

Using Connection
Manager to manage
seamless seamless HA
(RAC & DG) DB
connectivity

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What is Connection Manager ?

(the official answer)

- "Oracle Connection Manager is a multipurpose networking solution that offers increased scalability, multiprotocol connectivity and secure network access control."
- It can do -
 - Connection multiplexing
 - Access control
 - Source routing
 - Multiprotocol Support
 - Firewall Proxy Support

What is Connection Manager ?

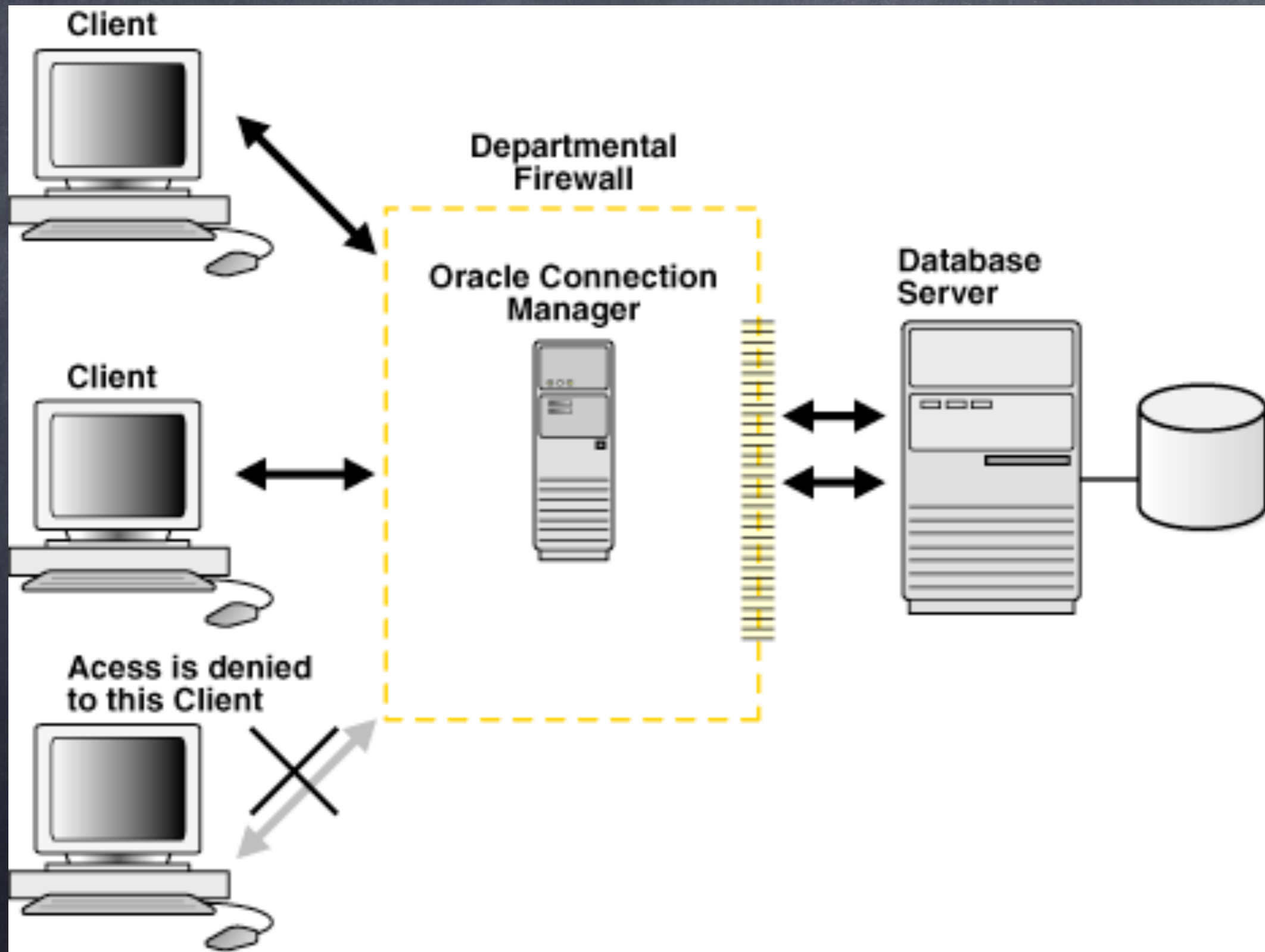
(the unofficial version)

