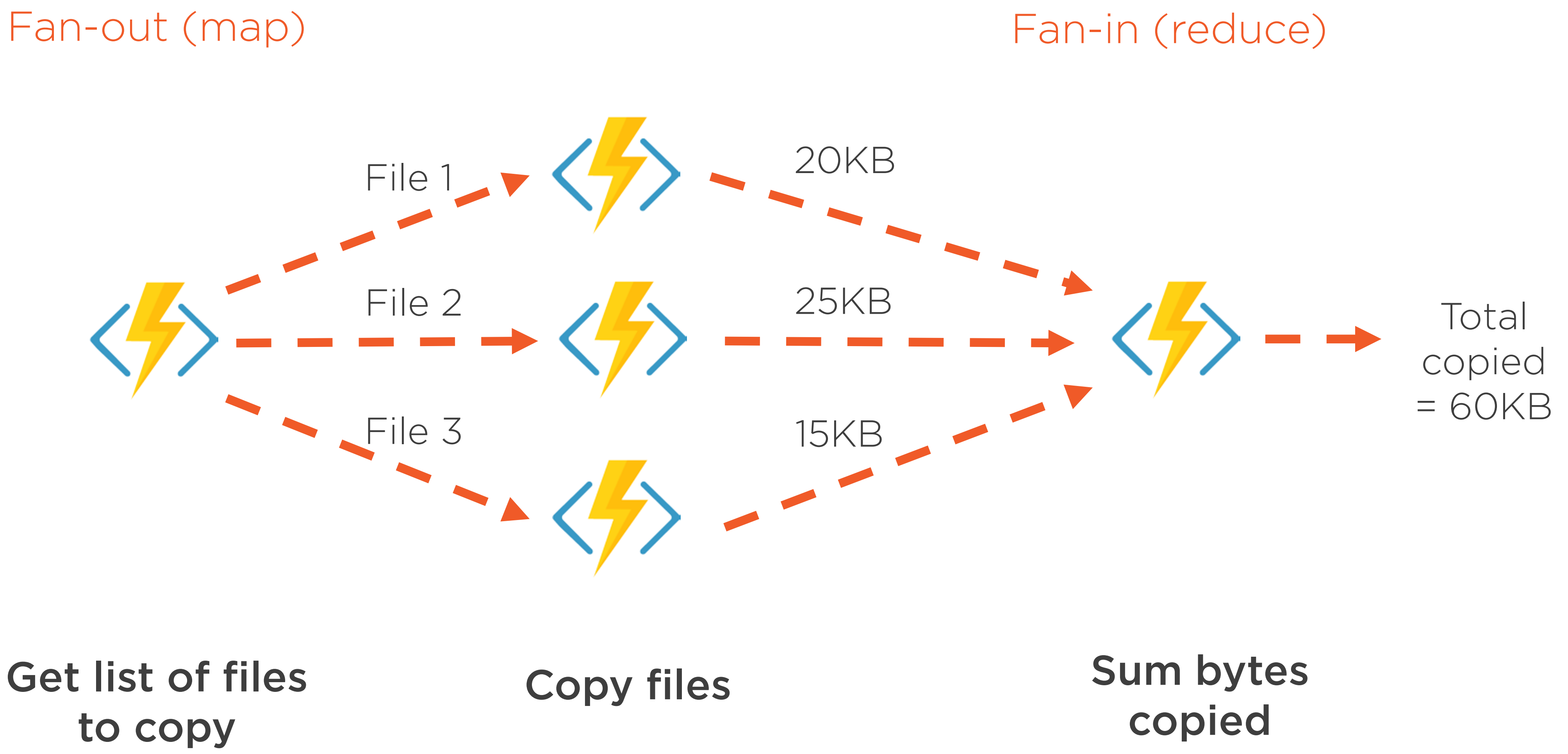
Scenario overview

In this sample, the functions upload all files under a specified directory recursively into blob storage. They also count the total number of bytes that were uploaded.

It's possible to write a single function that takes care of everything. The main problem you would run into is **scalability**. A single function execution can only run on a single VM, so the throughput will be limited by the throughput of that single VM. Another problem is **reliability**. If there's a failure midway through, or if the entire process takes more than 5 minutes, the backup could fail in a partially-completed state. It would then need to be restarted.

https://docs.microsoft.com/en-us/azure/azure-functions/durable-functions-cloud-backup

Fan-out Fan-in File Copy Demo



https://docs.microsoft.com/en-us/azure/azure-functions/durable-functions-cloud-backup

Up next …

Waiting for human interaction