single operation,
compensation

```
   client          conductor        participant         service
     │                 │                 │                 │
     │ start atomic group()             │                 │
     ├────────────────►│                 │                 │
     │          app msg()                │                 │
     ├──────────────────────────────────────────────────►│
     │                 │    ENROLL()     │                 │
     │                 │◄────────────────┤            ┌────────┐
     │                 │                 │            │Do stuff│
     │                 │                 │            └────────┘
     │                 │                 │         ┌──────────────────────┐
     │                 │                 │         │Store reverse operation│
     │          app reply()             │         └──────────────────────┘
     │◄─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┤
     │   complete()    │                 │                 │
     ├────────────────►│                 │                 │
     │                 │   PREPARE()     │                 │
     │                 ├────────────────►│                 │
     │                 │    VOTE()       │                 │
     │                 │◄────────────────┤                 │
     │      vote()     │                 │                 │
     │◄─ ─ ─ ─ ─ ─ ─ ─ ┤                 │                 │
     │   confirm()     │                 │                 │
     ├────────────────►│                 │                 │
     │                 │   CONFIRM()     │                 │
     │                 ├────────────────►│                 │
     │                 │                 │    confirm()    │
     │                 │                 ├────────────────►│
     │                 │                 │         ┌──────────────────────┐
     │                 │                 │         │Discard reverse operation│
     │                 │                 │         └──────────────────────┘
     │                 │                 │     done()      │
     │                 │                 │◄─ ─ ─ ─ ─ ─ ─ ─ ┤
     │                 │  CONFIRMED()    │                 │
     │                 │◄────────────────┤                 │
     │     done()      │                 │                 │
     │◄─ ─ ─ ─ ─ ─ ─ ─ ┤                 │                 │
     │                 │                 │                 │
```
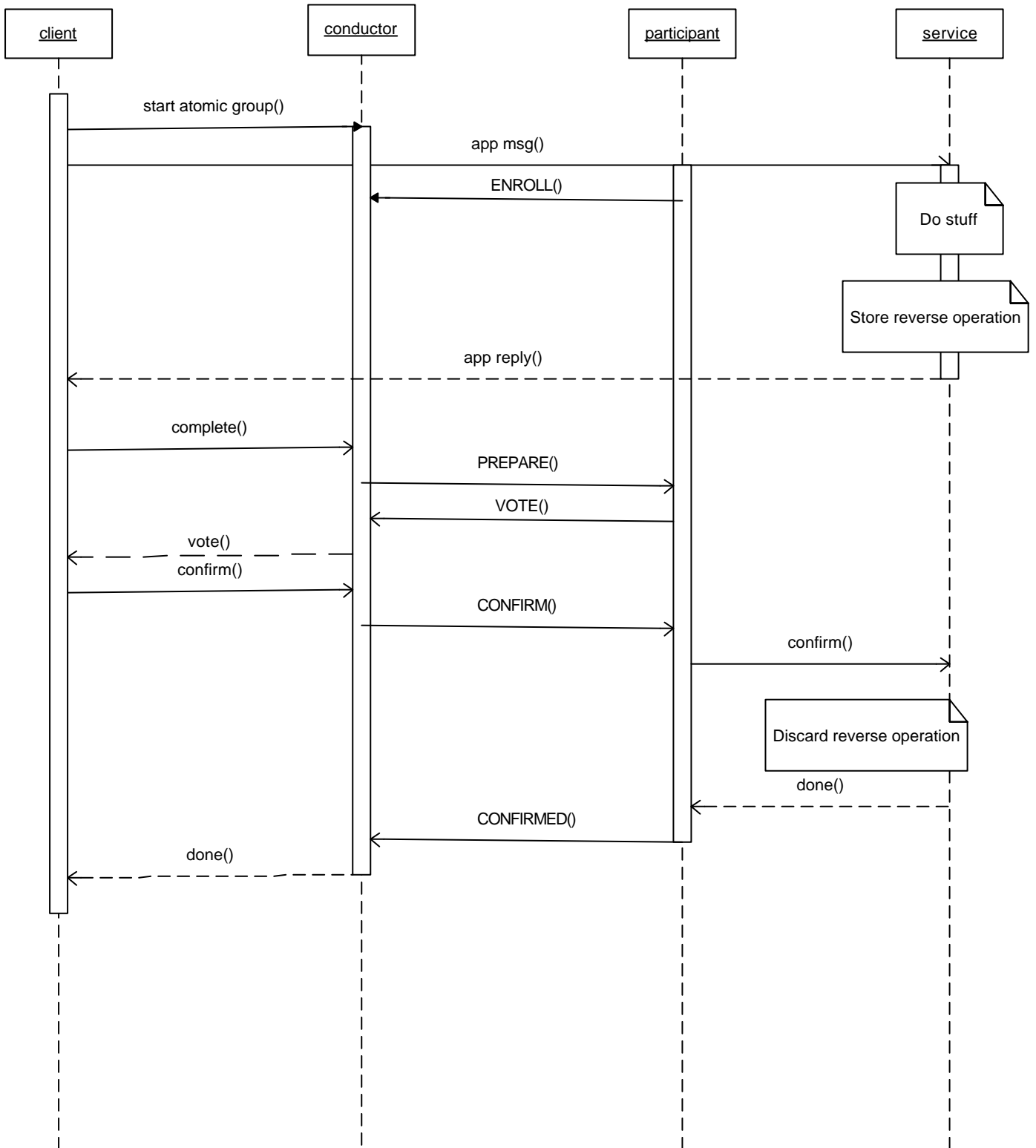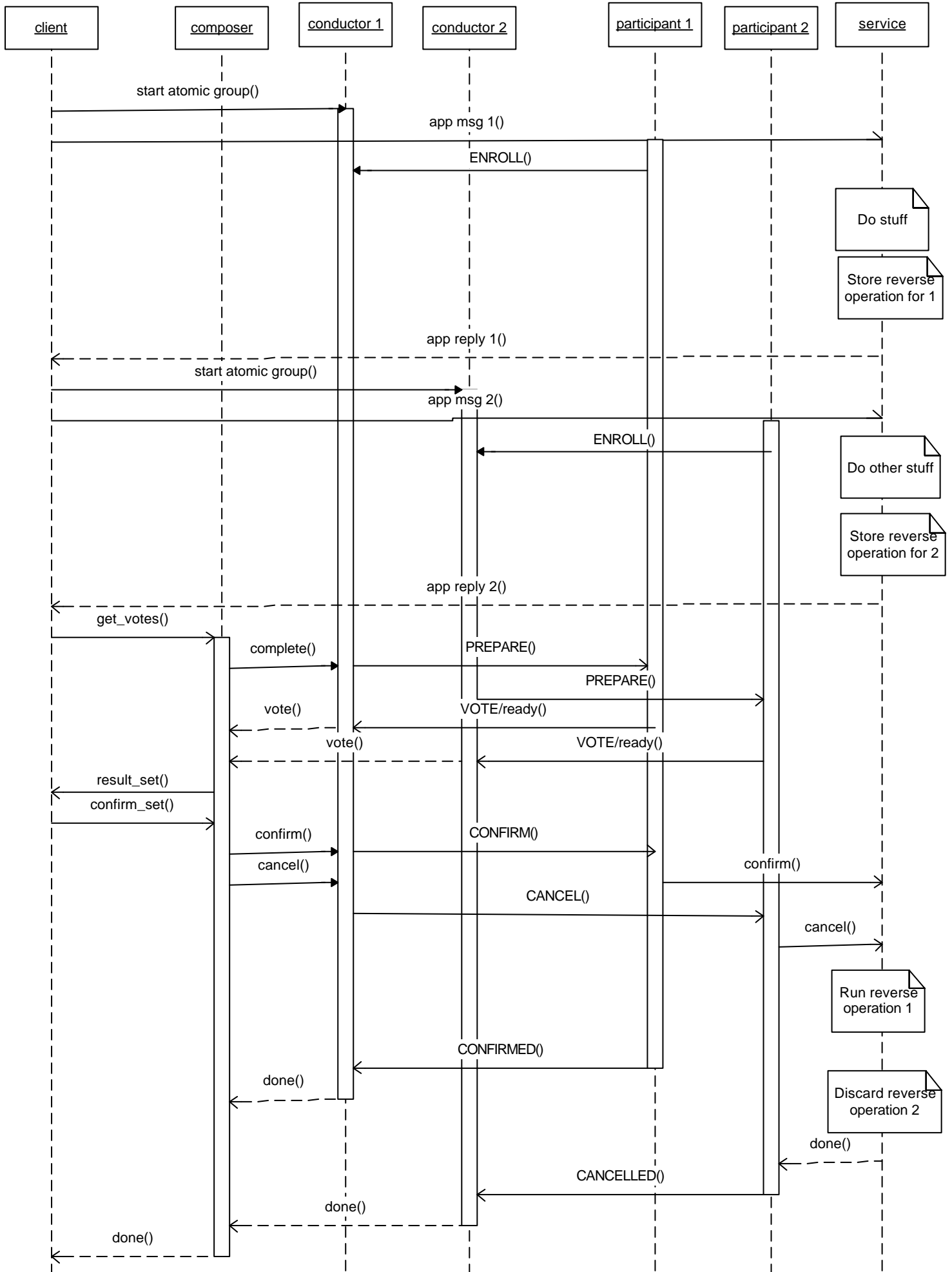
single operation,
cancelled

