

# Multiple Models



# What are we going to do?



- General vs specific relationships
- The read/write tradeoff

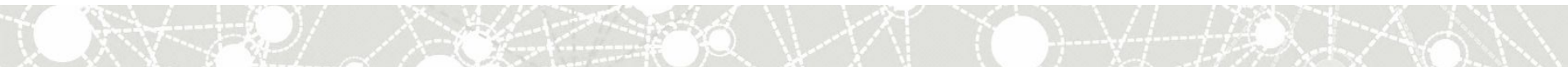


## So what's the problem?

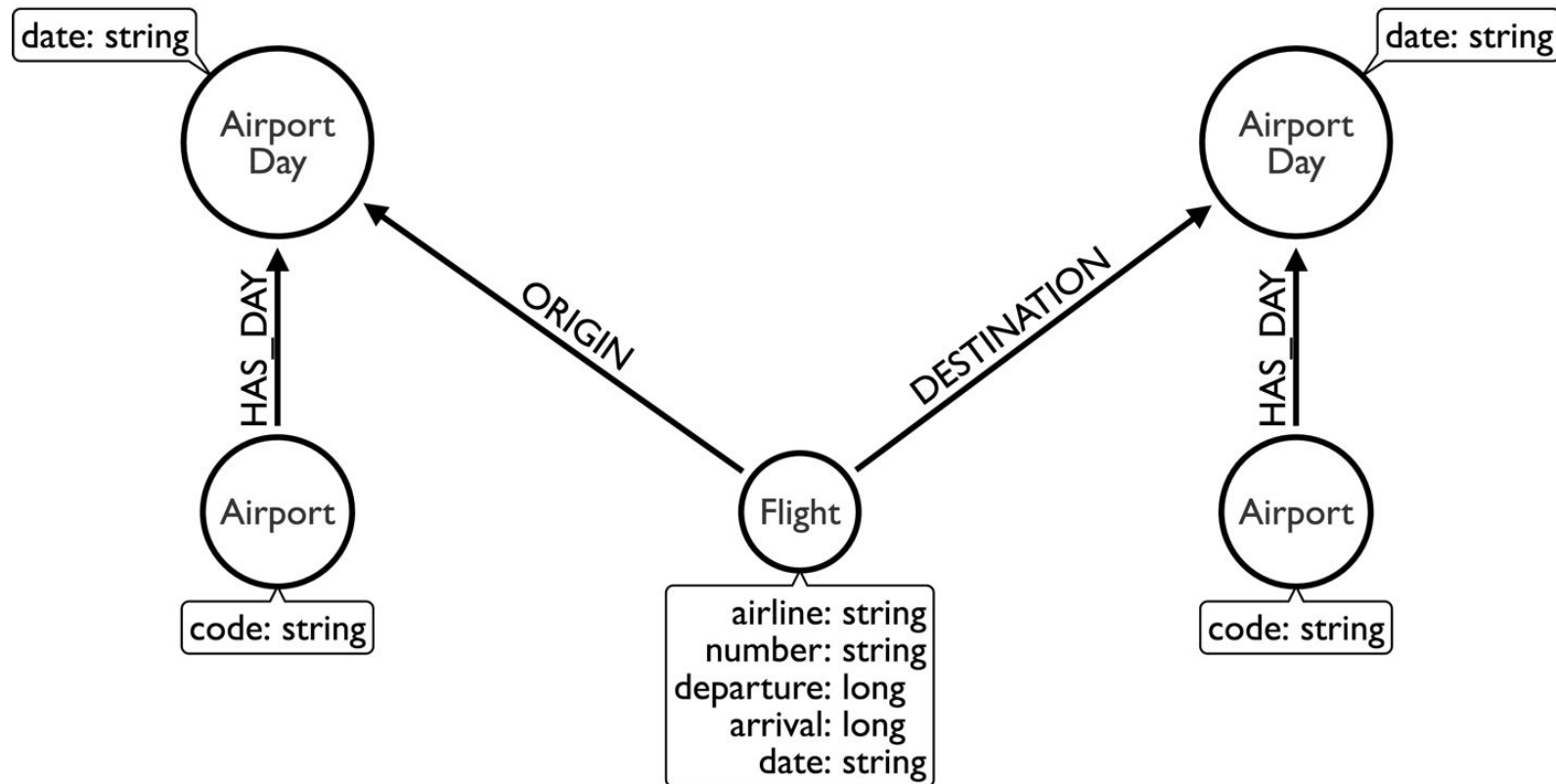


Different models perform better for different queries  
but worse for others

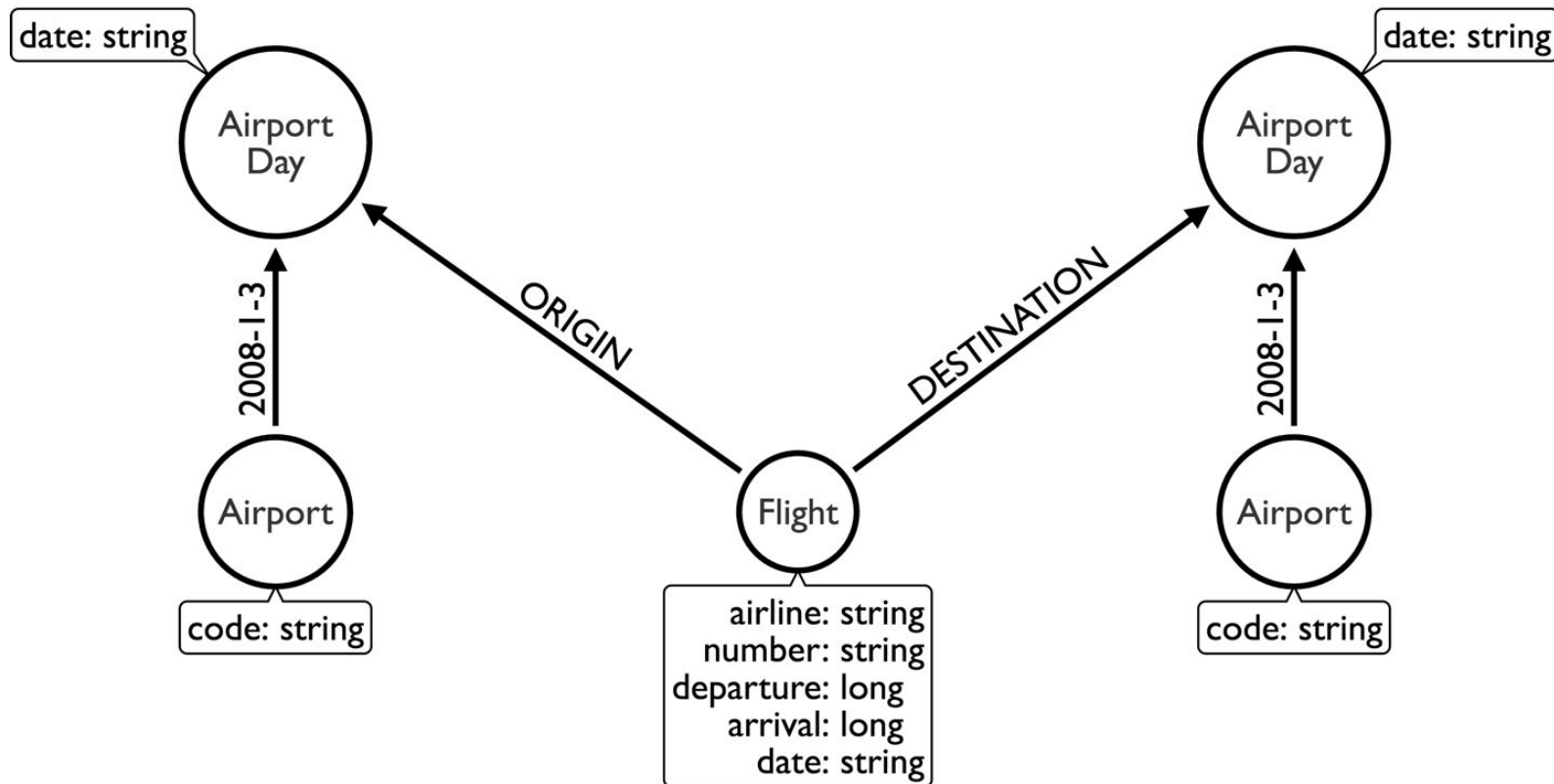
Optimising for reads may mean we pay a write and  
maintenance penalty



# General Relationships



# Specific Relationships



## Find flights on a specific date: Specific wins



```
MATCH (origin:Airport {code: "LAS"})-[:`2008-1-3`]->(originDay:AirportDay),  
        (originDay)<-[:ORIGIN]-(flight:Flight),  
        (flight)-[:DESTINATION]->(destinationDay),  
        (destinationDay:AirportDay)<-[:`2008-1-3`]->(destination:Airport {code: "MDW"})  
  
RETURN flight.date, flight.number, flight.airline, flight.departure, flight.arrival  
  
ORDER BY flight.date, flight.departure;
```

