Oracle自动化运维工具Oclient V3.0使用手册

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1. 工具概述

Oclient V1.0工具是通过Python3.6编写的一款Oracle数据库运维工具，设计目的是为了提升Oracle数据库管理员，或数据库运维人员工作效率，降低运维成本。

Oclient V2.0在Oclient V1.0基础上主要增加了多表传输，多表同步，新增支持DDL同步；同时修增加异常锁，大事务，会话详情等实用功能，方便运维人员定位问题。常用功能输入错误时增加了友好提示。最后修改了许多BUG更进一步增强了Oclient工具的可用性和健壮性。

Oclient V3.0在Oclient V2.0基础上增加了异构数据库之间的传输、同步功能；增加了对Oracle数据库的自动化运维功能。并对上一版本的部分功能进行优化改进。目前正在研发中。

## Oclient V1.0 功能

（1）支持DML，DDL，DCL操作。

（2）交互模式下支持事务，可以提交，回滚。

（3）Oracle数据库间表传输功能。

只支持单表传输，该版本仅支持DML同步，通过进度条条及信息窗口可以观察传输进度

（4）Oracle数据库间表同步功能。

首次全量，以后均为增量同步,目前支持同步的表要求表中列的数量小于等于20表表中必须有主键，仅支持DML同步，可以实时生成同步日志。

（5）查看数据库参数，查看数据库属性等。

（6）查看会话登陆信息

（7）查看TOP等待事件功能

（8）杀会话或杀进程功能

（9）执行匿名块，函数，过程，触发器，包头，包体

Oracle数据库运维工具Oclient V1.0 使用手册：

<http://www.zhitbar.com/2010.html>

## 1.2 Oclient V2.0 新特性

（1）支持多表传输，支持按用户传输。

（2）支持多表同步，支持按同户同步，支持DDL同步。

（3）支持按表导出表结构及数据，支持导出格式为sql格式。

（4）可以将导出的sql文件导入至相应用户中。

（5）交互模式增加@<文件名>功能，可以执行sql文件。

（6）交互模式增加查询表空间使用情况，实例信息、数据库信息。

（7）通过命令查询大事务、异常锁信息。

（8）查询会话增加 \sess <sid> ，显示会话详情及正执行语句，对其进行美化。

（9）调整配置文件config.ini的格式，使各功能参数不互相影响。

（10）修改查看表、索引定义，使之输出更简洁。

（11）登陆时语法不正确，增加友好提示，身份验证不正角时友好提示。

## 1.3 Oclient V3.0 新特性

（1）优化Oracle数据库间表同步性能。

（2）支持Oracle数据库同步表的列数由20列增加至100列。

（3）支持按表导出excel,csv格式。

（4）支持自定义查询语导出excel,csv格式。

说明：导出class:cx\_Oracle.BINARY，对应Oracle，RAW类型时存在问题，还未解决

（5）支持Oracle数据库自动监控，发现异常自地劝发邮件进行预警。已实现数据库表空间预警发邮件，空间恢复后进行邮件通知。

（6）支持Oracle至MySQL数据传输、数据同步。

（7）支持Oracle至PostgreSQL数据传输、数据同步。

（8）支持Oracle至SQLServer数据传输、数据同步。

（9）查询会话正执行的SQL语句，美化功能支持子查询。)

(6)-(10)功能还未开发完成。

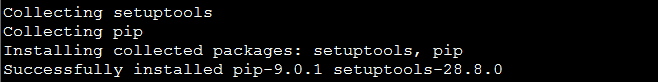
二、运行环境

## 2.1 开发环境

### 2.1.1 安装Python3.6

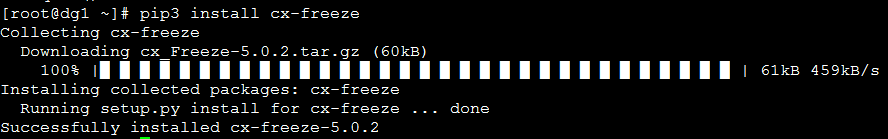
参考：<http://www.zhitbar.com/1534.html>

最后出现下图内容说明编译安装成功！



### 2.1.2 安装Python依赖库

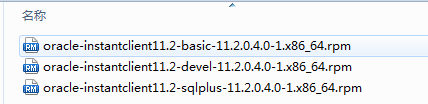
pip3 install cx-freeze

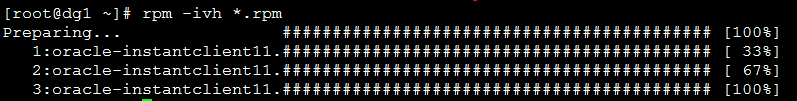


说明：这一步不需要执行，这一步安装源代码进行打包发布的工具。

### 2.1.3 安装Oracle客户端驱动

上传以下安装到到客户端，并进行安装：





mkdir -p /usr/lib/oracle/11.2/client64/network/admin

vi /etc/profile 末尾增加以下内容

|  |
| --- |
| export ORACLE\_HOME=/usr/lib/oracle/11.2/client64  export TNS\_ADMIN=$ORACLE\_HOME/network/admin  export NLS\_LANG=AMERICAN\_AMERICA.ZHS16GBK  export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib:$LD\_LIBRARY\_PATH  export OCI\_HEADERS\_HOME=/usr/lib/oracle/11.2/client64  export OCI\_LIBS\_HOME=$ORACLE\_HOME/lib  export NLS\_LANG=american\_america.AL32UTF8  export PATH=.:$ORACLE\_HOME/bin:$PATH  export PATH=.:/usr/local/python3.6.0/bin:$ORACLE\_HOME/bin:$PATH |

source /etc/profile

### 2.1.4 安装Python的Oracle驱动库

|  |
| --- |
| [root@dg1 ~]# pip3 install cx\_Oracle  Collecting cx\_Oracle  Using cached cx\_Oracle-5.3.tar.gz  Installing collected packages: cx-Oracle  Running setup.py install for cx-Oracle ... done  Successfully installed cx-Oracle-5.3 |

上传源文件：oclient.py 和配置文件 config.ini至/ops目录，并对oclient.py授于可执行权限。

|  |
| --- |
| chmod u+x oclient.py |

### 2.1.5 安装Python访问excel库

|  |
| --- |
| [root@dg1 ops]# pip3 install xlwt  Collecting xlwt  Downloading xlwt-1.2.0-py2.py3-none-any.whl (99kB)  100% |████████████████████████████████| 102kB 313kB/s  Installing collected packages: xlwt  Successfully installed xlwt-1.2.0 |

三、使用说明

## 3.1 命令行模式

### 3.1.1 查看帮助

oclient.py 不加任何参数，可后面增加-h，--help，/？均可查看帮助信息。

|  |
| --- |
| [root@dg1 ops]# oclient.py -h  oclient V2.0 tools for help:  ---------------------------------------------------------------------------------------------------------  -h or --help or /? query oclient help  -c <host:port:instance> connect oracle database tns string  -u <user>:<password> user and password information  -q <QUERY>\|<DML>\|<DDL>\|<DVL> execute sql language  -p <parameter name> query oracle parameter  -console enter into interaction mode  -consolehelp query interaction mode help  -transfer -conf <config file> transfer table in different oracle database  -sync -conf <config file> sync table in different oracle database  -exp -conf <config.ini> export table from source database  -imp -conf <config.ini> import table from exp sql file  oclient example:  ----------------------------------------------------------------------------------------------------------------------  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "select \* from scott.emp"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "update scott.emp set sal=sal+1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "create user lx1 identified by lx1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "grant connect,resource to lx1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -p sga  oclient -c 192.168.200.100:1521:orcl -u scott:tiger -e "/ops/lx3.sql"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -console  oclient -consolehelp  oclient -transfer -conf config.ini  oclient -sync -conf config.ini |

### 3.1.2 执行查询

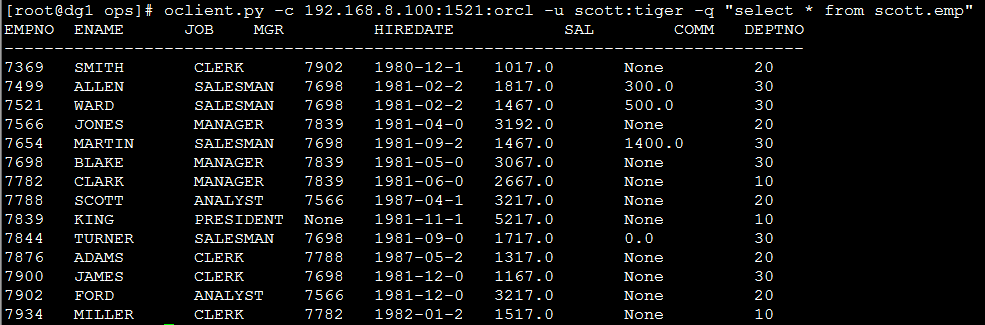
oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "select \* from scott.emp"

