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HOST BRANCH DATABASE SUPPORT GUIDE

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0 Document Control

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0.2 Document History

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0.4 Associated Documents (Internal & External)

Reference	Version	Date	Title	Source
PGM/DCM/TEM/0001 (DO NOT REMOVE)	2.0	16-Apr-07	Fujitsu Post Office Account HNG-X Document Template - PORTRAIT	Dimensions
DES/APP/HLD/0020			Branch Database High Level Design	Dimensions
DES/APP/LLD/0152			Branch Database Low Level Design	Dimensions
DES/APP/HLD/0021			Branch Database Scheduling High Level Design	Dimensions
DES/APP/HLD/0023			Branch Support Database High Level Design	Dimensions
DES/APP/LLD/0151			Branch Support Database Low Level Design	Dimensions
DES/APP/HLD/0025			Branch Support Database Scheduling High Level Design	Dimensions
DEV/APP/LLD/0199			Schema Definition for the Branch Database, Standyby Branch Database and Branch Support System	Dimensions
DEV/APP/LLD/0011			HOST BRANCH DATABASE SUPPORT GUIDE	Dimensions
DEV/APP/LLD/0802			Host BRDB Near-Real Time Service Interface – Low Level Design	Dimensions
DES/APP/HLD/0732			NRT Interface Agent High Level Design	Dimensions
DES/APP/DPR/0671			AEI Near-Real Time Design Proposal	Dimensions

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents.

0.5 Abbreviations

Abbreviation	Definition
ACE	Cisco Application Control Engine
ASM	Automatic Storage Management
BAL	Branch Access Layer
BDB	Acronym for Branch Database
BDS	Acronym for Branch Standby Database
BRDB	Branch Database Oracle SID
BRS	Acronym for Branch Support Database
CRS	Oracle Cluster Ready Services
FAN	Oracle Fast Application Notification
GREV	Guaranteed Reversals
HLD	High Level Design
ITM	IBM Tivoli Manager
JSN	Journal Sequence Number
LCR	Logical change record (generated by the Streams capture process)

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LPAN	Logical Processing Area Network
NPS	Network Persistant Store
OCFS	Oracle Cluster File System
OCR	Oracle Cluster Registry
PAN	Processing Area Network
RFS	Oracle Remote File Server (a process)
RHEL	Red Hat Enterprise Linux
RMAN	Oracle Recovery Manager
SAN	Storage Area Network
SCN	Oracle System Change Number
SHLD	Schedule High Level Design
SQL	Structured Query Language
SSN	Session Sequence Number
TT	Track & Trace
USN	User Sequence Number (in the context of the counter user)
NRT	Near-Real Time
AEI	Application & Enrolment Identity

0.6 Glossary

Term	Definition
BladeFrame	A BladeFrame is a chassis which contains processing blades (pBlade) and control blades, as well as integrated interconnect and power connections. The BladeFrame is connected to networks and storage with fully redundant cables.
Branch Access Layer	The middle-tier that carries out the data storage, retrieval and transfer on behalf of the Counter.
Cluster	A cluster is a group of loosely coupled computers that work together closely so that in many respects they can be viewed as though they are a single computer. Clusters are usually deployed to improve performance and/or availability over that provided by a single computer,
Database	A collection of records stored in a systematic way. The software used to manage and query records is known as the Database Management System. This document uses the term 'Database' to cover both meanings.
Host System	The collection of host systems including TPS, APS, DRS, LFS, NPS, RDDS and RDMC
Hydra	Phase covering the dual-running of Horizon and HNG-X
Instance	A database instance – this is composed of memory structures and the Oracle background processes that run on a server.
Node	Any device connected to a network such as a server. In the document, the term 'Node' includes the Oracle Instance.
pBlade	A processing blade which contains processors and memory, but not network or disk devices.
pServer	A logical representation of a pBlade.
Real Application Clusters	An Oracle Real Application Cluster is a group of loosely coupled computers that work together closely so that in many respects they can be viewed as though they

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	are a single computer. Clusters are usually deployed and/or availability over that provided by a single computer.

0.7 Changes Expected

Changes
Changes from time-to-time in subsequent versions of the all HLDs and LLDs may require changes to this document.

0.8 Accuracy

Fujitsu endeavours to ensure that the information contained in this document is correct but, whilst every effort is made to ensure the accuracy of such information, it accepts no liability for any loss (however caused) sustained as a result of any error or omission in the same.

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1 Introduction

1.1 Document Overview

This Support Guide details information in support of the Branch Database solution by documenting the operational processes that run for the application and in support of the infrastructure surrounding the application. Procedures for supporting and troubleshooting the Branch Database solution are also included.

The Branch Database has been designed to be able to fail over to a standby server in the event of a disaster but requires operator intervention because of the inherent complexity of the solution. Relevant procedures are provided for this purpose.

The Branch Support Database has been designed as a data store for support personnel. Keeping this database in step with BRDB is very important, the BRDB HLD indicates that the Branch Support Database should not lag BRDB by more than 15 minutes.

The BRDB schedule must run once for each and every calendar day. BRDB keeps a track of the current working day, in order to guarantee that data is correctly stored, processed and replicated.

Text which is highlighted in yellow like this indicates important information that should be noted.

1.2 Scope

This document is to serve as guide in support of the Branch and the Branch Support Databases. It is not a build manual, nor does it explain all the inner workings of Oracle or the operating system. Guidance for important tasks and troubleshooting scenarios are also included.

It is also to be noted that much of the detailed information for the support guide has already been documented in the associated specifications and designs. The main sources for this information are the BRDB High Level Design [DES/APP/HLD/0020], the BRSS High Level Design [DES/APP/HLD/0023] and the BRDB Low Level Design [DES/APP/LLD/0151].

1.3 Assumptions

This Support Guide assumes the Branch Database has been successfully built and is in operation.

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2 BRDB Host Processes

2.1 Approach used for Support Guide

Much of the relevant information for this section of the support guide has already been documented in the associated specifications and designs. The main source of information is:

The Branch Database High Level Design (DES/APP/HLD/0020)

The relevant information in this reference is already presented under repeating headings for the processes (i.e. the same headings for each process in turn), making it ideally suited for use as a support reference. This section of the document mainly serves to identify the relevant information, and indicate where it can be found. Pertinent information that is not covered by the existing documents has been added as appropriate.

The relevant process section of the Branch Database High Level Design is Section 7.2 - Host Processes.

For further information on the Host Processes and their integration in the overnight schedule, see Section 0 - BRDB Scheduling.

2.2 Table of BRDB Host Processes

The following table lists the current Branch Database Host processes, a brief description of each and the names of the executables used to run them. The process name corresponds to the name that is registered in table BRDB_PROCESSES and, where applicable, the name that is used to control processing via table BRDB_PROCESS_CONTROL.

