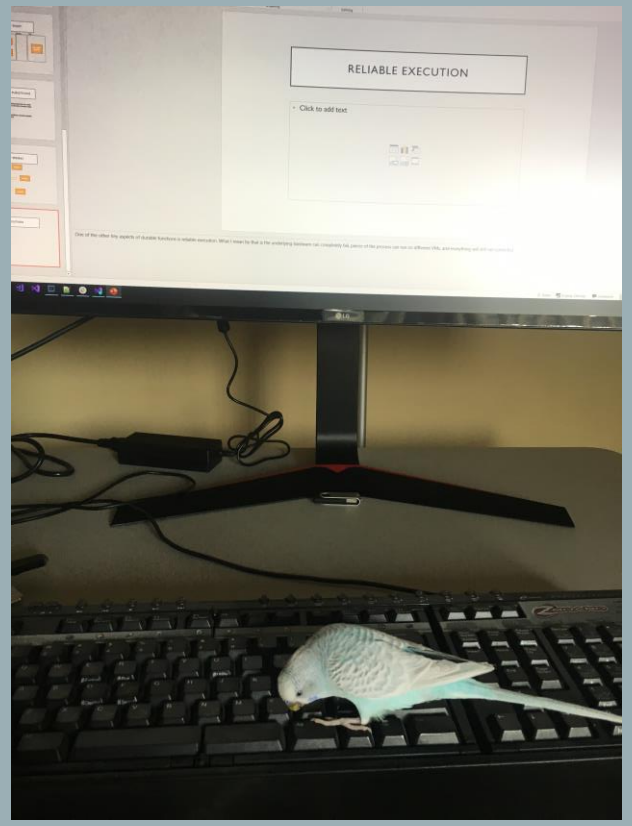
LONG RUNNING SERVERLESS TASKS WITH AZURE DURABLE FUNCTIONS

BRETT HAZEN



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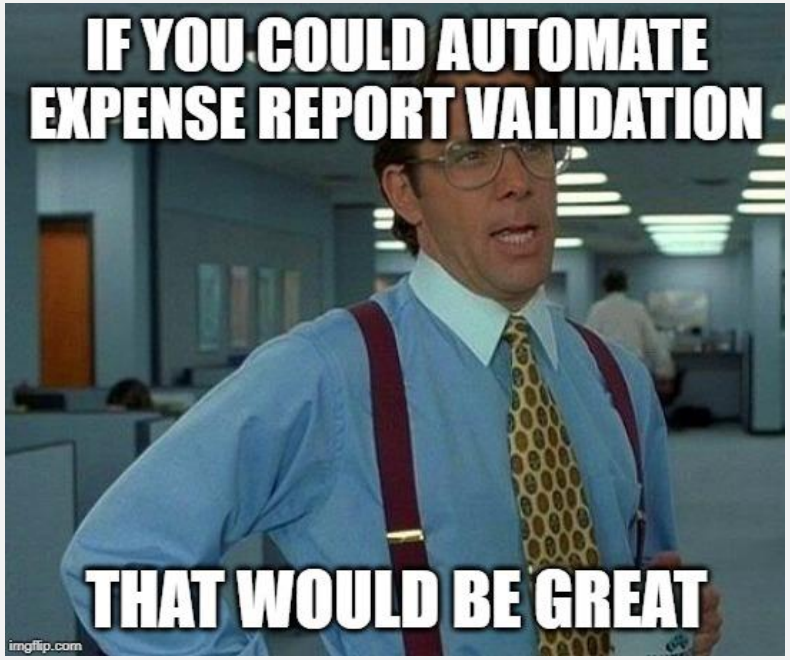
