Load Balancing Setup
For
Oracle Parallel Server

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For load balancing to work properly several parameters have to be set in oracle. This document discusses the recommended setting of these parameters and the reasons thereof.

Assumptions

?? There are 4 nodes in the OPS cluster named prodsvr1, prodsvr2, prodsvr3 and prodsvr4.
?? Only the first three nodes serve the OLTP clients and the last one (prodsvr4) exclusively serve the batch processes.
?? Only the OLTP nodes need multithreaded server setup; the batch node needs dedicated server setup.
?? The database name is PRDN.
?? Load balancing and Failover is to be set up between prodsvr1, prodsvr2 and prodsvr3 only. The instance on prodsvr4 is not to be balanced for load or is not to participate in failover.

TNSNAMES.ORA on PRODSVR

The tnsnames.ora file has to look the same in all four nodes like this.

```
PRODSVR1.OURCUSTOMER.COM =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr1.OURCUSTOMER.COM)
           (PORT = 1521))
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr1.OURCUSTOMER.COM)
           (PORT = 1526))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = PRDN.WORLD)
    )
  )

PRODSVR2.OURCUSTOMER.COM =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr2.OURCUSTOMER.COM)
           (PORT = 1521))
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr2.OURCUSTOMER.COM)
           (PORT = 1526))
    )
    (CONNECT_DATA =
```

```
        (SERVICE_NAME = PRDN.WORLD)
      )
   )


PRODSVR3.OURCUSTOMER.COM =
   (DESCRIPTION =
     (ADDRESS_LIST =
       (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr3.OURCUSTOMER.COM)
             (PORT = 1521))
       (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr3.OURCUSTOMER.COM)
             (PORT = 1526))
     )
     (CONNECT_DATA =
       (SERVICE_NAME = PRDN.WORLD)
     )
   )

PRODSVR4.OURCUSTOMER.COM =
   (DESCRIPTION =
     (ADDRESS_LIST =
       (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr4.OURCUSTOMER.COM)
             (PORT = 1521))
       (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr4.OURCUSTOMER.COM)
             (PORT = 1526))
     )
     (CONNECT_DATA =
       (SERVICE_NAME = PRDN.WORLD)
     )
   )
```

SQLNET.ORA on PRODSVR

All four nodes of PRODSVR machines should have the same sqlnet.ora as follows.

```
NAMES.DEFAULT_DOMAIN = OURCUSTOMER.COM
NAMES.DIRECTORY_PATH= (TNSNAMES)
AUTOMATIC_IPC=FALSE
```

TNSNAMES.ORA on Application Servers

All app servers (production and development app servers) have to have the same tnsnames.ora as follows. The name PRODSVR2RR was chosen as the name is currently used and it connects to the load balance machine. The applications need not change to connect to a load balanced prodsvr cluster.

The following setup always tries to connect to the listener on prodsvr1 port 1521 and if it's down, then the one on prodsvr1 port 1526. If that is down too, it tries to connect to prodsvr2 and so on.

Regardless of which listener it connects to, it connects to the instance that is least loaded. The final entry PRODSVR2BATCH is needed to connect to the last node as it is being used now.

```
PRODSVR2RR =
    (DESCRIPTION_LIST=
        (DESCRIPTION=
            (ADDRESS_LIST=
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr1)(PORT=1521))
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr1)(PORT=1526))
            )
            (CONNECT_DATA=(SERVICE_NAME=PRDN.WORLD))
        )
        (DESCRIPTION=
            (ADDRESS_LIST=
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr2)(PORT=1521))
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr2)(PORT=1526))
            )
            (CONNECT_DATA=(SERVICE_NAME=PRDN.WORLD))
        )
        (DESCRIPTION=
            (ADDRESS_LIST=
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr3)(PORT=1521))
                (ADDRESS=(PROTOCOL=TCP)(HOST=prodsvr3)(PORT=1526))
            )
            (CONNECT_DATA=(SERVICE_NAME=PRDN.WORLD))
        )
    )


PRODSVR2BATCH.OURCUSTOMER.COM =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr4.OURCUSTOMER.COM)
            (PORT = 1521))
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr4.OURCUSTOMER.COM)
            (PORT = 1526))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = PRDN.WORLD)
      (SERVER=DEDICATED)
    )
  )
```

SQLNET.ORA on Application Servers

All app servers should be setup in such a way that SQL*Net 2.3 client should not use IPC as a mode of communication if available. If IPC is used then the load balancing will not work.

```
AUTOMATIC_IPC=FALSE
```

LISTENER.ORA on PRODSVR

The prodsvr1 machines should have the listener.ora file as follows. On the other machines, the setup is similar except that the machine names are changed.

```
LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
```

```
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr1.OURCUSTOMER.COM)
          (PORT = 1521))
    )
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = IPC)(KEY = EXTPROC))
    )
  )

LISTENER1 =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = prodsvr1.OURCUSTOMER.COM)
          (PORT = 1526))
    )
  )

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = PLSExtProc)
      (ORACLE_HOME = /oracle/product/8.1.7)
      (PROGRAM = extproc)
    )
    (SID_DESC =
      (GLOBAL_DBNAME = PRDN.WORLD)
      (ORACLE_HOME = /oracle/product/8.1.7)
      (SID_NAME = PRDN)
    )
  )

SID_LIST_LISTENER1 =
  (SID_LIST =
    (SID_DESC =
      (GLOBAL_DBNAME = PRDN.WORLD)
      (ORACLE_HOME = /oracle/product/8.1.7)
      (SID_NAME = PRDN)
    )
  )
```

INIT.ORA on PRODSVR

The mts_dispatchers parameter of the prodsvr1 machine should have the following value.

```
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR1.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR2.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR3.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
```

The same in prodsvr2 is similar but the order is changed to make the prodsvr2 the first dispatcher.

```
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR2.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
```

```
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR3.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR1.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
```

The same goes for prodsvr3.

```
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR3.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR1.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
MTS_DISPATCHERS="(PROTOCOL=TCP)(LISTENER=PRODSVR2.OURCUSTOMER.COM)(DISP
ATCHERS=20)(CONNECTIONS=500)"
```

And finally since the prodsvr4 should be dedicated server only, the mts_dispatchers parameter should have no value in init.ora file. The parameter should be commented out.