

Acknowledging CAP at the Root -- in the Domain Model

Eric Evans

Domainlanguage.com

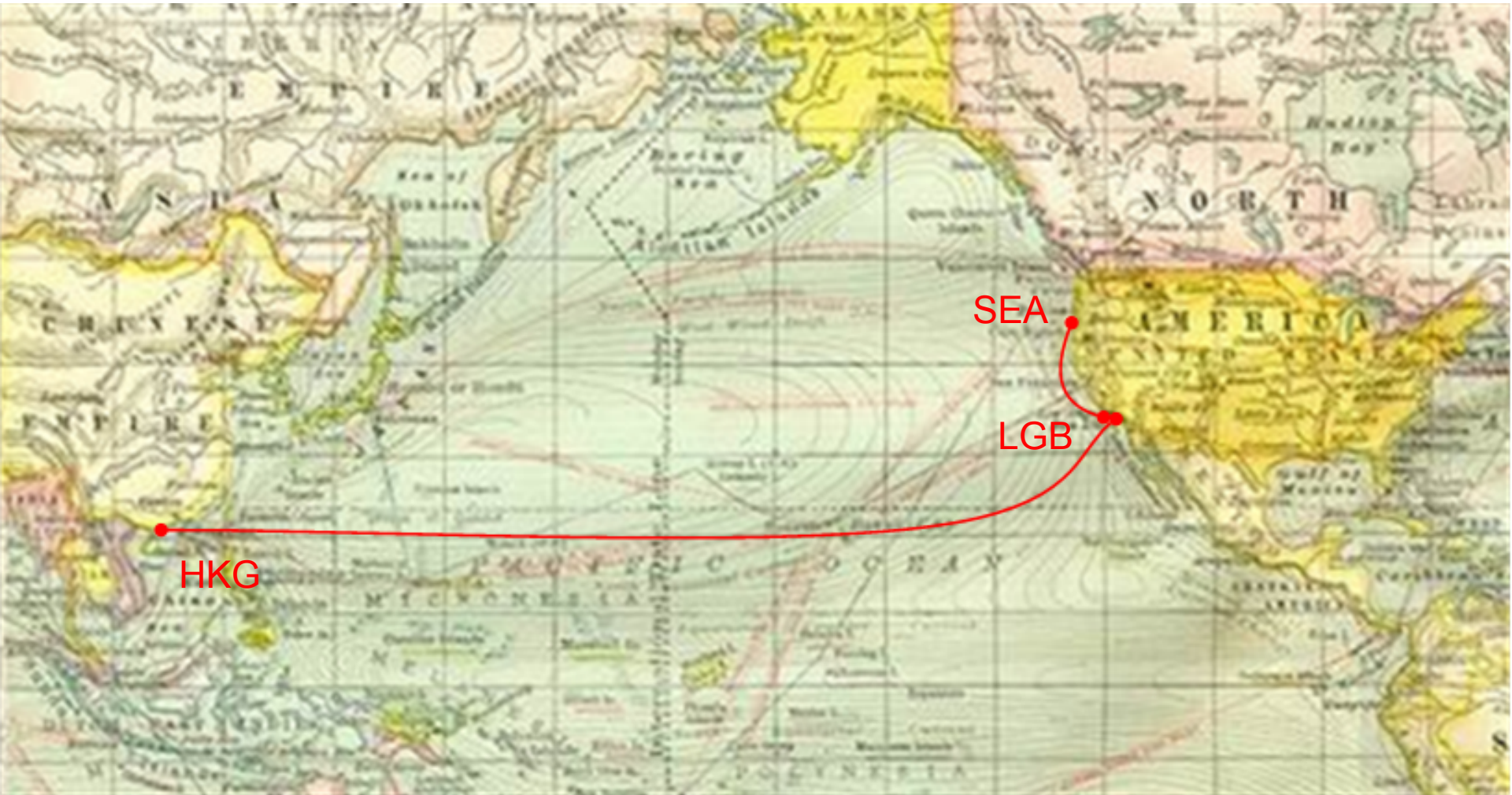
Twitter: [ericevans0](https://twitter.com/ericevans0) #ddd design

Gap between formalism and
practice

Vessel Voyage XYZ



Cargo Itinerary



HKG

SEA

LGB

Our Cargo Needs 2 Voyages



Schedules and Itineraries

Voyage Schedule for XYZ

- ETD HKG 08:30 Sa
- ETA SHA 21:00 Sa
- ETD SHA 06:30 Su
- ETA LGB 13:20 Th
- ...