- a specialised SQL*net listener
- a database proxy server – an intermediate server that forwards db client connections through to the registered databases.
- hides where the underlying database is
- can use firewall “like” filtering for DB access control
- can work with dataguard to present to DB clients the current “primary” database.
- can do protocol translation (i.e. ipV4 <-> ipV6)

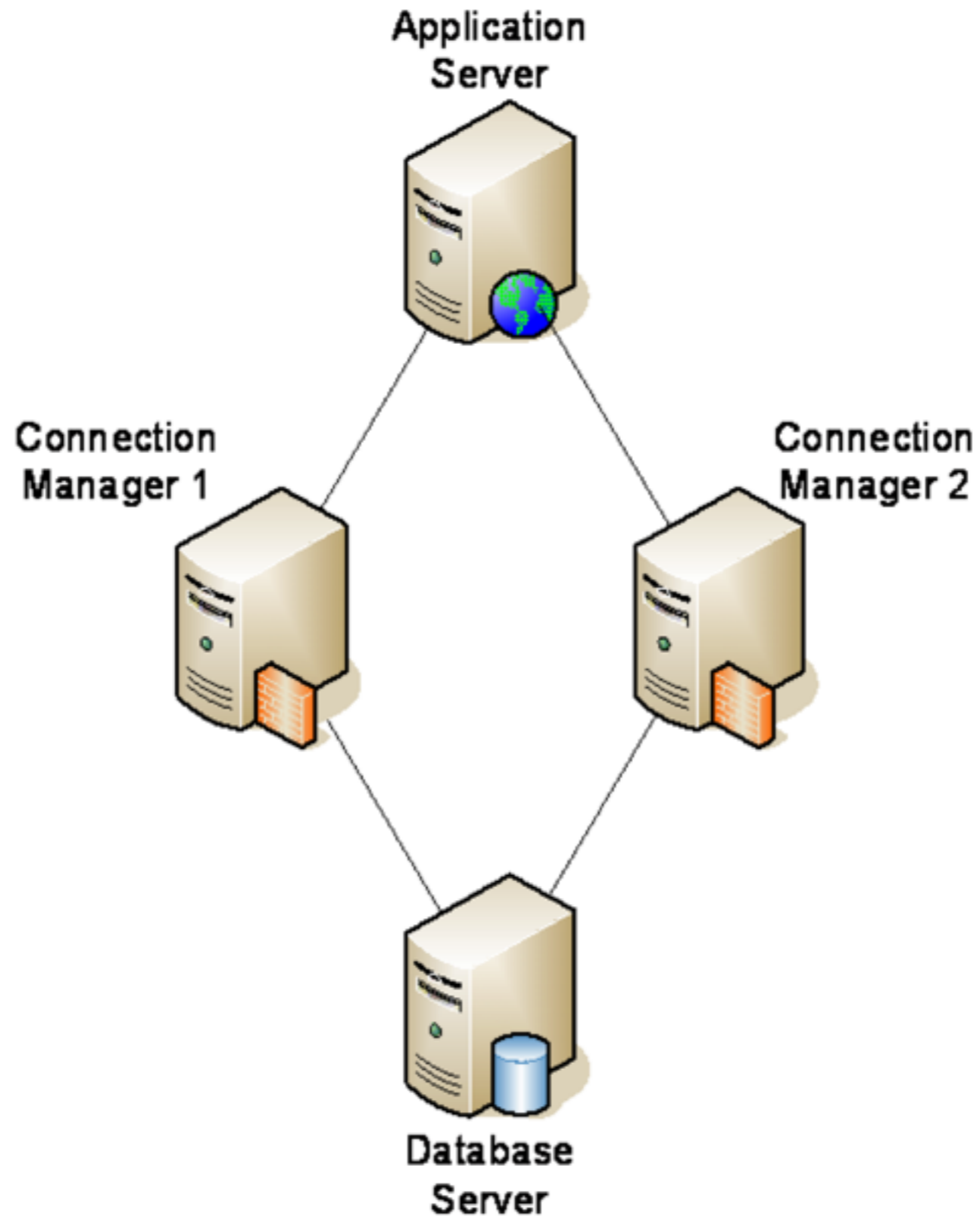
Why would you want to use it ?