**参数说明：**

-c 数据库连接串

-u 用户名口令

-q 查询语句



### 3.1.3 执行DML语句

oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "delete from scott.emp where empno=7369"

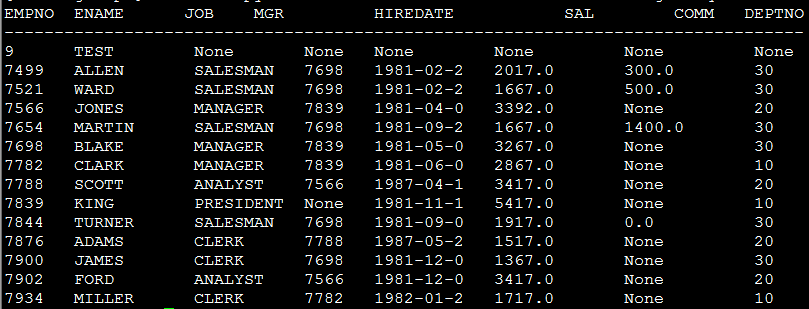
oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "update scott.emp set sal=sal+200"

oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "insert into scott.emp(empno,ename) values(9,'TEST')"

|  |
| --- |
| # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "delete from scott.emp where empno=7369"  delete 1 completed!  #oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "update scott.emp set sal=sal+200"  update 13 completed!  # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "insert into scott.emp(empno,ename) values(9,'TEST')"  insert 1 completed! |

再次查询，发现操成均成功了，已经少了7369的数据，同时SAL列均增加了200，另外新插的行也可以查到了。

oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "select \* from scott.emp"



说明：命令行模式中的DML操作是自动提交的。

### 3.1.4 执行DDL语句

|  |
| --- |
| # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "create table lx1(i int,v varchar2(20))"  Table created!  # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "drop table lx1"  Table dropped!  oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "alter table lx1 add d date"  Table altered!  # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -q "truncate table lx1"  Table Truncated! |

说明：支持的DDL语句有：create ,drop ,alter ,grant,truncate

### 3.1.5 查询参数

|  |
| --- |
| # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -p "sga"  ORA-00942: table or view does not exist  #以管理员登陆数据库进行授权  SQL> conn / as sysdba  Connected.  SQL> grant select any dictionary to scott;  Grant succeeded.  #再次运行命令：  # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -p "sga"  --------------------------------------------------------------------------------  sga\_max\_size 411041792  pre\_page\_sga FALSE  lock\_sga FALSE  sga\_target 0  # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -p "processes"  --------------------------------------------------------------------------------  processes 150  gcs\_server\_processes 0  db\_writer\_processes 1  log\_archive\_max\_processes 30  global\_txn\_processes 1  job\_queue\_processes 1000  aq\_tm\_processes 1 |

说明：查询参数需要连接用户具有查询数据字典权限，否则报找不到表错误。另外查询参数支持模糊查询。

## 3.2 交互模式

注意：交互模式下，不会自动提交，需要执行commit或rollback进行提交或回滚。

### 3.2.1 进入交互模式

|  |
| --- |
| # oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient monitor. Commands end with ;  Your Oracle connection sid is 39  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient> |

### 3.2.2 查看交互模式帮助

|  |
| --- |
| oclient>\h  Oclient V2.0 console for help:  ------------------------------------------------------------------  \q or \c exit the program!  \p <parameter name> search oracle parameter  \dt <table\_name> query table definition  \di <index\_name> query index definition  \dp <prop\_name> query database properties  \tp query tablespace usage  \db query v$database info  \inst query v$instance info  \lock query exception lock  \tran query exception transaction  \sess <sid> query session information  \wait query wait event  \kill <sid> kill session  \okill <spid> kill os process  call <procedure name> execute procedure  @<sql\_file\_name> execute sql file  Command line support the following operation.  ------------------------------------------------------------------  (1) select language,multi-table query  (2) DML opertion  (3) DDL operation,as create ,drop truncate and so on.  (4) DDL operation,as create ,drop truncate.  (5) DCL operation,as commit,rollback,grant,revoke.  (6) EXECUTE pl/sql block  (7) EXECUTE sql file |

### 3.2.3 执行DML操作

|  |
| --- |
| oclient>select \* from scott.emp;  EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO  -------------------------------------------------------------------------------------------------------------------------------------------  9 TEST None None None None None None  7499 ALLEN SALESMAN 7698 1981-02-2 2017.0 300.0 30  7521 WARD SALESMAN 7698 1981-02-2 1667.0 500.0 30  7566 JONES MANAGER 7839 1981-04-0 3392.0 None 20  7654 MARTIN SALESMAN 7698 1981-09-2 1667.0 1400.0 30  7698 BLAKE MANAGER 7839 1981-05-0 3267.0 None 30  7782 CLARK MANAGER 7839 1981-06-0 2867.0 None 10  7788 SCOTT ANALYST 7566 1987-04-1 3417.0 None 20  7839 KING PRESIDENT None 1981-11-1 5417.0 None 10  7844 TURNER SALESMAN 7698 1981-09-0 1917.0 0.0 30  7876 ADAMS CLERK 7788 1987-05-2 1517.0 None 20  7900 JAMES CLERK 7698 1981-12-0 1367.0 None 30  7902 FORD ANALYST 7566 1981-12-0 3417.0 None 20  7934 MILLER CLERK 7782 1982-01-2 1717.0 None 10  oclient>update scott.emp set sal=sal+10000 where empno=7499;  update 1 completed!  oclient>delete from scott.emp where empno=9;  delete 1 completed!  oclient>commit;  Committed! |

### 3.2.4 执行DDL操作

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient monitor. Commands end with ;  Your Oracle connection sid is 39  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>create table xs(xh int,xm varchar2(20),csrq date);  Table created!  oclient>alter table xs add (xb int);  Table altered!  oclient>truncate table xs;  Table Truncated!  oclient>drop table xs;  Table dropped!  oclient> |

### 3.2.5 执行DCL操作

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u system:manager -console  --------------------------------------------------------------------------------------  Welcome to the oclient monitor. Commands end with ;  Your Oracle connection sid is 34  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>grant select any table to scott;  Grant privileges success!  oclient>revoke select any table from scott;  Revoke privileges success! |

### 3.2.6 查询表定义\*

|  |
| --- |
| oclient>\dt xs  ------------------------------------------------------------  Create Table XS(  xh integer not null primary key,  name varchar2(20),  csrq date,  nl integer  ); TABLESPACE "USERS" |

### 3.2.7 查询索引定义

|  |
| --- |
| oclient>\di xs  ------------------------------------------------------------  Alter Table XS add primary key(XH);  Create Index IND\_XS\_N1 on XS(NAME); |

### 3.2.8 查询数据库参数

|  |
| --- |
| oclient>\p process  --------------------------------------------------------------------------------  processes 150  processor\_group\_name None  gcs\_server\_processes 0  db\_writer\_processes 1  log\_archive\_max\_processes 4  global\_txn\_processes 1  job\_queue\_processes 1000  cell\_offload\_processing TRUE  aq\_tm\_processes 1 |

### 3.2.9 查询会话信息

说明：该功能需要在连接数据库上创建一个触发器，代码如下：

|  |
| --- |
| create or replace trigger on\_logon\_trigger  after logon on database  begin  dbms\_application\_info.set\_client\_info(sys\_context( 'userenv', 'ip\_address' ) );  end;  / |

|  |
| --- |
| oclient>\sess  SID MACHINE CLIENT\_IP LOGON\_TIME STATUS  ------------------------------------------------------------------------------------------------------------------------  25 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:27 INACTIVE  26 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:28 INACTIVE  29 dg1 192.168.8.100 2017.06.28 08:21:42 ACTIVE  30 dg2 192.168.8.101 2017.06.28 08:21:53 INACTIVE |