client	conductor	participant	service

start atomic group()

app msg()

join()

ENROLL()

Do stuff

Store reverse operation

app reply()

complete()

PREPARE()

VOTE/ready()

vote()

Application decides to cancel

cancel()

CANCEL()

cancel()

Run reverse operation

done()
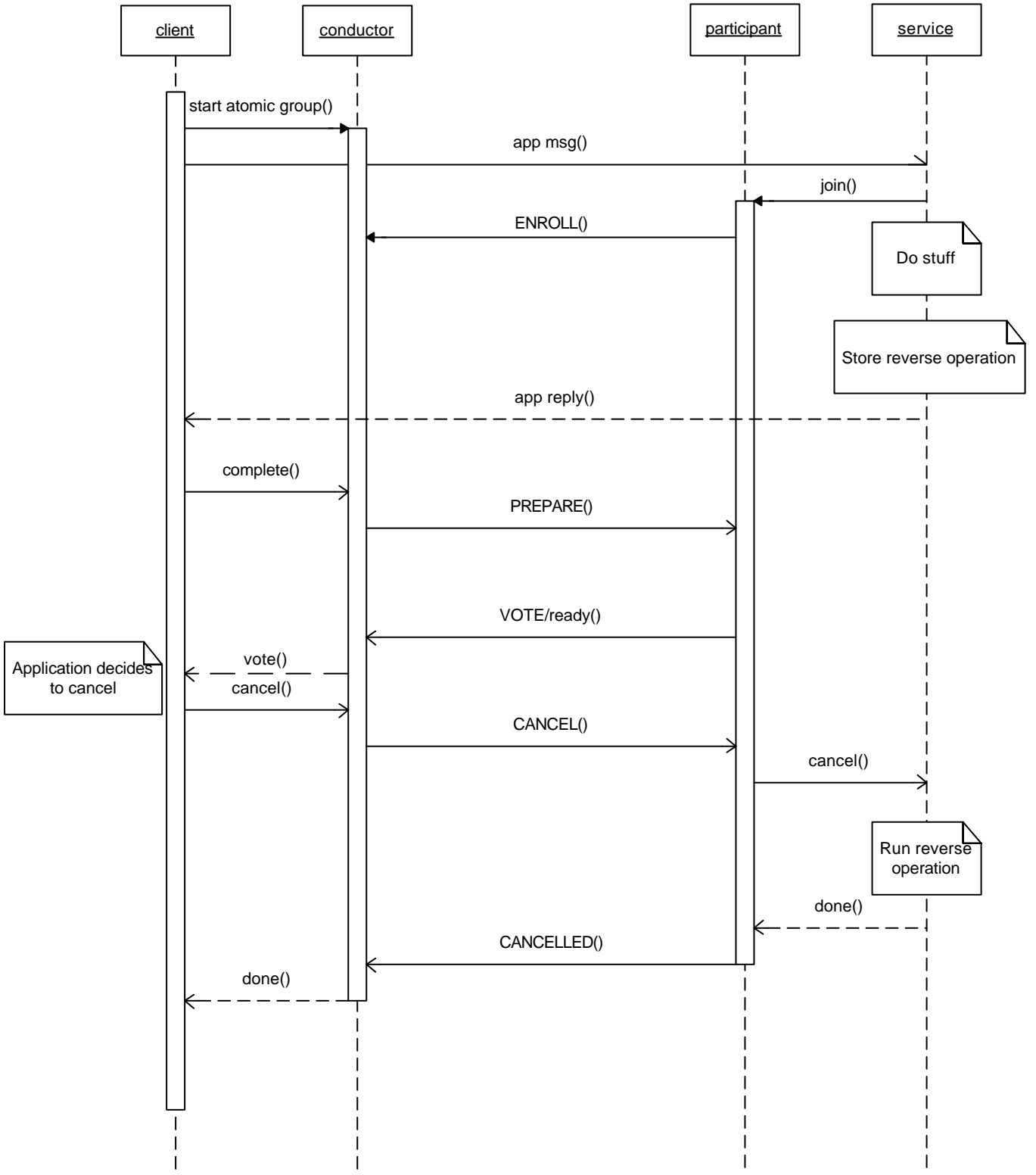
CANCELLED()

done()

single operation, XA resource

client	conductor	participant	service	XA resource

start atomic group()

app msg()

ENROLL()

xa_start()

Do stuff

Apply locks
make updates

xa_end()

app reply()

complete()

PREPARE()

xa_prepare()

XA_OK()

VOTE/ready()

vote()

confirm()

CONFIRM()

xa_commit()

