ManCluster DataGuard SAP User Guide

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*I=Information ; VA= Validation ; VE=Vérification ; A= Action*

# Introduction

The document explains how to use the *ManCluster* software developed for Total. The ManCluster software has been developed to help administrators to switch Application from one data center to another data center. Two data centers, one in PLD (secondary site) and one Clichy (main site), are used to house the servers and storage disk arrays of *Total*.

In case of a huge disaster, such as the loosing of a Data Center, the second data center is supposed to take over the whole activity with no impact on performance of the applications (DRP). When a disaster happens, the administrators must react very quickly to ensure the activity is not interrupted too long. For this reason, the tool ManCluster has been created to make all the checks and the right actions to switch over applications to the healthy data center very quickly and then later switching them back to the main site when it becomes available again.

# Summary

## Switch over and back

|  |  |
| --- | --- |
| **ACTION** | **Commande** |
| Starting all the applications (components) | # ./svcadmin start |
| Stopping all the applications (components) | # ./svcadmin stop |
| Starting the application *component* | # ./svcadmin start *component* |
| Stopping the application *component* | # ./svcadmin stop *component* |

## Status

|  |  |
| --- | --- |
| **ACTION** | **Commande** |
| Status of all the services | # ./svcadmin status |
| Status of the component *component* | # ./svcadmin status *component* |

# Overview

A manual cluster is composed of two nodes: one in Clichy and one in PLD (Michelet). Scripts have been developed for switching applications from one node to the other one. The administrator stops all the applications running on one node and then restarts them on the other node. The switching does not happen automatically: it is a manual operation.

The document explains, by using the ManCluster Software, how to switch from the master node (Clichy) to the auxiliary node (PLD) .

## Principles

The Cluster is composed of several components:

* Two nodes running linux operating system: one in Clichy and one in Michelet (PLD).
* Korn shell Scripts to switch from one Data Center to another.
* Applications

*ManCluster* is designed to stop and start the applications running on an linux servers in a DRP context. In the project, only one service *-Oracle/SAP-* represented by *SID* or *CIDB*, is implemented. The SAP service *SID* is composed of several applications (components): SAP, Oracle, Control-M…When we stop the service *CIDB*, all the applications will be stopped except for oracle listener, oracle instance and control-m agent.

**Applications run on one server at a time except for oracle listener, oracle instance and control-m agent** but since they can run on either of the two nodes, a logical host has been defined. The logical host, associated with an IP address, is defined on the node that runs the applications.

Arbitrarily, we define the **node at** **Clichy as the master node** that is the node on which applications are supposed to run in the nominal state. The fail over to the other node called the auxiliary node in Michelet occurs only if a problem occurs: the auxiliary node is a standby node.

In the nominal state:

* Sap applications run on the master node at Clichy. The auxiliary node at PLD is the standby node.
* On auxiliary node at PLD, the standby database is on read only mode during business hours and it is on redo apply out of business hours.

Under normal conditions, the servers are in the nominal state. The DRP is triggered when the master node or storage is down or is about to be down. The different states of the cluster will be detailed in the document.

Throughout the document, we will use the following definition:

* ***SID*** or ***CIDB***: The service managed by the cluster. For example, T3G. It composed of several applications (CTM, SAP, ORACLE….)
* ***Primary node*:**node on which applications are running. The primary node is the master node in the nominal state. In the DRP state, the primary node is the auxiliary node located at PLD.
* ***Secondary* *node*:** the node that does nothing but waiting for to become the primary node. In the nominal state, the secondary node is the auxiliary node. In the DRP state, the secondary node is the master node.
* ***Master node*:** server located in Clichy
* ***Auxiliary node (aux node)*:** server located in PLD

## Cluster states

Four states for the cluster are supported:

* Nominal Reporting
* Nominal Redo-Apply
* DRP Reporting
* DRP redo-Apply
* DRP lost of site

### Nominal Reporting (Clichy):

In the Nominal Reporting:

* Applications run on the master node. **The *primary node is the master node.***
* The stand-by Database of Dataguard is hosted in PLD and it is on state Read-Only (open for reporting throught business object).

**PLD :**

* SAP : DOWN
* Oracle StandBy DB : UP but READ-ONLY

**Clichy :**

* SAP : UP
* Oracle Primary DB : UP

### Nominal Redo-Apply (Clichy):

In the Nominal Redo-Apply :

* Applications run on the master node. **The *primary node is the master node.***
* The stand-by Database of Dataguard is hosted in PLD and it is on state Redo-Apply (not open for reporting throught business object). Database in Clichy and PLD are synchronized).

**PLD :**

* SAP : DOWN
* Oracle StandBy DB : UP but REDO-APPLY

**Clichy :**

* SAP : UP
* Oracle Primary DB : UP

### DRP Reporting (PLD):

In the DRP Reporting:

* Applications run on the auxiliary node. **The *primary node is the auxiliary node.***
* The stand-by Database of Dataguard is hosted in Clichy and it is on state Read-Only (open for reporting throught business object).

**PLD :**

* SAP : UP
* Oracle primary DB : UP

**Clichy :**

* SAP : DOWN
* Oracle Standby DB : UP but READ-ONLY

### DRP redo-Apply (PLD):

In the DRP redo-Apply:

* Applications run on the auxiliary node. **The *primary node is the auxiliary node.***
* The stand-by Database of Dataguard is hosted in Clichy and it is on state Redo-Apply (not open for reporting throught business object). Database in Clichy and PLD are synchronized).

**Clichy :**

* SAP : DOWN
* Oracle Standby DB : UP but REDO-APPLY

**PLD :**

* SAP : UP
* Oracle primary DB : UP

### DRP lost of site:

In DRP lost of site :

* Applications run on one node (Master or auxiliary).
* Reporting are done directly on this node.

