

你所不知道的MySQL S Lock

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PostgreSQL是没有前途的



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MySQL S Lock（共享锁）

- X Lock

-- 转账操作

```
BEGIN;  
SELECT * FROM User WHERE userId = ? FOR UPDATE;  
...  
COMMIT;
```

-- 库存操作

```
BEGIN;  
SELECT * FROM Stock WHERE skuId = ? FOR UPDATE;  
...  
COMMIT;
```

思考题：什么场景下你会使用到 LOCK IN SHARE MODE？？？

唯一冲突检测

- 普通索引怎么保证插入数据没有重复值？？？

```
SET tx_isolation = 'REPEATABLE-READ';  
BEGIN;  
SELECT * FROM xyz WHERE key = ? LOCK IN SHARE MODE;  
IF found_rows() == 0 THEN  
INSERT INTO xyz (...) values (... ,?, ....);  
END IF;  
COMMIT;
```

1. 事务隔离级别：Repeatable Read
2. S LOCK 保证唯一性

唯一冲突检测



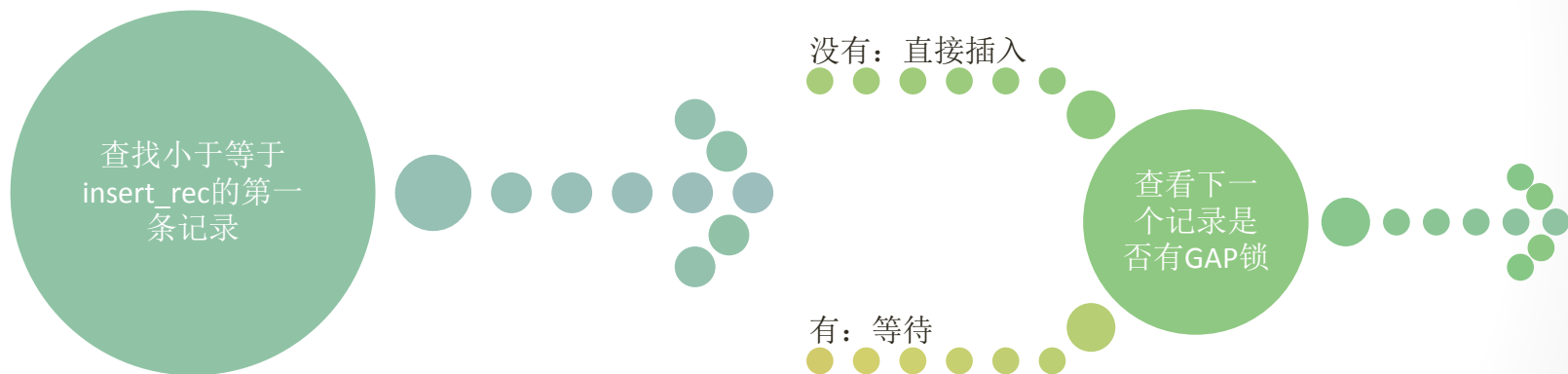
INSERT 5



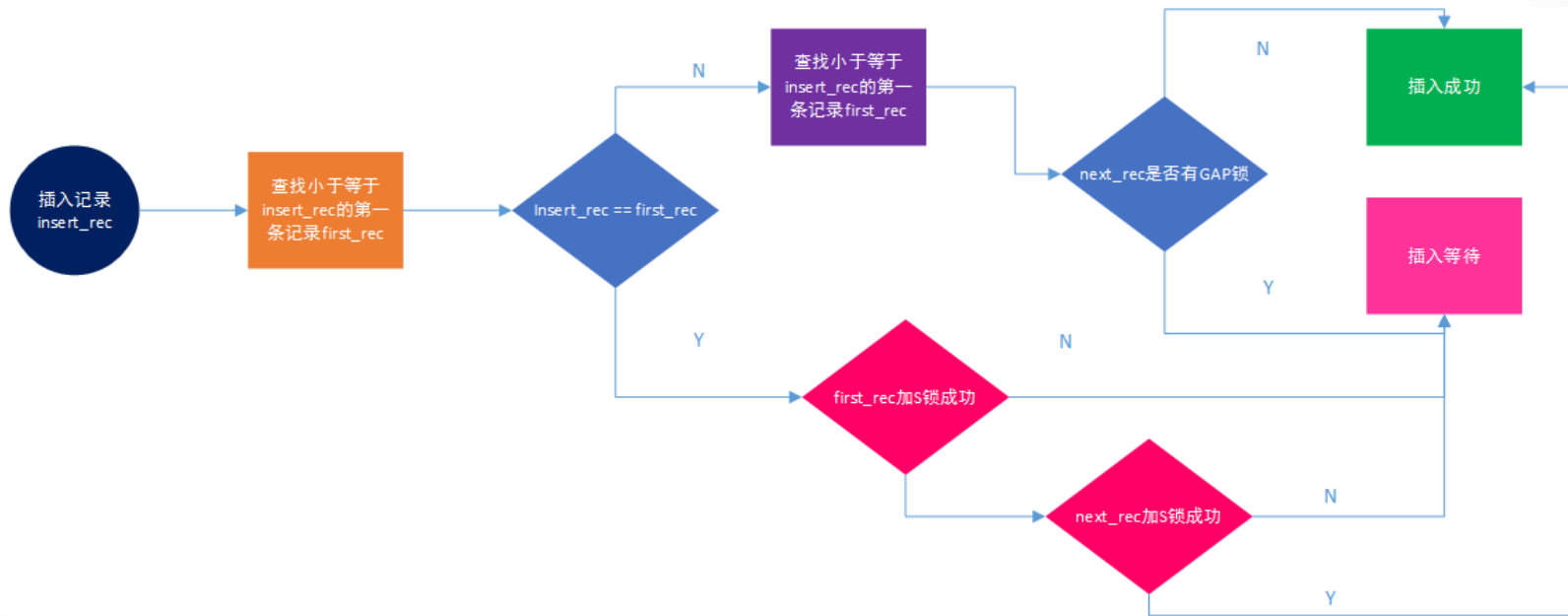
SELECT * FROM xxx WHERE KEY = 5
LOCK IN SHARE MODE
=> 6 S Next Key Lock