# Find flights by year and month: General wins



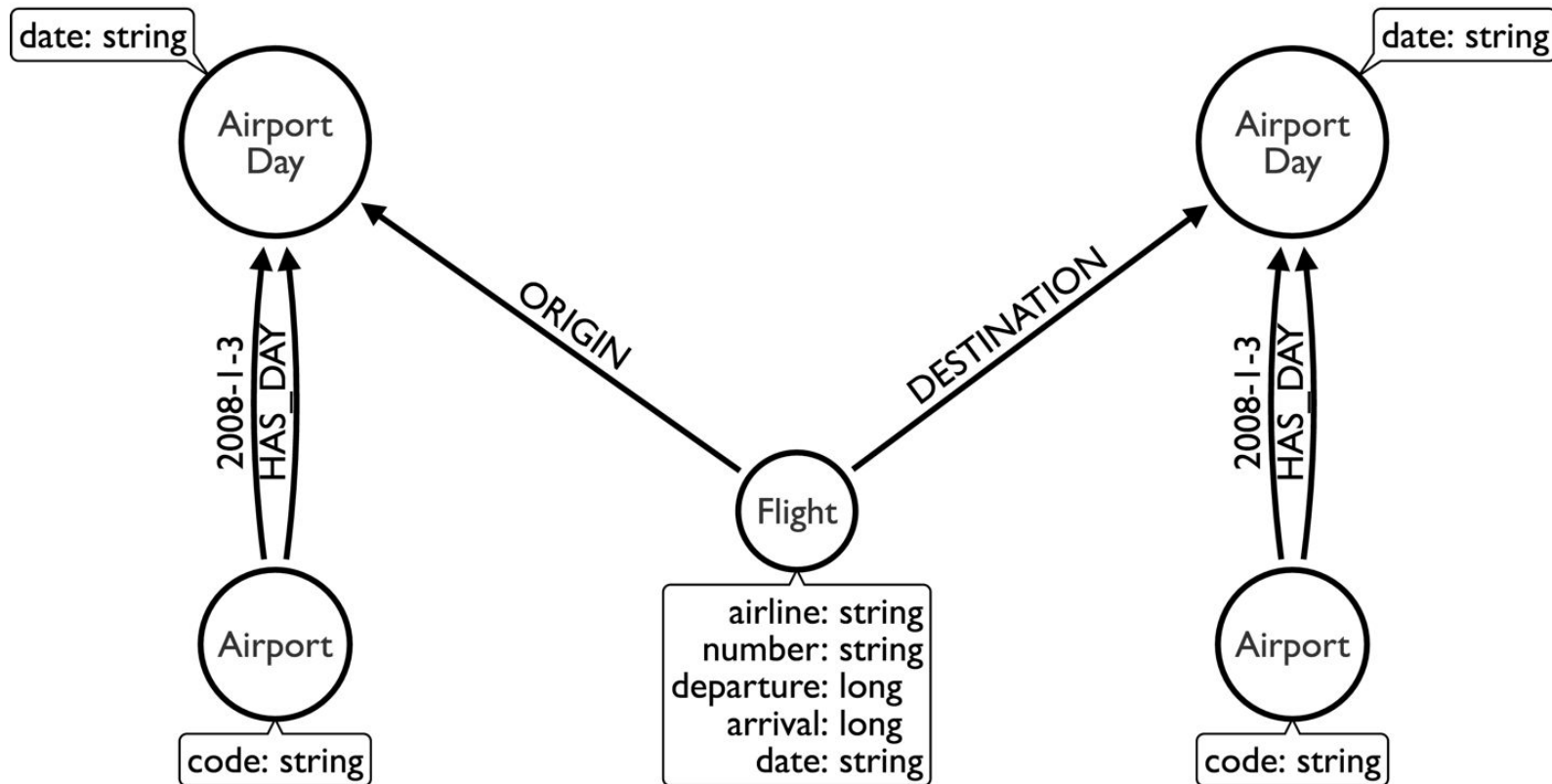
```
MATCH (origin:Airport {code: "LAS"})-[:HAS_DAY]->(originDay:AirportDay),  
        (originDay)<-[:ORIGIN]-(flight:Flight)
```

```
WHERE originDay.date STARTS WITH "2008-1"
```

```
RETURN flight.date, flight.number, flight.airline, flight.departure, flight.arrival
```

```
ORDER BY flight.date, flight.departure
```

## Best of both worlds?





# Read/Write trade off

## Read/Write trade off



By keeping both models we optimise for both the read use cases but pay a write penalty.