**Clichy :**

* SAP : DOWN
* Oracle Standby DB : UP but REDO-APPLY

**PLD :**

* SAP : UP
* Oracle primary DB : UP

**Clichy :**

* SAP : DOWN
* Oracle Standby DB : DOWN

**PLD :**

* SAP : UP
* Oracle primary DB : UP

Or :

**PLD :**

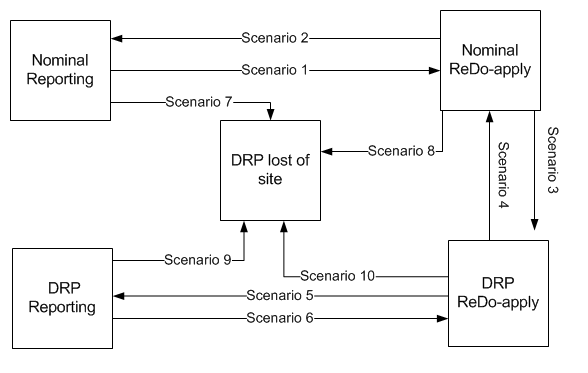
* SAP : DOWN
* Oracle standby DB : DOWN

**Clichy :**

* SAP : UP
* Oracle Primary DB : UP

## Potential scenarios

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Initial situation** | **Final Situation** | **Comments** |
| 1 | Nominal Reporting | Nominal Redo-Apply | Need to stop/restart standby. Must be done every day to make backup. |
| 2 | Nominal Redo-Apply | Nominal Reporting | Must be done every day to have reporting database. |
| 3 | Nominal Redo-Apply | DRP redo-Apply | Downtime of Primary and standby |
| 4 | DRP redo-Apply | Nominal Redo-Apply | Downtime of Primary and standby |
| 5 | DRP redo-Apply | DRP Reporting | Must be done every day to have reporting database. |
| 6 | DRP Reporting | DRP redo-Apply | Need to stop/restart standby. Must be done every day to make backup. |
| 7 | Nominal Reporting | DRP lost of on site | Downtime of Primary and standby |
| 8 | Nominal Redo-Apply | DRP lost of on site | Downtime of Primary and standby |
| 9 | DRP Reporting | DRP lost of on site | Downtime of Primary and standby |
| 10 | DRP redo-Apply | DRP lost of on site | Downtime of Primary and standby |
| 11 | Nominal Reporting | DRP Reporting | Downtime of Primary and standby |
| 12 | Nominal Reporting | DRP redo-Apply | Downtime of Primary and standby |
| 13 | Nominal Redo-Apply | DRP Reporting | Downtime of Primary and standby |
| 14 | DRP Reporting | Nominal Redo-Apply | Downtime of Primary and standby |
| 15 | DRP Reporting | Nominal Reporting | Downtime of Primary and standby |
| 16 | DRP redo-Apply | Nominal Reporting | Downtime of Primary and standby |
| 17 | DRP lost of on site | Nominal Reporting | Need to rebuild the standby. |
| 18 | DRP lost of on site | Nominal Redo-Apply | Need to rebuild the standby. |
| 19 | DRP lost of on site | DRP Reporting | Need to rebuild the standby. |
| 20 | DRP lost of on site | DRP redo-Apply | Need to rebuild the standby. |



# Services

## Switch over and back

The command **svcadmin** starts and stops the applications running on the primary node. The stop option stops all the applications and the start option starts all the applications.

Master Node

master# **svcadmin stop**

aux# **svcadmin start**

Aux Node

aux# **svcadmin stop**

master# **svcadmin start**

## Supported services

One service has been implemented: CIDB or *SID* composed of several components (applications) SAP, Oracle, CTM, COLUMBUS…

In the document, we call CIDB the service that groups all the applications (components) that have to be switched from one node to another.

A service is active (state OK) if all of its components are running and is inactive (state NOK) if at least one of its components is not running.

## Logical hosts

Logical hosts are associated with the CIDB service. A logical host is just a floating IP address set on the primary node (active node). Only one logical host is normally defined but several logical hosts can be defined, all of them will be set to the primary node when a switching is triggered.

The logical addresses of the service *CIDB* is defined in the file /opt/ManCluster/5.0/SERVICES/CIDB/etc/profile.config.

* The activation of the logical host is done by the script /opt/ManCluster/5.0/SERVICES/CIDB/rc3.d/S\*NET.
* The deactivation of the logical host for the service *SRVC* is done by the script /opt/ManCluster/5.0/SERVICES/CIDB/rc0.d/K\*NET.
* Both S\*NET and K\*NET are links to the Korn shell script /opt/ManCluster/5.0/SERVICES/CIDB/init.d/NET.

## Application

* The applications of *CIDB* are started by scripts in the directory /opt/ManCluster/5.0/SERVICES/CIDB/rc3.d.
* The applications of *SID* are stopped by scripts in the directory /opt/ManCluster/5.0/SERVICES/CIDB/rc0.d.

So that *ManCluster* could switch an application, if a start/stop script must be provided :

* The script accepts the argument start for starting the application
* The script accepts the argument stop for stopping the application
* The script accepts the argument status for having the status of the application (running, stopped or degraded).

The script has the following format:

#!/bin/ksh

case ″$1″ in

’start’) …

;;

’stop’) …

…

’status’) …

;;

esac

Then put the script to the directory /opt/ManCluster/5.0/SERVICES/CIDB/init.d. Then, create a link in /opt/ManCluster/5.0/SERVICES/CIDB/RC3.d and /opt/ManCluster/5.0/SERVICES/CIDB/RC0.d.

