PostgreSQL Pitfalls

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What's a "Pitfall"?

- Unintuitive
- Frequently misused or misunderstood
- Not necessarily "wrong"
- Might even be required by SQL standard

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NOT IN (...)

- `SELECT * FROM foo WHERE x NOT IN (SELECT y FROM bar);`
- Works great during testing.

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NOT IN (...) Pitfall

- `SELECT * FROM foo WHERE x NOT IN (SELECT y FROM bar);`
- Works great during testing.
- As soon as you put a NULL into "bar", query never returns any results at all!
  - IN uses SQL 3-valued logic
  - Predicate evaluates to FALSE or NULL

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Interval Math

- Add/subtract interval from timestamp
  - `SELECT * FROM order WHERE ts > (now() - '1 day'::interval');`
- Multiply interval by a scalar
  - `SELECT x * '1 second'::interval + now() FROM foo;`
- Wow, that's easy!

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Interval Math Pitfall 1

Additive inverse doesn't work:

```
SELECT
    '2009-03-31'::timestamp
  - '1 month'::interval
  + '1 month'::interval
 <> '2009-03-31'::timestamp
```

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Interval Math Pitfall 2

- Commutativity is lost:

```
select '2009-02-28'::timestamp +
        '1 month'::interval +
        '1 day'::interval
  <>
        '2009-02-28'::timestamp +
        '1 day'::interval +
        '1 month'::interval;
```

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Interval Math Pitfall 3

- Scalar multiplication is not the same as repeated addition:

```
select
 '2009-01-31'::timestamp +
 '2 month'::interval
<>
 '2009-01-31'::timestamp +
 '1 month'::interval +
 '1 month'::interval;
```
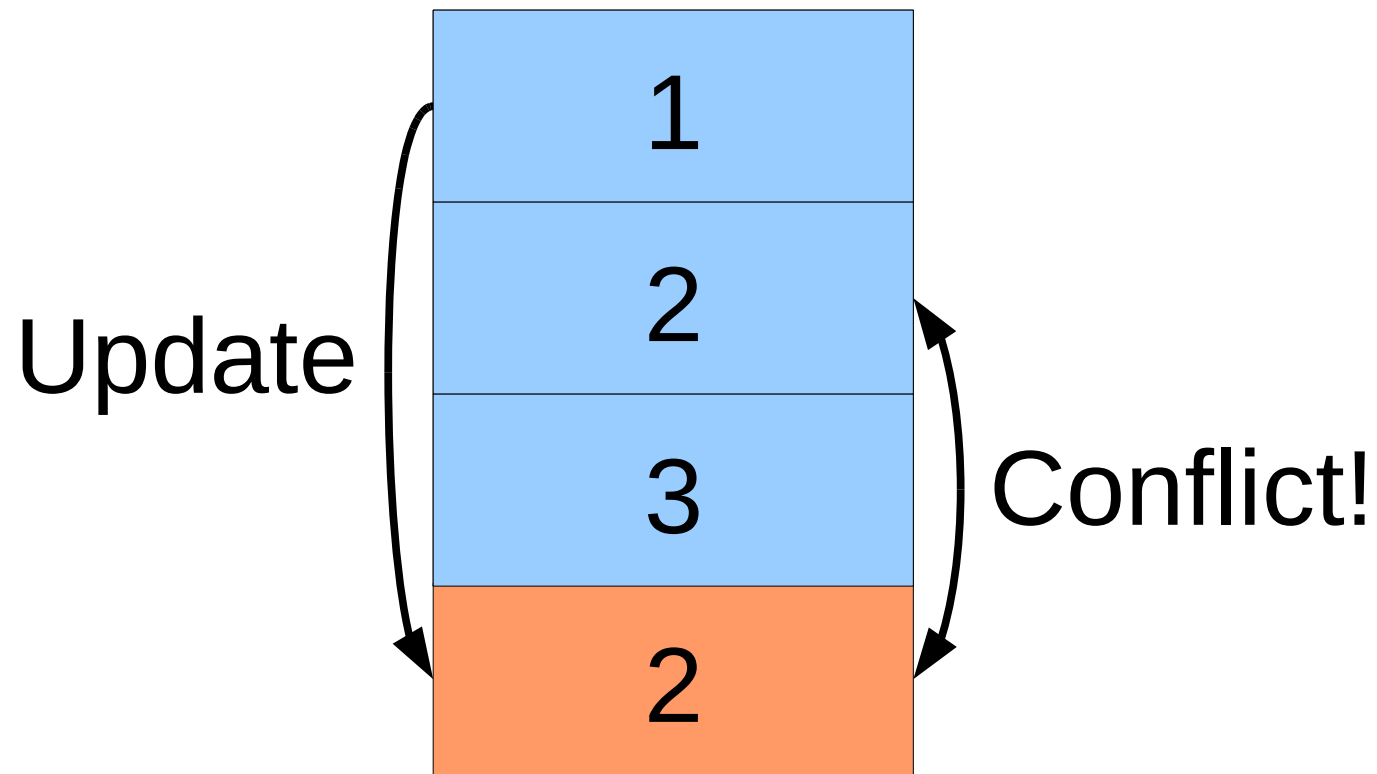
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UNIQUE

```
 CREATE TABLE t(i INT UNIQUE);
INSERT INTO t VALUES(1);
INSERT INTO t VALUES(2);
INSERT INTO t VALUES(3);
```