Voyage Schedule for ABC

- ETD SNG 14:15 Tu
- ETA LGB 22:05 Fr
- ETD LGB 10:15 Sa
- ETA SEA 07:40 Su

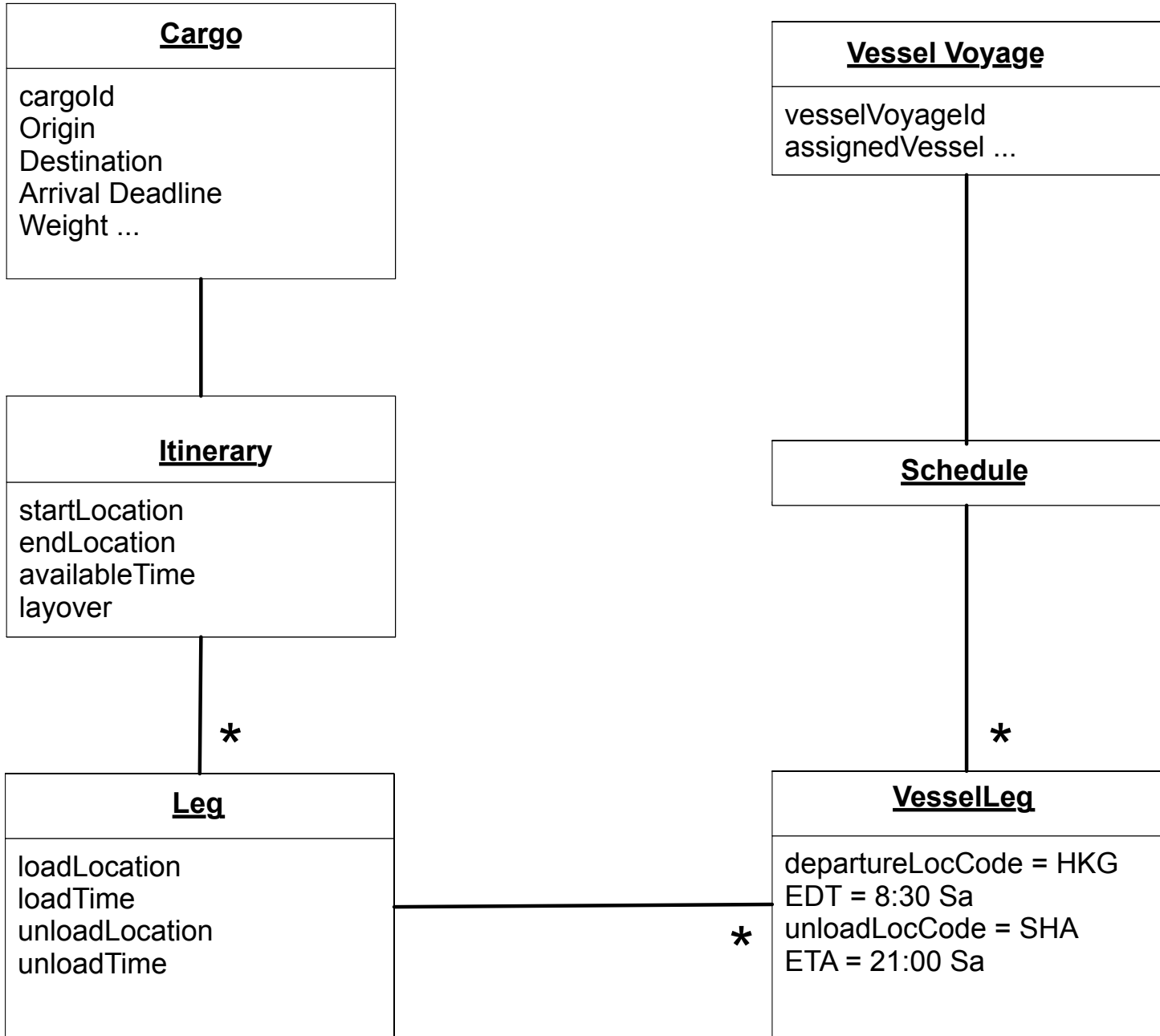
Itinerary HKG-SEA

- HKG-LGB on XYZ
- LGB- SEA on ABC

Estimated Layover in LGB:

13:20 Th –10:15 Sa

Elapsed: 45:55



Schedules and Itineraries

Voyage Schedule for XYZ

- ETD HKG 08:30 Sa
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Delay

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New Schedule

Voyage Schedule for XYZ

- ETD HKG 08:30 Sa
- ETA SHA 21:00 Sa
- ETD SHA 06:30 Su
- ETA LGB ~~13:20 Th~~ 3:00 Sa (next)
- ...

Voyage Schedule for ABC

- ETD SNG 14:15 Tu
- ETA LGB 22:05 Fr
- ETD LGB 10:15 Sa (next)
- ETA SEA 07:40 Su (next)