No.	Executable	BRDB Process Name	Description
1	BRDBC001	BRDBC001	Start of Day
2	BRDBC002	BRDBC002	Message Journal Auditing
3	BRDBX003.sh	BRDB_APS_TXN_FROM_TPS	BRDB APS transactions from TPS feed
4	BRDBX003.sh	BRDB_APS_TXN_TO_APS	BRDB APS transactions to APS feed
5	BRDBX003.sh	BRDB_APS_TXN_TO_TPS	BRDB APS transactions to TPS feed
6	BRDBX003.sh	BRDB_BDC_TXN_FROM_TPS	BRDB BDC transactions from TPS feed
7	BRDBX003.sh	BRDB_BDC_TXN_TO_TPS	BRDB BDC transactions to TPS feed
8	BRDBX003.sh	BRDB_CASH_TO_LFS	BRDB Cash Declarations to LFS feed
9	BRDBX003.sh	BRDB_CNTR_REF_FROM_RDDS	BRDB Counter Reference Data from RDDS feed
10	BRDBX003.sh	BRDB_CUTOFF_SUMM_TO_TPS	BRDB Cut Off Summaries to TPS feed
11	BRDBX003.sh	BRDB_DCS_TXN_FROM_TPS	BRDB DCS transactions from TPS feed
12	BRDBX003.sh	BRDB_DCS_TXN_TO_DRS	BRDB DCS transactions to DRS feed
13	BRDBX003.sh	BRDB_DCS_TXN_TO_TPS	BRDB DCS transactions to TPS feed
14	BRDBX003.sh	BRDB_EMDB_INTERFACE	BRDB Estate Management Interface feed
15	BRDBX003.sh	BRDB_EPOSS_EVNT_TO_TPS	BRDB EPOSS events to TPS feed
16	BRDBX003.sh	BRDB_EPOSS_TXN_FROM_TPS	BRDB EPOSS transactions from TPS feed
17	BRDBX003.sh	BRDB_EPOSS_TXN_TO_TPS	BRDB EPOSS transactions to TPS feed

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18	BRDBX003.sh	BRDB_HOST_REF_FROM_RDDS	BRDB Host Reference Data from RDDS feed
19	BRDBX003.sh	BRDB_INDAY_XML_FROM_TPS	**Redundant since R2 decommissioning** BRDB In-Day Migration Blob from TPS feed
20	BRDBX003.sh	BRDB_MEMOS_FROM_RDDS	BRDB Desktop Memos from RDDS feed
21	BRDBX003.sh	BRDB_NWB_TXN_FROM_TPS	BRDB NWB transactions from TPS feed
22	BRDBX003.sh	BRDB_NWB_TXN_TO_DRS	BRDB NWB transactions to DRS feed
23	BRDBX003.sh	BRDB_NWB_TXN_TO_TPS	BRDB NWB transactions to TPS feed
24	BRDBX003.sh	BRDB_PCOL_TO_LFS	BRDB Pouch Collections to LFS feed
25	BRDBX003.sh	BRDB_PDEL_TO_LFS	BRDB Pouch Deliveries to LFS feed
26	BRDBX003.sh	BRDB_PLO_FROM_LFS	BRDB Planned Order details from LFS feed
27	BRDBX003.sh	BRDB_RDC_FROM_LFS	BRDB Replenishment Delivery details from LFS feed
28	BRDBX003.sh	BRDB_RECON_XML_FROM_TPS	BRDB Reconciliation Blob from TPS feed
29	BRDBX003.sh	BRDB_REF_COPY_FROM_TPS	BRDB Outlets/Transaction Modes from TPS feed
30	BRDBX003.sh	BRDB_REV_TXN_TO_NPS	BRDB Reversal Records to NPS feed
31	BRDBX003.sh	BRDB_TT_TXN_TO_NPS	BRDB Track and Trace Records to NPS feed
32	BRDBX003.sh	BRDB_TXN_CORR_FROM_TPS	BRDB Transaction Corrections from TPS feed
33	BRDBX003.sh	BRDB_TXN_TOT_TO_APS	BRDB Transaction Totals to APS feed
34	BRDBX003.sh	BRDB_TXN_TOT_TO_TPS	BRDB Transaction Totals to TPS feed
35	BRDBC004	BRDBC004	Audit, Archive, Purge
36	BRDBX005.sh	BRDBX005.sh	Gather Optimiser Statistics
37	BRDBX006.sh	BRDBX006	File Housekeeping
38	BRDBX007.sh	BRDB_APS_TXN_TOTALS	Data aggregation to calculate APS transaction totals
39	BRDBX007.sh	BRDB_CUMU_TXN_AGGR	Data aggregation for daily cumulative summary
40	BRDBX007.sh	BRDB_NON_CUMU_TXN_AGGR	Data aggregation for daily summary
41	BRDBX007.sh	BRDB_TPS_TXN_TOTALS	Data aggregation to calculate outlet transaction totals
42	BRDBX007.sh	OVERNIGHT_CASH_ON_HAND	Data aggregation to calculate ONCH figures.
43	BRDBX007.sh	RAISE_FEED_DATA_EXCEPTIONS	Inserts into operational exceptions if Feed data exceptions
44	BRDBC008	BRDBC008	Check Job Completion
45	BRDBC009	BRDBC009	End Of Day
46	BRDBX011.sh	BRDBX011	Updates system parameters
47	BRDBX015.sh	None	Transaction correction tool

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48	BRDBX020.sh*	None	**Redundant since R2 decommissioning** File transfer for BRDB Branch Migration Status data feed
49	BRDBX021.sh	None	Pause or restart Oracle Streams propagation
50	BRDBX030.sh	BRDBX030_INDAY	**Redundant since R2 decommissioning** Hydra XML processing (INDAY)
51	BRDBX030.sh	BRDBX030_RECON_CATCHUP BRDBX030_RECON_NORMAL	**Redundant since R2 decommissioning** Hydra XML processing (RECON)
52	BRDBX031.sh*	BRDBX031	Reset JSN, USN and SSN
53	BRDBX032.sh*	BRDB_REF_DATA_SLAS	Reference Data SLAs
54	BRDBC033*	BRDBC033	Transaction Correction Journal Auditing
55	BRDBX033.sh	BRDBX033_PREP_RECON_CATCHUP BRDBX033_PREP_RECON_NORMAL	**Redundant since R2 decommissioning** Hydra XML processing (RECON)
56	BRDBX034.sh	BRDBX034	**Redundant since R2 decommissioning** Hydra - Maintain filter table of branches due to migrate and undergo 'normal' processing in BRDBX030/BRDBX033.
57	BRDBX035.sh	BRDBX035	**Redundant since R2 decommissioning** Hydra - Extracts checking version of the Branch Trading Statement report for migrating branches.
58	GREPX001.sh*	GREPX001	Create generic views for reporting
59 60	GREPX002.sh* BRDBX003.sh	GREPX002 BRDB_TXN_ACK_FROM_TPS	Create generic reports BRDB Transaction Acknowledgement from TPS feed
61	PKG_BRDB_NRT_TXN_TO_AGENT*	BRDB_NRT_TXN_TO_AGENT	BRDB Near-Real Time Service Interface to Agents

Table 1: Branch Processes

Note

At the time of writing, the processes/executables marked with an asterisk (*) in the table above have not yet been added to the High Level Design document, and therefore do not have the support information available for reference. They have been included here for completeness and early notification (rather than waiting until the details have been added to the design document).

Unlike other Host processes, *PKG_BRDB_NRT_TXN_TO_AGENT* package do not get executed by any script in the Batch Database schedule. Instead, NRT Agents directly access the package as detailed in subsequent sections. Branch Database HLD is yet to be updated with AEI NRT related changes but the low level design document [DEV/APP/LLD/0802] provides detailed information on the various procedures that constitute package *PKG_BRDB_NRT_TXN_TO_AGENT* and how NRT Agents connect to the Branch Database to process AEI NRT messages.