### 3.2.10 查询TOP等待事件

|  |
| --- |
| oclient>\wait  SID SPID EVENT STATE BLOCK  ---------------------------------------------------------------------------------------------------------------------------------------  1 107838 Space Manager: slave idle wait WAITING  13 78070 smon timer WAITING  2 78046 pmon timer WAITING  20 78102 Streams AQ: qmn coordinator idle wait WAITING  26 78152 Streams AQ: qmn slave idle wait WAITING  29 78154 Streams AQ: waiting for time management or cleanup WAITING  4 78050 VKTM Logical Idle Wait WAITING  6 78056 DIAG idle wait WAITING  8 78060 DIAG idle wait WAITING |

### 3.2.11 查询数据库属性

|  |
| --- |
| oclient>\dp char  oclient>\dp char  --------------------------------------------------------------------------------  NLS\_NUMERIC\_CHARACTERS .,  NLS\_CHARACTERSET AL32UTF8  NLS\_NCHAR\_CONV\_EXCP FALSE  NLS\_NCHAR\_CHARACTERSET AL16UTF16 |

### 3.2.12 杀数据库会话

|  |
| --- |
| oclient>\sess  SID SPID MACHINE CLIENT\_IP LOGON\_TIME STATUS  ------------------------------------------------------------------------------------------------------------------------------------------  25 121326 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:27 INACTIVE  26 121332 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:28 INACTIVE  31 122101 dg2 192.168.8.101 2017.06.28 08:25:52 INACTIVE  29 123089 dg1 192.168.8.100 2017.06.28 08:31:25 ACTIVE  oclient>\kill 31  Session killed! |

### 3.2.13 杀系统进程

|  |
| --- |
| oclient>\sess  SID SPID MACHINE CLIENT\_IP LOGON\_TIME STATUS  ------------------------------------------------------------------------------------------------------------------------------------------  25 121326 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:27 INACTIVE  26 121332 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.06.28 08:21:28 INACTIVE  31 122101 dg2 192.168.8.101 2017.06.28 08:25:52 INACTIVE  29 123089 dg1 192.168.8.100 2017.06.28 08:31:25 ACTIVE  oclient>\okill 122101  Process killed! |

### 3.2.14 创建函数

|  |
| --- |
| oclient>create or replace function get\_val(i int) return int is  >begin  > return i\*i;  >end;  Function Created!  oclient>  oclient>select get\_val(10) from dual;  GET\_VAL(10)  --------------------  100 |

### 3.2.15 创建过程

|  |
| --- |
| oclient>select \* from scott.emp;  EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO  ------------------------------------------------------------------------------------------------------------------------------------------------  7499 ALLEN SALESMAN 7698 1981-02-2 12217.0 300.0 30  7521 WARD SALESMAN 7698 1981-02-2 1867.0 500.0 30  7566 JONES MANAGER 7839 1981-04-0 3592.0 None 20  7654 MARTIN SALESMAN 7698 1981-09-2 1867.0 1400.0 30  7698 BLAKE MANAGER 7839 1981-05-0 3467.0 None 30  7782 CLARK MANAGER 7839 1981-06-0 3067.0 None 10  7788 SCOTT ANALYST 7566 1987-04-1 3617.0 None 20  7839 KING PRESIDENT None 1981-11-1 5617.0 None 10  7844 TURNER SALESMAN 7698 1981-09-0 2117.0 0.0 30  7876 ADAMS CLERK 7788 1987-05-2 1717.0 None 20  7900 JAMES CLERK 7698 1981-12-0 1567.0 None 30  7902 FORD ANALYST 7566 1981-12-0 3617.0 None 20  7934 MILLER CLERK 7782 1982-01-2 1917.0 None 10  oclient>create or replace procedure upd\_sal is  begin  update scott.emp set sal=sal+100;  commit;  end;  procedure Created!  oclient>  oclient>call upd\_sal;  procedure executed!  oclient>select \* from scott.emp;  EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO  ------------------------------------------------------------------------------------------------------------------------------------------------  7499 ALLEN SALESMAN 7698 1981-02-2 12317.0 300.0 30  7521 WARD SALESMAN 7698 1981-02-2 1967.0 500.0 30  7566 JONES MANAGER 7839 1981-04-0 3692.0 None 20  7654 MARTIN SALESMAN 7698 1981-09-2 1967.0 1400.0 30  7698 BLAKE MANAGER 7839 1981-05-0 3567.0 None 30  7782 CLARK MANAGER 7839 1981-06-0 3167.0 None 10  7788 SCOTT ANALYST 7566 1987-04-1 3717.0 None 20  7839 KING PRESIDENT None 1981-11-1 5717.0 None 10  7844 TURNER SALESMAN 7698 1981-09-0 2217.0 0.0 30  7876 ADAMS CLERK 7788 1987-05-2 1817.0 None 20  7900 JAMES CLERK 7698 1981-12-0 1667.0 None 30  7902 FORD ANALYST 7566 1981-12-0 3717.0 None 20  7934 MILLER CLERK 7782 1982-01-2 2017.0 None 10 |

### 3.2.16 创建包

|  |
| --- |
| oclient>create or replace package dp\_xs is  function get\_xm(p\_xh int) return varchar2;  end;  Package spec Created!!  oclient>  oclient>create or replace package body dp\_xs is  function get\_xm(p\_xh int) return varchar2 is  v\_xm varchar2(20);  begin  select xm into v\_xm from xs where xh=p\_xh;  return v\_xm;  exception  when others then  return '';  end;  end;  Package Body Created!  oclient>  oclient>insert into xs(xh,xm) values(1,'zhang.san');  insert 1 completed!  oclient>insert into xs(xh,xm) values(2,'wang.liu');  insert 1 completed!  oclient>commit;  oclient>select substr(dp\_xs.get\_xm(1),1,20) from dual;  SUBSTR(DP\_XS.GET\_XM(1),1,20)  ------------------------------  zhang.san |

### 3.2.17 创建触发器

|  |
| --- |
| oclient>create or replace trigger trg\_xs  before delete or insert or update  on xs  for each row  declare  v\_sql varchar2(4000);  v\_col varchar2(1000);  begin  execute immediate 'alter session set nls\_date\_format=''YYYY-MM-DD HH24:MI:SS''';  case  when inserting then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val,col\_name1,col\_name2,col\_type1,col\_type2,col\_new\_val1,col\_new\_val2) values(syn\_log\_seq.nextval,'XS','I',systimestamp,'XH','NUMBER',:new.xh,'XH','XM','NUMBER','VARCHAR2',:ne >w.xh,:new.xm);  when updating then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val,col\_name1,col\_name2,col\_type1,col\_type2,col\_new\_val1,col\_new\_val2,col\_old\_val1,col\_old\_val2) values(syn\_log\_seq.nextval,'XS','U',systimestamp,'XH','NUMBER',:new.xh,'XH','XM','NUMBER','VARCHAR2',:new.xh,:new.xm,:old.xh,:old.xm);  when deleting then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val) values(syn\_log\_seq.nextval,'XS','D',systimestamp,'XH','NUMBER',:old.xh);  end case;  end;  Trigger Created! |

### 3.2.18 执行存储过程或包

|  |
| --- |
| oclient>call upd\_sal;  procedure executed!  oclient>create table xs(xh int primary key,xm varchar2(20));  Table created!  oclient>call DP\_SYN\_BUILD.INIT\_TAB(xs);  procedure executed!  oclient> |

### 3.2.19 执行匿名块

|  |
| --- |
| oclient>create table sys\_log(id int,msg varchar2(100));  Table created!  oclient>declare  n\_xh int;  begin  select max(xh) into n\_xh from xs;  insert into sys\_log(id,msg) values(1,n\_xh);  commit;  end;  plsql block executed!  oclient>select substr(id,1,3),substr(msg,1,10) from sys\_log;  SUBSTR(ID,1,3) SUBSTR(MSG,1,10)  ----------------------------------  1 2 |

### 3.2.20 执行多行查询

|  |
| --- |
| oclient>select empno,ename,sal  >from scott.emp  >order by deptno,ename;  EMPNO ENAME SAL  --------------------------------  7782 CLARK 3167.0  7839 KING 5717.0  7934 MILLER 2017.0  7876 ADAMS 1817.0  7902 FORD 3717.0  7566 JONES 3692.0  7788 SCOTT 3717.0  7499 ALLEN 12317.0  7698 BLAKE 3567.0  7900 JAMES 1667.0  7654 MARTIN 1967.0  7844 TURNER 2217.0   1. ARD 1967.0 |