- better control of DB access
- you do not want to give out access to ALL databases on a server / cluster
- transparent access to the primary DB regardless of where it is
- gives the DBA control of DB access – controlled access for “fat clients”
- protocol translation

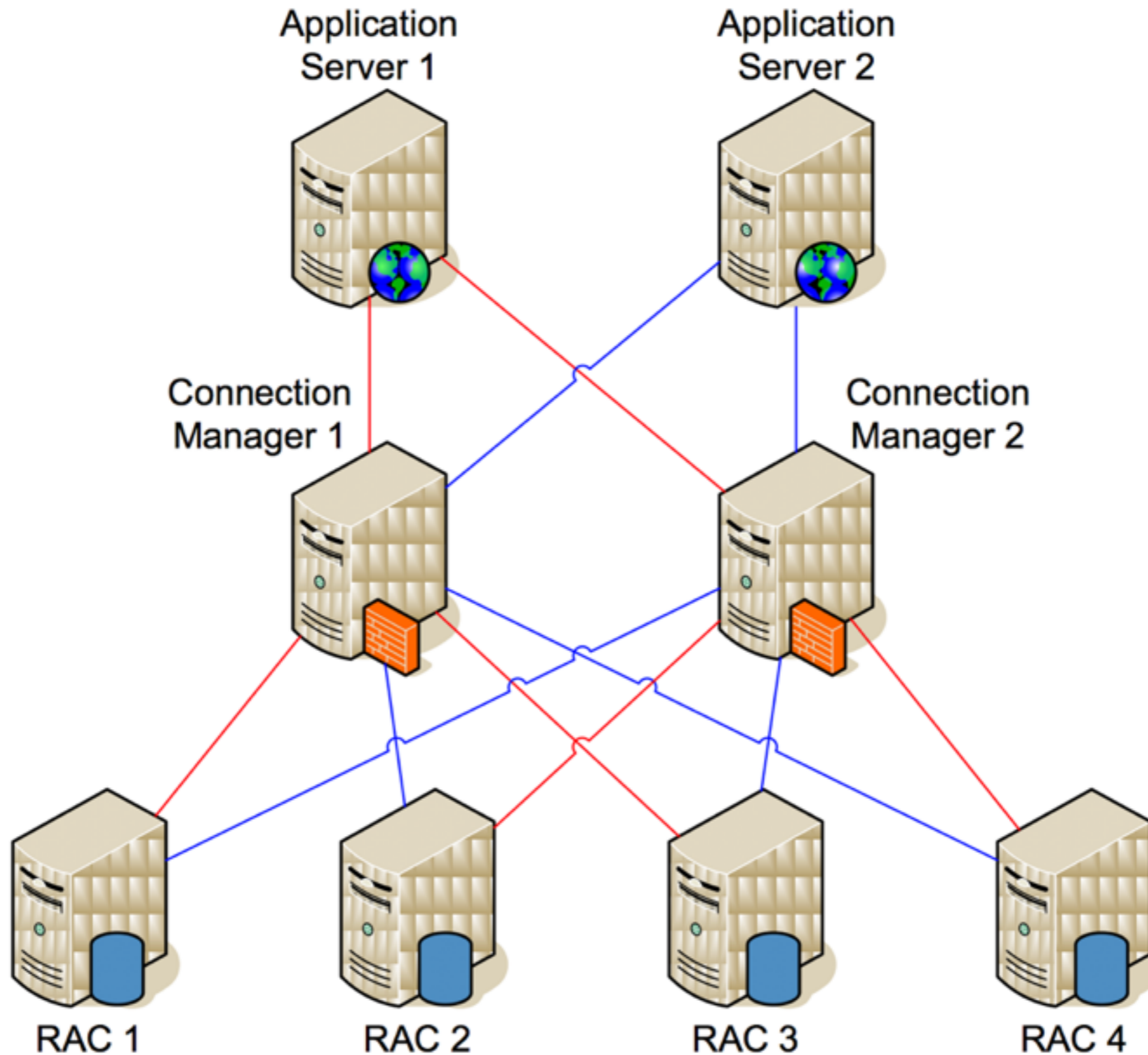
Connection Manager Architecture



Redundant Connection Managers



Redundant everything



Requirements for CMAN

- uses dynamic listener registration
- requires setting the "remote_listener" on the DB
- needs separate host/s to install CMAN on
- a copy of the Oracle Client install media