# Managing the services

Scripts for starting and stopping the applications and switching the disks arrays are in /opt/ManCluster/5.0.

## Services

The scripts that manage the services are in the directory /opt/ManCluster/5.0/ADMIN/SERVICES.

### Service status

The command svcstatus shows the status of a service:

**svcstatus *component***

**svcadminstatus *component***

With no option, the command shows the status of the services on the local node:

**svcstatus**

**svcadmin status**

### Starting/Stopping services

The command svcadmin starts and stops the service *CIDB* or just a component:

**svcadmin start [*component*]**

**svcadmin stop [*component*]**

* *component*: name of the component.

Examples :

1. Starting all applications of the service:

# ./svcadmin start

2. Stopping the service (all applications of the service):

# ./svcadmin stop

3. Stopping the logical host:

# ./svcadmin stop NET

## Configuration files

There are three configuration files (/opt/ManCluster/5.0/SERVICES/CIDB/etc/profile.config, /opt/ManCluster/5.0/etc/checkconf.config, /opt/ManCluster/DG/etc/global.config) but only one, profile.config must be reviewed when installing the ManCluster software.

### /opt/ManCluster/5.0/SERVICES/CIDB/etc/profile.config:

It contains variables used by the administrative script **svcadmin**. Here is an example:

|  |
| --- |
| # --- Fichier de configuration general ---  # positionnement de variables d'environnement  #--------- 1. The following lines Must not be changed ----------  HCLBASEDIR=/opt/ManCluster/DG/SERVICES/CIDB  HCLLOG=$HCLBASEDIR/logs  INITDIR=$HCLBASEDIR/init.d  RC3DIR=$HCLBASEDIR/rc3.d  RC0DIR=$HCLBASEDIR/rc0.d    VERSION=5.0  MANBASEDIR=/opt/ManCluster/$VERSION  ADMINDIR=$MANBASEDIR/ADMIN  SCRIPT\_DIR=$ADMINDIR/script  SERVICE\_DIR=$MANBASEDIR/SERVICES/CIDB  SERVICE\_CONF\_DIR=$MANBASEDIR/SERVICES/CIDB/etc  ADMIN\_SERVICE\_DIR=$ADMINDIR/SERVICES  ADMIN\_STORAGE\_DIR=$ADMINDIR/STORAGE  TMP=$ADMINDIR/tmp  SERVICE\_LOGDIR=$ADMIN\_SERVICE\_DIR/log  STORAGE\_LOGDIR=$ADMIN\_STORAGE\_DIR/log  PREV\_SERVICE\_LOGDIR=$SERVICE\_LOGDIR/previous\_log  PREV\_STORAGE\_LOGDIR=$STORAGE\_LOGDIR/previous\_log  #---------- END OF 1 -------------------------------------------  # ----------- 2. The FOLLOWING LINES MUST BE CHANGED -----------  # NODES contains the nodes of the cluster  #  # Examples:  master\_node=urblint111  aux\_node=urblint124  nodename=$( /bin/uname -n )  other\_host=$( echo $master\_node $aux\_node | /bin/sed "s/$nodename//" )  mytype=$( [[ $master\_node = $nodename ]] && echo Master || echo Aux )  sshkey\_master\_node=/root/.ssh/internal\_node  sshkey\_aux\_node=/root/.ssh/internal\_node  master\_db\_name="TEX\_PRIMARY"  aux\_db\_name="TEX\_STANDBY"  sys\_password="redhat"  # DFSTAB contais file systems to export for sharing  #  # Examples:  #DFSTAB=$HCLBASEDIR/exports.sapt2m  #  DFSTAB=$HCLBASEDIR/exports.saptex  # NAME of SAP and ORACLE instance  #  # Examples:  #INSTANCE=T2M  #  INSTANCE=TEX  # SERVICES contains logical hosts and addresses  SERVICES="saptex"    SAP\_LIST="saptex"  ORACLE\_LIST="oratex"  ASM="N"  # INTERFACES contains the physical network interface on which logical hosts and addresses are attached  #  # Examples:  #INTERFACES="bond0"  #INTERFACES="bond0 bond0 eth3"  INTERFACES="eth0"  #  # List of SAP Application Servers  #  # Examples:  #LIST\_AS="sapas1 sapas2 sapas3"  #  #--------------- END OF 2 ---------------------------------------  # ----------- 3. The FOLLOWING LINES CAN BE CHANGED BUT IT IS NOT A REQUIREMENT ----------  #Number of LOGS that are kept in the logs directory  #  MAX\_LOGS=30  EMAIL=mathieu.gravil@total.com  #------------- END OF 3 ----------------------------------------- |

The following variables must set:

* EMAIL: List of persons to be contacted if the script checkconf meets differences when comparing the configuration files of the nodes.
* master\_node: The hostname or IP address of the master node
* aux\_node: The hostname or IP address of the aux node
* master\_db\_name: The name of the master database
* aux\_db\_name : The name of the aux database.
* sys\_password : The password of oracle user sys.
* sshkey\_master\_node: private ssh key to log in to the master node for the root user.
* sshkey\_aux\_node private ssh key to log in to the aux node for the root user
* DFSTAB : path of file lwhich list nfs export.
* INSTANCE: SAP SID
* SERVICES : logical host name
* SAP\_LIST : logical host name
* ORACLE\_LIST : oracle user.
* INTERFACES : name of interface.
* LIST\_AS: list of application servers.
* MAX\_LOGS: number of logs file.
* ASM: is equal Y if db is install with ASM else it equals N.

## Logs

### Principle

Log files are in the directory logs. The number of log files kept is determined by the variable MAX\_LOGS set in the configuration file cluster.config. Log files are suffixed by the creation date. Each service has its own log files.