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UNIQUE Pitfall

```
UPDATE t SET i = i + 1;
```

- ERROR!
  - Finds duplicate key and raises error before command is finished.

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UNIQUE Pitfall (cont.)

Snapshots

```
CREATE TABLE foo(b BOOLEAN);
INSERT INTO foo VALUES(TRUE);
INSERT INTO foo VALUES(FALSE);
```

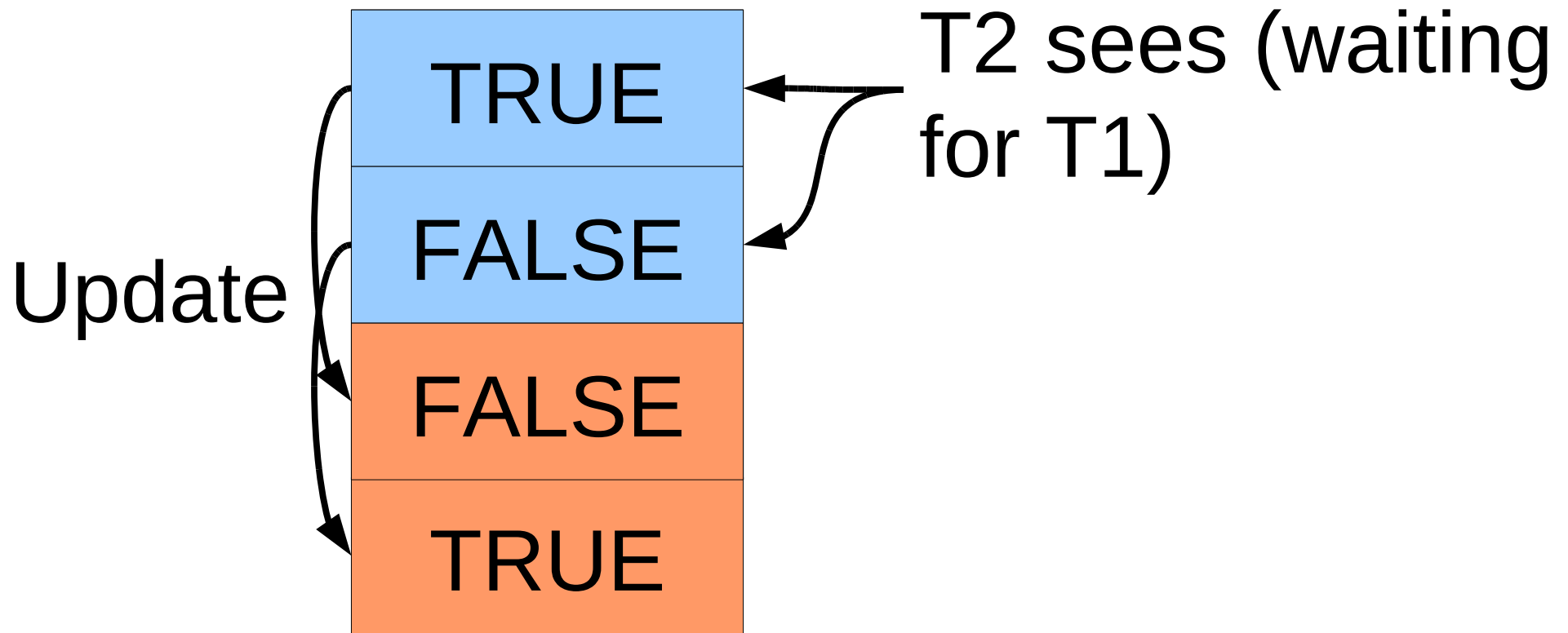**TRUVISO**

Snapshots Pitfall
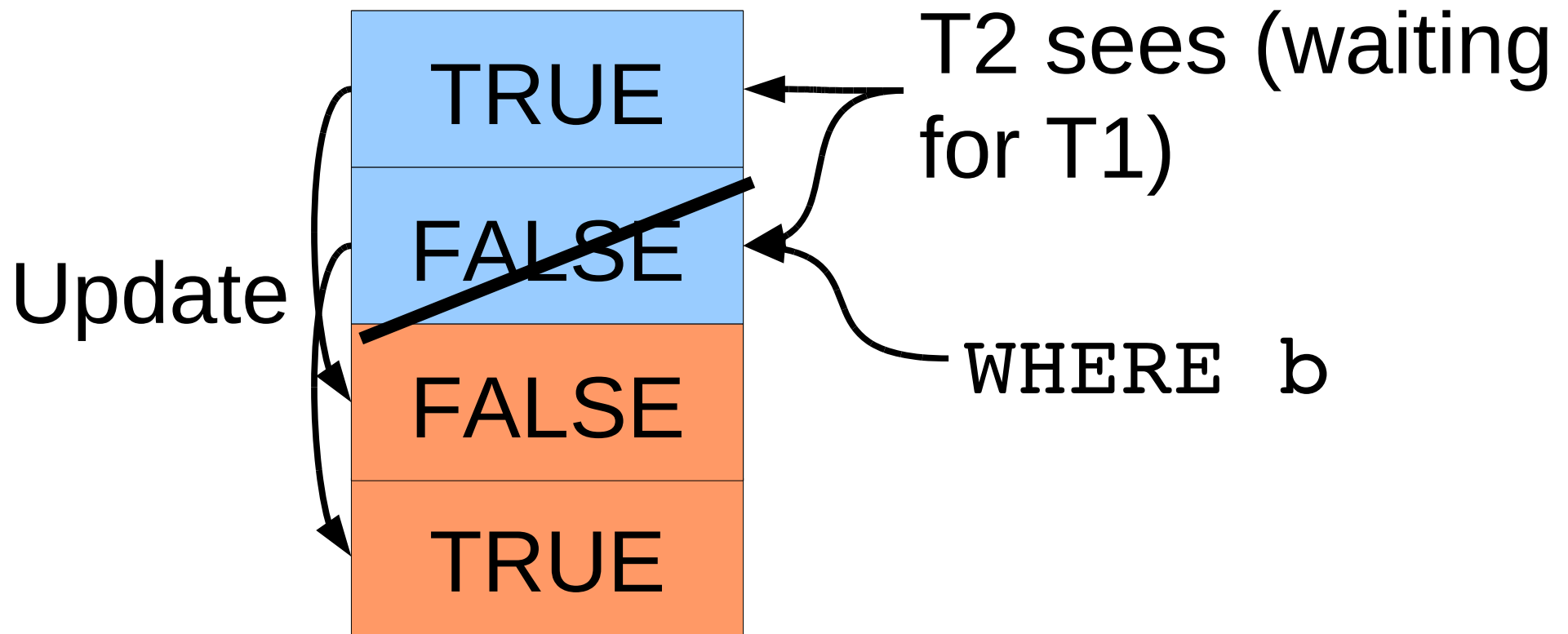
- Transaction 1:
```
BEGIN;
UPDATE foo SET
  b = NOT b;



COMMIT;
```

