

【故障解决】IPCS 和 IPCRM 使用

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1.2 前言部分

1.2.1 导读和注意事项

各位技术爱好者，看完本文后，你可以掌握如下的技能，也可以学到一些其它你所不知道的知识，~O(∩_∩)O~：

- ① ipcs 的使用
- ② ipcrm 释放 oracle 内存段
- ③ sysresv 的使用

Tips：

① 若文章代码格式有错乱，推荐使用搜狗、QQ 或 360 浏览器，也可以下载 pdf 格式的文档来查看，pdf 文档下载地址：<http://yunpan.cn/cdEQedhCs2kFz>（提取码：ed9b）

② 本篇 BLOG 中命令的输出部分需要特别关注的地方我都用灰色背景和粉红色字体来表示，比如下边的例子中，thread 1 的最大归档日志号为 33，thread 2 的最大归档日志号为 43 是需要特别关注的地方；而命令一般使用黄色背景和红色字体标注；对代码或代码输出部分的注释一般采用蓝色字体表示。

```
List of Archived Logs in backup set 11
Thrd Seq      Low SCN      Low Time      Next SCN      Next Time
-----
1      32      1621589      2015-05-29 11:09:52 1625242      2015-05-29 11:15:48
1      33      1625242      2015-05-29 11:15:48 1625293      2015-05-29 11:15:58
2      42      1613951      2015-05-29 10:41:18 1625245      2015-05-29 11:15:49
2      43      1625245      2015-05-29 11:15:49 1625253      2015-05-29 11:15:53

[ZFXXDB1:root]:/>ls -lsvg -o
T_XDESK_APP1_vg
rootvg
[ZFXXDB1:root]:/>
00:27:22 SQL> alter tablespace idxtbs read write;

====> 2097152*512/1024/1024/1024=1G
```

本文如有错误或不完善的地方请大家多多指正，ITPUB 留言或 QQ 皆可，您的批评指正是我写作的最大动力。

1.2.2 相关参考文章链接

<http://blog.itpub.net/26736162/viewspace-2112443/>
<http://blog.itpub.net/26736162/viewspace-2112447/>

1.2.3 本文简介

同事搭建 DG 的时候报错了，然后强制退出会话，结果 sqlplus 不能进入，且看正文部分。

1.3 相关知识点扫盲

unix/linux 下的共享内存、信号量、队列信息管理

在 unix/linux 下，经常有因为共享内存、信号量，队列等共享信息没有干净地清楚而引起一些问题。

查看共享信息的内存的命令是 `ipcs [-m|-s|-q]`。

默认会列出共享内存、信号量，队列信息，`-m` 列出共享内存，`-s` 列出共享信号量，`-q` 列出共享队列

清除命令是 `ipcrm [-m|-s|-q] id`。

`-m` 删除共享内存，`-s` 删除共享信号量，`-q` 删除共享队列。

1.4 故障分析及解决过程

1.4.1 故障环境介绍

项目	source db
db 类型	rac
db version	11.2.0.4
db 存储	ASM
ORACLE_SID	oraDESDB2
db_name	oraDESDB
OS 版本及 kernel 版本	AIX 64 位 7.1.0.0
OS hostname	ZFLHRDB2

1.4.2 故障发生现象及解决过程

oracle 的进程已经关闭，但是执行 sqlplus 的时候 hang 住，之后报错 ORA-09925: Unable to create audit trail file，加-prelim 也不行，主要是 oracle