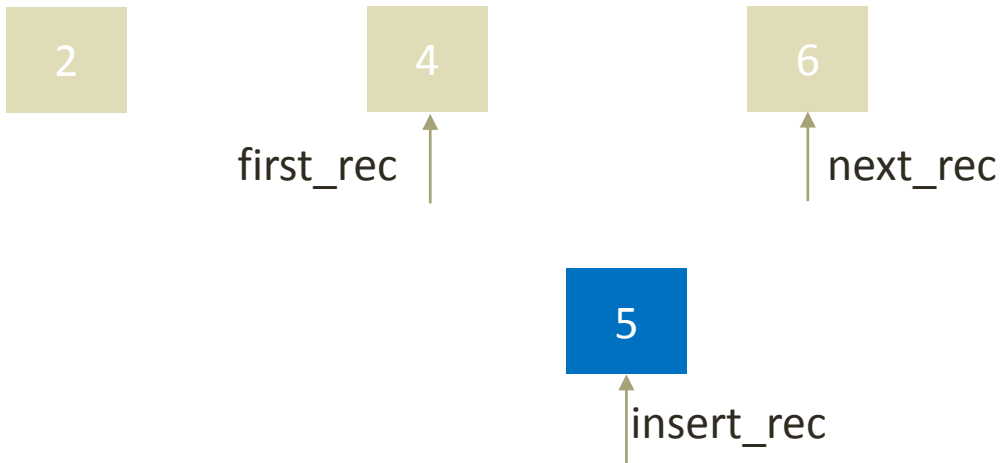
普通索引插入过程



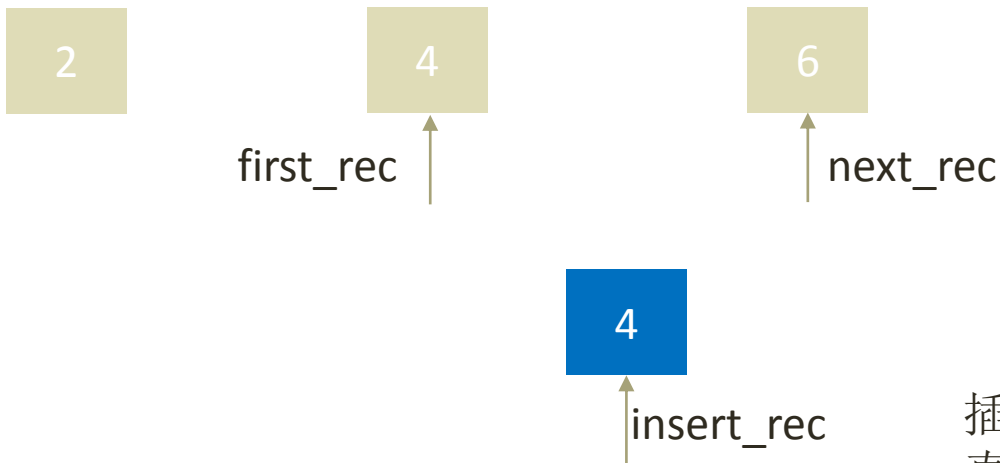
唯一索引插入过程



唯一索引插入过程

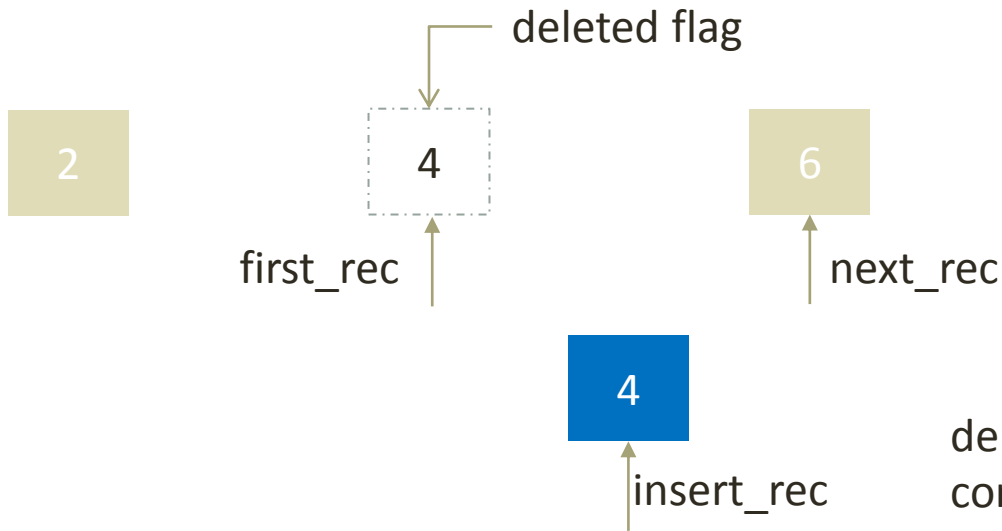


唯一索引插入过程



插入数据重复
直接报duplicate error?

唯一索引插入过程



delete flag 的4这条记录
committed or running ?

如果是running的状态
则容易产生死锁

唯一索引插入过程

Time	会话1	会话2	会话3
	BEGIN		
	<i>DELETE FROM a WHERE b = 4</i>		
		INSERT INTO a VALUES(NULL,4)	
			INSERT INTO a VALUES(NULL,4)
	COMMIT		
V		INSERT SUCCESS	DEADLOCK???

```
CREATE TABLE `a` (  
  `a` int(11) AUTO_INCREMENT NOT NULL,  
  `b` int(11) DEFAULT NULL,  
  PRIMARY KEY (`a`),  
  UNIQUE KEY `b` (`b`)  
) ENGINE=InnoDB;
```

```
-- 测试用例  
delete from mytest.a where b = 4;  
begin;  
insert ignore into mytest.a values (NULL,4)  
commit;
```

LATEST DETECTED DEADLOCK

.....

*** (1) TRANSACTION:

TRANSACTION 6283, ACTIVE 0 sec inserting, thread declared inside InnoDB 1

mysql tables in use 1, locked 1

LOCK WAIT 5 lock struct(s), heap size 1136, 3 row lock(s), undo log entries 1

MySQL thread id 82, OS thread handle 140110021482240, query id 7980 localhost root update

insert ignore into mytest.a values (NULL,4)

*** (1) WAITING FOR THIS LOCK TO BE GRANTED:

RECORD LOCKS space id 88 page no 4 n bits 72 index b of table `mytest`.`a` trx id 6283 **lock_mode X locks gap before rec insert intention waiting**