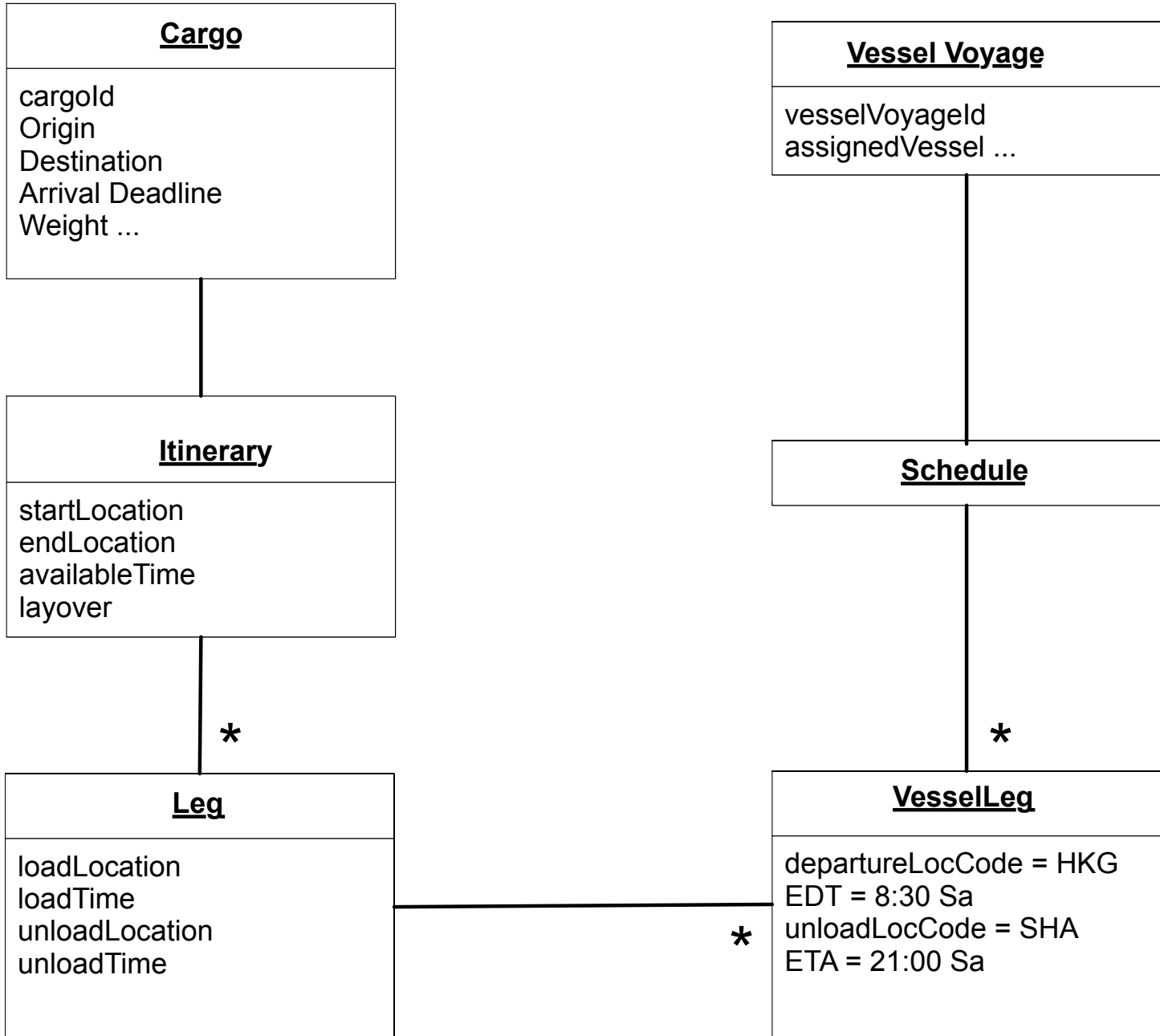
Itinerary HKG-SEA

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Estimated Layover in LGB:

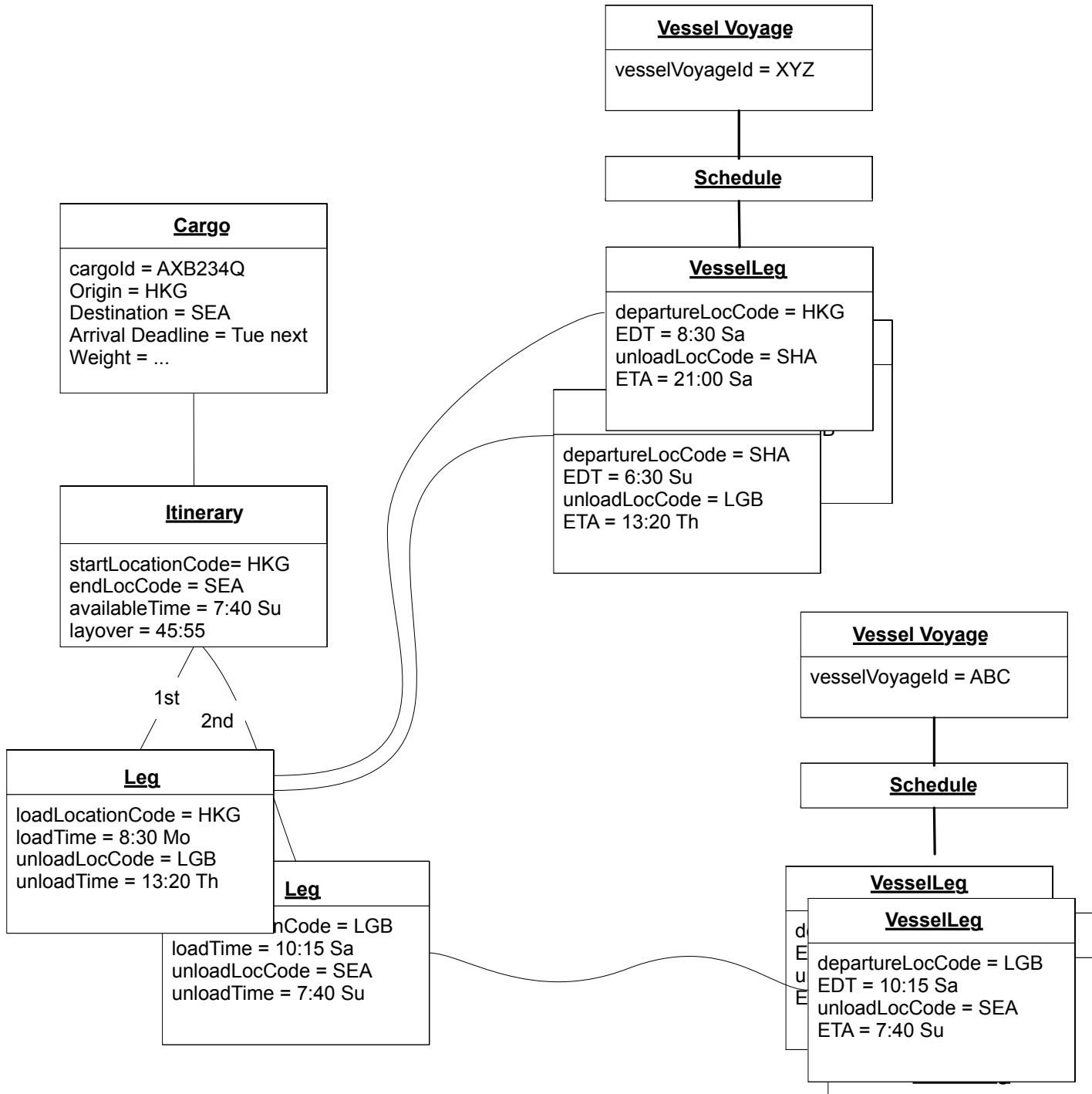
3:00 Sa – 10:15 Sa

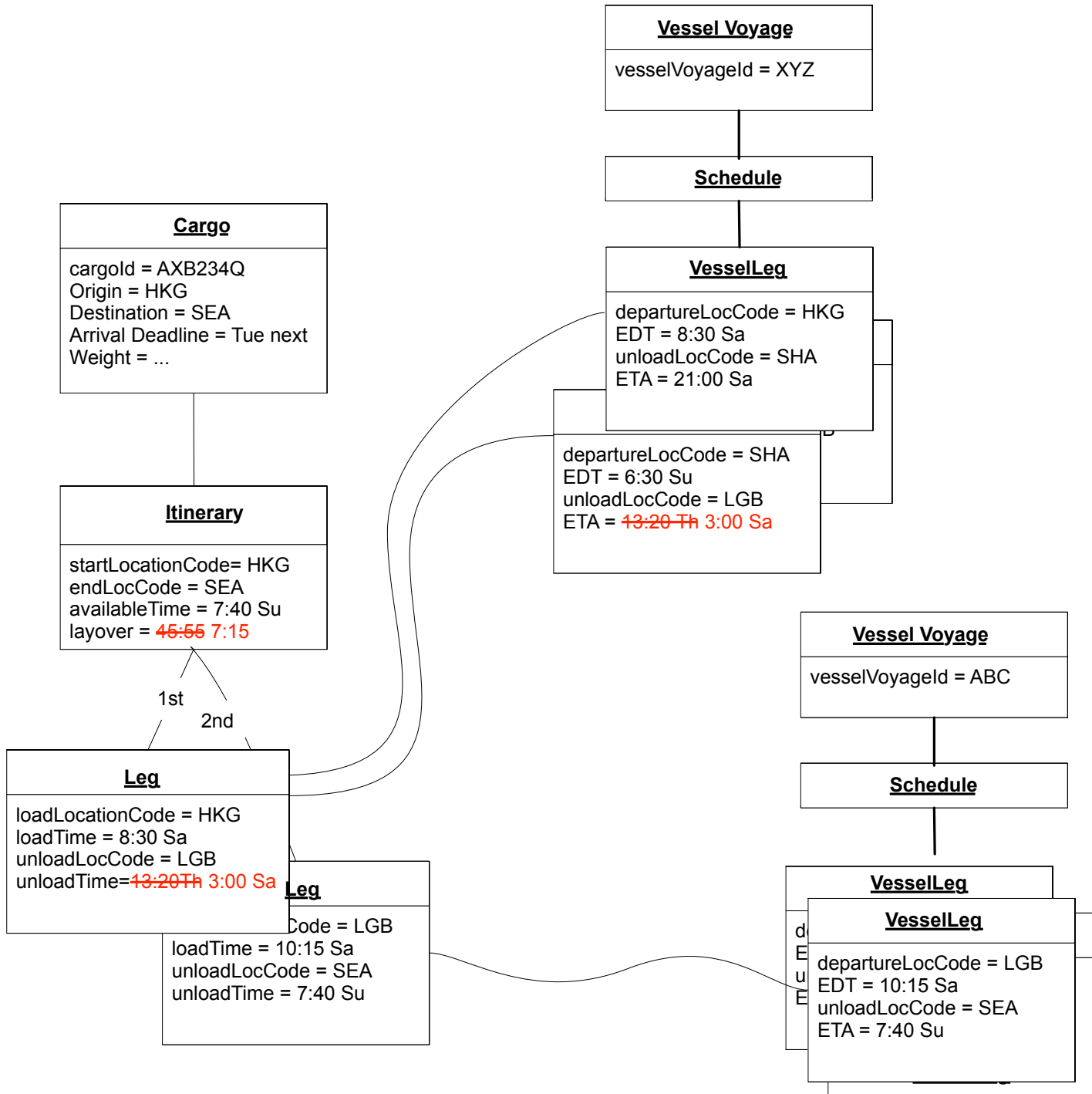
Elapsed: ~~45:55~~ 7:15



Some Consistency Rules

- Itinerary corresponds to Vessel Voyage
- Itinerary connected
- Layover > 24 hours