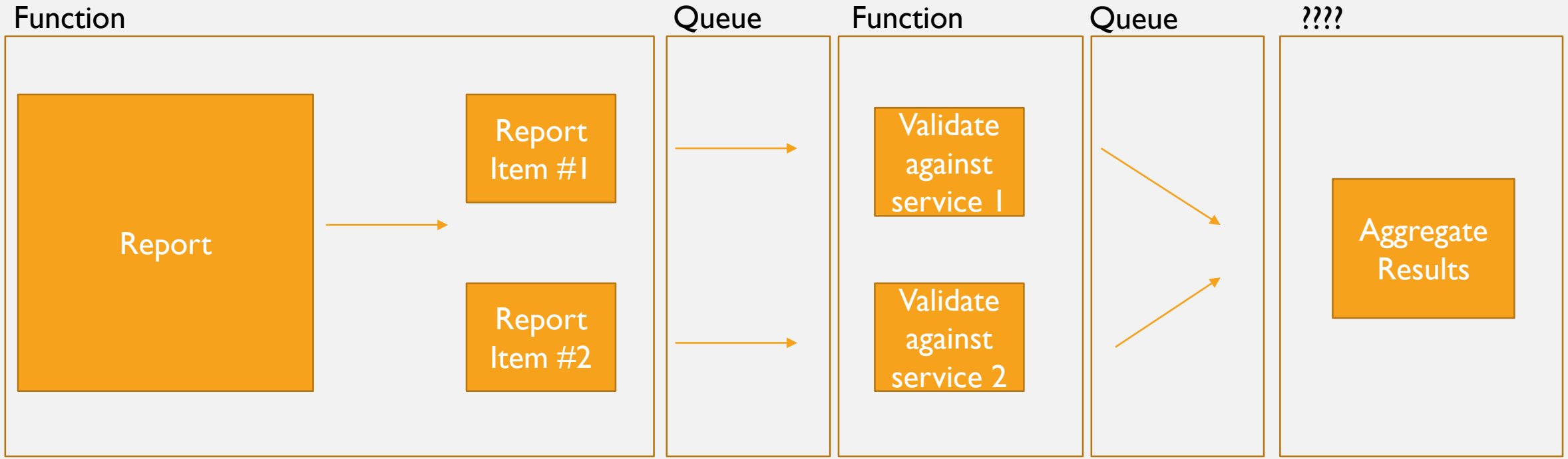
OUR SCENARIO

- Internal tool exists for tracking expense reports
- It's serverless and life is good

A NEW REQUIREMENT EMERGES!



HOW COULD WE DO THAT?