Record lock, heap no 4 PHYSICAL RECORD: n_fields 2; compact format; info bits 0

0: len 4; hex 80000006; asc ;;

1: len 4; hex 80000004; asc ;;

*** (2) TRANSACTION:

TRANSACTION 6266, ACTIVE 0 sec inserting, thread declared inside InnoDB 1

mysql tables in use 1, locked 1

4 lock struct(s), heap size 1136, 2 row lock(s), undo log entries 1

MySQL thread id 81, OS thread handle 140109011977984, query id 7957 localhost root update

insert ignore into mytest.a values (NULL,4)

*** (2) HOLDS THE LOCK(S):

RECORD LOCKS space id 88 page no 4 n bits 72 index b of table `mytest`.`a` trx id 6266 lock mode **S locks gap before rec**

Record lock, heap no 4 PHYSICAL RECORD: n_fields 2; compact format; info bits 0

0: len 4; hex 80000006; asc ;;

1: len 4; hex 80000004; asc ;;

*** (2) WAITING FOR THIS LOCK TO BE GRANTED:

RECORD LOCKS space id 88 page no 4 n bits 72 index b of table `mytest`.`a` trx id 6266 **lock_mode X locks gap before rec insert intention waiting**

Record lock, heap no 4 PHYSICAL RECORD: n_fields 2; compact format; info bits 0

0: len 4; hex 80000006; asc ;;

1: len 4; hex 80000004; asc ;;

进一步思考

- Purge线程和上述死锁问题的关系？如何验证？
- *INSERT*唯一索引冲突为什么不直接加X Lock而是S Lock？
- REPLACE唯一索引加的是什么锁？为什么？
- INSERT ... ON DUPLICATE KEY唯一索引加的是什么锁？

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