### Log files of nodes

Log files generated by the script svcadmin are in the directory /opt/ManCluster/5.0/ADMIN/SERVICES/logs.

# Procedures

## Scenario 1: Switching from Nominal Reporting to Nominal Redo-Apply OK

|  |
| --- |
| **Nominal Reporting to Nominal Redo-Apply**  This scenario consist to switch standby db from read-only mode to redo apply in order to resynchronize boths DBS. This action should be done every day after business hours and before backup which should be done on the standby.  WARNING : By doing this scenario, you will stop and restart the standby database !!  This action can be done by launching this command from on of nodes (master or auxiliary) :  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE reporting\_to\_stdby  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  o I try to put TEX\_STANDBY in state OFFLINE :  INFO : TEX\_STANDBY is in state OFFLINE :  o I have nothing to do. TEX\_STANDBY is already DOWN.  o I will try to start TEX\_STANDBY  INFO : TEX\_STANDBY in urblint124 is UP  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  I put TEX\_STANDBY on urblint124 on state APPLY-ON  o I check if apply-on is done on TEX\_STANDBY  INFO : Apply-ON Succeed  INFO reporting\_to\_stdby : start TEX\_STANDBY succeed  If standby is already in APPLY-ON when you launch the script, the script will not stop and restart :  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE reporting\_to\_stdby  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  WARN reporting\_to\_stdby : nothing to do TEX\_STANDBY is on state APPLY-ON |

## Scenario 2: Switching from Nominal Redo-Apply to Nominal Reporting OK

|  |
| --- |
| **Nominal Redo-apply to Nominal Reporting**  This scenario consists to switch standby db from redo-apply mode to read-only mode in order to open it for reporting. This action should be done every day before business hours and after backup which should be done on the standby.  This action can be done by launching this command from one of nodes (master or auxiliary):  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE stdby\_to\_reporting  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  I put TEX\_STANDBY on urblint124 on state APPLY-OFF  o I check if apply-off is done on TEX\_STANDBY  INFO : Apply-OFF Succeed  O I try to open TEX\_STANDBY  o I check if TEX\_STANDBY is open  INFO : Open Succeed  INFO stdby\_to\_reporting : open TEX\_STANDBY  If standby is already in APPLY-OFF when you launch the script, the script will do nothing:  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE stdby\_to\_reporting  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  INFO stdby\_to\_reporting : TEX\_STANDBY is already in APPLY-OFF |

## Scenario 3: Switching from Nominal Redo-Apply to DRP redo-Apply OK

|  |
| --- |
| **Nominal Redo-apply to DRP redo-Apply**  On master node, we check the status :  [root@urblint111 ~]# svcadmin status  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec running (pid = 13885)  sapstartsrv running (pid = 13898)  10:19:11 13.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  saposcol running (pid = 14496)  pid's (13898 13990 14098 14189 25394)  running  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is SUCCESS TRANSPORT-ON  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: OK  o Status: 0  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex running ...  O Total Duration: 5 s  On master node, we stop the node (notice: it doesn’t stop neither ORACLE nor LISTENER) :  [root@urblint111 ~]# svcadmin stop  1. Now, I stop all resources  Are you sure you want to stop all resources? [yes,no] yes  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES stop  =================================================================  O Run Application SMD (script K091SMD)  =================================================================  Stoping SMD instance for Logical Host : saptex....  Sap user : smdadm  stopping the SAP instance SMDA97  Shutdown-Log is written to /usr/sap/SMD/smdadm/stopsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Stop  Instance on host urblint111 stopped  Waiting for cleanup of resources  .  =================================================================  O Run Application SAP (script K092SAP)  =================================================================  O Stopping SAPTEX  o SAPTEX: Stopping CI OK  =================================================================  O Run Application SAPINIT (script K093SAPINIT)  =================================================================  saphostexec is already running (pid=13885). Stopping...Stopped  =================================================================  O Run Application NET (script K110NET)  =================================================================  O Stopping NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:72:E5  inet addr:192.168.20.111 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:72e5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:5900444 errors:0 dropped:0 overruns:0 frame:0  TX packets:3322544 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:1065992913 (1016.6 MiB) TX bytes:2505562797 (2.3 GiB)  eth0:1 Link encap:Ethernet HWaddr 00:50:56:B7:72:E5  inet addr:192.168.20.145 Bcast:192.168.20.255 Mask:255.255.255.0  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:2297165 errors:0 dropped:0 overruns:0 frame:0  TX packets:2297165 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:857474432 (817.7 MiB) TX bytes:857474432 (817.7 MiB)  o Deletion of the logical host 192.168.20.145 on eth0:1: OK  O Total Duration: 106 s  Status of stop ALL\_RESOURCES: OK  On auxiliary node, we start the node with SWITCH :  [root@urblint124 ~]# svcadmin start  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] yes  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.124 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:59b5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:5953342 errors:0 dropped:0 overruns:0 frame:0  TX packets:2544375 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2336402115 (2.1 GiB) TX bytes:761887992 (726.5 MiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:16226539 errors:0 dropped:0 overruns:0 frame:0  TX packets:16226539 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:3171343448 (2.9 GiB) TX bytes:3171343448 (2.9 GiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_STANDBY on urblint124 (yes/no)?**yes**  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is SUCCESS TRANSPORT-ON  o TEX\_STANDBY is already started and status is SUCCESS APPLY-ON  TEX\_STANDBY is Physical standby and is on state APPLY-ON. So do you want to change state to READ-ONLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/SWITCH/FAIL-OVER)?**SWITCH**  o I will try to switchover to TEX\_STANDBY  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  AUX on urblint124 = Primary database : TEX\_STANDBY  MASTER on urblint111 = Physical standby database : TEX\_PRIMARY  TEX\_STANDBY on urblint124 is primary DB and db status is SUCCESS TRANSPORT-ON  TEX\_PRIMARY on urblint111 is physical standby DB and db status is SUCCESS APPLY-ON  Switch to TEX\_STANDBY OK  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint124 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint124 started  O Total Duration: 254 s  Status of start ALL\_RESOURCES: OK |