- Transaction 2:

```
SELECT * FROM
  foo WHERE b
  FOR SHARE;
```

Returns Nothing!
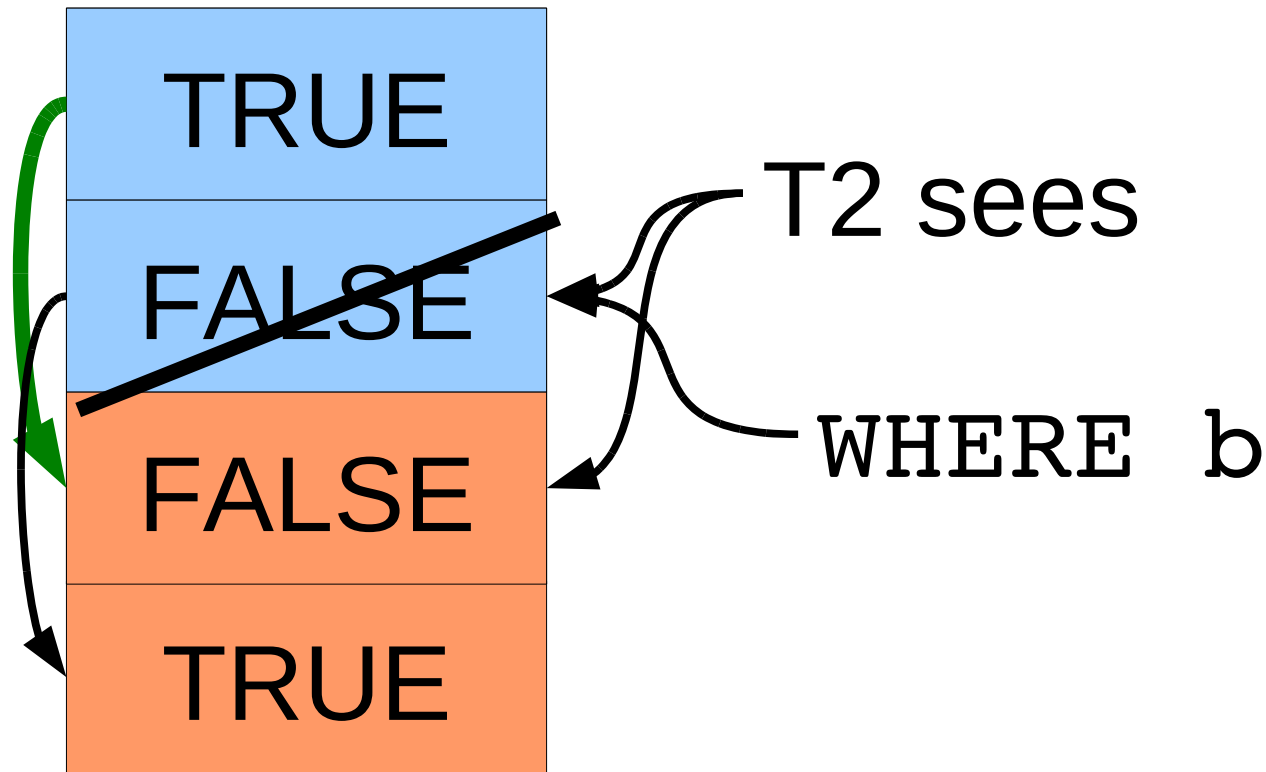
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Snapshots Pitfall (cont.)