### 3.2.21 执行sql文件\*

|  |
| --- |
| oclient>truncate table xs;  Table Truncated!  oclient>@/ops/sql/xs.sql  ORA-00955: name is already used by an existing object  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  Committed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  Committed!  insert 1 completed!  Committed!  oclient>  oclient>select \* from xs;  XH NAME CSRQ NL  ------------------------------------------------------------------------------------------------------------  1 zhang.san 1978-10-10 23  2 wang.gang 1988-10-10 33  3 wu.lili 1979-08-10 36  4 yang.gang 1992-02-10 12  5 wang.gang 1988-10-10 45  7 feng.gang 1988-10-10 33  8 li.lili 1979-08-10 36  9 cao.gang 1992-02-10 12  10 liu.gang 1988-10-10 45  6 zhang.dao 1958-10-10 61  11 zhong.dao 1958-10-10 61  oclient> |

### 3.2.22 查看表空间信息\*

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 30  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>\tp  TABLESPACE\_NAME TOTAL(MB) FREE(MB) USAGE%  ----------------------------------------------------------------------------------------------------------  SECURE 200 187 6.5%  SYSAUX 630 35.69 94.34%  SYSTEM 1500 4.06 99.73%  UNDOTBS1 2280 73.75 96.77%  USERS 80 5.56 93.05% |

### 3.2.23 查看数据库信息\*

|  |
| --- |
| oclient>\db  --------------------------------------------------  OPEN\_MODE :READ WRITE  SWITCHOVER\_STATUS :NOT ALLOWED  DATAGUARD\_BROKER :DISABLED  GUARD\_STATUS :NONE  DATABASE\_ROLE :PRIMARY  FORCE\_LOGGING :YES  LOG\_MODE :NOARCHIVELOG  PROTECTION\_MODE :MAXIMUM AVAILABILITY  PROTECTION\_LEVEL :UNPROTECTED  NAME :ORCL  CONTROLFILE\_TYPE :CURRENT  FS\_FAILOVER\_STATUS :DISABLED |

### 3.2.24 查看实例信息\*

|  |
| --- |
| oclient>\inst  --------------------------------------------------  INSTANCE\_NUMBER :1  INSTANCE\_NAME :orcl  HOST\_NAME :dg1  VERSION :11.2.0.4.0  STARTUP\_TIME :2017-06-10 10:25:02  STATUS :OPEN  DATABASE\_STATUS :ACTIVE  INSTANCE\_ROLE :PRIMARY\_INSTANC  ACTIVE\_STATE :NORMAL  BLOCKED :NO  oclient> |

### 3.2.25 查看异常锁信息\*

|  |
| --- |
| oclient>\lock  SID LOCK\_TYPE HELD REQUESTED OBJ\_NAME XIDSQN ELAPSED(s) STATUS  --------------------------------------------------------------------------------------------------------------------------------------------  30 DML Row-X (SX) None XS None 860 Not Blocking  44 DML Row-X (SX) None XS2 None 818 Not Blocking  43 DML Row-X (SX) None XS None 876 Not Blocking  34 DML Row-X (SX) None XS2 None 824 Not Blocking  43 Transaction Exclusive None None 1629 876 Blocking  34 Transaction Exclusive None None 1420 824 Blocking  30 Transaction None Exclusive None 1629 860 Not Blocking  44 Transaction None Exclusive None 1420 818 Not Blocking |

说明：可以通过STATUS列看到哪些会话正被阻塞。以上的查询结果表明会话Id为34，43阻塞了其它会话。#通过\wait功能要吧查看以上会话正在阻塞的会话，以下表格显示出：

* 会话30，正在申请行级锁处于等待状态，阻塞会话为43。
* 会话44，正在申请行级锁处于等待状态，阻塞会话为34。

|  |
| --- |
| oclient>\wait  SID SPID EVENT STATE BLOCK  ----------------------------------------------------------------------------------------------------------------------------------------------  13 62557 smon timer WAITING  2 62526 pmon timer WAITING  20 62589 Streams AQ: qmn coordinator idle wait WAITING  24 62639 Streams AQ: waiting for time management or cleanup WAITING  26 62637 Streams AQ: qmn slave idle wait WAITING  30 51694 enq: TX - row lock contention WAITING 43  39 53878 Space Manager: slave idle wait WAITING  4 62537 VKTM Logical Idle Wait WAITING  44 51783 enq: TX - row lock contention WAITING 34  6 62543 DIAG idle wait WAITING  8 62547 DIAG idle wait WAITING  oclient> |

### 3.2.26 查看大事务信息\*

|  |
| --- |
| oclient>\tran  START\_RQ RUN(MIN) UBABLK EVENT SES\_STATUS TRANS\_STATUS  -------------------------------------------------------------------------------------------------------------------------------------------------  2017-07-02 03:40:14 3.55 8920 SQL\*Net message from client INACTIVE ACTIVE  2017-07-02 03:41:06 2.68 523 SQL\*Net message from client INACTIVE ACTIVE |

### 3.2.27 查看会话详情及正执行SQL\*

#通过oclient工具连接至scott用户，循环执行一匿名块模拟一个长时间运行的SQL

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 35  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>select sid from v$mystat where rownum=1;  SID  -----------------------  35  oclient>declare  n int;  begin  for i in 1..1000 loop  execute immediate 'select count(0) from dba\_objects where object\_type in(''TABLE'',''VIEW'') and object\_name like ''%CON%''' into n;  end loop;  end; |

#再通过oclient打开一个新会话，查询会话35详情，可以抓到正在执行的SQL，SQL是通过美化过的，目前暂不支持子查询嵌套的美化，算法在进一步优化中。

|  |
| --- |
| oclient>\sess  SID SPID MACHINE CLIENT\_IP LOGON\_TIME STATUS  ---------------------------------------------------------------------------------------  40 106560 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.01 18:59:58 INACTIVE  45 108358 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.01 19:10:08 INACTIVE  43 118009 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.01 20:05:47 INACTIVE  33 1036 dg1 192.168.8.100 2017.07.01 21:25:13 INACTIVE  22 51379 dg1 192.168.8.100 2017.07.02 03:37:57 ACTIVE  30 51694 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.02 03:40:30 ACTIVE  34 51726 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.02 03:40:47 INACTIVE  44 51783 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.02 03:41:11 ACTIVE  1 52243 WORKGROUP\MAFEI-WORK 192.168.8.8 2017.07.02 03:44:51 ACTIVE  oclient>\sess 1  Current SID :1 for details:  ------------------------------------------------------------------  SID :1  SERIAL :2939  SPID :52243  MACHINE :WORKGROUP\MAFEI-WORK  ACTION :SQL Window - New  MODULE :PL/SQL Developer  OSUSER :mafei  PROGRAM :plsqldev.exe  SADDR :00000000778836E0  PADDR :0000000077CC7F68  SQL\_HASH\_VALUE :25950640  PREV\_HASH\_VALUE :25950640  SPID :52243  EVENT :direct path read  LOGON\_TIME :2017-07-0  CLIENT\_IP :192.168.8.8  LOGON\_TIME :2017.07.02 03:44:51  STATUS :ACTIVE  TO\_CHAR(S.SQL\_ID) :5cx35y00srydh  Current Executing SQL:  --------------------------------------------------  SELECT  count(0)  FROM dba\_objects  WHERE OBJECT\_TYPE IN('TABLE','VIEW')  and object\_name like '%CON% |

### 3.2.28 登陆时身份验证友好提示\*

**#登陆语法不正确时的提示**

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100/1521:orcl -u scott:tiger -console  Please: oclient -h for help! |

**#登陆参数值输入不正确时的提示**

|  |
| --- |
| #实例名输入错误演示  [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl2 -u scott:tiger -console  ORA-12505: TNS:listener does not currently know of SID given in connect descriptor  #端口输入错误演示  [root@dg1 ops]# oclient.py -c 192.168.8.100:1522:orcl -u scott:tiger -console  ORA-12541: TNS:no listener  #IP输入错误演示  [root@dg1 ops]# oclient.py -c 192.168.8.102:1521:orcl -u scott:tiger -console  ORA-12543: TNS:destination host unreachable  #IP用户名或口令输入错误演示  [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger2 -console  ORA-01017: invalid username/password; logon denied |