## Adding a new day



If we want to add a new day we have to add two relationships instead of one.

```
MATCH (airport {code: "LAX"})  
MERGE (airportDay:AirportDay {id: "LAX_2008-2-1"})  
ON CREATE SET airportDay.date = "2008-2-1"  
CREATE (airport)-[:HAS_DAY]->(airportDay)  
CREATE (airport)-[:`2008-2-1`]->(airportDay)
```

If we want to remove a day we have to delete two relationships instead of one.

```
MATCH (airport {code: "LAX"})  
MATCH (airportDay:AirportDay {id: "LAX_2008-1-1"})  
MATCH (airport)-[general:HAS_DAY]->(airportDay)  
MATCH (airport)-[specific:`2008-1-1`]->(airportDay)  
DELETE general, specific
```

# Start playing the next guide....



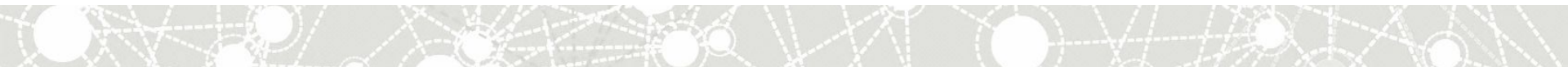
...if you aren't playing it already

▶ Multiple Models

:play [http://guides.neo4j.com/modeling\\_airports/06\\_multiple\\_models.html](http://guides.neo4j.com/modeling_airports/06_multiple_models.html)

or

:play [http://guides.neo4j.com/modeling\\_sandbox/06\\_multiple\\_models.html](http://guides.neo4j.com/modeling_sandbox/06_multiple_models.html)