## Scenario 4: Switching from DRP redo-Apply to Nominal Redo-Apply

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| **DRP Redo-apply to Nominal Redo-Apply**  On Auxiliary node, we check the status :  [root@urblint124 ~]# svcadmin status  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec running (pid = 18789)  sapstartsrv running (pid = 18811)  10:39:22 13.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  saposcol running (pid = 19402)  pid's (18811 18895 19009 19103 31066)  running  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/c figuration\_20140313-10-39-24.log  AUX on urblint124 = Primary database : TEX\_STANDBY  MASTER on urblint111 = Physical standby database : TEX\_PRIMARY  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/s w\_db\_20140313-10-40-08.log  TEX\_STANDBY on urblint124 is primary DB and db status is ERROR TRANSPORT-ON  TEX\_PRIMARY on urblint111 is physical standby DB and db status is SUCCESS APPL ON  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: OK  o Status: 0  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex running ...  O Total Duration: 47 s  On auxiliary node, we stop the node (notice: it doesn’t stop neither ORACLE nor LISTENER) :  [root@urblint124 ~]# **svcadmin stop**  1. Now, I stop all resources  Are you sure you want to stop all resources? [yes,no] yes  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES stop  =================================================================  O Run Application SMD (script K091SMD)  =================================================================  Stoping SMD instance for Logical Host : saptex....  Sap user : smdadm  stopping the SAP instance SMDA97  Shutdown-Log is written to /usr/sap/SMD/smdadm/stopsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Stop  Instance on host urblint124 stopped  Waiting for cleanup of resources  .  =================================================================  O Run Application SAP (script K092SAP)  =================================================================  O Stopping SAPTEX  o SAPTEX: Stopping CI OK  =================================================================  O Run Application SAPINIT (script K093SAPINIT)  =================================================================  saphostexec is already running (pid=18789). Stopping...Stopped  =================================================================  O Run Application NET (script K110NET)  =================================================================  O Stopping NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.124 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:59b5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:5972960 errors:0 dropped:0 overruns:0 frame:0  TX packets:2554123 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2338087006 (2.1 GiB) TX bytes:763141079 (727.7 MiB)  eth0:1 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.145 Bcast:192.168.20.255 Mask:255.255.255.0  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:16368051 errors:0 dropped:0 overruns:0 frame:0  TX packets:16368051 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:3296733686 (3.0 GiB) TX bytes:3296733686 (3.0 GiB)  o Deletion of the logical host 192.168.20.145 on eth0:1: OK  O Total Duration: 176 s  Status of stop ALL\_RESOURCES: OK  On master node, we start the node with SWITCH:  [root@urblint111 ~]# **svcadmin start**  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] **yes**  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:72:E5  inet addr:192.168.20.111 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:72e5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:5937892 errors:0 dropped:0 overruns:0 frame:0  TX packets:3335353 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:1094813461 (1.0 GiB) TX bytes:2508350537 (2.3 GiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:2305107 errors:0 dropped:0 overruns:0 frame:0  TX packets:2305107 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:858308434 (818.5 MiB) TX bytes:858308434 (818.5 MiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_PRIMARY on urblint111 (yes/no)?**yes**  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  AUX on urblint124 = Primary database : TEX\_STANDBY  MASTER on urblint111 = Physical standby database : TEX\_PRIMARY  TEX\_STANDBY on urblint124 is primary DB and db status is SUCCESS TRANSPORT-ON  TEX\_PRIMARY on urblint111 is physical standby DB and db status is SUCCESS APPLY-ON  o TEX\_PRIMARY is already started and status is SUCCESS APPLY-ON  TEX\_PRIMARY is Physical standby and is on state APPLY-ON. So do you want to change state to READ-ONLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/SWITCH/FAIL-OVER)?**SWITCH**  o I will try to switchover to TEX\_PRIMARY  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is SUCCESS TRANSPORT-ON  Switch to TEX\_PRIMARY OK  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint111 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint111 started  O Total Duration: 201 s  Status of start ALL\_RESOURCES: OK |

## Scenario 5: Switching from DRP redo-Apply to DRP Reporting OK

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| **DRP Redo-apply to DRP Reporting**  This scenario consists to switch standby db from redo-apply mode to read-only mode in order to open it for reporting. This action should be done every day before business hours and after backup which should be done on the standby.  This action can be done by launching this command from one of nodes (master or auxiliary):  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE stdby\_to\_reporting  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  I put TEX\_STANDBY on urblint124 on state APPLY-OFF  o I check if apply-off is done on TEX\_STANDBY  INFO : Apply-OFF Succeed  O I try to open TEX\_STANDBY  o I check if TEX\_STANDBY is open  INFO : Open Succeed  INFO stdby\_to\_reporting : open TEX\_STANDBY  If standby is already in APPLY-OFF when you launch the script, the script will do nothing:  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE stdby\_to\_reporting  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  INFO stdby\_to\_reporting : TEX\_STANDBY is already in APPLY-OFF |