2.2.1 BRDB Environment Variables

The following set of environment variables are relevant for the BRDB batch users which are used by TWS when calling batch jobs. The table below is a representation of ***brdbblv1***. and includes only BRDB application related variables.

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Environment Variable	Variable Value
BRDB_EXCP_USER	ORAEXCPLV/EXCPLV123
BRDB_TCT_FILE_TEMP	/app/brdb/trans/support/working
BRDB_AUDIT_FILE_TEMP	/app/brdb/trans/support/working
NCHOME	/opt/netcool
NLS_DATE_FORMAT	DD-MON-YYYY
EXPORT_DIR	/var/tmp
BRDB_TCT_AUDIT_OUTPUT	/app/brdb/trans/audit/tctaudit
BRDB_MSU_OUTPUT	/app/brdb/trans/support/reportoutput
BRDB_ARCHIVE_OUTPUT	/app/brdb/trans/support/archive
BRDB_HOST_AUDIT_OUTPUT	/app/brdb/trans/audit/hostaudit
BRDB_COUNTER_AUDIT_OUTPUT	/app/brdb/trans/audit/counteraudit
ORACLE_HOME	/u01/app/oracle/product/10.2.0/db_1
OMNIHOME	/opt/netcool/omnibus
INPUTRC	/etc/inputrc
G_BROKEN_FILENAMES	1
ORACLE_SID	BRDB1
LANG	C
NETCOOL_LICENSE_FILE	27000@lltpbdb001
BRDB_CONNECT_STR	BRDB
LOGNAME	brdbblv1
BRDB_SH	/app_sw/brdb/sh
HISTSIZE	1000
REPOSITORY	/pw/stagonl/repository
LESSOPEN	|/usr/bin/lesspipe.sh %s
BRDB_MSU_WORKING	/app/brdb/trans/support/working
FAN_EVENT_LOG_DIR	/app_sw/brdb/log
BRDB_PROC	/app_sw/brdb/c
SSH_ASKPASS	/usr/libexec/openssh/gnome-ssh-askpass
BRDB_SQL	/app_sw/brdb/sql
EXCP_USER	ORAEXCPLV/EXCP123

Table 2: Branch Environment Variables

2.3 BRDB Host Processes - Overview

The BRDB Host processes and how they are implemented fall into 3 main categories:

2.3.1 Individual Programs

These are individual shell scripts or Pro*C programs that perform a specified task. Typically, they have been migrated (with minimal change) from existing Horizon processes. e.g. “Start of Day” (BRDBC001), “Audit, Archive Purge” (BRDBC004) and “File Housekeeping” (BRDBX006). They are invoked by a direct call (from a Linux shell) to an executable.

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2.3.2 Interface Feeds

2.3.2.1 Host Interface Feeds

These are new for the Branch Database, and load data between the BRDB and the legacy Host systems (in both directions). There are currently over 30 different Feeds, with each being performed by a separate, specific database package. All of the Feeds have a common interface/parameter list and are invoked via a single shell script (BRDBX003.sh). The first parameter passed to this script controls which Feed process (packaged procedure) is executed.

For example, line 17 of the Table of BRDB Host Processes shows that the Feed of EPOSS transactions from BRDB to TPS, is performed by a call to BRDBX003.sh with a first parameter of "BRDB_EPOSS_TXN_TO_TPS".

The corresponding database packages are named according to the following convention:

PKG_<Feed name> e.g. PKG_BRDB_EPOSS_TXN_TO_TPS

See 2.4.1 for feed information and troubleshooting guides.

2.3.2.2 Agent Interfaces

These interfaces are new for the Branch Database introduced at HNG-X Release 3 to cater for various Near-Real Time (NRT) Service messages. In Release 3, Application and Enrolment Identity (AEI) NRT Service has been implemented as a NRT interface within the Branch Database. Unlike other Host Interface feeds these Interfaces do not get invoked from BRDB batch schedule via shell script BRDBX003.sh; instead they get invoked directly by NRT Agents connecting to the Branch Database. Wherever applicable these interfaces re-use feed procedures and exception handling mechanisms that are common to Host Interface feeds.

2.3.3 Data Aggregations

These are also new for the Branch Database, and are similar to the Interface Feeds in that different processes (currently numbering six) are invoked via a single shell script (BRDBX007.sh) with a controlling first parameter. However, they differ from the Feeds in that the program code is stored in the database as raw SQL or PL/SQL, with no corresponding database packages.

2.3.4 Support Differences

The differences between the categories outlined above will translate into variations from a support perspective. For example, issues with database links, synonyms, grants etc. may manifest as package compilation errors for the Feeds, but run-time errors for the Aggregations.

An invalid Feed package can be re-compiled for verification (before running) after certain problems have been resolved (e.g. when a missing database link has been restored). A recompilation can be performed using the "ALTER PACKAGE" command from SQL*Plus:

e.g. ALTER PACKAGE PKG_BRDB_EPOSS_TXN_TO_TPS COMPILE;

In contrast, an Aggregation or Pro*C executable cannot be re-validated against the database in advance, it can only be re-run.

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Another difference between the categories outlined above concerns the amount of information that is output when the processes are run. The Interface Feeds and main executables (see sections 2.3.1 and 2.3.2 above) provide the option to specify a debug level in order control the amount of output from within each process/Feed. Typically, the default debug settings provide milestone information only. However, should the need arise, for example whilst investigating a possible problem, the amount of output can be easily increased via meta-data (i.e. without changing the program concerned) - the debug levels are held as numeric system parameters with a higher number (e.g. 1) producing more detailed output than a lower number (e.g. 0) - see HLD for further details.

From Support perspective, Agent Interfaces vary from Host Interface Feeds. The extent of 3rd line support required is limited within the Branch Database as operational control lies with the NRT Agents. Within the Branch Database, support will be confined to any exceptions encountered and archiving of processed messages.

The Aggregations are more limited in this respect. The mechanism that calls each Aggregation issues output and has the debug capability, but the Aggregations themselves do not.

Differences relating to the support of the program return codes when a Node/Instance failure is encountered are detailed in section 2.5.1 Program Return Code.

2.4 BRDB Host Processes – Support Details

Much of the detailed information required for support purposes is contained in the following sections of the **BRDB High Level Design**:

HLD: Section 7.2 Host Processes

This section of the HLD contains details of each of the Host Processes, and has been written with support requirements in mind. The information is presented under the following headings **for each** process:

- Application Type – indicates the programming language in which the module has been developed e.g. PL/SQL packages, Pro*C etc
- Inputs – lists the input parameters and whether they are mandatory or optional.
- Outputs – indicates the program return codes.
- Location – states the Linux directory in which the executable code resides.
- Scheduling – gives an overview of the scheduling
- Processing details – gives high level details of the processing performed, along with information on the more important and specific functionality.
- Handling Failures and Rerun ability – gives information on the likely failure conditions, plus instructions on how to proceed.

A significant part of the BRDB daily processing concerns the loading of data between the Branch database and numerous Host applications (in both directions) by the Host Interface Feeds. Because of the variety of processing involved, further details are contained in a separate section of the HLD:

HLD: Section 5.3.4 Host Interfaces

This section of the HLD contains detailed information on the data and requirements for BRDB Host Interfaces. It includes details of the data being processed, the Host applications, and how the data is selected for processing.