TRUE

FALSE

FALSE

TRUE

Update

T2 sees (waiting for T1)

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TRUE

FALSE

FALSE

TRUE

Update

T2 sees (waiting for T1)

`WHERE b`

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After T1 commit, follow update chain.

TRUE
FALSE
FALSE
TRUE

T2 sees

`WHERE  b`

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Snapshots Pitfall (cont.)
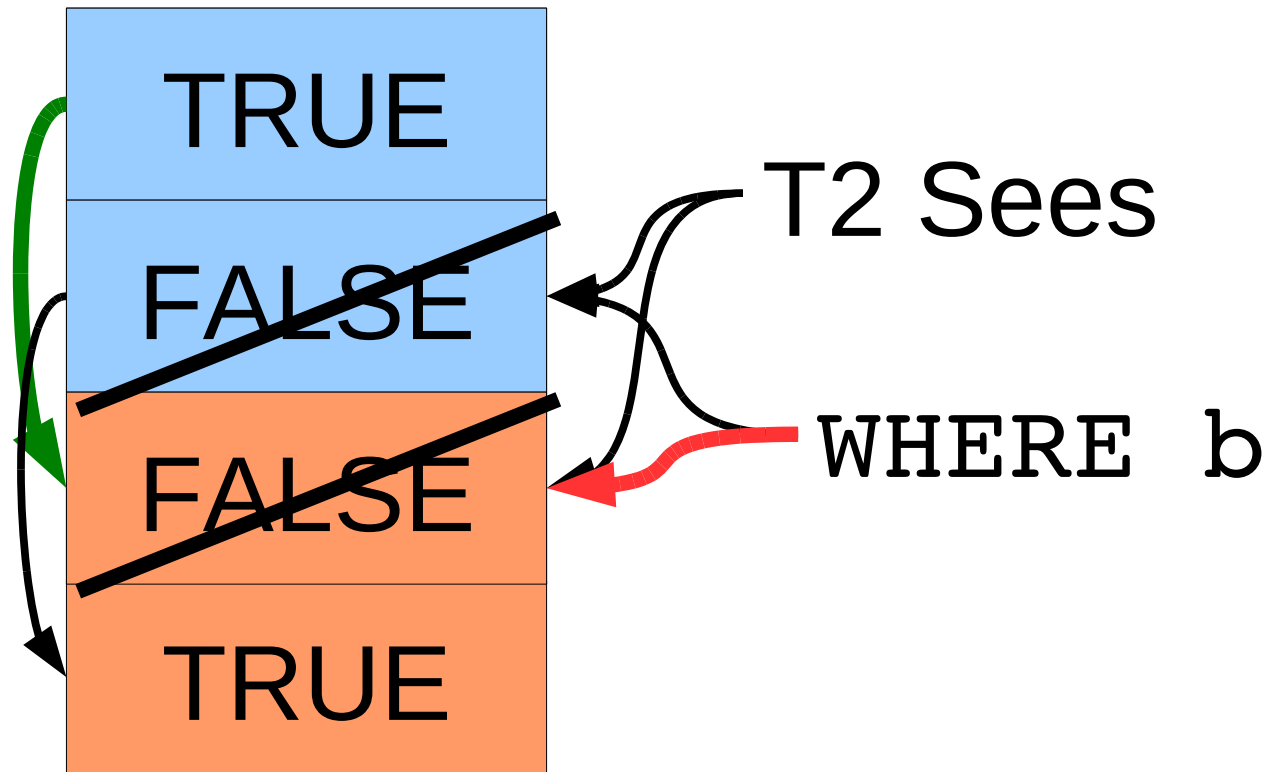
Good News!

Deferrable UNIQUE check patch submitted by Dean Rasheed

- July Commitfest
- commitfest.postgresql.org

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Conclusion

- PostgreSQL isn't perfect
- SQL isn't perfect
- Even if they were, these complex behaviors are tricky
  - E.g. Interval math
- Where improvements can be made, solutions are appearing very quickly

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