How to install it

- Install the Oracle Client "Administrator" first
- next do a "Custom" install
 - use same location as the Admin install
 - select "Oracle Connection Manager"
 - select "Oracle Net Listener"
 - complete install & root.sh



Available Product Components

- Select Installation Type
- Download Software Updates
- Select Product Languages
- Specify Installation Location
- Available Product Component**
- Perform Prerequisite Checks
- Summary
- Install Product
- Finish

	Component Name
<input type="checkbox"/>	Oracle SQLJ
<input type="checkbox"/>	Oracle Database Utilities
<input type="checkbox"/>	Oracle Java Client
<input type="checkbox"/>	SQL*Plus
<input type="checkbox"/>	Oracle JDBC/THIN Interfaces
<input type="checkbox"/>	Oracle Internet Directory Client
<input type="checkbox"/>	Oracle Call Interface (OCI)
<input type="checkbox"/>	Oracle Programmer
<input type="checkbox"/>	Oracle XML Development Kit
<input type="checkbox"/>	Oracle Advanced Security
<input type="checkbox"/>	Enterprise Manager Minimal Integration
<input type="checkbox"/>	OLAP Analytic Workspace Manager and Worksheet
<input type="checkbox"/>	Oracle Net
<input checked="" type="checkbox"/>	Oracle Connection Manager
<input checked="" type="checkbox"/>	Oracle Net Listener
<input type="checkbox"/>	Oracle Multimedia Client Option
<input type="checkbox"/>	Oracle ODBC Driver
<input type="checkbox"/>	Oracle Clusterware High Availability API
<input type="checkbox"/>	Oracle SQL Developer
<input type="checkbox"/>	Oracle Scheduler Agent

Configuring CMAN

- `cd $ORACLE_HOME/network/admin`
- `cp samples/cman.ora .`
- `replace...`
 - `<fqhost>` with the FQDN of the host
 - `<lsnport>` with the port for incoming CMAN connections (1522)
 - `<logdir>` & `<trcdir>` with ...
- for now leave everything else as default

Starting / Stopping CMAN

- uses the "cmctl" command (similar to lsnrctl)
- cmctl startup
- cmctl shutdown
- cmctl show services


```
$ cmctl startup
```

```
CMCTL for Linux: Version 11.2.0.3.0 - Production on 07-MAR-2013 12:23:47
```

```
Copyright (c) 1996, 2011, Oracle. All rights reserved.
```

```
Current instance CMAN_oraxlnacn01.nonprodeps.xxxx.com.au is not yet started
```

```
Connecting to (address=(protocol=tcp)
```

```
(host=oraxlnacn01.nonprodeps.xxxx.com.au) (port=1522))
```

```
Starting Oracle Connection Manager instance
```

```
CMAN_oraxlnacn01.nonprodeps.xxxx.com.au. Please wait...
```

```
TNS-04077: WARNING: No password set for the Oracle Connection Manager instance.
```

```
CMAN for Linux: Version 11.2.0.3.0 - Production
```

```
Status of the Instance
```

```
-----  
Instance name          cman_oraxlnacn01.nonprodeps.xxxx.com.au  
Version                CMAN for Linux: Version 11.2.0.3.0 - Production  
Start date             07-MAR-2013 12:23:47  
Uptime                 0 days 0 hr. 0 min. 9 sec  
Num of gateways started 2  
Average Load level     0  
Log Level              OFF  
Trace Level            OFF  
Instance Config file   /u01/oracle/product/112/client/network/admin/  
cman.ora  
Instance Log directory /u01/oracle/diag/netcman  
Instance Trace directory /u01/oracle/diag/netcman  
The command completed successfully.
```


Configure a database to use it

- add a CMAN destination entries on DB server
- configure DB remote listener
- register the database with CMAN
- Check that CMAN can now see the DB