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Although much of this information will be too detailed for initial support purposes, it is referenced here in case more detailed analysis and understanding of a process(es) is required.

2.4.1 Host Interface Feeds – additional support details

This section gives further details and support information on the Interface Feeds:

The Host Interface Feeds have been designed and written to be robust and should therefore require very little support. For example, all of the Feed processes can simply be re-run (when the underlying problem has been resolved) if they fail to complete successfully. They all write the details of any 'show-stopper' errors to the standard output, as well as logging the necessary information to the operational exceptions table (BRDB_OPERATIONAL_EXCEPTIONS). Output is also generated under normal circumstances, providing useful information on the actions performed, time taken etc.

In addition, certain foreseeable issues/events such as a Node or database instance failure have been catered for within the logic of the Feed programs and the daily schedule.

2.4.1.1 Process Control

Where relevant, the Feeds utilise the existing 'process control' functionality – to store information on when the processes were run and whether they completed successfully etc. Table BRDB_PROCESS_CONTROL can be queried for this information. This table is also used to enforce requirements such as ensuring that certain processes can only be run once for a given trading date.

2.4.1.2 FAD Hashes

As part of the high level design, the processing of the largest volumes of data has been sub-divided - into FAD hashes (currently numbering 128). Under normal circumstances, the processing of the FAD Hashes is evenly distributed across the Nodes (currently numbering 4) within the Real Application Cluster (RAC).

2.4.1.3 Node/Instance Failure

If one of the Nodes or database instances goes down, the loss is automatically detected and flagged using Oracle's Fast Application Notification (FAN). FAN then allows the processing that would have normally taken place on the failed Node to be automatically re-allocated across the remaining Nodes (when the processes are re-run – see below).

Further details of the FAN event processing are contained in the HLD.

Details of how the failed Node should (when fixed) should be reintroduced to the Cluster (i.e. made available to the Host processes) are contained within the database support section of this document.

2.4.1.4 Scheduled Re-Run of Multi-Node Feeds

The daily BRDB schedule does not automatically re-run multi-node Feed processes in the event of a single or multi-node failure. If these processes/jobs were in the state of executing when a node failure is experienced they will still appear to be executing until such time as the TWS agent re-establishes communications. Operational support will be notified in the event of such a failure.

Therefore, in order to process any FAD Hashes that have been re-allocated from a failed Node, Operational support will need to be involved in any steps of intervention.

2.4.1.5 Data Exceptions

One of the high level design assumptions was that because the Feeds load data between internal systems (to/from the Branch Access Layer and to/from the Host applications) the data being processed should be error-free. To this end, the Feeds have (where possible) been designed to perform optimally when this is the case. However, because the unexpected can (and does) happen, many of the Feeds (where appropriate) incorporate a mechanism to handle any data errors. This means loading the valid records, whilst writing any exception records to a separate exceptions table for investigation.

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In order to prevent such BRDB data errors from going un-noticed, there is a job (RAISE_FEED_DATA_EXCEPTIONS) within the normal, daily schedule that highlights any such exceptions by inserting a summary record into the operational exceptions table. This record provides an alert to the SMC, and includes the following information:

- Number of interface Feeds that encountered a data exception(s)
- Total number of data exceptions
- Processing date on which the exceptions were encountered
- The names of the affected Feeds and how many exceptions each one encountered
- The name of the database table where the exceptions have been stored
- A statement/instruction to indicate that investigation is required.

It should be noted that such exceptions are DATA errors - caused by issues with the data or underlying specification of the data format - and NOT Feed errors. The presence of a data error(s) will not cause the Feed process to fail unless the quantity of such errors is significant – the allowable limit is configurable for each Feed, and is currently set to 1000.

The nature of this type of exception means that they are unexpected, and therefore cannot be easily fixed by a support procedure etc. The correct action from a support perspective is to notify the development team of the situation - so that they can investigate the actual data and data specifications etc. in order to identify where the problem/discrepancy lies. They will also need to determine whether to re-process the data that could not be loaded, and if so, how it will be done.

2.4.1.6 Data Exception Thresholds

Every feed has a data exception (numeric) threshold stored in BRDB_SYSTEM_PARAMETERS identified by a parameter name of the form '<FEED NAME>_MAX_DATA_ERRORS'.

BRDBX011.sh can be used to change a threshold value e.g. the following changes the exception threshold value for the Track and Trace feed to 10,000:

```
$BRDB_SH/BRDBX011.sh -n "BRDB_TT_TXN_TO_NPS_MAX_DATA_ERRORS" -t "N" -v 10000
```

2.4.2 Agent Interfaces – additional support details

This section gives further details and support information on Agent Interfaces:

The Agent Interfaces have been designed and written to be robust and should therefore require very little support. For example, if there are NRT Agent connection failures or node instance failures then NRT Agents will have to call the initialise method and continue to process NRT service messages. All procedures within the NRT Interaface return the details of any ‘show-stopper’ errors to the calling NRT Agent, as well as logging the necessary information to the operational exceptions table (BRDB_OPERATIONAL_EXCEPTIONS). Since Agent Interfaces are not batch jobs execution output (stdlist) is not applicable.

On Windows platforms Agent events are written to the Windows Application Event Log whilst on Linux systems Agent events are written to syslog (See DES/APP/SPG/0002 section 3.1).

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2.4.2.1 Process Control

As all the procedures implemented within the package PKG_BRDB_NRT_TXN_TO_AGENT are independent, atomic and directly accessible by the NRT Agents there is no need for process control within the Branch Database for Agent Interfaces.

2.4.2.2 FAD Hashes

Similar to Host Interfaces, the processing of the largest volumes of data has been sub-divided - into FAD hashes (currently numbering 128). Under normal circumstances, the processing of the FAD Hashes is evenly distributed across the Nodes (currently numbering 4) within the Real Application Cluster (RAC).

2.4.2.3 Node/Instance Failure

If one of the Nodes or database instances goes down, the loss is automatically detected and flagged using Oracle's Fast Application Notification (FAN). The mechanism then allows the processing that would have normally taken place on the failed Node to be automatically re-allocated across the remaining Nodes.

Further details of the FAN event processing are contained in the Branch Database HLD.

Details of how the failed Node (when fixed) should be reintroduced to the Cluster (i.e. made available to the Host processes) are contained within the database support section of this document.

Details of how the NRT Agents will recover and re-connect to the Branch Database in the event of Node / Database Instance failure are contained in NRT Interface Agent High Level Design [DES/APP/HLD/0732].

2.4.2.4 AEI NRT Interface

HNG-X Counters will write AEI NRT Service messages (triggered by new AP-ADC data type AssociateNRT) to a table called BRDB_RX_NRT_TRANSACTIONS in OPS$BRDB schema of the Branch Database. These NRT messages will be set initially with a *processed_yn* value of 'N'. All such unprocessed messages will be picked up and processed, one by one, by NRT Agents.