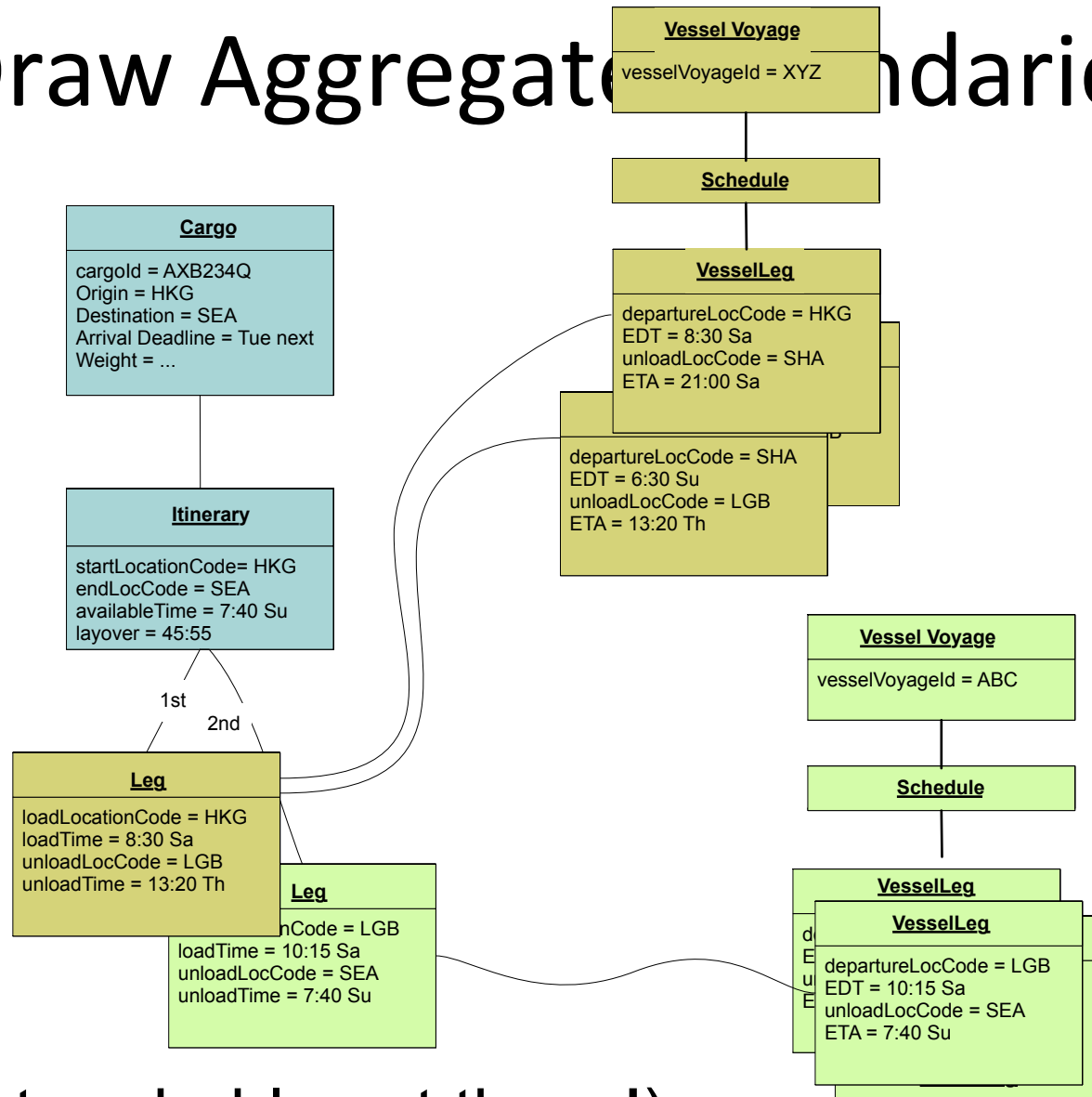
Aggregates



Aggregates: Consistency Boundaries

- Aggregates are always internally consistent.
 - Invariants apply at every transaction commit
- Aggregates “eventually consistent” with each other.
 - Asynchronous updates propagate through system
- Limit Interconnectedness.
 - References limited to aggregate roots.

Draw Aggregate Boundaries



(But probably not these!)

Allowed State

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- ...

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- ETD SNG 14:15 Tu
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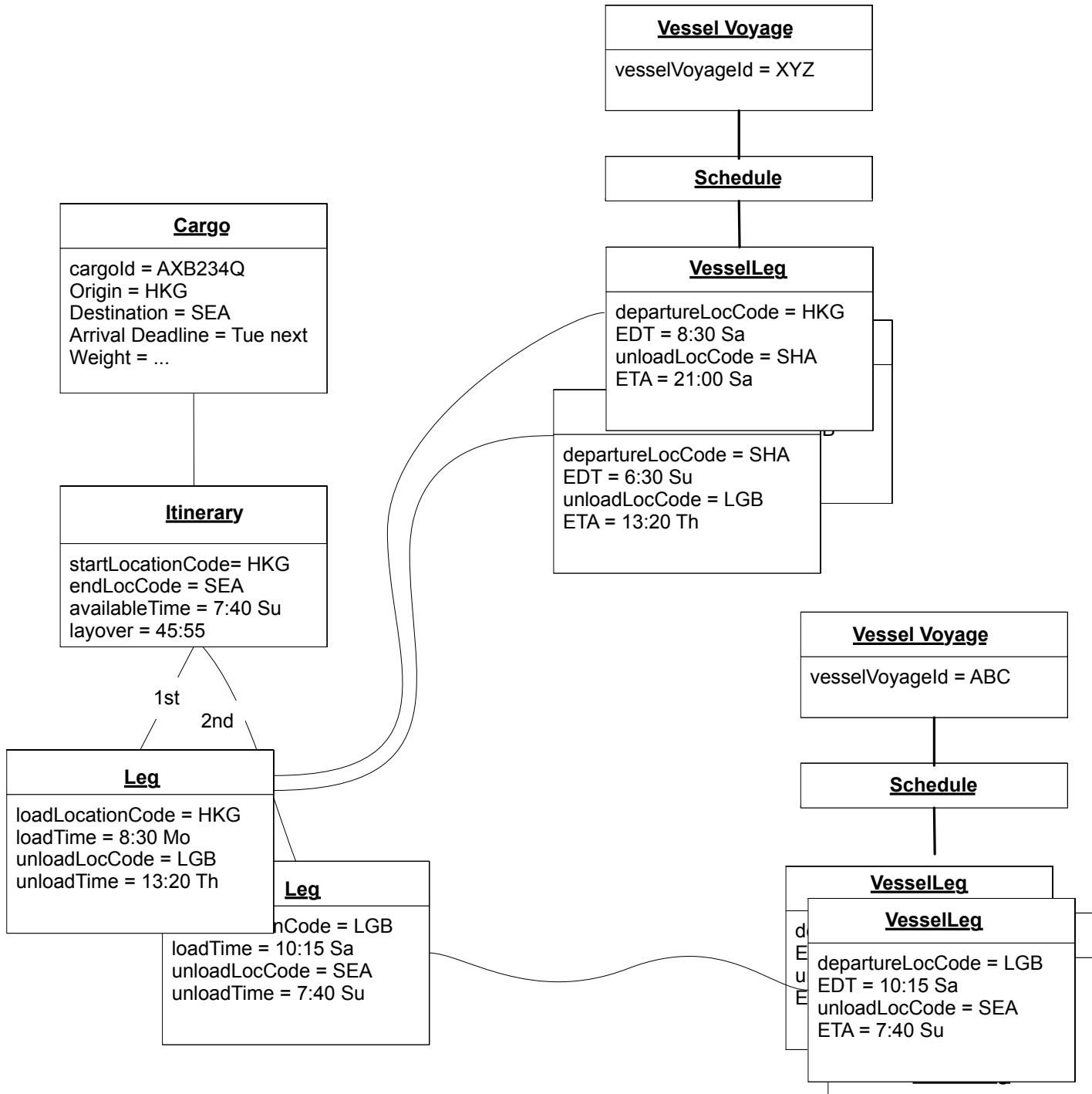
Itinerary HKG-SEA