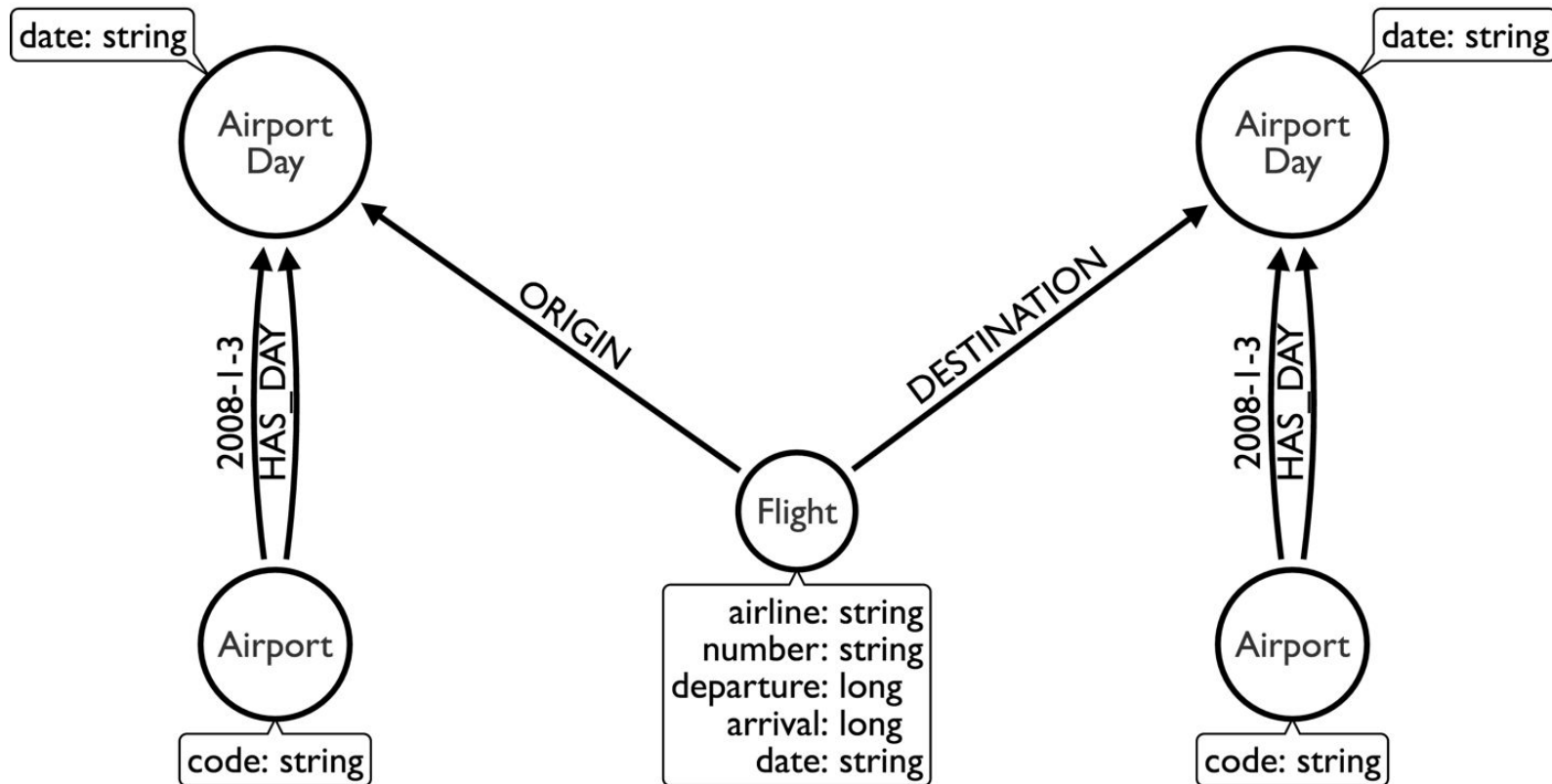


**Do we need  
multiple models?**

**Questions ?**



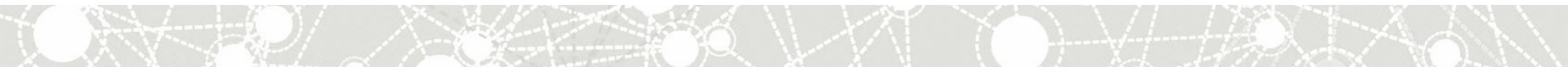
## Our current model



## Shrinking the model

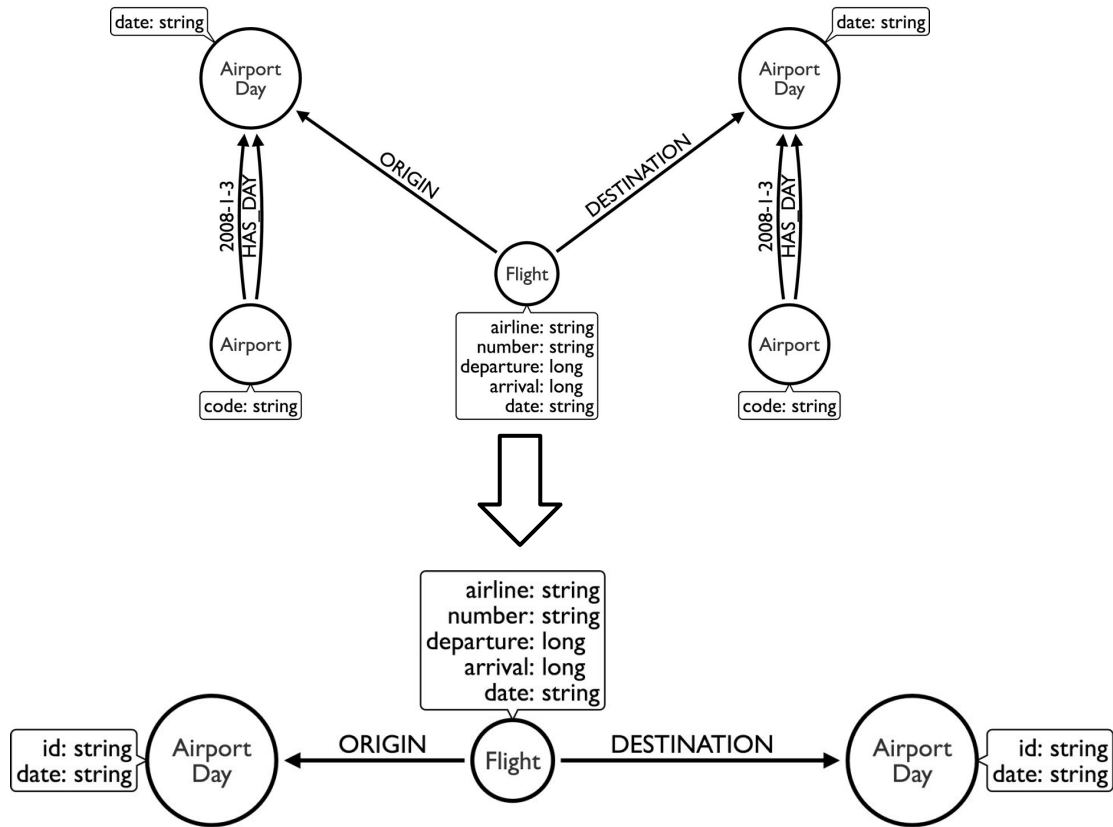


At the start of the day the first thing we did was create Airport nodes  
but we actually don't need them anymore!





# Flight as a first class citizen



## Let's get on with the refactoring



Continue playing the guide in your browser



# Multiple Models