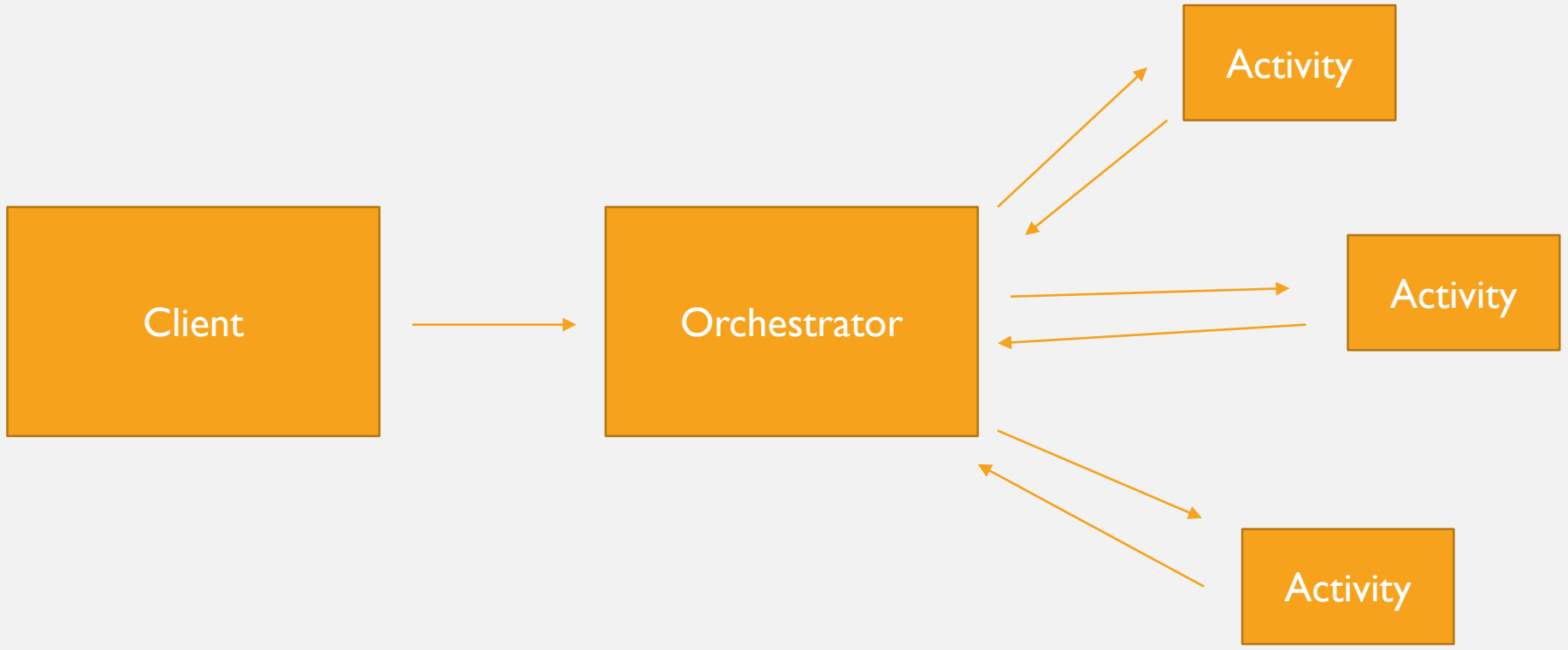


ENTER AZURE DURABLE FUNCTIONS

- Durable Functions are an extension of Azure Functions that lets you write stateful functions in a serverless environment. The extension manages state, checkpoints, and restarts for you.

- The primary use case for Durable Functions is simplifying complex, stateful coordination requirements in serverless applications

ANATOMY OF A DURABLE FUNCTION



RELIABLE EXECUTION

ORCHESTRATOR CONSTRAINTS

- Must be deterministic
- Should be non-blocking
- Must never initiate async operations except using the DurableOrchestrationContext API or equivalent
- Infinite loops should be avoided
- JavaScript orchestrator functions cannot be async

TASK HUBS

- One history table
- One instance table
- One work-item queue
- One or more control queues
- One storage container containing one or more lease blobs

ERROR HANDLING

- Write try/catch blocks as you normally would
  - Be sure orchestrator is deterministic
- DurableOrchestrationContext API has built-in retry mechanism

OTHER FEATURES

- External Events
- Timers

VERSIONING

- Do nothing
- Stop all in-flight instances
- Side-by-side deployments
- Version in code

THINGS WE DIDN'T COVER

- Sub-orchestrators
- Eternal Orchestrators
- Unit testing
- Singleton Orchestrations
- Concurrency Throttling
- Instance Management

SOME FINAL THOUGHTS

- Be sure everyone understands orchestrators must be deterministic
- Figure our logging early
- Determine versioning strategy early
- Separate storage account or task hub per durable function

QUESTIONS

THANK YOU

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https://github.com/bhazen/durable-functions-talk

RESOURCES

- https://docs.microsoft.com/en-us/azure/azure-functions/durable/durable-functions-overview
- https://mikhail.io/2018/12/making-sense-of-azure-durable-functions/
- https://medium.com/@tsuyoshiushio/durable-functions-101-35aa3919f182
- https://markheath.net/post/10-reasons-durable-functions
- https://www.freecodecamp.org/news/an-introduction-to-azure-durable-functions-patterns-and-best-practices-b1939ae6c717/