## Scenario 6: Switching from DRP Reporting to DRP redo-Apply OK

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| **DRP reporting to DRP Redo-apply**  This scenario consist to switch standby db from read-only mode to redo apply in order to resynchronize boths DBS. This action should be done every day after business hours and before backup which should be done on the standby.  WARNING: By doing this scenario, you will stop and restart the standby database !!  This action can be done by launching this command from one of nodes (master or auxiliary):  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE reporting\_to\_stdby  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  o I try to put TEX\_STANDBY in state OFFLINE :  INFO : TEX\_STANDBY is in state OFFLINE :  o I have nothing to do. TEX\_STANDBY is already DOWN.  o I will try to start TEX\_STANDBY  INFO : TEX\_STANDBY in urblint124 is UP  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  I put TEX\_STANDBY on urblint124 on state APPLY-ON  o I check if apply-on is done on TEX\_STANDBY  INFO : Apply-ON Succeed  INFO reporting\_to\_stdby : start TEX\_STANDBY succeed  If standby is already in APPLY-ON when you launch the script, the script will not stop and restart:  [root@urblint124 ManCluster]# /opt/ManCluster/5.0/SERVICES/CIDB/init.d/ORACLE reporting\_to\_stdby  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  WARN reporting\_to\_stdby : nothing to do TEX\_STANDBY is on state APPLY-ON |

## Scenario 7: Switching from Nominal Reporting to DRP lost of site OK

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| **Nominal Reporting to DRP lost of site**  In this scenario, we make the hypothesis that the master site crash when primary database and SAP was on this site (ie all resources on master server are down).  So on auxiliary site, you can check status :  [root@urblint124 ~]# **svcadmin status**  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: NOK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec stopped  18:12:14 19.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  No process running.  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140319-18-12-17.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-OFF  TEX\_PRIMARY on urblint111 is primary DB and db status is DOWN  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: NOK  o Status: 1  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex stopped ...  O Total Duration: 6 s  You can see in ORACLE status that the Master database is down and standby in on state APPLY-OFF. So you can make failover on auxiliary node by doing :   * Stop auxiliary db :   [root@urblint124 ~]# svcadmin stop ORACLE  1. Now, I stop ORACLE  Are you sure you want to stop ORACLE? [yes,no] yes  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ORACLE stop  Are you sure you want to stop TEX\_STANDBY on urblint124 (yes/no) ?yes  o I will try to stop TEX\_STANDBY  INFO : TEX\_STANDBY in urblint124 is DOWN  Status of stop ORACLE: OK   * Start auxiliary node with :   [root@urblint124 ~]# **svcadmin start**  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] **yes**  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.124 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:59b5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:35881480 errors:0 dropped:0 overruns:0 frame:0  TX packets:56996084 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:6101664056 (5.6 GiB) TX bytes:80057147843 (74.5 GiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:21002398 errors:0 dropped:0 overruns:0 frame:0  TX packets:21002398 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:5764236903 (5.3 GiB) TX bytes:5764236903 (5.3 GiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_STANDBY on urblint124 (yes/no)?**yes**  o I will try to start TEX\_STANDBY  INFO : TEX\_STANDBY in urblint124 is UP  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  INFO : the Data Guard broker is not yet available... Try again in 10 seconds.  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140324-14-32-58.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is Physical standby. So do you want to start it on READ-ONLY OR REDO-APPLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/REDO-APPLY/SWITCH/FAIL-OVER)?**FAIL-OVER**  6 redo to applied.  Fail-OVER to be launch on TEX\_STANDBY...  o I will try to failover to TEX\_STANDBY  o I check if failover is done on TEX\_STANDBY  INFO : Failover Succeed  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint124 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint124 started  O Total Duration: 234 s  Status of start ALL\_RESOURCES: OK |

## Scenario 8: Switching from Nominal Redo-Apply to DRP lost of site OK

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| **Nominal Redo-Apply to DRP lost of site**  In this scenario, we make the hypothesis that the master site is down (ie all resssource on master server are down).  So on auxiliary site, you can check status :  [root@urblint124 ~]# **svcadmin status**  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: NOK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec stopped  09:23:37 19.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  No process running.  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140319-09-23-39.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is DOWN  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: NOK  o Status: 1  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex stopped ...  O Total Duration: 6 s  You can see in ORACLE status that the master database is down and we are on APPLY-ON on standby. So you can make failover with :  [root@urblint124 ~]# **svcadmin start**  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] **yes**  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.124 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:59b5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:7782951 errors:0 dropped:0 overruns:0 frame:0  TX packets:3443084 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2519022921 (2.3 GiB) TX bytes:1564483892 (1.4 GiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:16895327 errors:0 dropped:0 overruns:0 frame:0  TX packets:16895327 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:3435489587 (3.1 GiB) TX bytes:3435489587 (3.1 GiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_STANDBY on urblint124 (yes/no)?**yes**  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140319-09-26-08.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is DOWN  o TEX\_STANDBY is already started and status is SUCCESS APPLY-ON  TEX\_STANDBY is Physical standby and is on state APPLY-ON. So do you want to change state to READ-ONLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/SWITCH/FAIL-OVER)?**FAIL-OVER**  TEX\_STANDBY has 0 archive log to recover. So wait before switchover  ########### 0/0  Fail-OVER to be launch on TEX\_STANDBY...  o I will try to failover to TEX\_STANDBY  o I check if failover is done on TEX\_STANDBY  INFO : Failover Succeed  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint124 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint124 started  O Total Duration: 193 s  Status of start ALL\_RESOURCES: OK |

