

Saga transactions

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@narayana

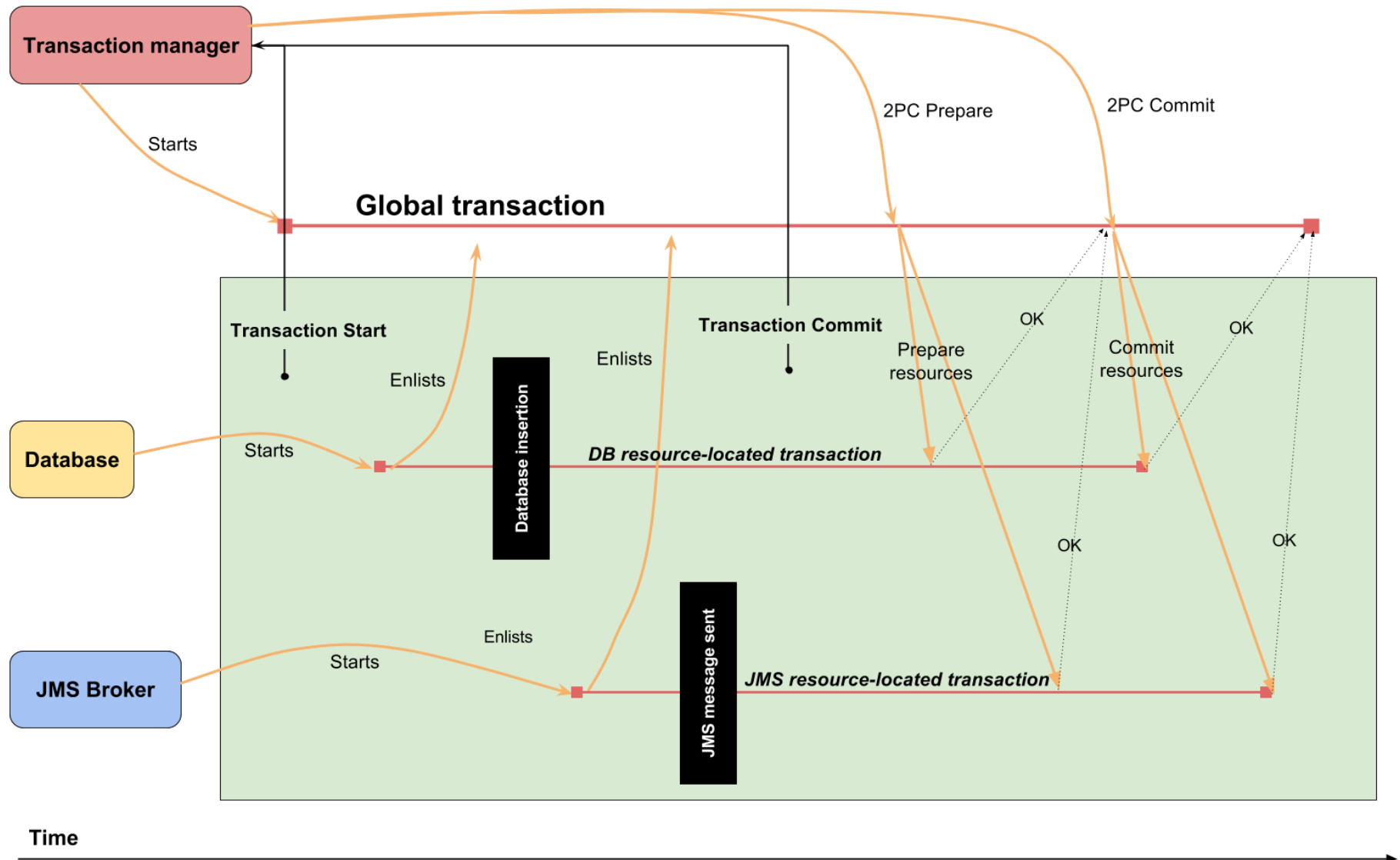
Saga (transactions)



An ACID transaction

- One logical unit of work
 - everything or nothing happens
 - usually in regards of a data manipulation
- Protecting shared resources from multiple users
- ACID properties guaranteed