NRT Agents – There will be four NRT Agents connecting to the Branch Database through Nodes 1|2|3|4 respectively. A NRT Agent connecting through a specific BRDB Node will connect to the Branch Database and access the AEI NRT Interface package using respective database user LVAGENTUSER{1|2|3|4}. Similarly, while processing NRT messages a NRT Agent will only process those messages allocated through FAD hash load-balancing for a particular node – this includes Node / Database Instance failure scenario also.

Processed NRT messages will be set with *processed_yn* to 'Y' and an appropriate *processed_timestamp* in BRDB_RX_NRT_TRANSACTIONS table. Such processed messages will be archived based on meta-data defined in BRDB_ARCHIVED_TABLES.

For an end-to-end overview of the AEI NRT solution in HNG-X refer to AEI Near-Real Time Design Proposal document [DES/APP/DPR/0671].

2.5 Error Logging/Notification

When an error is detected within one of the BRDB Host processes it is highlighted and logged using the following standard procedures:

2.5.1 Program Return Code

Processes that fail return a non-zero number to the calling environment. Typically, 0 represents successful completion, 1 represents a failure and 99 indicates that a Node or Instance failure has been encountered.

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Note

Within the Host processes, two different mechanisms have been used to identify whether an error code encountered within a program corresponds to a Node/Instance failure:

- Dynamic - The Interface Feeds use a dynamic, meta-data driven mechanism, using BRDB_ORACLE_ERROR_CODES as a look-up table.

- 'Hard-coded' - The 2 other categories of Host process (Individual Programs and Data Aggregations) have fixed ('hard-coded') error codes within the programs.

Therefore, if another, 'new' Oracle error code is found to correspond to a Node/Instance failure (and therefore the Host processes need to return a code of 99), the support activity required will differ accordingly:

For the Interface Feeds, a new record for the error code will need to be added to the look-up table, with column INSTANCE_CONN_ERROR_YN set to 'Y'. None of the Feed programs will need to be changed.

For the other processes, the hard-coded list in each affected shell script/Pro*C program will need to be updated, and each program re-released.

2.5.2 Screen Output

Most of the BRDB Host processes will output the details of an error (what the problem is, where it was encountered etc.) to the standard output.

2.5.3 Operational Exceptions

When an error is encountered, the details are logged in table BRDB_OPERATIONAL_EXCEPTIONS, including what the error is and where and when it was encountered. Agent Interfaces also pass the exception message and Oracle database error code, if applicable, back to the calling NRT Agent.

In addition, table BRDB_HYDRA_EXCEPTIONS was used to log errors associated with Hydra processing (prior to release 2 decommissioning).

2.5.4 Process Control

As with many existing Host applications, most of the BRDB processes use table BRDB_PROCESS_CONTROL to manage re-starting, and to control whether an invoked process should be allowed to run. This table can be queried (using SQL*Plus or TOAD) to determine when a process started and if/when it completed successfully etc. The column OPS$BRDB.BRDB_PROCESS_CONTROL.PROCESS_NAME will map to those processes listed in 2.2. This is not applicable for Agent Interfaces.

2.5.5 Feed Data Exceptions

See section 2.4.1.5 (Data Exceptions) for details.

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3 BRDB Scheduling

The Branch Database schedule is run each day, and controls how and when most of the processes are executed. Sections 3.1 to 3.6 describe features of the schedule as a whole, and sections 3.7 onwards describe the individual schedules that it is composed of.

3.1 Multi-Instance Batch Jobs

Scheduling HLD: Section 5.2 Common Approach for multi-instance batch jobs

The main BRDB processes are scheduled across the nodes of the Real Application Cluster (RAC). Some of these processes are simply restarted when a failure occurs, but, most are implemented with built-in delays and reruns in the case of an initial failure. This approach means that a support call is only raised when a failure condition persists i.e. after an automatic retry has been attempted.

Please note: Currently, all scheduled processes/jobs will raise an alert upon failure. Therefore in all cases Operational support will be aware of each failure and respond accordingly.

In the schedule listings from sections 3.7 onwards, only the main jobs which perform the relevant task are listed. However, they are implemented using a common schedule template consisting of the main job running on each of the four nodes, and additional jobs to perform the waiting, checking and rerunning, as per the following table.

Job Name	Job Dependency	Rerun Action
15_min_wait		
Job-Instance-1		On failure continue
Job-Instance-2		On failure continue
Job-Instance-3		On failure continue
Job-Instance-4		On failure continue
Check-Job-Instance-1	Follows 15_min_wait	
Check-Job-Instance-2	Follows 15_min_wait	
Check-Job-Instance-3	Follows 15_min_wait	
Check-Job-Instance-4	Follows 15_min_wait	
CHECK_FOR_INTRO	Follows 15_min_wait	RERUN ABENDPROMPT "One or more jobs are stuck at INTRO. Investigate before re-run."
Check-DB-Job *Job to be run on an active node*	Follows Job-Instance-1…4	On success or failure continue
15_min_wait_rerun	Follows Check-DB-Job	
Job-Instance-1-rerun	Follows Check-DB-Job	On failure continue
Job-Instance-2-rerun	Follows Check-DB-Job	On failure continue
Job-Instance-3-rerun	Follows Check-DB-Job	On failure continue
Job-Instance-4-rerun	Follows Check-DB-Job	On failure continue
Check-Job-Instance-1-rerun	Follows 15_min_wait_rerun	
Check-Job-Instance-2-rerun	Follows 15_min_wait_rerun	
Check-Job-Instance-3-rerun	Follows 15_min_wait_rerun	

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Check-Job-Instance-4-rerun	Follows 15_min_wait_rerun	
CHECK_FOR_INTRO_RERUN	Follows 15_min_wait_rerun	RERUN ABENDPROMPT "One or more jobs are stuck at INTRO. Investigate before re-run."
Check-DB-Job-rerun *Job to be run on an active node*	Follows Job-Instance-1…4-rerun	On failure Alert Operations
Schedule-complete	Follows Check-DB-Job, Check-DB-Job-rerun	

3.1.1 Rerunning Failed Multi-Instance Batch Jobs

If the built-in rerun of any particular multi-instance job fails then

- the cause of the failure should be resolved
- the job should be rerun on all nodes
- the associated check job should then be rerun on all nodes

3.2 Any Active Node Batch Jobs

Certain BRDB processes can be run on any node of the Real Application Cluster (RAC).

In the schedule listings from sections 3.7 onwards, only the main jobs which perform the relevant task are listed. However, they are implemented using a common schedule template consisting of the main job running on each of the four nodes, and an additional parent job to co-ordinate them, as follows:

Job Name	Job Dependency	Rerun Action
JobName		RERUN ABENDPROMPT "Unable to determine an active BRDB node. Re-run?"
JobName1	Follows JobName	STOP ABENDPROMPT "Appropriate Message"
JobName2	Follows JobName	STOP ABENDPROMPT "Appropriate Message"
JobName3	Follows JobName	STOP ABENDPROMPT "Appropriate Message"
JobName4	Follows JobName	STOP ABENDPROMPT "Appropriate Message"

In this approach, once an available node has been selected the jobs defined for the other nodes are cancelled.

3.3 Branch Database Jobs in other Schedules

(Scheduling HLD: Section 5.5 Branch Database Jobs in other schedules)

Although most of the BRDB processes are called from within the BRDB schedule, there are a number of BRDB processes called from other application TWS schedules such as LFS and RDDS. This section lists the schedules concerned.