的进程已经关掉了，但是 sqlplus 却进不去。

```
[ZFLHRDB4:oracle]:/oracle>ps -ef|grep ora_
[ZFLHRDB4:oracle]:/oracle>

[ZFLHRDB4:oracle]:/oracle>sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue May 31 14:39:47 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.
```

```
ERROR:
ORA-09925: Unable to create audit trail file
IBM AIX RISC System/6000 Error: 2: No such file or directory
Additional information: 9925
ORA-09925: Unable to create audit trail file
IBM AIX RISC System/6000 Error: 2: No such file or directory
Additional information: 9925
```

```
[ZFLHRDB4:oracle]:/oracle>
[ZFLHRDB4:oracle]:/oracle>
[ZFLHRDB4:oracle]:/oracle>
[ZFLHRDB4:oracle]:/oracle>
[ZFLHRDB4:oracle]:/oracle>sqlplus -prelim / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue May 31 14:40:26 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.
```

```
ERROR:
ORA-09925: Unable to create audit trail file
IBM AIX RISC System/6000 Error: 2: No such file or directory
Additional information: 9925
ORA-09925: Unable to create audit trail file
IBM AIX RISC System/6000 Error: 2: No such file or directory
Additional information: 9925
```

```
[ZFLHRDB4:oracle]:/oracle>ipcs
IPC status from /dev/mem as of Tue May 31 14:42:01 BEIST 2016
T      ID      KEY      MODE      OWNER      GROUP
Message Queues:
q      0 0x9283a0d2 -Rrw-----   root    system
q      1 0xffffffff -----      root    system

Shared Memory:
m      3 0x210000ac --rw-rw----   root    system
m 395313156 0x0ecaefdc --rw-r-----   oracle  asmadmin
m  9437189  00000000 --rw-r-----   oracle  asmadmin
m 276824070  00000000 --rw-r-----   oracle  asmadmin
m 912261127 0x210000d4 --rw-rw----   grid     dba
Semaphores:
s  3145728 0x0100324a --ra-ra-r--   root    system
s      1 0x620025b4 --ra-r--r--   root    system
s      2 0x02001958 --ra-ra-ra-   root    system
s      3 0x01001958 --ra-ra-ra-   root    system
s      9 0x010024be --ra-----   root    system
```

```
s 3145738 0x410000ab --ra-ra---- root system
s 21 0x410000cb --ra-ra---- grid dba
[ZFLHRDB4:oracle]:/oracle>ipcrm -m 395313156
[ZFLHRDB4:oracle]:/oracle>ipcs
IPC status from /dev/mem as of Tue May 31 14:42:23 BEIST 2016
T ID KEY MODE OWNER GROUP
Message Queues:
q 0 0x9283a0d2 -Rrw----- root system
q 1 0xffffffff ----- root system

Shared Memory:
m 3 0x210000ac --rw-rw---- root system
m 9437189 00000000 --rw-r----- oracle asmadmin
m 276824070 00000000 --rw-r----- oracle asmadmin
m 912261127 0x210000d4 --rw-rw---- grid dba
Semaphores:
s 3145728 0x0100324a --ra-ra-r-- root system
s 1 0x620025b4 --ra-r--r-- root system
s 2 0x02001958 --ra-ra-ra- root system
s 3 0x01001958 --ra-ra-ra- root system
s 9 0x010024be --ra----- root system
s 3145738 0x410000ab --ra-ra---- root system
s 21 0x410000cb --ra-ra---- grid dba
[ZFLHRDB4:oracle]:/oracle>ipcrm -m 9437189
[ZFLHRDB4:oracle]:/oracle>ipcrm -m 276824070
[ZFLHRDB4:oracle]:/oracle>ipcs
IPC status from /dev/mem as of Tue May 31 14:42:39 BEIST 2016
T ID KEY MODE OWNER GROUP
Message Queues:
q 0 0x9283a0d2 -Rrw----- root system
q 1 0xffffffff ----- root system

Shared Memory:
m 3 0x210000ac --rw-rw---- root system
m 912261127 0x210000d4 --rw-rw---- grid dba
Semaphores:
s 3145728 0x0100324a --ra-ra-r-- root system
s 1 0x620025b4 --ra-r--r-- root system
s 2 0x02001958 --ra-ra-ra- root system
s 3 0x01001958 --ra-ra-ra- root system
s 9 0x010024be --ra----- root system
s 3145738 0x410000ab --ra-ra---- root system
s 21 0x410000cb --ra-ra---- grid dba
[ZFLHRDB4:oracle]:/oracle>sqlplus / as sysdba

SQL*Plus: Release 11.2.0.4.0 Production on Tue May 31 14:42:46 2016

Copyright (c) 1982, 2013, Oracle. All rights reserved.

Connected to an idle instance.

SYS@oraDESDB2>
```

问题解决了，但是为啥会出现这样的错误，我在 MOS 上搜了以下的文章。

1.4.2.1 MOS 上的文件

---Connect /as sysdba or Startup Fails With ORA-09925 When Instance Is Down (文档 ID 392643.1)

In this Document

Symptoms

Cause

Solution

References

APPLIES TO:

Oracle Database - Enterprise Edition - Version 8.1.7.0 to 12.1.0.1 [Release 8.1.7 to 12.1]

Information in this document applies to any platform.