Release locks

XA_OK()
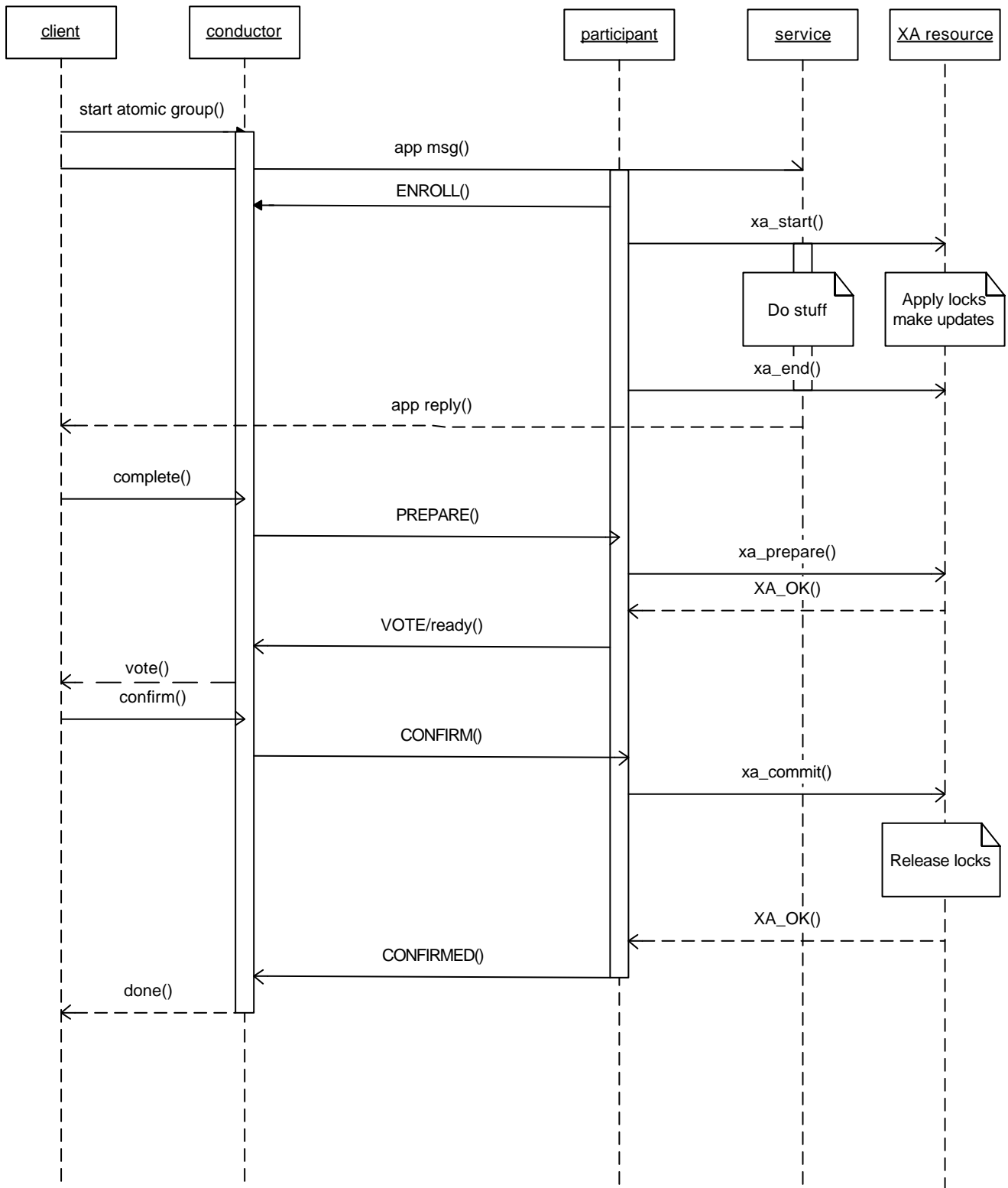
CONFIRMED()

done()

two groups at one service- one confirmed, one cancelled

client	composer	conductor 1	conductor 2	participant 1	participant 2	service

start atomic group()

app msg 1()

ENROLL()

Do stuff

Store reverse operation for 1

app reply 1()

start atomic group()

app msg 2()

ENROLL()

Do other stuff

Store reverse operation for 2

app reply 2()

get_votes()

complete()

PREPARE()

PREPARE()

vote()

VOTE/ready()

vote()

VOTE/ready()

result_set()

confirm_set()

confirm()

CONFIRM()

cancel()

confirm()

CANCEL()

cancel()

Run reverse operation 1

CONFIRMED()

done()

Discard reverse operation 2

done()

CANCELLED()

done()

done()

single operation, early
prepare and vote

client	conductor	participant	service

start atomic group()

app msg()

PREPARE()

ENROLL()

Do stuff

Store reverse operation

app reply()

VOTE/ready()

complete()

vote()

confirm()

CONFIRM()

confirm()

Discard reverse operation

done()