## 3.3 数据库表间传输\*

### 3.3.1 修改配置文件

|  |
| --- |
| [root@dg1 ops]# more config.ini  #config transfer or sync source database information  ##################################################  # config transfer or sync table ,support: #  # transer or syn fromdb all tables #  # tname=\* #  # transer or syn fromdb lx1,lx2,lx3 table #  # tname=lx1,lx2,lx3 #  ##################################################  [TRANSFER]  from\_ip = 192.168.8.100  from\_port = 1521  from\_sid = orcl  from\_user = scott  from\_pass = tiger  to\_ip = 192.168.8.101  to\_port = 1521  to\_sid = orcl  to\_user = scott  to\_pass = tiger  tname=lx1,lx2,lx3 |

说明：查询参数需要连接用户具有查询数据字典权限，否则报找不到表错误。另外查询参数支持模糊查询。tname可以指定多张表，以逗号分隔，也可以指定\*，表示传输from\_user用户下的所有表至to\_user用户下。

### 3.3.2 准备传输表

以下通过oclient工具在源库创建表张表lx1,lx2,lx3

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 34  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>create table lx1 as select \* from dba\_objects;  Table created!  oclient>  oclient>create table lx2 as select \* from dba\_users;  Table created!  oclient>  oclient>create table lx3 as select \* from dba\_sys\_privs;  Table created!  oclient> |

### 3.3.3 数据库间表传输

|  |
| --- |
| [root@dg1 ops]# oclient.py -transfer -conf config.ini  Table created!  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \* Transfer table :lx1 \*  \* Transfer rows :86305 \*  \* Transfer batch :1000 \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Transferring Table...LX1  86305/86305: ###########################################  Transfer complete!  Transfer total time:202s  Table created!  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \* Transfer table :lx2 \*  \* Transfer rows :31 \*  \* Transfer batch :15 \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Transferring Table...LX2  31/ 31: ###########################################  Transfer complete!  Transfer total time:0s  Table created!  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \* Transfer table :lx3 \*  \* Transfer rows :793 \*  \* Transfer batch :1000 \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Transferring Table...LX3  793/793: ###########################################  Transfer complete!  Transfer total time:1s |

### 3.3.4 验证传输

|  |
| --- |
| #在目标库上查询表是否已被传输过来  sqlplus scott/tiger  SQL> select count(0) from lx1;  COUNT(0)  ------------------  86305  SQL> select count(0) from lx2;  COUNT(0)  ------------------  31  SQL> select count(0) from lx3;  COUNT(0)  ------------------  793 |

## 3.4 数据库表同步\*

### 3.4.1 修改配置文件

|  |
| --- |
| #config transfer or sync source database information  ##################################################  # config transfer or sync table ,support: #  # transer or syn fromdb all tables #  # tname=\* #  # transer or syn fromdb lx1,lx2,lx3 table #  # tname=lx1,lx2,lx3 #  ##################################################  #config sync destination database information  [SYNC]  from\_ip = 192.168.8.100  from\_port = 1521  from\_sid = orcl  from\_user = scott  from\_pass = tiger  to\_ip = 192.168.8.101  to\_port = 1521  to\_sid = orcl  to\_user = scott  to\_pass = tiger  tname=lx1,lx2 |

### 3.4.2 同步前初始化

#### （1）对源库连接用户进行授权

|  |
| --- |
| [root@dg1 ~]# su – oracle  #授权语句  [oracle@dg1 ~]$ more /home/oracle/grant.sql  grant create any table to scott;  grant create any trigger to scott;  grant create any sequence to scott;  grant select any dictionary to scott;  #对同步用户(scott)进行授权  SQL> conn / as sysdba  Connected.  SQL> @/home/oracle/grant.sql  Grant succeeded.  Grant succeeded.  Grant succeeded.  Grant succeeded. |

#### （2）在源库创建同步包

|  |
| --- |
| SQL> show user  USER is "SCOTT"  SQL> @/home/oracle/dp\_syn\_build.pck  Package created.  Package body created. |

#### （3）在源库上进行同步初始化

|  |
| --- |
| SQL> exec dp\_syn\_build.init\_syn;  PL/SQL procedure successfully completed. |

说明：创建同步日志表及相关索引；增加了DDL同步触发器，详见下表：

|  |
| --- |
| create or replace trigger trg\_SCOTT  after ddl on SCOTT.schema  declare  tr\_sql\_text ora\_name\_list\_t;  tr\_n number;  tr\_stmt varchar2(2000) := null;  begin  begin  tr\_n := ora\_sql\_txt(tr\_sql\_text);  for i in 1 .. tr\_n loop  tr\_stmt := tr\_stmt || tr\_sql\_text(i);  end loop;  exception when others then  tr\_stmt := null;  end;  tr\_stmt:=replace(upper(tr\_stmt),'SCOTT.');  tr\_stmt:=replace(tr\_stmt,chr(10));  tr\_stmt:=replace(tr\_stmt,chr(13));  tr\_stmt:=replace(tr\_stmt,chr(0));  tr\_stmt:=ltrim(rtrim(tr\_stmt,chr(32)));  tr\_stmt:=trim('EXECUTE IMMEDIATE '||chr(39)||tr\_stmt||chr(39));    if instr(dp\_syn\_build.get\_syn\_tab\_list,ORA\_DICT\_OBJ\_NAME)>0 then  if instr(tr\_stmt,'CREATE OR REPLACE TRIGGER')>0 then  null;  elsif instr(tr\_stmt,'CREATE OR REPLACE PACKAGE')>0 then  null;  elsif instr(tr\_stmt,'CREATE UNIQUE INDEX')>0 then  null;  elsif instr(upper(tr\_stmt),'CREATE')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'SELECT')>0 then  null;  elsif instr(upper(tr\_stmt),'TRUNCATE')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'SYN\_LOG')>0  and instr(upper(tr\_stmt),'TRUNCATE')<instr(upper(tr\_stmt),'TABLE')  and instr(upper(tr\_stmt),'TABLE')<instr(upper(tr\_stmt),'SYN\_LOG') then  null;  else  insert into syn\_log(syn\_id,tname,otype,ddl\_stat,syn\_time)  values(syn\_log\_seq.nextval,ORA\_DICT\_OBJ\_NAME,'DDL',tr\_stmt,systimestamp);  end if;    if instr(upper(tr\_stmt),'ALTER')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'ADD')>0  and instr(upper(tr\_stmt),'PRIMARY')=0  and instr(upper(tr\_stmt),'ALTER')<instr(upper(tr\_stmt),'TABLE')  and instr(upper(tr\_stmt),'TABLE')<instr(upper(tr\_stmt),'ADD') then  insert into syn\_log(syn\_id,tname,otype,ddl\_stat,syn\_time)  values(syn\_log\_seq.nextval,ORA\_DICT\_OBJ\_NAME,'SYN','DP\_SYN\_BUILD.INIT\_TAB('''||ORA\_DICT\_OBJ\_NAME||''')',systimestamp);  end if;    if instr(upper(tr\_stmt),'ALTER')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'MODIFY')>0  and instr(upper(tr\_stmt),'ALTER')<instr(upper(tr\_stmt),'TABLE')  and instr(upper(tr\_stmt),'TABLE')<instr(upper(tr\_stmt),'MODIFY') then  insert into syn\_log(syn\_id,tname,otype,ddl\_stat,syn\_time)  values(syn\_log\_seq.nextval,ORA\_DICT\_OBJ\_NAME,'SYN','DP\_SYN\_BUILD.INIT\_TAB('''||ORA\_DICT\_OBJ\_NAME||''')',systimestamp);  end if;  if instr(upper(tr\_stmt),'ALTER')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'DROP')>0  and instr(upper(tr\_stmt),'ALTER')<instr(upper(tr\_stmt),'TABLE')  and instr(upper(tr\_stmt),'TABLE')<instr(upper(tr\_stmt),'DROP')  and instr(upper(tr\_stmt),'DROP')<instr(upper(tr\_stmt),'COLUMN') then  insert into syn\_log(syn\_id,tname,otype,ddl\_stat,syn\_time)  values(syn\_log\_seq.nextval,ORA\_DICT\_OBJ\_NAME,'SYN','DP\_SYN\_BUILD.INIT\_TAB('''||ORA\_DICT\_OBJ\_NAME||''')',systimestamp);  end if;  if instr(upper(tr\_stmt),'CREATE')>0  and instr(upper(tr\_stmt),'TABLE')>0  and instr(upper(tr\_stmt),'SELECT')=0  and instr(upper(tr\_stmt),'CREATE')<instr(upper(tr\_stmt),'TABLE') then  insert into syn\_log(syn\_id,tname,otype,ddl\_stat,syn\_time)  values(syn\_log\_seq.nextval,ORA\_DICT\_OBJ\_NAME,'SYN','DP\_SYN\_BUILD.INIT\_TAB('''||ORA\_DICT\_OBJ\_NAME||''')',systimestamp);  end if;  end if;  end; |