Checked for relevance on 05-Oct-2010

SYMPTOMS

When the database instance is down, trying to connect or startup the database fails with:

ERROR:

ORA-09925: Unable to create audit trail file

SVR4 Error: 13: Permission denied

Additional information: 9925

CAUSE

On Unix systems, the investigation should be done using the OS tracing utility, ie: truss (AIX, Solaris), strace (Linux) or tusc (HP-UX).

```
truss -aefo sqlplus.trc sqlplus "/ as sysdba"
```

shows that the problem is caused by a missing directory, insufficient permissions or not enough space on that particular directory:

```
open("/opt/oracle/admin/test102/adump/ora_31704.aud", O_RDWR|O_CREAT|O_APPEND|O_LARGEFILE, 0660) = -1 EACCES (Permission denied)
```

From 10gR2, the \$ORACLE_BASE/admin/<SID>/adump directory is the new default directory for audit files (instead of previous releases location, \$ORACLE_HOME/rdbms/audit).

SOLUTION

1. Starting with 10gR2, check if the

`$ORACLE_BASE/admin/$ORACLE_SID/adump`
directory exists and create it if not.

If `ORACLE_BASE` is not set, the default audit directory is still `$ORACLE_HOME/rdbms/audit`, as in pre 10gR2 releases.

2. If the directory exists (if in previous releases or if `ORACLE_BASE` not set, check: `$ORACLE_HOME/rdbms/audit`), make sure that permissions on it are set to 775.

3. If the directory exists and permissions are correctly set, make sure that there is enough space on the file system to accommodate the newly created audit files.

Starting with 10gR2: Note that when the database instance is down and the first connect and the startup command is run, the `audit_file_dest` parameter is not yet initialized, hence unknown to the shadow process, as such the audit files for these commands can only be written to the default destination. Writing these files is a mandatory requirement for NCSC C2 security evaluation criteria and therefore this behavior cannot be turned off.

4. Generically, `ORACLE_BASE` is set, as recommended by the documentation. If `ORACLE_BASE` is not set, then the default audit location becomes: `$ORACLE_HOME/rdbms/audit`. This is important to mention especially on RAC, where the environment variables are set in the OCR and should be updated, as documented, using `srvctl`, eg:

```
srvctl setenv database -d <db name> -t ORACLE_BASE=<Oracle Base directory>
```

5. A rare scenario was found when `ORACLE_PATH` is set and the Oracle software transparently appended it to the default value: `$ORACLE_BASE/admin/$ORACLE_SID/adump`. `ORACLE_PATH` needs to be unset to workaround the problem. This issue was found to be a regression in the fix to bug 9438890 , and can be fixed by installing patch 14488943.

---ORA-09925 : Error During Database Creation Using Other OS Users. (文档 ID 405885.1)

In this Document

Symptoms

Cause

Solution

This document is being delivered to you via Oracle Support's Rapid Visibility (RaV) process and therefore has not been subject to an independent technical review.

APPLIES TO:

Oracle Server - Enterprise Edition - Version 9.2.0.1 and later

Linux x86

HP-UX PA-RISC (64-bit)

IBM AIX on POWER Systems (64-bit)

Oracle Solaris on SPARC (64-bit)

Linux x86-64

Checked for relevance on 19-Jun-2012

SYMPTOMS

Creating database using DBCA logged in as another user belonging to the installation group results in following error

ORA-09925 : Unable to create audit trail file.

If you ignore this error it will error out with following message

ORA-01034 : Oracle not available.

CAUSE

By default Oracle will create directories with permission 755. So the other users belonging to the group will not have write permission which results in this issue.

SOLUTION

Any user other than the software owner belonging to the same group will not be able to create database. To resolve the issue give write permission to the group on following directories.