RDDS: Scheduling HLD is DES/APP/HLD/0097

LFS: Scheduling HLD is DES/APP/HLD/0088

3.4 Monitoring Jobs

The BRDB schedule includes several monitoring jobs. These are jobs which raise an alert if a specified process has not been completed by a required point in time. These jobs have been collected within a single schedule, BRDB_MONITOR – see section 3.69 for details.

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3.5 Repeating/Daemon Processes

Currently there are four BRDB Host Interface Feeds that are run as 'daemon' processes within the daily schedule: The 'Track and Trace' and 'Guaranteed Reversals' Feeds to NPS, and the 'Pouch Collections' and 'Pouch Deliveries' Feeds to LFS.

After starting, these processes enter a cycle of 'sleep and repeat' - where they perform any necessary processing, then sleep for a pre-defined time before 'waking' and running again. Each daemon process is controlled by a separate system parameter, named after the Feed with a '_STOP_YN' suffix, as follows:

- BRDB_REV_TXN_TO_NPS_STOP_YN
- BRDB_TT_TXN_TO_NPS_STOP_YN
- BRDB_PDEL_TO_LFS_STOP_YN
- BRDB_PCOL_TO_LFS_STOP_YN

When this parameter is set to 'Y' (from within the schedule using BRDBX011.sh) the daemon Feed process will stop, although **it should be noted that there will be a time delay between setting the stop flag to 'Y' and the process actually terminating**. This is because the daemon processes only check the stop flag after 'waking' from a sleep or completing processing.

Additional metadata concerning the feeds (e.g. sleep time) can be queried in table BRDB_HOST_INTERFACE_FEEDS as per the following:

```
SELECT interface_desc, sleep_repeat_yn, use_fad_hash_yn, sleep_repeat_secs
FROM   brdb_host_interface_feeds
WHERE  interface_feed_name = 'BRDB_TT_TXN_TO_NPS';
```

3.5.1 Node Failures

The daemon feed processes have been designed and developed to cope with node/instance failures automatically. If a FAN event occurs for a node then:

- Database Column OPS$BRBD.BRDB_OPERATIONAL_INSTANCES.IS_AVAILABLE will be set to 'N' for the failed instance
- View BRDB_FAD_HASH_CURRENT_INSTANCE will automatically redistribute the FAD_HASHes of the failed node amongst the other operational nodes.
- Each of the daemon jobs reference the view BRDB_FAD_HASH_CURRENT_INSTANCE when waking from sleep therefore the remaining operational nodes will work on any unprocessed data from the FAD_HASHes associated with the failed node.

The failed TWS job can be set to SUCC. Refer to 4.3.3 for instance recovery.

3.5.2 Manually Stopping Daemon Processes

N.B. Stopping daemon feeds could result in the breaching of one or more service level agreements.

If there is a need to stop one of the above daemons manually then running the required job from the following table will accomplish this:

Feed	TWS Job
NPS Track & Trace	BRDBX011_PAUSE_NPS_TT_COPY
NPS Gurarranteed Reversals	BRDBX011_PAUSE_NPS_GREV_COPY

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LFS Pouch Collections	BRDBX011_PAUSE_LFS_PCOL_COPY
LFS Pouch Deliveries	BRDBX011_PAUSE_LFS_PDEL_COPY

3.5.3 Manually Starting Daemon Processes

N.B. Be aware that there should only be one feed job per instance running for each daemon, ensure the jobs are NOT started more than once. Duplicate running feeds may result in a number of unexpected and unpredictable failures (TT and GREV might be subject to deadlocking for example).

If there is a need to restart a stopped daemon manually then running the required jobs (i.e. changing the start/stop flag and then restarting the deamon process on each node) from the following table will accomplish this:

Feed	TWS Job - Flag Change	TWS Job - Daemon Process
NPS Track & Trace	BRDBX011_START_NPS_TT_COPY	BRDBX003_TT_TO_NPS_1...4_NOPAGE[1]
NPS Guraranteed Reversals	BRDBX011_START_NPS_GREV_COPY	BRDBX003_GREV_TO_NPS_1...4_NOPAGE
LFS PCOL	BRDBX011_START_LFS_PCOL_COPY	BRDBX003_PCOL_TO_LFS_1...4_NOPAGE
LFS PDEL	BRDBX011_START_LFS_PDEL_COPY	BRDBX003_PDEL_TO_LFS_1...4_NOPAGE

3.5.4 Track and Trace Feed

TT transactions will be flagged with 'Y' in column PROCESSED_YN once those transactions have been inserted into the remote NPS database. Any transactions failing to be inserted due to some exception will:

- have the PROCESSED_YN flag set to 'Y' if the exception was due to some data error[2], NPS_DELIVERED_TIMESTAMP will be left as NULL to allow support groups (SMC, SSC, HOST) time to examine the exceptions before the archive/purge job removes the source rows.
- be left unprocessed if the exception is due to a network or instance failure; this allows the row to be resent once the problem has been resolved (e.g. network is back up, NPS is back up etc)

3.5.5 Guaranteed Reversals Feed

GREV transactions will be flagged with 'Y' in column PROCESSED_YN once those transactions have been inserted into the remote NPS database. Any transactions failing to be inserted due to some exception will:

- have the PROCESSED_YN flag set to 'Y' if the exception was due to some data error[3], NPS_DELIVERED_TIMESTAMP will be left as NULL to allow support groups (SMC, SSC, HOST) time to examine the exceptions before the archive/purge job removes the source rows
- be left unprocessed if the exception is due to a network or instance failure; this allows the row to be resent once the problem has been resolved (e.g. network is back up, NPS is back up etc)

3.6 BRDB Schedules and Failover

The Scheduling tool used for running BRDB (and other HNG-X schedules) is TWS. TWS needs to undergo a number of steps in a failover scenario. These are detailed in the relevant TWS and scheduling documentation. However, it is still the case that TWS (as with other applications) requires

[1] 1..4 indicates that the job should be run concurrently on each BDB instance/node

[2] As defined in table OPS$BRDB.BRDB_ORACLE_ERROR_CODES where data_error_yn = 'Y'

[3] As defined in table OPS$BRDB.BRDB_ORACLE_ERROR_CODES where data_error_yn = 'Y'

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the DNS reconfigured before post-failover testing can begin. To clarify, failover refers only to the database failover from the primary database cluster (lprpbdb001 - lprpbdb004) to the standby database cluster (lprpbds001 - lprpbds004) and *not* a full campus failover, e.g. IRE11 to IRE19.

See Steps [7.] and [8.] of Section 6.1 for more on allowing applications seamless access to BRDB on database primary-to-standby cluster post-failover.

3.7 Schedule BRDB_PAUSE_FEED3

This schedule is run daily. It stops the two NPS copy processes prior to the starting of the daily BRDB schedule. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_PAUSE_NPS_TT_COPY

BRDBX011_PAUSE_NPS_GREV_COPY

3.7.1 Dependencies

Schedule BRDB_PAUSE_FEED3 depends on the completion of schedule BRDB_BKP_COMPL.

3.7.2 Job BRDBX011_PAUSE_NPS_TT_COPY

This job stops the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

3.7.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value “Y” (i.e. System parameter in BRDB_SYSTEM_PARAMETER.parameter_text named 'BRDB_TT_TXN_TO_NPS_STOP_YN' is set to 'Y').