#### （4）在源库上初始化同步表

说明：该步在oclient V1.0需要对待同步表手动进行初始化，oclient V2.0，程序自动实现初始化。并且首次同步时，如果目标库不存在表时，会自动调用表传输，以后该表的DML，DDL日志会实时同步至目标用户。

|  |
| --- |
| SQL> exec dp\_syn\_build.init\_tab('lx1');  BEGIN dp\_syn\_build.init\_tab('lx1'); END;  ORA-20002: SCOTT.LX1 NOT EXIST PRIMARY KEY!  原因：同步的表上必须有主键同步。  解决：SQL> alter table lx1 add constraint pk\_lx1 primary key(object\_id);  Table altered.  #创建主键后再次对需要同表的表进行初始化  SQL> exec dp\_syn\_build.init\_tab('lx1');  PL/SQL procedure successfully completed. |

说明：初始化同步的表时，为表自动创建了一个触发器，用于收集表的DML操作日志至sys\_log表中。

#### （5）通过表名查看自动生成的触发器名称

|  |
| --- |
| SQL> select trigger\_name from dba\_triggers where owner='SCOTT' and table\_name='LX1';  TRIGGER\_NAME  ------------------------------  TRG\_LX1 |

#### （6）查看自动生成的触发器代码

select text from dba\_source where owner='SCOTT' and name='TRG\_LX1' order by line;

|  |
| --- |
| create or replace trigger trg\_lx1  before delete or insert or update  on lx1  for each row  declare  v\_sql varchar2(4000);  v\_col varchar2(1000);  begin  execute immediate 'alter session set nls\_date\_format=''YYYY-MM-DD HH24:MI:SS''';  case  when inserting then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val,col\_name1,col\_name2,col\_name3,col\_name4,col\_type1,col\_type2,col\_type3,col\_type4,col\_new\_val1,col\_new\_val2,col\_new\_val3,col\_new\_val4) values(syn\_log\_seq.nextval,'LX1','I',systimestamp,'OBJECT\_ID','NUMBER',:new.object\_id,'OBJECT\_ID','OBJECT\_NAME','OBJECT\_TYPE','OWNER','NUMBER','VARCHAR2','VARCHAR2','VARCHAR2',:new.object\_id,:new.object\_name,:new.object\_type,:new.owner);  when updating then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val,col\_name1,col\_name2,col\_name3,col\_name4,col\_type1,col\_type2,col\_type3,col\_type4,col\_new\_val1,col\_new\_val2,col\_new\_val3,col\_new\_val4,col\_old\_val1,col\_old\_val2,col\_old\_val3,col\_old\_val4) values(syn\_log\_seq.nextval,'LX1','U',systimestamp,'OBJECT\_ID','NUMBER',:new.object\_id,'OBJECT\_ID','OBJECT\_NAME','OBJECT\_TYPE','OWNER','NUMBER','VARCHAR2','VARCHAR2','VARCHAR2',:new.object\_id,:new.object\_name,:new.object\_type,:new.owner,:old.object\_id,:old.object\_name,:old.object\_type,:old.owner);  when deleting then  insert into syn\_log(syn\_id,tname,otype,syn\_time,pk\_name,pk\_type,pk\_val ) values(syn\_log\_seq.nextval,'LX1','D',systimestamp,'OBJECT\_ID','NUMBER',:old.object\_id);  end case;  end; |

### 3.4.3 源库新建表同步

#### （1）源库启动同步命令

|  |
| --- |
| [root@dg1 ops]# oclient.py -sync -conf config.ini  lx1,lx2  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Sync Table:lx1 ERROR! ORA-20001: SCOTT.LX1 NOT EXIST!  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 949  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 964  ORA-06512: at line 2  Sync Table:lx2 ERROR! ORA-20001: SCOTT.LX2 NOT EXIST!  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 949  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 964  ORA-06512: at line 2 |

说明：操作前删除源库和目标库中lx1,lx2表；首次同步时会检测源库是否存在lx1,lx2表，如果不存在会输出错误。

#### （2）在源库用户下新建表

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 36  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>create table lx1(xh int,xm varchar2(20));  Table created!  oclient>  oclient>create table lx2(dwid varchar2(20),dwdm varchar2(20));  Table created!  oclient> |

#### （3）查看报错同步日志

|  |
| --- |
| Sync Table:lx2 ERROR! ORA-20002: SCOTT.LX2 NOT EXIST PRIMARY KEY!  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 957  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 964  ORA-06512: at line 2  Sync Table:lx1 ERROR! ORA-20002: SCOTT.LX1 NOT EXIST PRIMARY KEY!  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 957  ORA-06512: at "SCOTT.DP\_SYN\_BUILD", line 964  ORA-06512: at line 2 |

说明：同步表必须有主键，否则会出现错误提示。

#### （4）源库为表增加主键

|  |
| --- |
| oclient>alter table lx1 add primary key(xh);  Table altered!  oclient>  oclient>alter table lx2 add primary key(dwid);  Table altered!  oclient> |

#查看DDL同步日志

|  |
| --- |
| Sync time :2017-07-01 20:14:36.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:2 rows  Sync complete!,elapsed time:0s  Sync time :2017-07-01 20:14:48.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:2 rows  Sync complete!,elapsed time:0s |

说明：同步表必须有主键，否则会出现错误提示，共同步了四条DDL操作，分别是创建和加主键。

#### （6）查看目标库已同步表

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.101:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 23  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>  oclient>select tname from tab;  TNAME  --------------------------------  LX1  LX2  oclient>  oclient>\dt lx1  ------------------------------------------------------------  Create Table LX1(  integer not null primary key,  varchar2(20)  );  oclient>\dt lx2  ------------------------------------------------------------  Create Table LX2(  varchar2(20) not null primary key,  varchar2(20)  ); |

说明：在目标库中执行\dt <table\_name>时，需要在目标库用户中创建dp\_ops\_build.sql包。另外在目标用户需要执行相关授权语句，详见4.3节中的grant.sql文件。

#### （7）源库同步表增加列

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 35  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>  oclient>  oclient>alter table lx1 add nl int;  Table altered!  oclient>  oclient>alter table lx2 add dwmc varchar2(40);  Table altered!  oclient> |

#查看DDL同步日志增加列

|  |
| --- |
| Sync time :2017-07-01 20:52:00.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:1 rows  Sync complete!,elapsed time:0s  Sync time :2017-07-01 20:52:34.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:1 rows  Sync complete!,elapsed time:0s |

#查看目标库中表结构

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.101:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 39  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>\dt lx1  ------------------------------------------------------------  Create Table LX1(  xh integer not null primary key,  xm varchar2(20),  nl integer  );  oclient>\dt lx2  ------------------------------------------------------------  Create Table LX2(  dwid varchar2(20) not null primary key,  dwdm varchar2(20),  dwmc varchar2(40)  ); |

#### （8）源库同步表修改列

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 33  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>alter table lx1 modify nl number;  Table altered!  oclient>  oclient>alter table lx2 modify dwmc varchar2(200);  Table altered!  oclient> |

#查看DDL同步日志增加列

|  |
| --- |
| Sync time :2017-07-01 21:25:58.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:1 rows  Sync complete!,elapsed time:0s  Sync time :2017-07-01 21:26:18.  Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:1 rows  Sync complete!,elapsed time:0s |

#查看目标库中表结构

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.101:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 38  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>\dt lx1  ------------------------------------------------------------  Create Table LX1(  xh integer not null primary key,  xm varchar2(20),  nl number  );  oclient>\dt lx2  ------------------------------------------------------------  Create Table LX2(  dwid varchar2(20) not null primary key,  dwdm varchar2(20),  dwmc varchar2(200)  );  oclient> |

