SQL语句优化建议

查询用户

场景:

搜索用户属性中包含特定字符串的用户

要匹配的用户属性很多

用户属性分布在多张表中

表结构

```
CREATE TABLE `ofUser` (
`username` varchar(64) NOT NULL,
`plainPassword` varchar(32) DEFAULT NULL,
`encryptedPassword` varchar(255) DEFAULT NULL,
`name` varchar(100) CHARACTER SET utf8mb4 DEFAULT NULL,
`email` varchar(100) DEFAULT NULL,
`phone` varchar(64) DEFAULT NULL,
`isEmailBind` tinyint(4) NOT NULL DEFAULT '1',
`isPhoneBind` tinyint(4) NOT NULL DEFAULT '1',
`tenementId` varchar(64) DEFAULT NULL,
`role` varchar(32) DEFAULT NULL,
`status` varchar(64) DEFAULT NULL,
`clientEnabled` tinyint(4) DEFAULT '1',
`ntxDomainId` varchar(255) DEFAULT NULL,
`sipAccount` varchar(255) DEFAULT NULL,
`creationDate` char(15) NOT NULL,
`modificationDate` char(15) NOT NULL,
`customId` varchar(255) DEFAULT NULL,
`activeDate` bigint(15) DEFAULT '0',
`deleteDate` bigint(15) DEFAULT '0',
`platformId` varchar(255) NOT NULL DEFAULT '',
`mobileAuth` int(2) DEFAULT '1',
`isMobileAuth` int(2) DEFAULT '1' COMMENT '手机号
码认证', PRIMARY KEY (`username`),
KEY `ofUser_cDate_idx` (`creationDate`),
KEY `ofUser_sipAccount_idx`
(`sipAccount`(10)), KEY
`ofUser_phone_idx` (`phone`(11)),
KEY `ofUser_email_idx`
(`email`(10)), KEY
`ofUser_customId`
(`customId`(32)), KEY
`ofUser_name` (`name`(16)),
KEY `ofUser_status_idx` (`status`(4)),
```

```
  KEY `ofUser_idx_paltformId` (`platformId`(10))
) ENGINE=InnoDB DEFAULT CHARSET=utf8

CREATE TABLE `ucTenementMember` (
`tenementId` varchar(64) NOT NULL,
`username` varchar(64) NOT NULL,
`alias` varchar(255) NOT NULL DEFAULT '',
`role` varchar(64) NOT NULL,
`status` varchar(64) NOT NULL,
`createDate` bigint(15) DEFAULT '0',
`joinedDate` bigint(15) DEFAULT
'0', PRIMARY KEY
(`tenementId`,`username`),
KEY `ucTenementMember` (`username`) USING BTREE,
KEY `ucTenementMember_tenementId` (`tenementId`) USING
BTREE,
KEY `alias` (`alias`(32))
) ENGINE=InnoDB DEFAULT CHARSET=utf8

CREATE TABLE `ucVCardItem` (
`username` varchar(64) NOT NULL,
`itemId` varchar(64) NOT NULL,
`tenementId` varchar(64) NOT NULL,
`value` mediumtext CHARACTER SET utf8mb4 NOT
NULL, PRIMARY KEY
(`username`,`itemId`,`tenementId`),
KEY `ucVCardItem_itemId_tenementId` (`itemId`(10),`tenementId`(16))
) ENGINE=InnoDB DEFAULT CHARSET=utf8
```

查询语句：
```
    SELECT distinct t.username FROM ofUser as t
    INNER JOIN
    (SELECT username FROM ucTenementMember
    WHERE (tenementId IN ('880001'))) AS tm ON t.username = tm.username
    WHERE (t.username NOT IN ('u1000014','u1000148')
    AND (status!='lock')
    AND (t.username in (SELECT username FROM ofUser
    WHERE (t.username='查询字符串')
    OR (customId='')
    OR (phone='')
    OR (email='查询字符串')
    OR (sipAccount='查询字符串')
    OR (name LIKE '查询字符串')
    OR (username in(SELECT username FROM ucVCardItem
    WHERE (itemId='extTelephone'
```

```
        AND value='5002' AND tenementId='880006')
      )
    )))) LIMIT 1,10
```

原始执行计划

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	PRIMARY	\<derived2\>	ALL	NULL	NULL	NULL	NULL	14750	Using where; Using temporary
1	PRIMARY	t	eq_ref	PRIMARY,ofUser_cDate_idx,ofUser_sipAccount...	PRIMARY	194	tm.username	1	Using where
1	PRIMARY	ofUser	eq_ref	PRIMARY,ofUser_sipAccount_idx,ofUser_phon...	PRIMARY	194	tm.username	1	Using where; Distinct
4	SUBQUERY	ucVCardItem	ref	PRIMARY,ucVCardItem_itemId_tenementId	ucVCardItem_itemId_tenementId	82	const,const	1	Using index condition; Using where
2	DERIVED	ucTenementMember	ref	PRIMARY	PRIMARY	194	const	14750	Using where; Using index

执行速度: 0.016 - 0.234秒

问题分析：

1．2次扫描同一个表，获得结果集需要的步骤过多；
2．SQL逻辑复杂，可读性差，不易维护；

推荐优化方案:

重写SQL如下：
```
SELECT username
  FROM ofUser
  WHERE (username in (SELECT username
                        FROM ucTenementMember
                       WHERE (tenementId IN ('880001'))))
                and (username NOT IN ('u1000014','u1000148'))
                AND (status!='lock')
    and ((username='查询字符串')
                    OR (customId='')
                  OR (phone='')
                  OR (email='查询字符串')
                  OR (sipAccount='查询字符串')
                  OR (name LIKE '查询字符串')
                  OR (username in(SELECT username
                              FROM ucVCardItem
                             WHERE (itemId='extTelephone' AND
value='5002' AND tenementId='880006')))
                              )
LIMIT 1,10;
```

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	PRIMARY	ucTenementMember	range	PRIMARY,ucTenementMember_username_idx	PRIMARY	388	NULL	14752	Using where; Using index
1	PRIMARY	ofUser	eq_ref	PRIMARY,ofUser_sipAccount_idx,ofUser_phon...	PRIMARY	194	DB_eim.ucTenementMember.username	1	Using where
3	SUBQUERY	ucVCardItem	ref	PRIMARY,ucVCardItem_itemId_tenementId	ucVCardItem_itemId_tenementId	82	const,const	1	Using index condition; Using where

优化结果分析：

1．避免了不必要的重复扫描，减少了获取结果集的步骤；

2．简化了SQL，提高了可读性；

3．执行时间从0.016 - 0.234秒，提升到0 - 0.016秒；

4．提高系统并发能力；