Distributed transaction: 2PC



ACID transactions: assuming

- closely coupled environment
 - harder to scale
 - tight data coupling
- short duration
 - locking reduces parallelism

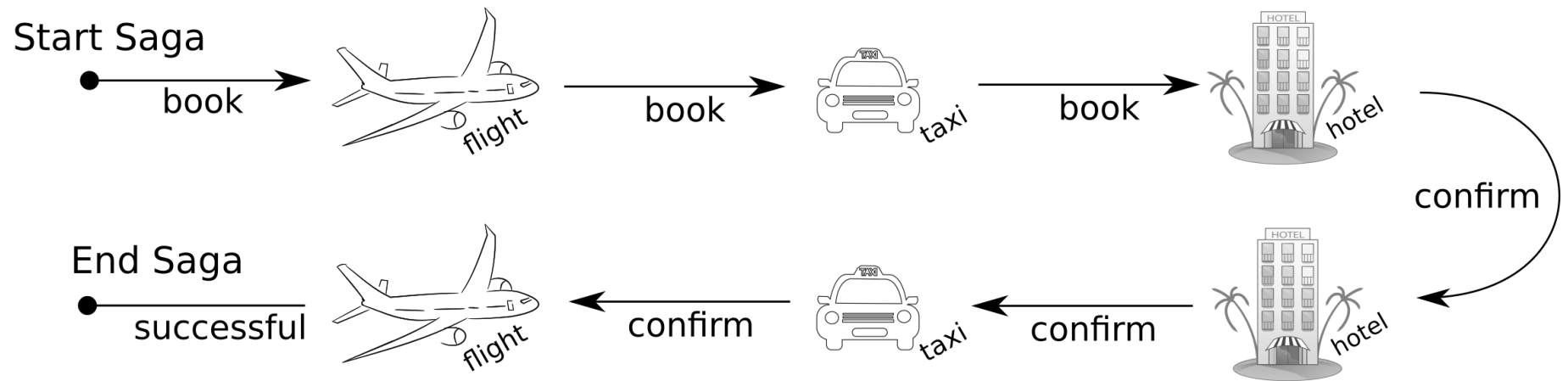
Microservice architecture: expecting

- loosely coupling
- scaling
- long duration for transaction

Sagas

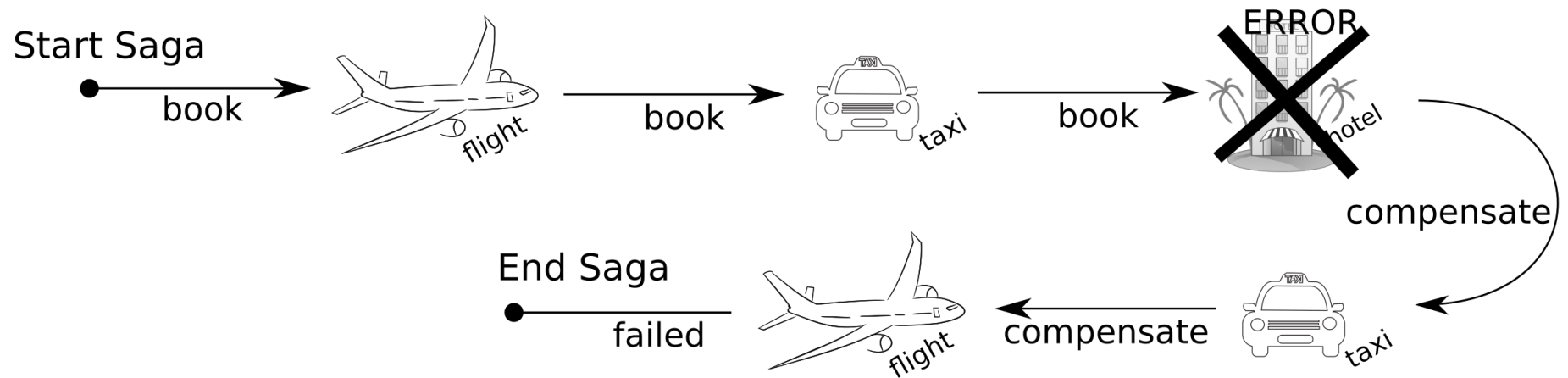
- Relaxing ACID properties
- Eventual consistency
- Saga paper (H. Garcia-Molina, K. Salem; 1987)

