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# Implementing all-or-nothing atomicity

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april 2007



# Xfer

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- `xfer(A, B, amt)`

```
A <- A - amt;
```

```
B <- B + amt;
```



# recovery

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start at the top:

- while more records

  - if commit add t to committed list

  - if change and t not in committed list, undo

start at the bottom:

- while more records

  - if change and t in committed list, redo



# Scenario

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<begin 17>



# Scenario

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<begin 17>

<begin 18>



# Scenario

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<begin 17>

<begin 18>

<change 18 F 4500 5300>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>





# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>

<change 19 F 4500 5000>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>

<change 19 F 4500 5000>

<outcome 19 commit>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>

<change 19 F 4500 5000>

<outcome 19 commit>

<change 17 F 5000 4000>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>

<change 19 F 4500 5000>

<outcome 19 commit>

<change 17 F 5000 4000>

<change 17 B 7500 8500>



# Scenario

---

<begin 17>

<begin 18>

<change 18 F 4500 5300>

<outcome 18 abort>

<begin 19>

<change 19 F 4500 5000>

<outcome 19 commit>

<change 17 F 5000 4000>

<change 17 B 7500 8500>

<outcome 17 commit>