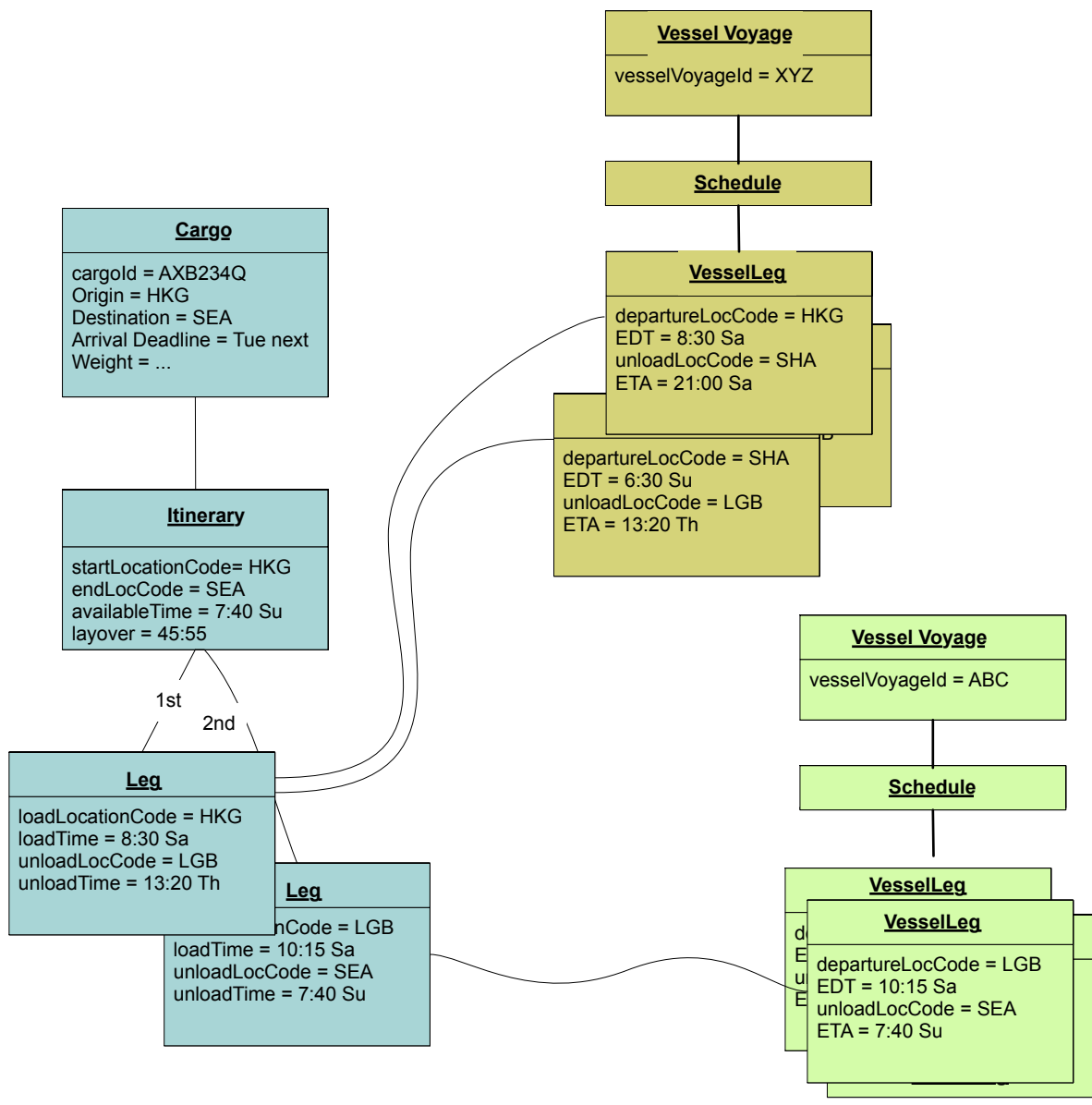
- HKG-LGB on XYZ
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Estimated Layover in LGB:

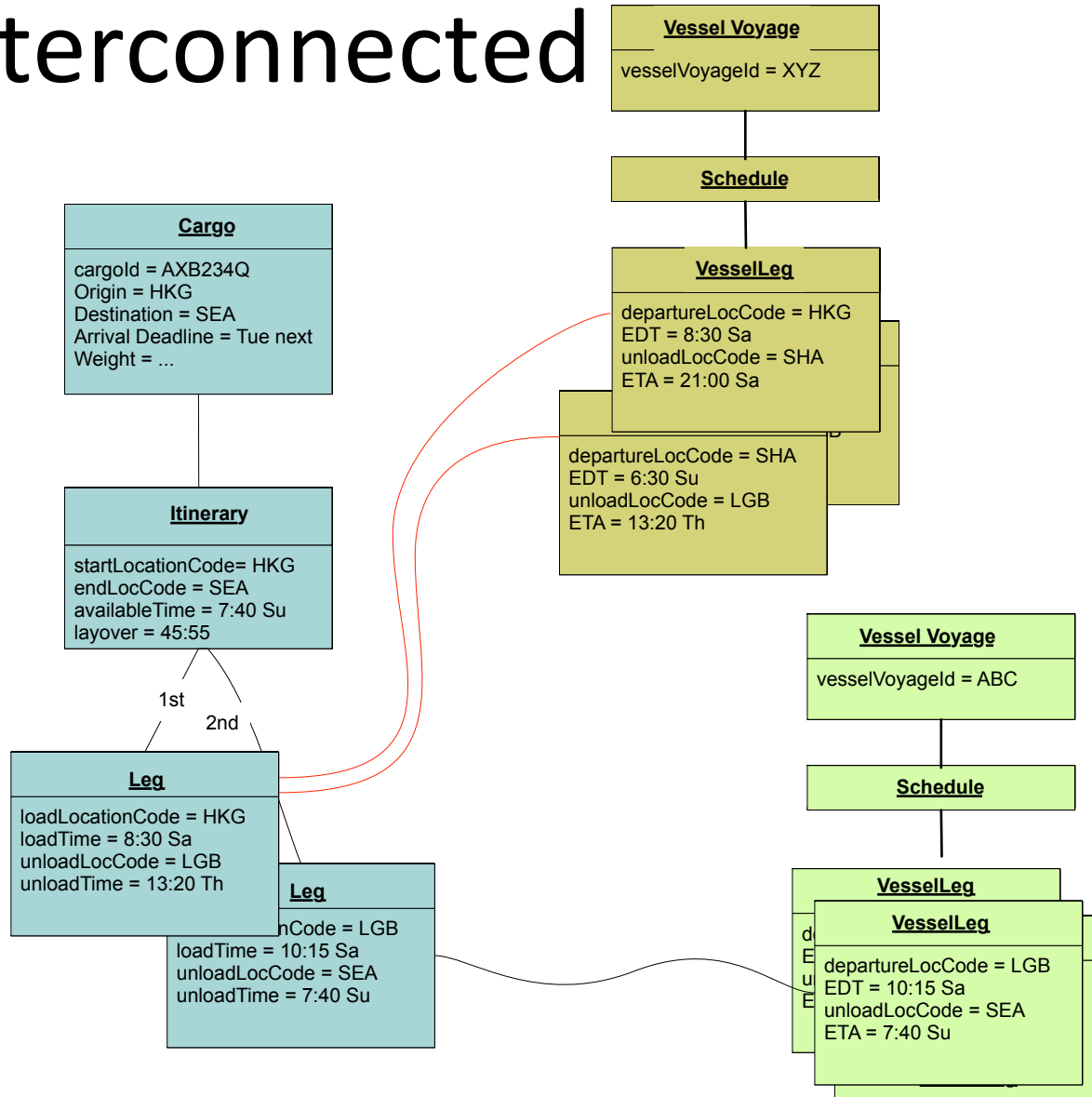
3:00 Sa – 10:15 Sa

Elapsed: 45:55

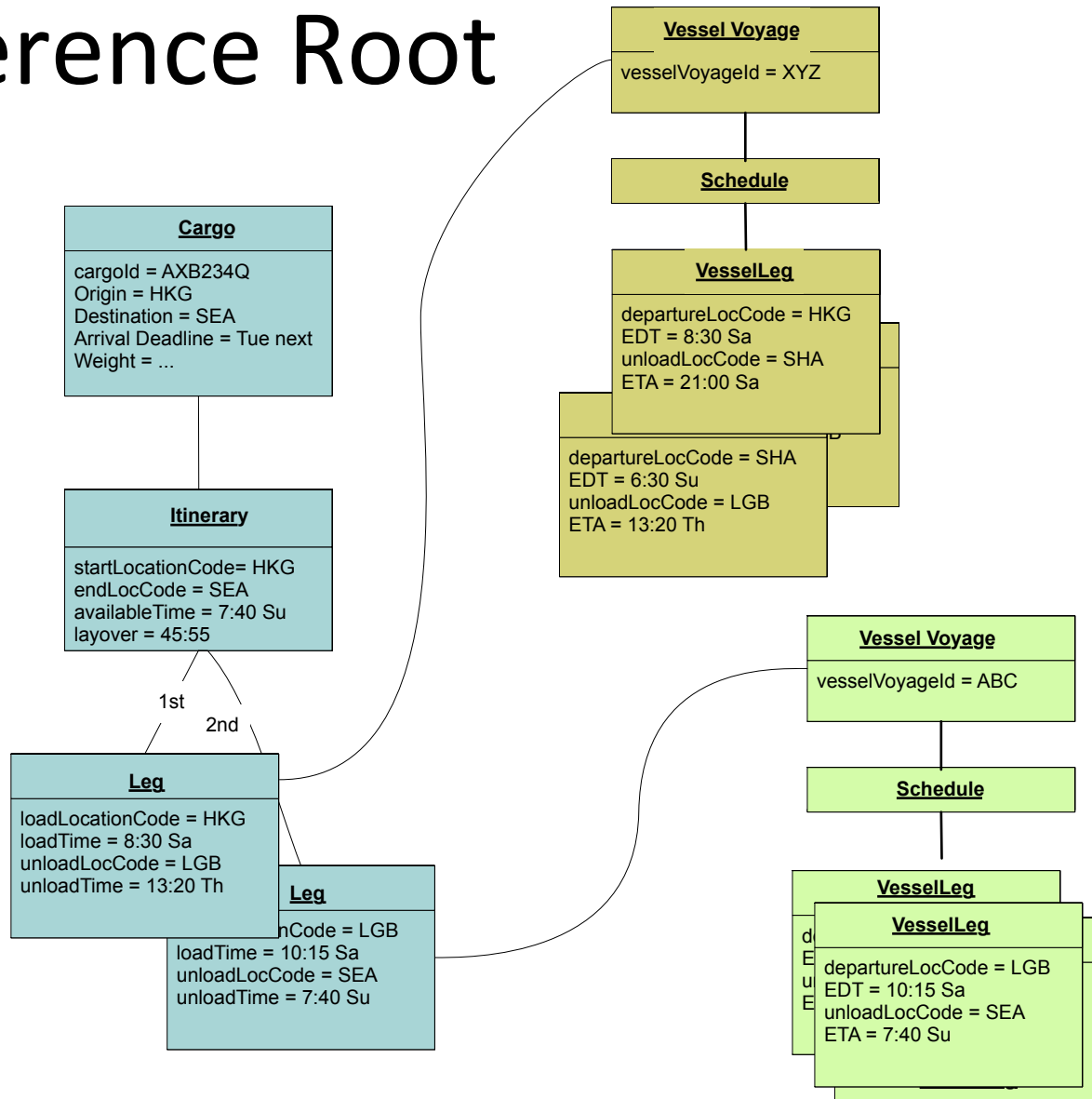




Too Interconnected



Reference Root



Allowed State

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Itinerary HKG-SEA

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13:20 Th – 10:15 Sa

Elapsed: 45:55

A While Later

Voyage Schedule for XYZ

- ETD HKG 08:30 Sa
- ETA SHA 21:00 Sa
- ETD SHA 06:30 Su
- ETA LGB ~~13:20 Th~~ 3:00 Sa (next)
- ...

Voyage Schedule for ABC

- ETD SNG 14:15 Tu
- ETA LGB 22:05 Fr
- ETD LGB 10:15 Sa (next)
- ETA SEA 07:40 Su (next)

Itinerary HKG-SEA

- HKG-LGB on XYZ
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Estimated Layover in LGB:

3:00 Sa – 10:15 Sa

Elapsed: ~~45:55~~ 7:15

A few seconds (or hours) later

Voyage Schedule for XYZ

- ETD HKG 08:30 Mo
- ETA LGB ~~13:20 Th~~ 03:00 Sa
- ...