Sagas (2)



- consists of a sequence of autonomous operations, each immediately visible to outer world
- responsibility of failures handling to developer (handlers)
- transaction manager is responsible for calling handlers

Sagas (3)



- compensation handler defined by developer, called by transaction manager

Narayana LRA

```
@Inject
private AlohaService alohaService;

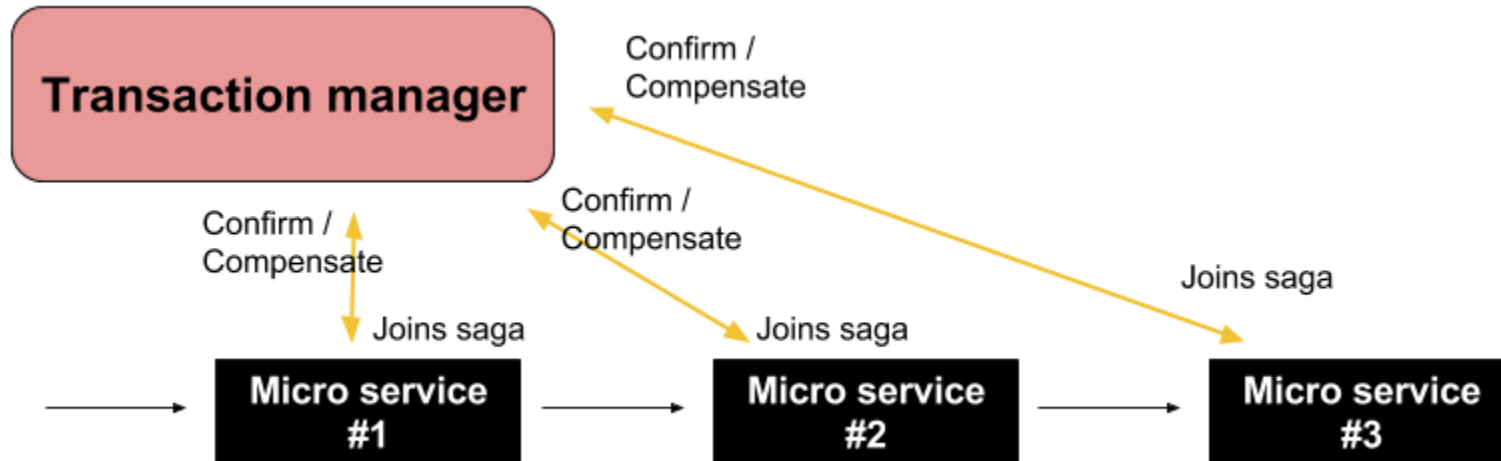
@Inject
private LRAClientAPI lraClient;

@GET
@Path("/hello")
@LRA(value = LRA.Type.REQUIRED)
public List<String> hello() {
    alohaService.aloha(lraClient.getCurrent())
}

@POST
@PUT("/complete")
@Complete
public Response completeWork(@HeaderParam(LRAClient.LRA_HTTP_HEADER) String lraId) {
    String txId = LRAClient.getLRAId(lraId);
    System.out.printf("ActivityController completing %s\n", txId);
    return Response.ok().build();
}

@POST
@Path("/compensate")
@Compensate
public Response compensateWork(@HeaderParam(LRAClient.LRA_HTTP_HEADER) String lraId) {
    String txId = LRAClient.getLRAId(lraId);
    System.out.printf("ActivityController compensating %s\n", txId);
    return Response.ok().build();
}
```

Narayana LRA



- LRA: Long Running Actions
- transaction context over REST



- Java EE stack for microservices
- LRA specification proposal, <https://github.com/jbosstm/microprofile-sandbox>
- Microprofile Google group, <http://bit.ly/transactions-microprofile>