HA Single instance DB & RAC DB tnsnames examples

```
-bash-3.2$ vi tnsnames.ora
```

```
...
```

```
LISTENER_CMAN_SINGLE_TST =
```

```
(DESCRIPTION=
```

```
(ADDRESS=(PROTOCOL=tcp) (HOST=cman_host1) (port=1522))
```

```
(ADDRESS=(PROTOCOL=tcp) (HOST=cman_host2) (port=1522))
```

```
)
```

```
LISTENER_CMAN_RAC_UAT =
```

```
(DESCRIPTION=
```

```
(ADDRESS = (PROTOCOL = TCP) (HOST = oraxdnadb01-ibvip) (PORT = 1521))
```

```
(ADDRESS = (PROTOCOL = TCP) (HOST = oraxdnadb02-ibvip) (PORT = 1521))
```

```
(ADDRESS = (PROTOCOL = TCP) (HOST = oraxdnadb03-ibvip) (PORT = 1521))
```

```
(ADDRESS = (PROTOCOL = TCP) (HOST = oraxdnadb04-ibvip) (PORT = 1521))
```

```
(ADDRESS=(PROTOCOL=tcp) (HOST=cman_host1) (port=1522))
```

```
(ADDRESS=(PROTOCOL=tcp) (HOST=cman_host2) (port=1522))
```

```
)
```


Set remote listener & Register DB

```
SQL> alter system set  
remote_listener='LISTENER_CMANT_SINGLE_TST'  
scope=both;  
System altered.
```

```
SQL> alter system register;  
System altered.
```


Check that CMAN can see the DB & its services

```
$ cmctl show services
```

```
CMCTL for Linux: Version 11.2.0.3.0 - Production on 07-MAR-2013 13:51:57
```

```
Copyright (c) 1996, 2011, Oracle. All rights reserved.
```

```
TNS-04077: WARNING: No password set for the Oracle Connection Manager instance.  
Current instance CMAN_oraxlnacn01.nonprodeps.xxxx.com.au is already started  
Connecting to (address=(protocol=tcp)(host=oraxlnacn01.nonprodeps.xxxx.com.au)(port=1522))
```

```
Services Summary...
```

```
Proxy service "cmgw" has 1 instance(s).
```

```
Instance "cman", status READY, has 2 handler(s) for this service...
```

```
Handler(s):
```

```
"cmgw001" established:0 refused:0 current:0 max:256 state:ready
```

```
<machine: ::1, pid: 18159>
```

```
(ADDRESS=(PROTOCOL=tcp)(HOST=:1)(PORT=1521))
```

```
"cmgw000" established:0 refused:0 current:0 max:256 state:ready
```

```
<machine: ::1, pid: 18157>
```

```
(ADDRESS=(PROTOCOL=tcp)(HOST=:1)(PORT=1521))
```

```
Service "DORE92XDB" has 1 instance(s).
```

```
Instance "TWBC02", status READY, has 1 handler(s) for this service...
```

```
Handler(s):
```

```
"D000" established:0 refused:0 current:0 max:1022 state:ready
```

```
DISPATCHER <machine: oraxdnadb03.nonprodeps.xxxx.com.au, pid: 109555>
```

```
(ADDRESS=(PROTOCOL=tcp)(HOST=oraxdnadb03.nonprodeps.xxxx.com.au)(PORT=43734))
```

```
Service "TWBC02" has 1 instance(s).
```

```
Instance "TWBC02", status READY, has 1 handler(s) for this service...
```

```
Handler(s):
```

```
"DEDICATED" established:0 refused:0 state:ready
```

```
REMOTE SERVER
```

```
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.112.143)(PORT=1521)))
```

```
...
```

```
Service "cmon" has 1 instance(s).
```

```
Instance "cman", status READY, has 1 handler(s) for this service...
```

```
Handler(s):
```

```
"cmon" established:2 refused:0 current:1 max:4 state:ready
```

```
<machine: ::1, pid: 18148>
```

```
(ADDRESS=(PROTOCOL=tcp)(HOST=:1)(PORT=1521))
```

```
The command completed successfully.
```