1. `chmod 775 $ORACLE_HOME/audit`
2. `chmod 775 $ORACLE_HOME/cfgtoollogs/dbca`
3. Give write permission on directories where data files and control files are getting created.
4. Give write permission on `$ORACLE_BASE`
5. `chgrp <oracle group> /etc/oratab`

Note: This holds good for other Unix platforms as well.

---OS AUDIT ERROR IN ASM AND ORA-09925 in RDBMS (文档 ID 1921650.1)

In this Document

Symptoms

Cause

Solution

References

APPLIES TO:

Oracle Database - Enterprise Edition - Version 11.2.0.3 to 11.2.0.4 [Release 11.2]

Information in this document applies to any platform.

SYMPTOMS

1] The following error message is reported in ASM alert.log

OS Audit file could not be created; failing after x retries

2] The following similar message is visible in RDBMS alert.log

Additional information: 9925

ORA-01122: database file 5 failed verification check

ORA-01110: data file 5: '+DATA/asmdb/datafile/rcts.343.849109407'

ORA-01565: error in identifying file '+DATA/asmdb/datafile/rcts.343.849109407'

ORA-17503: ksfdopn:2 Failed to open file +DATA/asmdb/datafile/rcts.343.849109407

ORA-15055: unable to connect to ASM instance

ORA-09925: Unable to create audit trail file

Linux-x86_64 Error: 13: Permission denied

Additional information: 9925

NOTE: deferred map free for map id 180

WARNING: ASM communication error: op 18 state 0x40 (9925)

ERROR: slave communication error with ASM

NOTE: Deferred communication with ASM instance

Errors in file /u01/app/oracle/diag/rdbms/asmdb/ASMDB/trace/ASMDB_pmon_3692.trc:

ORA-09925: Unable to create audit trail file

Linux-x86_64 Error: 13: Permission denied

Additional information: 9925

WARNING: ASM communication error: op 0 state 0x0 (15055)

ERROR: direct connection failure with ASM

3] Logging in ASM instance produces the following error.

\$ sqlplus / as sysasm

ERROR:

ORA-09925: Unable to create audit trail file

Linux-x86_64 Error: 13: Permission denied

Additional information: 9925

ORA-01075: you are currently logged on

4] Filesystem for GRID home shows enough space

df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/mapper/host_root	9.7G	1.8G	7.5G	19%	/
/dev/mapper/host_var					

```
4.9G 923M 3.7G 20% /var
/dev/mapper/host_usr
4.9G 3.4G 1.3G 74% /usr
/dev/mapper/host_crs_oracle
54G 23G 28G 46% /crs/oracle
```

<<<<<<<<----- GRID HOME filesystem

CAUSE

Permission on GRID_HOME/rdbms/audit was incorrect.

\$ ls -l \$GRID_HOME/rdbms

```
drwxr-xr-x. 2 grid oinstall 40960 Jul 31 15:01 admin
dr-xr-xr-x. 2 grid oinstall 12288 Aug 26 08:13 audit
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 14:59 demo
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 14:59 doc
drwxr-xr-x. 4 grid oinstall 4096 Jul 31 15:01 install
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 14:57 jlib
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 15:01 lib
drwxr-xr-x. 2 grid oinstall 4096 Aug 24 08:05 log
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 14:57 mesg
drwxr-xr-x. 2 grid oinstall 4096 Jul 31 14:57 public
drwxr-xr-x. 5 grid oinstall 4096 Jul 31 14:56 xml
```

<<<<<<----- Here, there is no write privilege by grid OS user.

SOLUTION

1] Change the permission so that grid OS user can write on \$GRID_HOME/rdbms/audit

As grid OS user:

\$ chmod +w \$GRID_HOME/rdbms/audit

2] Check whether enough free space exists on GRID_HOME filesystem

SQL> show parameter dest

NAME	TYPE	VALUE

audit_file_dest	string	/oracle/app/11.2.0/grid/rdbms/audit
background_dump_dest	string	/oracle/app/grid/diag/asm/+asm/+ASM2/trace

```
core_dump_dest      string      /oracle/app/grid/diag/asm/+asm
                    /+ASM2/cdump
diagnostic_dest     string      /oracle/app/grid
user_dump_dest      string      /oracle/app/grid/diag/asm/+asm
                    /+ASM2/trace

SQL> exit
Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Real Application Clusters and Automatic Storage Management options
[ZFLHRDB2:grid]:/oracle/app/grid>cd /oracle/app/11.2.0/grid/rdbms/audit
[ZFLHRDB2:grid]:/oracle/app/11.2.0/grid/rdbms/audit>l
[ZFLHRDB2:grid]:/oracle/app/11.2.0/grid/rdbms/audit>ls | wc -l
    42828

[ZFLHRDB2:grid]:/oracle/app/11.2.0/grid/rdbms/audit>rm -rf *
ksh: /usr/bin/rm: 0403-027 The parameter list is too long.

[ZFLHRDB2:grid]:/oracle/app/11.2.0/grid/rdbms/audit>find . -name "*.aud" | xargs rm
[ZFLHRDB2:grid]:/oracle/app/11.2.0/grid/rdbms/audit>ls

[ZFLHRDB2:root]:/oracle/app/11.2.0/grid/rdbms>chmod 775 audit
[ZFLHRDB2:root]:/oracle/app/11.2.0/grid/rdbms>l
total 176
drwxr-xr-x    2 grid    dba          53248 Dec 23 2014  admin
drwxrwxr-x    2 grid    dba           256 Jun 01 09:47  audit
drwxr-xr-x    2 grid    dba           256 Nov 05 2014  demo
drwxr-xr-x    2 grid    dba           256 Nov 05 2014  doc
drwxr-xr-x    4 grid    dba          4096 Nov 05 2014  install
drwxr-xr-x    2 grid    dba          4096 Nov 05 2014  jlib
drwxr-xr-x    2 grid    dba          8192 Dec 23 2014  lib
drwxr-xr-x    2 grid    dba          4096 May 31 19:02  log
drwxr-xr-x    2 grid    dba          8192 Nov 05 2014  mesg
drwxr-xr-x    2 grid    dba           256 Nov 05 2014  public
drwxr-xr-x    5 grid    dba          4096 Nov 05 2014  xml
[ZFLHRDB2:root]:/oracle/app/11.2.0/grid/rdbms>
```

1.4.3 ipcs 命令扩展

MOS 上的几篇文章：

文档 68281.1 DETERMINING WHICH INSTANCE OWNS WHICH SHARED MEMORY SEGMENTS & SEMAPHORE SETS (文档 ID 68281.1) .mhtml

文档 731658.1 ipcs -m Displays Incorrect Shared Memory Segment Sizes in Oracle 11G (文档 ID 731658.1).mhtml