3.7.2.2 Rerun Action

Rerun the job once the underlying problem has been resolved, unless the the node on which it was running is now down; rerun one of the cancelled jobs from one of the other instances instead.

3.7.3 Job BRDBX011_PAUSE_NPS_GREV_COPY

This job stops the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.7.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “Y” (i.e. System parameter in BRDB_SYSTEM_PARAMETER.parameter_text named 'BRDB_REV_TXN_TO_NPS_STOP_YN' is set to 'Y').

3.7.3.2 Rerun Action

Rerun the job once the underlying problem has been resolved, unless the the node on which it was running is now down; rerun one of the cancelled jobs from one of the other instances instead.

3.8 Schedule BRDB_STARTUP

This schedule is run daily. It runs the BRDB start of day utility. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBC001 is included here.

Additional monitoring is required so that an alert is raised if this job has not completed by 06:00. This is implemented within the BRDB_MONITOR schedule – see section 3.69.

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3.8.1 Dependencies

Schedule BRDB_STARTUP depends on the completion of schedule BRDB_PAUSE_FEED3.

3.8.2 Job BRDBC001

This job runs the BRDB start of day utility in order to create "tomorrow's" partitions. BRDB's system date is incremented by one.

3.8.2.1 Implementation

This job is implemented by a call to the executable BRDBC001.

3.8.2.2 Rerun Action

Check the partition metadata is as expected (refer to 5.3.3.1), if the metadata appears OK then fix the underlying problem (that caused the abend), raise a high priority call with 4th line support and then rerun the job.

If the rerun fails then do not attempt to rerun a 3rd time, liase with 4th line support - the resolution should be reached before 6 p.m. that day.

3.9 Schedule BRDB_START_FEED3

This schedule is run daily. It prepares for the running of the two NPS copy processes by reversing the changes that stopped them earlier in the schedule. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_START_NPS_TT_COPY

BRDBX011_START_NPS_GREV_COPY

3.9.1 Dependencies

Schedule BRDB_START_FEED3 depends on the completion of schedule BRDB_STARTUP.

3.9.2 Job BRDBX011_START_NPS_TT_COPY

This job prepares for the starting of the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

3.9.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value “N”.

3.9.2.2 Rerun Action

Alert Operations on failure.

3.9.3 Job BRDBX011_START_NPS_GREV_COPY

This job prepares for the starting of the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.9.1.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “N”.

3.9.1.2 Rerun Action

Alert Operations on failure.

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3.10 Schedule BRDB_TT_TO_NPS3

This schedule is run daily to start the Track and Trace NPS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_TT_TO_NPS_1…4_NOPAGE.

3.10.1 Dependencies

Schedule BRDB_TT_TO_NPS3 depends on the completion of schedule BRDB_START_FEED3.

3.10.2 Job BRDBX003_TT_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Track and Trace transactions to NPS.

3.10.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TT_TXN_TO_NPS.

3.10.2.2 Database Link Information

NBX_TT_HARVESTER_AGENT_1@NPS1

3.10.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.11 Schedule BRDB_GREV_NPS3

This schedule is run daily to start the Reversals NPS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_GREV_TO_NPS_1…4_NOPAGE.

3.11.1 Dependencies

Schedule BRDB_GREV_NPS3 depends on the completion of schedule BRDB_START_FEED3.

3.11.2 Job BRDBX003_GREV_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Reversals transactions to NPS.

3.11.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_REV_TXN_TO_NPS.

3.11.2.2 Database Link Information

NBX_GREV_AGENT_1@NPS2

3.11.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.12 Schedule BRDB_PAUSE_FEED1

This schedule is run daily at 07:50. It stops the two NPS copy processes prior to the start of day processing. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_PAUSE_NPS_TT_COPY

BRDBX011_PAUSE_NPS_GREV_COPY

Additional monitoring is required so that an alert is raised if this job has not completed by 08:00. This is implemented within the BRDB_MONITOR schedule – see section 3.69.

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3.12.1 Dependencies

Schedule BRDB_PAUSE_FEED1 depends on the completion of schedules BRDB_STARTUP and BRDB_START_FEED3.

3.12.2 Job BRDBX011_PAUSE_NPS_TT_COPY

This job stops the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

3.12.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value “Y”.

3.12.2.2 Rerun Action

Alert Operations on failure.

3.12.3 Job BRDBX011_PAUSE_NPS_GREV_COPY

This job stops the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.12.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “Y”.

3.12.3.2 Rerun Action

Alert Operations on failure.

3.13 Schedule BRDB_COMPLETE

This schedule is run daily. It checks that the BRDB schedule has completed and creates a flag file via the job CREATE_BRDB_COMPLETE_FLAG.

3.13.1 Dependencies

Schedule BRDB_COMPLETE depends on the completion of schedules BRDB_BKP_COMPL, BRDB_STARTUP and BRDB_PAUSE_FEED1.

3.13.2 Job CREATE_BRDB_COMPLETE_FLAG

This job creates the flag file /opt/tws/FLAGS/BRDB_COMPLETE_FLAG.

3.13.2.1 Implementation

This job is implemented by a call to the “touch” command with the relevant file name.

3.13.2.2 Rerun Action

*** Prompts for rerun – action? **

3.14 Schedule BRDB_SOD

This schedule is run daily at 08:00. It checks that the BRDB has completed start of day processing.

3.14.1 Dependencies

Schedule BRDB_COMPLETE depends on the existence of the flag files /opt/tws/FLAGS/BRDB_COMPLETE.flag and /opt/tws/FLAGS/BRDB_BKUP_COMPLETE.flag.

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3.14.2 Job DELETE_BRDB_COMPLETE_FLAG

This job deletes the flag file /opt/tws/FLAGS/BRDB_complete.FLAG.

3.14.2.1 Implementation

This job is implemented by a call to the “rm” command with the relevant file name.

3.14.2.2 Rerun Action

Alert Operations on failure?

3.14.3 Job DELETE_BRDB_COMPLETE_FLAG

This job deletes the flag file /opt/tws/FLAGS/BRDB_BKUP_complete.FLAG.

3.14.3.1 Implementation

This job is implemented by a call to the “rm” command with the relevant file name.

3.14.3.2 Rerun Action

Alert Operations on failure?

3.15 Schedule BRDB_START_FEED1

This schedule is run daily at 08:02. It prepares for the running of the two NPS copy processes by reversing the changes that stopped them earlier in the schedule. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_START_NPS_TT_COPY

BRDBX011_START_NPS_GREV_COPY

3.15.1 Dependencies

Schedule BRDB_START_FEED1 depends on the completion of schedule BRDB_SOD.

3.15.2 Job BRDBX011_START_NPS_TT_COPY

This job prepares for the starting of the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

3.15.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value “N”.

3.15.2.2 Rerun Action

Alert Operations on failure.

3.15.3 Job BRDBX011_START_NPS_GREV_COPY

This job prepares for the starting of the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.15.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “N”.

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3.15.3.2 Rerun Action

Alert Operations on failure.

3.16 Schedule BRDB_START_LFS

This schedule is run daily at 08:02. It prepares for the running of the two LFS copy processes by reversing the changes that stop them from running. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_START_LFS_PCOL_COPY

BRDBX011_START_LFS_PDEL_COPY

3.16.1 Dependencies

Schedule BRDB_START_LFS depends on the completion of schedule BRDB_SOD.