Connecting to the DB via CMAN

```
$ sqlplus system/xxxx@' (DESCRIPTION = (ADDRESS =  
(PROTOCOL = TCP) (HOST = cman_host1) (PORT = 1522))  
(CONNECT_DATA = (SERVER = DEDICATED) (SERVICE_NAME =  
UCMT1_PRIM))) '
```

```
SQL*Plus: Release 11.2.0.3.0 Production on Thu Mar 7  
13:59:15 2013  
Copyright (c) 1982, 2011, Oracle. All rights reserved.
```

```
Connected to:  
Oracle Database 11g Enterprise Edition Release  
11.2.0.3.0 - 64bit Production  
With the Partitioning, Automatic Storage Management,  
OLAP, Data Mining  
and Real Application Testing options
```

```
SQL> exit
```


Connecting to the DB via CMAN

```
$ sqlplus system/xxxx@cman_host1:1522/UCMT1_PRIM
```

```
SQL*Plus: Release 11.2.0.3.0 Production on Thu Mar 7  
14:01:58 2013  
Copyright (c) 1982, 2011, Oracle. All rights reserved.
```

```
Connected to:
```

```
Oracle Database 11g Enterprise Edition Release  
11.2.0.3.0 - 64bit Production
```

```
With the Partitioning, Automatic Storage Management,  
OLAP, Data Mining  
and Real Application Testing options
```

```
SQL> exit
```


Clustered CMAN connections

```
$ cat tnsnames.ora
```

```
UCMS1_PRIM =  
  (DESCRIPTION =  
    (ADDRESS_LIST= (LOAD_BALANCE =ON)  
      (ADDRESS = (PROTOCOL = TCP) (HOST = cman_host1.nsw.xxxx.com.au) (PORT = 1522))  
      (ADDRESS = (PROTOCOL = TCP) (HOST = cman_host2.nsw.xxxx.com.au) (PORT = 1522))  
    )  
    (CONNECT_DATA =  
      (SERVER = DEDICATED)  
      (SERVICE_NAME = UCMS1_PRIM)  
    )  
  )
```

```
UCMS1_CMAN1 =  
  (DESCRIPTION =  
    (ADDRESS = (PROTOCOL = TCP) (HOST = cman_host1.nsw.xxxx.com.au) (PORT = 1522))  
    (CONNECT_DATA =  
      (SERVER = DEDICATED)  
      (SERVICE_NAME = UCMS1_PRIM)  
    )  
  )
```

```
UCMS1_CMAN2 =  
  (DESCRIPTION =  
    (ADDRESS = (PROTOCOL = TCP) (HOST = cman_host2.nsw.xxxx.com.au) (PORT = 1522))  
    (CONNECT_DATA =  
      (SERVER = DEDICATED)  
      (SERVICE_NAME = UCMS1_PRIM)  
    )  
  )
```


Filtering and other rules

- the cman.ora file has a "rule_list" section
- NOTE: it is very sensitive to syntax
- needs a loopback entry - in 11.2.0.3+ this is an IPV6 entry
- can filter per DB (not just per server)
- source & destination filtering
- service filtering - can allow connections to specific services

Filtering example - services

```
(rule_list=  
  (rule=(src=oraxlpacn01.nsw.xxxx.com.au) (dst>:::1) (srv=cmon)  
(act=accept))  
    (rule=  
      (src=*) (dst=*) (srv=UCMP1_EXTERN) (act=accept)  
      (action_list=(aut=off) (moct=0) (mct=0) (mit=0) (conn_stats=on))  
    )  
  (rule=  
    (src=*) (dst=*) (srv=ODQP1_BATCH) (act=accept)  
    (action_list=(aut=off) (moct=0) (mct=0) (mit=0) (conn_stats=on))  
  )  
  (rule=  
    (src=*) (dst=*) (srv=PWBCEM) (act=accept)  
    (action_list=(aut=off) (moct=0) (mct=0) (mit=0) (conn_stats=on))  
  )  
  (rule=  
    (src=*) (dst=*) (srv=oem12c) (act=accept)  
    (action_list=(aut=off) (moct=0) (mct=0) (mit=0) (conn_stats=on))  
  )  
)
```


Any Questions ?

For additional information, look up -

Deploying an Oracle Connection Manager

Hardening Oracle Net 11gR2 with Proxy and Reverse Proxy Connection Filtering

By Peter Magee