说明：可以看到源码对lx1,lx2表结构进行修改后，马上同步至目标库中了。

#### （9）源库同步表插入数据操作

|  |
| --- |
| oclient>insert into lx1(xh,xm,nl) values(1,'ma.fei',23);  insert 1 completed!  oclient>insert into lx1(xh,xm,nl) values(2,'cao.cao',200);  insert 1 completed!  oclient>insert into lx1(xh,xm,nl) values(3,'fei.fei',32);  insert 1 completed!  oclient>commit;  Committed!  oclient>insert into lx2(dwid,dwdm,dwmc) select object\_id,owner,object\_name from dba\_objects;  insert 86308 completed!  oclient>commit;  Committed!  oclient> |

#查看DML同步日志

|  |
| --- |
| Sync time :2017-07-01 21:30:12.  Sync table :insert:3 rows,update 0 rows ,delete 0 rows,ddl:0 rows  Sync complete!,elapsed time:0s  Sync time :2017-07-01 21:32:56.  Sync table :insert:86308 rows,update 0 rows ,delete 0 rows,ddl:0 rows  Sync complete!,elapsed time:909s |

#查看目标库中表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.101:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 38  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>select count(0) from lx1;  COUNT(0)  ------------------------------  3  oclient>select count(0) from lx2;  COUNT(0)  ---------------------------  86308 |

#### （10）源库同步表更新数据操作

|  |
| --- |
| oclient>select \* from scott.lx1;  XH XM NL  ---------------------------------------------------------------------------------------------------------------------------  1 ma.fei 23  2 cao.cao 200  3 fei.fei 32  oclient>  oclient>update scott.lx1 set nl=nl+10;  update 3 completed!  oclient>commit; |

#查看DML同步日志

|  |
| --- |
| Sync time :2017-07-01 21:51:24.  Sync table :insert:0 rows,update 3 rows ,delete 0 rows,ddl:0 rows  Sync complete!,elapsed time:0s |

#查看目标库中表数据

|  |
| --- |
| oclient>select \* from scott.lx1;  XH XM NL  ----------------------------------------------------------------------------------  1 ma.fei 33  2 cao.cao 210  3 fei.fei 42  oclient> |

#### （11）源库同步表删除数据操作

|  |
| --- |
| oclient>select \* from scott.lx1;  XH XM NL  ----------------------------------------------------------------------------------  1 ma.fei 33  2 cao.cao 210  3 fei.fei 42  oclient>delete from lx1 where xh=3;  delete 1 completed!  oclient>commit;  Committed!oclient>commit; |

#查看DML同步日志

|  |
| --- |
| Sync time :2017-07-01 22:01:12.  Sync table :insert:0 rows,update 0 rows ,delete 1 rows,ddl:0 rows  Sync complete!,elapsed time:0s |

#查看目标库中表数据

|  |
| --- |
| oclient>select \* from lx1;  XH XM NL  ---------------------------------------------------------------------------------------------------------------------------------  1 ma.fei 33  2 cao.cao 210 |

#### （12）源库同步表删除列

|  |
| --- |
| oclient>alter table lx1 drop column nl;  Table altered!  oclient>\dt lx1  ------------------------------------------------------------  Create Table LX1(  xh integer not null primary key,  xm varchar2(20)  );  oclient> |

#查看DML同步日志

|  |
| --- |
| Sync table :insert:0 rows,update 0 rows ,delete 0 rows,ddl:1 rows  Sync complete!,elapsed time:0s |

#查看目标库中表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.101:1521:orcl -u scott:tiger -console  \--------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 24  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>\dt lx1  ------------------------------------------------------------  Create Table LX1(  xh integer not null primary key,  xm varchar2(20)  );  oclient>  oclient>select \* from lx1;  XH XM  ---------------------------------------------------------------  1 ma.fei  2 cao.cao  oclient> |

### 3.4.4 源库存在表同步

#### （1）源库启动同步命令

|  |
| --- |
| \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \* Transfer table :lx1 \*  \* Transfer rows :2 \*  \* Transfer batch :1 \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Transferring Table...LX1  2/ 2: ###########################################  Transfer complete!  Transfer total time:0s  Table created!  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \* To database :192.168.8.101:1521:orcl \*  \* To user :scott \*  \* Transfer table :lx2 \*  \* Transfer rows :86308 \*  \* Transfer batch :1000 \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Transferring Table...LX2  86308/86308: ###########################################  Transfer complete!  Transfer total time:159s |

说明：为了演示，将目标库中的lx1,lx2表删除。如果目标库中不存在相应表，同次表中数据没有生产过同步日志，因此会进行一次表传输操作。以后再进行DDL，DML操作会进行同步。

## 3.5 数据库表导出\*

### 3.5.1 修改配置文件

|  |
| --- |
| #config exp table ,support export sql,excel,csv format  [EXP]  from\_ip = 192.168.8.100  from\_port = 1521  from\_sid = orcl  from\_user = scott  from\_pass = tiger  exp\_type=sql  tname=xs |

### 3.5.2 导出表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -exp -conf config.ini  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* From database :192.168.8.100:1521:orcl \*  \* From user :scott \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Export Table...XS ,Batch=5 ,Rows=11...  11/ 11: ###########################################  Exporting complete!  Export total time:0s |

#查看导出结果

|  |
| --- |
| [root@dg1 ops]# more ./sql/xs.sql  Create Table XS(  xh integer not null primary key,  name varchar2(20),  csrq date,  nl integer  );  insert into scott.xs(xh,name,csrq,nl) values(1,'zhang.san',to\_date('1978-10-10','yyyy-mm-dd'),23);  insert into scott.xs(xh,name,csrq,nl) values(2,'wang.gang',to\_date('1988-10-10','yyyy-mm-dd'),33);  insert into scott.xs(xh,name,csrq,nl) values(3,'wu.lili',to\_date('1979-08-10','yyyy-mm-dd'),36);  insert into scott.xs(xh,name,csrq,nl) values(4,'yang.gang',to\_date('1992-02-10','yyyy-mm-dd'),12);  insert into scott.xs(xh,name,csrq,nl) values(5,'wang.gang',to\_date('1988-10-10','yyyy-mm-dd'),45);  commit;  insert into scott.xs(xh,name,csrq,nl) values(7,'feng.gang',to\_date('1988-10-10','yyyy-mm-dd'),33);  insert into scott.xs(xh,name,csrq,nl) values(8,'li.lili',to\_date('1979-08-10','yyyy-mm-dd'),36);  insert into scott.xs(xh,name,csrq,nl) values(9,'cao.gang',to\_date('1992-02-10','yyyy-mm-dd'),12);  insert into scott.xs(xh,name,csrq,nl) values(10,'liu.gang',to\_date('1988-10-10','yyyy-mm-dd'),45);  insert into scott.xs(xh,name,csrq,nl) values(6,'zhang.dao',to\_date('1958-10-10','yyyy-mm-dd'),61);  commit;  insert into scott.xs(xh,name,csrq,nl) values(11,'zhong.dao',to\_date('1958-10-10','yyyy-mm-dd'),61);  commit; |

## 3.6 数据库表导入\*

### 3.6.1 修改配置文件

|  |
| --- |
| #config imp table  [IMP]  to\_ip = 192.168.8.100  to\_port = 1521  to\_sid = orcl  to\_user = scott  to\_pass = tiger  filename=/ops/sql/xs.sql |

### 3.6.2 清空表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 33  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>truncate table xs;  Table Truncated! |

### 3.6.3 导入表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -imp -conf config.ini  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  \* To database :192.168.8.100:1521:orcl \*  \* To user :scott \*  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  Table created!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  Committed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  insert 1 completed!  Committed!  insert 1 completed!  Committed! |

### 3.6.4 查询表数据

|  |
| --- |
| [root@dg1 ops]# oclient.py -c 192.168.8.100:1521:orcl -u scott:tiger -console  --------------------------------------------------------------------------------------  Welcome to the oclient V2.0 monitor. Commands end with ;  Your Oracle connection sid is 42  Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production  PL/SQL Release 11.2.0.4.0 - Production  CORE 11.2.0.4.0 Production  TNS for Linux: Version 11.2.0.4.0 - Production  NLSRTL Version 11.2.0.4.0 - Production  oclient>select \* from xs;  XH NAME CSRQ NL  ----------------------------------------------------------------------------------------------------------------------  1 zhang.san 1978-10-10 23  2 wang.gang 1988-10-10 33  3 wu.lili 1979-08-10 36  4 yang.gang 1992-02-10 12  5 wang.gang 1988-10-10 45  7 feng.gang 1988-10-10 33  8 li.lili 1979-08-10 36  9 cao.gang 1992-02-10 12  10 liu.gang 1988-10-10 45  6 zhang.dao 1958-10-10 61  11 zhong.dao 1958-10-10 61  oclient> |

