

Building Materialized Views



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Querying Real-time Flight Data

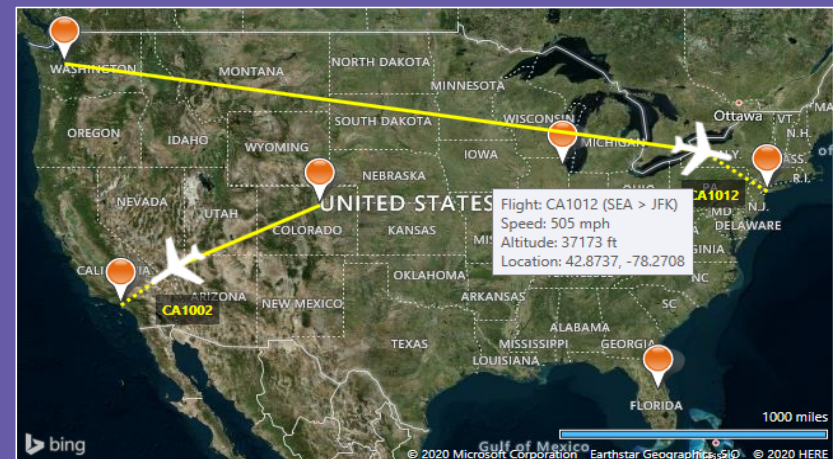
Get current telemetry

Query the location container
for each flight in the air

```
SELECT TOP 1 *  
FROM c  
WHERE  
  c.flightNumber = 'CA1012'  
ORDER BY  
  c._ts DESC
```

Present a live map

Bing Maps mashup



Demo



Flight Location Map



Introducing Materialized Views

Get current location

Continuous querying for each flight's current telemetry

Expensive operation over voluminous raw data using cross-partition query

Build a materialized view

Materialize a tiny view – one document per flight

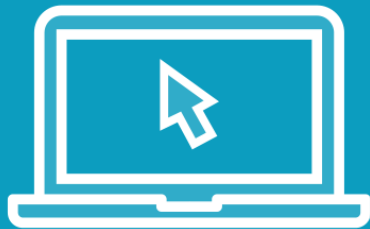
Partition on /type

Set /id to flight number

Extremely cheap to query the materialized view



Demo



Current Location Microservice



Querying Arrival Data

Get current telemetry

Query the remaining time for each flight in the air

Group the flights by airport

Create a materialized view

```
{
  "id": "LAX",
  "type": "arrival",
  "arrival": {
    "flights": [
      {
        "id": "SEA",
        "type": "arrival",
        "arrival": {
          "flights": [
            {
              "id": "MCO",
              "type": "arrival",
              "arrivalAirport": "MCO",
              "flights": [
                {
                  "flightNumber": "CA1008",
                  "departureAirport": "ORD",
                  "remainingMinutes": 88.8
                },
                {
                  "flightNumber": "CA1007",
                  "departureAirport": "LAX",
                  "remainingMinutes": 235.8
                },
                {
                  "flightNumber": "CA1007",
                  "departureAirport": "LAX",
                  "remainingMinutes": 235.8
                }
              ]
            }
          ]
        }
      }
    ]
  }
}
```



Querying Arrival Data

Get current telemetry

Query the remaining time for
each flight in the air

Group the flights by airport

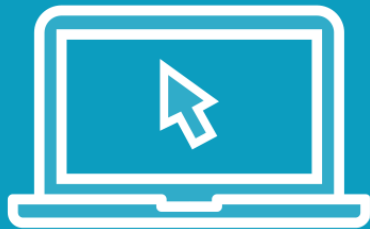
Create a materialized view

Present an arrivals board

Query the materialized view

ARRIVALS			
Flight	From	To	Status
CA1001	JFK	LAX	10:49 PM
CA1002	DEN	LAX	ARRIVED
CA1003	ORD	LAX	09:33 PM
CA1005	MCO	LAX	10:06 PM
CA1010	SEA	LAX	ARRIVED

Demo



Arrivals Board Microservice



Summary



Querying IoT data

- Build materialized views

Current Location microservice

- Real-time flight location maps

Arrivals Board microservice

- Real-time flight arrivals, by airport

