Serverless Bomberman: RTMPG PoC based on Durable Functions

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RTMPGs

A new frontier for serverless application design...

RTGs: Real-Time Games
[Holmes & Curia 2019]

RTMPGs: Real-Time Multiplayer Games

Bomberman

MPGs: Multiplayer Games
[Barratt 2020]

Cloud Hero

Rock Paper Scissors Lizard Spock


Statelessness of Functions

In memory
(static class)

On local disk
(probabilistic)

In backend
(BaaS: DB, orchestration)

Azure durable entities:
• Cost-effective
   (almost no extra pricing)
• Appropriate size limits
   (64 kB → Tables, else → Blob)
• Eventual consistency
   (polling required)
Architecture

Functions:

GameInputFunction \( \text{api/input/\{gameKey\}} \) \( \leftarrow \) Input
GameResetFunction \( \text{api/reset/\{gameKey\}} \)
RemovePlayerFunction \( \text{api/remove/\{gameKey\}} \)
GetGameStateFunction \( \text{api/getgamestate/\{gameKey\}} \) \( \rightarrow \) Game

Game function (entity-triggered)
Results

Consistently < 100ms per function response → RT feasible

3 minute game:
GameInputFunction 1x/s
GetGameStateFunction 100x/s
= 18180 events
= 0.0036 US$ per player

Storage 3 kB (field-dependent)
= 180 transactions
= 0.0000024 US$ per player

Optimisation: delta transfers