其中 68281.1 中提到 DETERMINING WHICH INSTANCE OWNS WHICH SHARED MEMORY SEGMENTS & SEMAPHORE SETS，即若是一个主机上有多个 oracle 实例的话该如何确定哪个共享内存段属于我们该清掉的 oracle 实例的内存段，下边给个小实验即可，相关的 MOS 文档可以去小麦苗的云盘下载。

```
[ZFXDESKDB2:oracle]:/oracle>ps -ef|grep ora_pmon_
oracle 12255344 21626964  0 17:43:01 pts/0  0:00 grep ora_pmon_
oracle 17629238      1  0 18:57:42    -  0:09 ora_pmon_rac1hr2
oracle 20250806      1  0 18:57:42    -  0:10 ora_pmon_oraESKDB2
[ZFXDESKDB2:oracle]:/oracle>which sysresv
/oracle/app/oracle/product/11.2.0/db/bin/sysresv
[ZFXDESKDB2:oracle]:/oracle>ORACLE_SID=rac1hr2
[ZFXDESKDB2:oracle]:/oracle>sysresv
```

```
IPC Resources for ORACLE_SID "rac1hr2" :
Shared Memory:
ID          KEY
5242886     0xffffffff
5242883     0xffffffff
1048583     0xd92489e0
Oracle Instance alive for sid "rac1hr2"
[ZFXDESKDB2:oracle]:/oracle>ipcs
IPC status from /dev/mem as of Wed Jun  1 17:43:47 BEIST 2016
T          ID      KEY          MODE          OWNER      GROUP
Message Queues:
q          0 0x9283a0d2 -Rrw-----   root      system
q          1 0xffffffff -----      root      system

Shared Memory:
m  1048576  00000000 --rw-r-----   grid      dba
m  1048577  00000000 --rw-r-----   grid      dba
m  1048578 0x210000aa --rw-rw----   root      system
m  5242883  00000000 --rw-r-----   oracle asmadmin
m  1048580  00000000 --rw-r-----   oracle asmadmin
m  1048581  00000000 --rw-r-----   oracle asmadmin
m  5242886  00000000 --rw-r-----   oracle asmadmin
m  1048583 0xd92489e0 --rw-r-----   oracle asmadmin
m  1048584 0xd1a4a5d8 --rw-r-----   grid      dba
m  8388617 0x3f516768 --rw-r-----   oracle asmadmin
m  759169034 0x21000148 --rw-rw----   oracle      dba
Semaphores:
s  3145728 0x0100324a --ra-ra-r--   root      system
s          1 0x620025b4 --ra-r-r--   root      system
s          2 0x02001958 --ra-ra-ra-   root      system
s          3 0x01001958 --ra-ra-ra-   root      system
s          9 0x010024be --ra-----   root      system
s  1048590 0x410000a8 --ra-ra----   root      system
s 11534361 0x41000147 --ra-ra----   oracle      dba
[ZFXDESKDB2:oracle]:/oracle>ipcs -m
IPC status from /dev/mem as of Wed Jun  1 17:43:56 BEIST 2016
T          ID      KEY          MODE          OWNER      GROUP
Shared Memory:
m  1048576  00000000 --rw-r-----   grid      dba
m  1048577  00000000 --rw-r-----   grid      dba
m  1048578 0x210000aa --rw-rw----   root      system
```

```
m 5242883 00000000 --rw-r----- oracle asmadmin
m 1048580 00000000 --rw-r----- oracle asmadmin
m 1048581 00000000 --rw-r----- oracle asmadmin
m 5242886 00000000 --rw-r----- oracle asmadmin
m 1048583 0xd92489e0 --rw-r----- oracle asmadmin
m 1048584 0xd1a4a5d8 --rw-r----- grid dba
m 8388617 0x3f516768 --rw-r----- oracle asmadmin
m 759169034 0x21000148 --rw-rw---- oracle dba
[ZFXDESKDB2:oracle]:/oracle>ipcrm -m 5242886
[ZFXDESKDB2:oracle]:/oracle>ipcrm -m 5242883
[ZFXDESKDB2:oracle]:/oracle>ipcrm -m 1048583
[ZFXDESKDB2:oracle]:/oracle>sysresv

IPC Resources for ORACLE_SID "rac1hr2" :
Shared Memory
ID          KEY
No shared memory segments used
Oracle Instance not alive for sid "rac1hr2"
Oracle Instance not alive for sid "rac1hr2"
[ZFXDESKDB2:oracle]:/oracle>ps -ef|grep ora_pmon_
oracle 17629238      1    0 18:57:42      -    0:09 ora_pmon_rac1hr2
oracle 20250806      1    0 18:57:42      -    0:10 ora_pmon_oraESKDB2
oracle 23330844 21626964    0 17:44:46 pts/0    0:00 grep ora_pmon_
[ZFXDESKDB2:oracle]:/oracle>sqlplus / as sysdba
```

SQL*Plus: Release 11.2.0.4.0 Production on Wed Jun 1 17:44:52 2016

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Connected to an idle instance.

```
SYS@rac1hr2> shutdown abort
ORACLE instance shut down.
SYS@rac1hr2> exit
Disconnected from Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,
Data Mining and Real Application Testing options
```

1.5 故障处理总结

- ① ipcs 和 ipcrm 应该学会使用
- ② sysresv 的使用可以查看对应实例的共享内存段
- ③ 文章中的所有 MOS 文章在小麦苗的云盘中 <http://yunpan.cn/cdEQedhCs2kFz> （提取码：ed9b）
- ④ 关于 ipcs 的使用 cuug 的老师也讲过公开课，公开课的录像文件参考 <http://yunpan.cn/cdEQedhCs2kFz> （提取码：ed9b）



About Me

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