## 3.7 数据库监控

### 3.7.1 修改配置文件

|  |
| --- |
| #monitor Oracle Server  [MONITOR]  mon\_sleep=1  mon\_ip = 192.168.8.100  mon\_port = 1521  mon\_sid = orcl  mon\_user = oclient  mon\_pass = oclient  from\_user = xxxx@163.com  from\_pass = xxxxxxxx  to\_user = aa@163.com,bb@163.com  tablespace\_usage\_rate=0.85 |

### 3.7.2 启动监控程序

[root@dg1 ops]# oclient.py -monitor -conf config.ini

四、程序源码

## 4.1 Oclient源程序

**说明：**

oclient.py : oclient工具源程序。

config.ini : 用来实现Oracle同步及传输功能的配置文件。

4.2 Oclient配置文件



**说明：**

ora.profile:文件是加载Oracle驱动环境配置文件。

## 4.3 Oclient数据库脚本

（1）包：package



（2）权限：grant



（3）触发器：

****

（4）创表

****

（5）初始化监控

****

（6）测试及查询

****

**脚本说明：**

dp\_syn\_build.pck Oracle数据库间同步相关功能包。

dp\_ops\_build.pck Oracle数据库运维常用功能包。

dp\_mon\_build.pck Oracle数据库监控预警功能包。

cre\_mon\_tab.sql Oracle创建数据库监控相关表

external\_table.txt Oracle 创建外部表相关脚本

ins\_mon\_script.sql Oracle 数据库监控初始化脚本

grant.sql 用户同步需要的权限，以管理员身份执行。

cre \_trg.sql 用户同步需要的权限，以管理员身份执行。

五、打包发布

## 5.1 打包程序

cxfreeze oclient.py

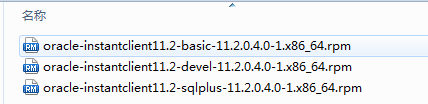
tar -cvf oclientV2.0.tar.gz ./oclient\_2.0/

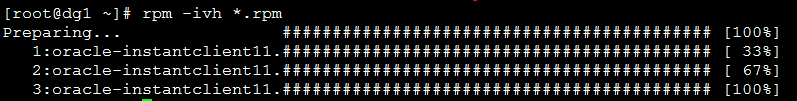
|  |
| --- |
| [root@dg1 oclient\_1.0]# oclient -h | more  oclient tools for help:  --------------------------------------------------------------------------------------  -h or --help or /? query oclient help  -c <host:port:instance> connect oracle database tns string  -u <user>:<password> user and password information  -q <QUERY>\|<DML>\|<DDL>\|<DVL> execute sql language  -p <parameter name> query oracle parameter  -console enter into interaction mode  -consolehelp query interaction mode help  -transfer -conf <config file> transfer table in different oracle database  -sync -conf <config file> sync table in different oracle database  oclient example:  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "select \* from scott.emp"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "update scott.emp set sal=sal+1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "create user lx1 identified by lx1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -q "grant connect,resource to lx1"  oclient -c 192.168.200.100:1521:orcl -u apps:apps -p sga  oclient -c 192.168.200.100:1521:orcl -u apps:apps -console  oclient -consolehelp  oclient -transfer -conf config.ini  oclient -sync -conf config.ini |

## 5.2 运行工具

（1） 安装Oracle客户端驱动

上传以下安装到到客户端，并进行安装：





（2）增加环境变量

vi /etc/profile 末尾增加以下内容

|  |
| --- |
| export ORACLE\_HOME=/usr/lib/oracle/11.2/client64  export LD\_LIBRARY\_PATH=$ORACLE\_HOME/lib:$LD\_LIBRARY\_PATH  export PATH=.:$ORACLE\_HOME/bin:$PATH  export NLS\_LANG=american\_america.AL32UTF8 |

source /etc/profile

（3）将二进制程序上传至linux客户端运行

tar -xvf oclientV1.0.tar.gz

cd oclient\_1.0/

oclient -c 192.168.8.101:1521:orcl -u scott:tiger -q "select \* from scott.emp"

oclient -c 192.168.8.100:1521:orcl -u scott:tiger -console

六、数据库监控

## 6.1 监控内容

（1）数据库主机：CPU、内存、硬盘、网卡

（2）数据库表空间使用率

（3）大事务

（4）异常锁

（5）慢查询

（6）与磁盘、共享池、队列有关等待事件

（7）SGA，PGA，连接数等建议值

## 6.2 表空间监控邮件输出

**主机信息：**

|  |  |
| --- | --- |
| 主机名： |  |
| IP地址： |  |
| 操作系统： |  |

**数据库信息：**

|  |  |
| --- | --- |
| 数据库版本： |  |
| 数据库名： |  |
| 日志模式 |  |
| 建库时间: |  |
| 运行时间： |  |

表空间预警信息：

|  |  |  |  |
| --- | --- | --- | --- |
| 表空间名 | 总空间(MB) | 可用空间(MB) | 使用率(%) |
| SYSAUX | 700 | 40.94 | 5.85% |
| UNDOTBS1 | 1235 | 80.56 | 84.8% |
| USERS | 1182.5 | 43.44 | 80.81% |
| SYSTEM | 750 | 2.81 | .38% |
| SECURE | 200 | 187 | 93.5% |

说明：标红部分为为预警信息。

## 6.3 表空间预警邮件

**表空间使用率预警[主机名:dg1,IP:192.168.8.100]**

发件人：zhdn\_791006

收件人：zhdn\_791005@163.com；　zhdn\_791006　　抄　送：密　送：

时　间：2017-08-11 18:22

### 主机信息：

|  |  |
| --- | --- |
| **主机名称：** | dg1 |
| **主机地址：** | 192.168.8.100 |
| **操作系统：** | CentOS release 6.8 (Final) |
| **主机时间：** | 2017-07-07 00:54:08 |

### 数据库信息：

|  |  |
| --- | --- |
| **软件版本：** | Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production |
| **数据库名：** | ORCL |
| **日志模式：** | 非归档 |
| **建库时间：** | 2017-05-31 07:48:33 |
| **启动时间：** | 2017-07-03 09:47:22 |
| **运行时长：** | 87 小时 |

### 表空间预警信息：

|  |  |  |  |
| --- | --- | --- | --- |
| **表空间名** | **总空间(MB)** | **可用空间(MB)** | **使用率(%)** |
| SYSAUX | 6936 | 2096.38 | 69.78% |
| UNDOTBS1 | 20805 | 4174.75 | 79.93% |
| USERS | 11591.25 | 3148.5 | 72.84% |
| SYSTEM | 3548 | 1999.13 | 43.65% |
| SECURE | 200 | 27 | 86.5% |

## 6.4 表空间预警解除邮件

**表空间使用率预警解除[主机名:dg1,IP:192.168.8.100]**

详情

zhdn\_791006　　发送至 zhdn\_791005@163.com；　zhdn\_791006

发件人：zhdn\_791006

收件人：zhdn\_791005@163.com；　zhdn\_791006

　抄　送：密　送：

时　间：2017-08-11 18:23

### 主机信息：

|  |  |
| --- | --- |
| **主机名称：** | dg1 |
| **主机地址：** | 192.168.8.100 |
| **操作系统：** | CentOS release 6.8 (Final) |
| **主机时间：** | 2017-07-07 00:54:35 |

### 数据库信息：

|  |  |
| --- | --- |
| **软件版本：** | Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production |
| **数据库名：** | ORCL |
| **日志模式：** | 非归档 |
| **建库时间：** | 2017-05-31 07:48:33 |
| **启动时间：** | 2017-07-03 09:47:22 |
| **运行时长：** | 87 小时 |

### 表空间预警信息：

SECURE,

|  |  |  |  |
| --- | --- | --- | --- |
| **表空间名** | **总空间(MB)** | **可用空间(MB)** | **使用率(%)** |
| SECURE | 200 | 186.94 | 6.53% |