## Scenario 9: Switching from DRP Reporting to DRP lost of site OK

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| **DRP reporting to DRP lost of site**  In this scenario, we make the hypothesis that the auxiliary site crash when primary database and SAP was on this site (ie all resources on auxiliary server are down).  So on master site, you can check status :  [root@urblint111 ~]# **svcadmin status**  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: NOK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec stopped  11:35:23 25.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  No process running.  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : DOWN  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140324-11-35-25.log  AUX on urblint124 = Primary database : TEX\_STANDBY  MASTER on urblint111 = Physical standby database : TEX\_PRIMARY  TEX\_STANDBY on urblint124 is primary DB and db status is DOWN  TEX\_PRIMARY on urblint111 is physical standby DB and db status is SUCCESS APPLY-OFF  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: NOK  o Status: 1  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex stopped ...  O Total Duration: 7 s  You can see in ORACLE status that the auxiliary database is down and standby in on state APPLY-OFF. So you can make failover on master node by doing :   * Stop master db :   [root@urblint111 ~]# **svcadmin stop ORACLE**  1. Now, I stop ORACLE  Are you sure you want to stop ORACLE? [yes,no] yes  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ORACLE stop  Are you sure you want to stop TEX\_PRIMARY on urblint111 (yes/no) ?yes  o I will try to stop TEX\_PRIMARY  INFO : TEX\_PRIMARY in urblint111 is DOWN  Status of stop ORACLE: OK     * Start master node with :   [root@urblint111 ~]# **svcadmin start**  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] **yes**  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:72:E5  inet addr:192.168.20.111 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:72e5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:10312509 errors:0 dropped:0 overruns:0 frame:0  TX packets:5742085 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2523004381 (2.3 GiB) TX bytes:3962347777 (3.6 GiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:3859791 errors:0 dropped:0 overruns:0 frame:0  TX packets:3859791 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:1553034600 (1.4 GiB) TX bytes:1553034600 (1.4 GiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_PRIMARY on urblint111 (yes/no)?**yes**  o I will try to start TEX\_PRIMARY  INFO : TEX\_PRIMARY in urblint111 is UP  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : UP  DB AUX named TEX\_STANDBY on urblint124 : DOWN  o I check which DB is primary:  INFO : the Data Guard broker is not yet available... Try again in 10 seconds.  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140324-11-37-46.log  AUX on urblint124 = Primary database : TEX\_STANDBY  MASTER on urblint111 = Physical standby database : TEX\_PRIMARY  TEX\_PRIMARY on urblint111 is Physical standby. So do you want to start it on READ-ONLY OR REDO-APPLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/REDO-APPLY/SWITCH/FAIL-OVER)?**FAIL-OVER**  5 redo to applied.  Fail-OVER to be launch on TEX\_PRIMARY...  o I will try to failover to TEX\_PRIMARY  o I check if failover is done on TEX\_PRIMARY  INFO : Failover Succeed  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint111 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint111 started  O Total Duration: 490 s  Status of start ALL\_RESOURCES: OK |

## Scenario 10: Switching from DRP redo-Apply to DRP lost of site OK

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| **DRP redo-Apply to DRP lost of site**  In this scenario, we make the hypothesis that the auxiliary site crash when primary database and SAP was on this site (ie all resource on auxiliary server are down).  So on master site, you can check status :  [root@urblint124 ~]# svcadmin status  =================================================================  O Run Application NET (script S02NET)  =================================================================  o Logical host 192.168.20.145: NOK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  saphostexec stopped  18:05:38 13.03.2014 LOG: Using PerfDir (DIR\_PERF) = /usr/sap/tmp  No process running.  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  o Status of LISTENERTEX :  o LISTENERTEX: OK  o Status: 0  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140313-18-05-41.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is DOWN  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  o SAPTEX: NOK  o Status: 1  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Checking SMD instance saptex ...  - SMD for Logical Host : saptex stopped ...  O Total Duration: 6 s  You can see in ORACLE status that the auxiliary database which the primary one is down. So you can make failover with FAIL-OVER:  [root@urblint124 ~]# **svcadmin start**  1. Before Running all resources, I check the remote node: OK.  2. Now, I start all resources  Are you sure you want to start all resources? [yes,no] **yes**  I execute /opt/ManCluster/DG/SERVICES/CIDB/init.d/ALL\_RESOURCES start  =================================================================  O Run Application NET (script S02NET)  =================================================================  O Starting NET  o List of active interfaces:  eth0 Link encap:Ethernet HWaddr 00:50:56:B7:59:B5  inet addr:192.168.20.124 Bcast:192.168.20.255 Mask:255.255.255.0  inet6 addr: fe80::250:56ff:feb7:59b5/64 Scope:Link  UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  RX packets:6100417 errors:0 dropped:0 overruns:0 frame:0  TX packets:2641634 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2398794719 (2.2 GiB) TX bytes:829832128 (791.3 MiB)  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:16436 Metric:1  RX packets:16392394 errors:0 dropped:0 overruns:0 frame:0  TX packets:16392394 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:0  RX bytes:3298913446 (3.0 GiB) TX bytes:3298913446 (3.0 GiB)  o Creation of the logical host 192.168.20.145 on eth0:1: OK  =================================================================  O Run Application SAPINIT (script S090SAPINIT)  =================================================================  start hostcontrol using profile /usr/sap/hostctrl/exe/host\_profile  =================================================================  O Run Application LISTENER (script S100LISTENER)  =================================================================  O Starting LISTENERTEX...  o Starting of LISTENERTEX: OK (already started)  =================================================================  O Run Application ORACLE (script S101ORACLE)  =================================================================  Are you sure you want to start TEX\_STANDBY on urblint124 (yes/no)?**yes**  o I check if DB are up :  DB MASTER named TEX\_PRIMARY on urblint111 : DOWN  DB AUX named TEX\_STANDBY on urblint124 : UP  o I check which DB is primary:  WARN: There is some ORA- : See /opt/ManCluster/DG/SERVICES/CIDB/logs/DGBROKER/configuration\_20140313-18-07-35.log  MASTER on urblint111 = Primary database : TEX\_PRIMARY  AUX on urblint124 = Physical standby database : TEX\_STANDBY  TEX\_STANDBY on urblint124 is physical stand by DB and db status is SUCCESS APPLY-ON  TEX\_PRIMARY on urblint111 is primary DB and db status is DOWN  o TEX\_STANDBY is already started and status is SUCCESS APPLY-ON  TEX\_STANDBY is Physical standby and is on state APPLY-ON. So do you want to change state to READ-ONLY OR SWITCH-OVER OR FAIL-OVER (READ-ONLY/SWITCH/FAIL-OVER)?**FAIL-OVER**  TEX\_STANDBY has 0 archive log to recover. So wait before switchover  ########### 0/0  Fail-OVER to be launch on TEX\_STANDBY...  o I will try to failover to TEX\_STANDBY  o I check if failover is done on TEX\_STANDBY  INFO : Failover Succeed  =================================================================  O Run Application SAP (script S110SAP)  =================================================================  O Starting SAPTEX  o SAPTEX: Starting CI OK  =================================================================  O Run Application SMD (script S111SMD)  =================================================================  Starting SMD instance for Logical Host : saptex....  SMD user : smdadm  Starting Startup Agent sapstartsrv  OK  Instance Service on host urblint124 started  -------------------------------------------  starting SAP Instance SMDA97  Startup-Log is written to /usr/sap/SMD/smdadm/startsap\_SMDA97.log  -------------------------------------------  /usr/sap/SMD/SMDA97/exe/sapcontrol -prot NI\_HTTP -nr 97 -function Start  Instance on host urblint124 started  O Total Duration: 187 s  Status of start ALL\_RESOURCES: OK |