CONFIRMED()

done()
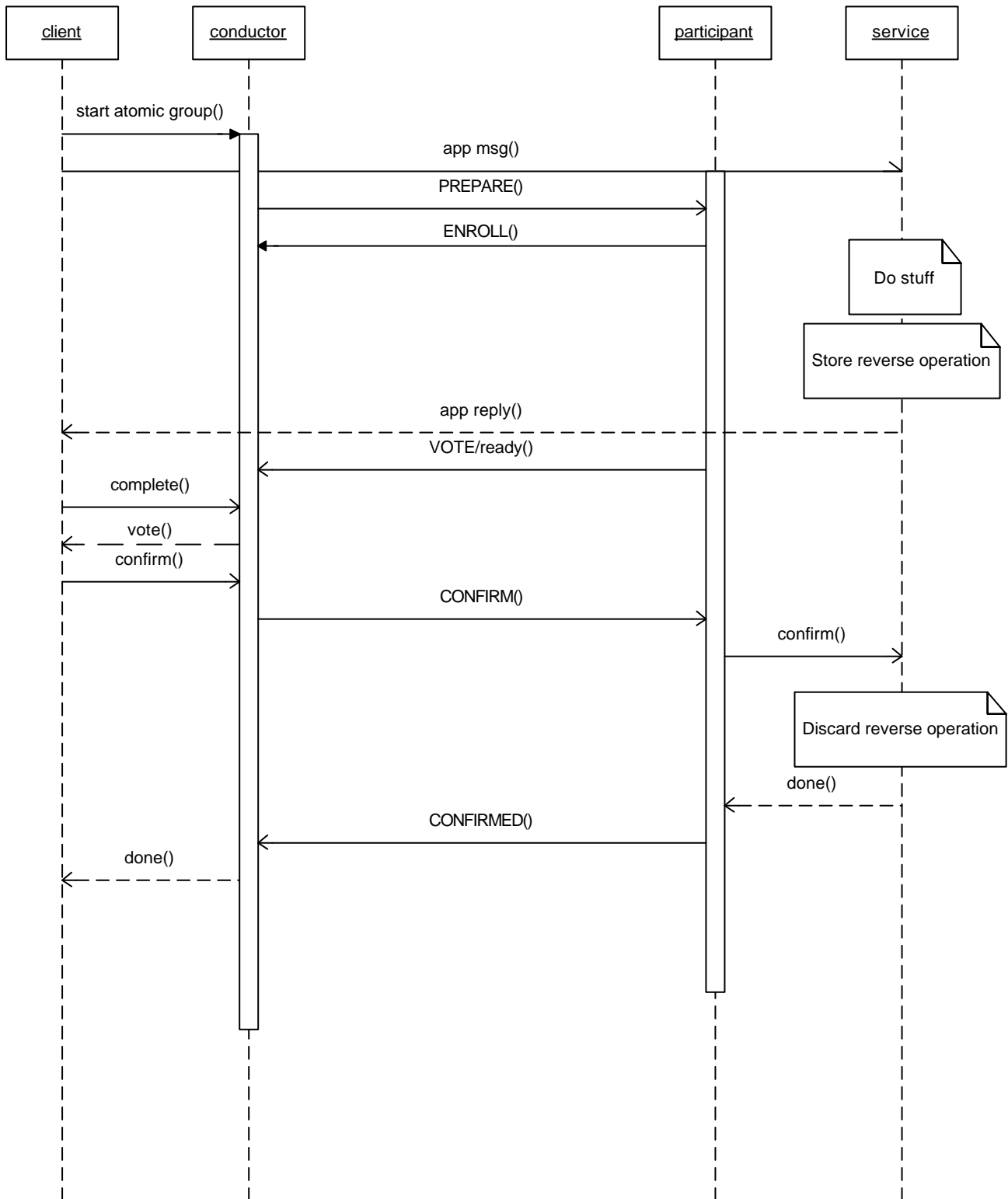
one group, two operations

client	conductor	participant	service

start atomic group()

app msg()

ENROLL()

Do stuff

Store reverse operation

app reply()

app msg()

Do more stuff

Store/update reverse operation

app reply()

complete()

PREPARE()

VOTE/ready()

vote()

confirm()

CONFIRM()

confirm()

Discard reverse operation

done()

CONFIRMED()

done()