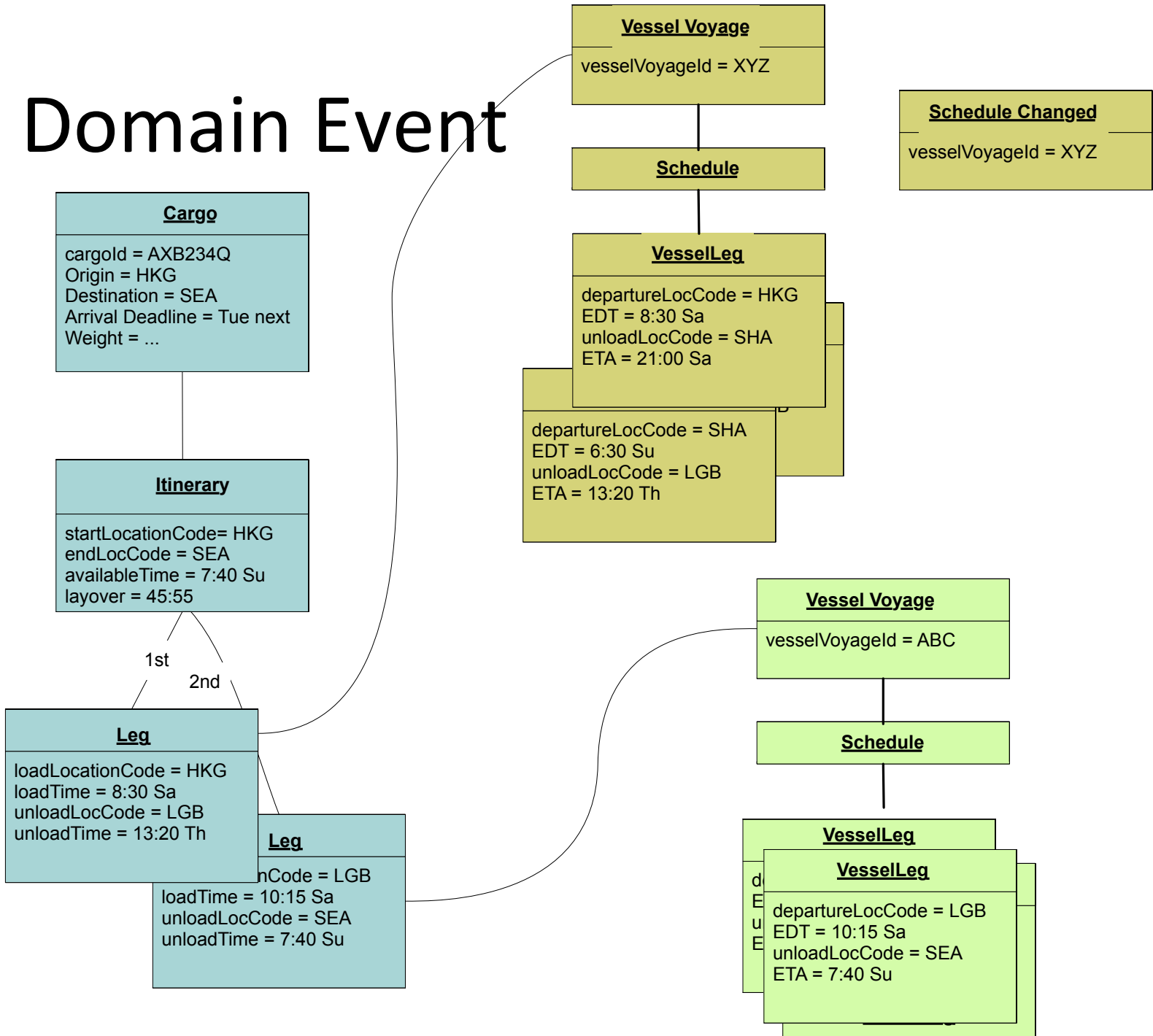
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Domain Event



Bounded Context

- Aggregates are part of the model
- Data inconsistency within a context with *model consistency*
- Strict assertions about what's consistent when

Fewer Assumptions

Cargo

cargoid = AXB234Q
 Origin = HKG
 Destination = SEA
 Arrival Deadline = Tue next
 Weight = ...

Itinerary

startLocationCode= HKG
 endLocCode = SEA
 availableTime = 7:40 Su
 layover = 45:55

Leg

loadLocationCode = HKG
 loadTime = 8:30 Sa
 unloadLocCode = LGB
 unloadTime = 13:20 Th

1st

2nd

Leg

loadTime = 10:15 Sa
 unloadLocCode = SEA
 unloadTime = 7:40 Su

Vessel Voyage

vesselVoyageld = XYZ

Schedule

VesselLeg

departureLocCode = HKG
 EDT = 8:30 Sa
 unloadLocCode = SHA
 ETA = 21:00 Sa

VesselLeg

departureLocCode = SHA
 EDT = 6:30 Su
 unloadLocCode = LGB
 ETA = 13:20 Th

Schedule Changed

vesselVoyageld = XYZ

Vessel Voyage

vesselVoyageld = ABC

Schedule

VesselLeg

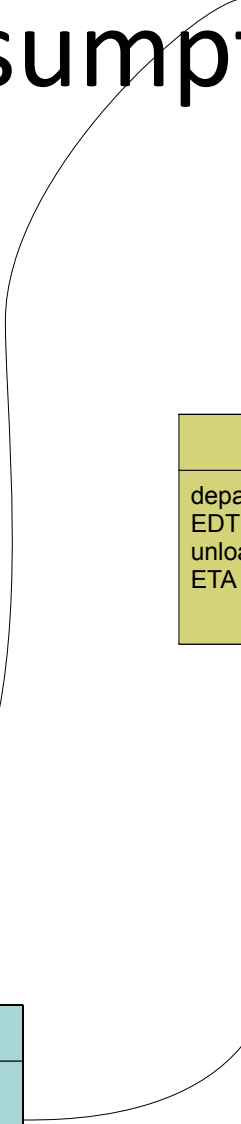
VesselLeg

departureLocCode = LGB
 EDT = 10:15 Sa
 unloadLocCode = SEA
 ETA = 7:40 Su

Schedule Changed

vesselVoyageld = ABC

Anticorruption Layer



Main Points

- Aggregates model domain knowledge about logic coupling and update patterns.
- Domain Events represent what happened in domain, giving meaning to state change.
- Context boundaries mark where a model allows strong assertions.

- Eric Evans
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- Twitter: [ericevans0](https://twitter.com/ericevans0) #ddd design