## Scenario 11: Switching from Nominal Reporting to DRP Reporting OK

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| **Nominal Reporting to DRP Reporting**  For this scenario, you need to do :   * [Scenario 1: switch from Nominal reporting to Normal redo-apply](#_Switching_from_Nominal) * [Scenario 3: switch from Nominal redo-apply to DRP redo-apply](#_Switching_from_Nominal_1) * [Scenario 5: switch from DRP redo-apply to DRP Reporting](#_Switching_from_DRP) |

## Scenario 12: Switching from Nominal Reporting to DRP redo-apply OK

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| **Nominal Reporting to DRP redo-apply**  For this scenario, you need to do :   * [Scenario 1 : switch from Nominal reporting to Nominal redo-apply](#_Scenario_1:_Switching) * [Scenario 3 : switch from Nomimal redo-apply to DRP redo-apply](#_Scenario_3:_Switching) |

## Scenario 13: Switching from Nominal Redo-Apply to DRP Reporting OK

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| **Nominal Redo-Apply to DRP Reporting**  For this scenario, you need to do :   * [Scenario 3: switch from Nominal redo-apply to DRP redo-apply](#_Switching_from_Nominal_1) * [Scenario 5: switch from DRP redo-apply to DRP Reporting](#_Scenario_5:_Switching) |

## Scenario 14: Switching from DRP Reporting to Nominal Redo-Apply OK

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| **DRP Reporting to Nominal Redo-Apply**  For this scenario, you need to do :   * [Scenario 6: switch from DRP Reporting to DRP redo-apply](#_Scenario_6:_Switching) * [Scenario 4: switch from DRP redo-apply to Nominal redo-apply](#_Scenario_4:_Switching) |

## Scenario 15: Switching from DRP Reporting to Nominal Reporting OK

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| **DRP Reporting to Nominal Reporting**  For this scenario, you need to do :   * [Scenario 6: switch from DRP Reporting to DRP redo-apply](#_Scenario_6:_Switching) * [Scenario 4: switch from DRP redo-apply to Nominal redo-apply](#_Scenario_4:_Switching) * [Scenario 2: switch from Nominal redo-apply to Nominal reporting](#_Scenario_2:_Switching) |

## Scenario 16: Switching from DRP redo-Apply to Nominal Reporting OK

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| **DRP Redo-Apply to Nominal Reporting**  For this scenario, you need to do :   * [Scenario 4: switch from DRP redo-apply to Nominal redo-apply](#_Scenario_4:_Switching) * [Scenario 2: switch from Nominal redo-apply to Nominal reporting](#_Scenario_2:_Switching) |

## Scenario 17: Switching from DRP lost of site to Nominal Reporting

Cf [ANNEXES](#_ANNEXES): reconstruction Datagard.

## Scenario 18: Switching from DRP lost of site to Nominal Redo-Apply

Cf [ANNEXES](#_ANNEXES): reconstruction Datagard.

## Scenario 19: Switching from DRP lost of site to DRP Reporting

Cf [ANNEXES](#_ANNEXES): reconstruction Datagard.

## Scenario 20: Switching from DRP lost of site to DRP redo-Apply

Cf [ANNEXES](#_ANNEXES): reconstruction Datagard.

# Checkconf

## scripts

In the directory /opt/ManCluster/5.0/ADMIN/script/ we can find the scripts checkconf. It compares the files listed in /opt/ManCluster/5.0/ADMIN/etc/checkconf.config.

It is recommended to run it through cron:

\* 6 \* \* \* /opt/ManCluster/5.0/ADMIN/script/checkconf sendmail

The option sendmail tells the script to send E-mails if it finds a difference between the given files. The variable EMAIL in the cluster.config file list the persons to be notified.

## Configuration

The configuration file /opt/ManCluster/5.0/ADMIN/etc/checkconf.config tells to checkconf what to compare and how to compare. An entry has the following syntax:

***File\_path*:*action*[,*action*,…]**

Action is one of the following keywords:

* checksum : compare the check sums
* checkperm: compare the UNIX permissions

For example:

/etc/group:checksum,checkperm

/etc/hosts:checksum,checkperm

# ANNEXE