3.16.2 Job BRDBX011_START_LFS_PCOL_COPY

This job prepares for the starting of the copying of Pouch Collections to LFS, by setting a system parameter (see section 3.5).

3.16.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_PCOL_TO_LFS_STOP_YN and value “N”.

3.16.2.2 Rerun Action

Alert Operations on failure.

3.16.3 Job BRDBX011_START_LFS_PDEL_COPY

This job prepares for the starting of the copying of Pouch Deliveries to LFS, by setting a system parameter (see section 3.5).

3.16.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_PDEL_TO_LFS_STOP_YN and value “N”.

3.16.3.2 Rerun Action

Alert Operations on failure.

3.17 Schedule BRDB_TT_TO_NPS1

This schedule is run daily at 08:05 to restart the Track and Trace NPS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_TT_TO_NPS_1…4_NOPAGE.

3.17.1 Dependencies

Schedule BRDB_TT_TO_NPS1 depends on the completion of schedule BRDB_START_FEED1.

3.17.2 Job BRDBX003_TT_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Track and Trace transactions to NPS.

3.17.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TT_TXN_TO_NPS.

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3.17.2.2 Database Link Information

NBX_TT_HARVESTER_AGENT_1@NPS1

3.17.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.18 Schedule BRDB_GREV_NPS1

This schedule is run daily at 08:05 to restart the Reversals NPS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_GREV_TO_NPS_1…4_NOPAGE.

3.18.1 Dependencies

Schedule BRDB_GREV_NPS1 depends on the completion of schedule BRDB_START_FEED1.

3.18.2 Job BRDBX003_GREV_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Reversals transactions to NPS.

3.18.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_REV_TXN_TO_NPS.

3.18.2.2 Database Link Information

NBX_GREV_AGENT_1@NPS2

3.18.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.19 Schedule BRDB_PCL_TO_LFS

This schedule is run daily at 08:05 to start the Pouch Collection to LFS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_PCOL_TO_LFS_1…4_NOPAGE.

3.19.1 Dependencies

Schedule BRDB_PCL_TO_LFS depends on the completion of schedule BRDB_START_LFS.

3.19.2 Job BRDBX003_PCOL_TO_LFS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Pouch Collections to LFS.

3.19.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_PCOL_TO_LFS.

3.19.2.2 Database Link Information

LFSBRDB@LFS

3.19.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.20 Schedule BRDB_PDL_TO_LFS

This schedule is run daily at 08:05 to start the Pouch Deliveries to LFS data feed. It consists of a single task which is run on each active node by jobs named BRDBX003_PDEL_TO_LFS_1…4_NOPAGE.

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3.20.1 Dependencies

Schedule BRDB_PDL_TO_LFS depends on the completion of schedule BRDB_START_LFS.

3.20.2 Job BRDBX003_PDEL_TO_LFS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Pouch Deliveries to LFS.

3.20.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_PDEL_TO_LFS.

3.20.2.2 Database Link Information

LFSBRDB@LFS

3.20.2.3 Rerun Action

Rerun on failure. See 3.5.1

3.21 Schedule BRDB_SOB

This schedule is run daily at 19:00. It marks the start of the evening BRDB schedule.

3.21.1 Dependencies

None.

3.21.2 Job COMPLETE

This job simply echoes a message before exiting.

3.21.2.1 Implementation

This job is implemented by a call to the echo command.

3.21.2.2 Rerun Action

None.

3.22 Schedule BRDB_REF_DATA_SLA

This schedule is run daily. It runs the BRDB utility to generate Reference Data SLAs. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX032_BRDB_REF_DATA_SLA is included here.

3.22.1 Dependencies

Schedule BRDB_REF_DATA_SLA depends on the completion of schedule BRDB_SOB.

3.22.2 Job BRDBX032_BRDB_REF_DATA_SLA

This job runs the BRDB utility that generates Reference Data SLAs.

3.22.1.1 Implementation

This job is implemented by a call to the shell script BRDBX032.sh.

3.22.1.2 Rerun Action

Alert Operations on failure.

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3.23 Schedule BRDB_ONCH_AGG

This schedule is run daily. It aggregates the overnight cash on hand (ONCH) figures as well as setting the last good ONCH date for relevant rows in column OPS$BRDB.BRDB_BRANCH_STOCK_UNITS.LAST_GOOD_ONCH_DATE. It performs two tasks, firstly running the aggregation itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX007_ONCH_AGG_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_ONCH_AGG is included here.

3.23.1 Dependencies

Schedule BRDB_ONCH_AGG depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_ONCH_AGG depends on jobs BRDBX007_ONCH_AGG_1…4.

3.23.2 Job BRDBX007_ONCH_AGG_1…4

These jobs (one per node) perform the aggregation of the overnight cash on hand (ONCH) figures.

3.23.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX007.sh specifying the relevant aggregation name OVERNIGHT_CASH_ON_HAND.

3.23.2.2 Rerun Action

As specified in section 03.1, alert Operations if rerun fails.

3.23.3 Job BRDBC008_CHECK_ONCH_AGG

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.23.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant aggregation name OVERNIGHT_CASH_ON_HAND.

3.23.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.24 Schedule BRDB_CSH_TO_LFS

This schedule is run daily. It runs the Cash Declarations to LFS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_CASH_TO_LFS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_CASH_TO_LFS is included here.

3.24.1 Dependencies

Schedule BRDB_CSH_TO_LFS depends on the completion of schedule BRDB_ONCH_AGG.

Job BRDBC008_CHECK_CASH_TO_LFS depends on jobs BRDBX003_CASH_TO_LFS_1…4.

3.24.2 Job BRDBX003_CASH_TO_LFS_1…4

These jobs (one per node) run the feed that copies the Cash Declarations to LFS.

3.24.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_CASH_TO_LFS.

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3.24.2.2 Database Link Information

LFSBRDB@LFS

3.24.2.3 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.24.3 Job BRDBC008_CHECK_CASH_TO_LFS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.24.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_CASH_TO_LFS.

3.24.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.25 Schedule BRDB_FROM_EMDB

This schedule is run daily at 19:30. It runs the Estate Management interface feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX003_BRDATA_FROM_EMDB is included here.

3.25.1 Dependencies

Schedule BRDB_FROM_EMDB depends on the completion of schedules BRDB_SOB and EST_BRDB_UPD.

3.25.2 Job BRDBX003_BRDATA_FROM_EMDB

This job runs the Estate Management interface feed.

3.25.2.1 Implementation

This job is implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_EMDB_INTERFACE.

The SUSPEND_DISTRIBUTION flag is maintained by this BRDBX003 job.

This process references the following EMDB maintained tables:

Table Name	Description
OPS$BRBD.EMDB_POST_OFFICE	Maintained by EMDB, contains information relevant to each individual PO branch (e.g. total number of counters/nodes, CTO_FLAG). OPS$BRDB.RDDS_BRANCH_OPENING_PERIODS is used to update the address information back into OP$BRDB.EMDB_POST_OFFICE
OPS$BRDB.EMDB_MANAGED_NODE	Maintained by EMDB, contains information relevant to each individual counter per branch - most relevantly the IP address associated with the counter.

The process updates the following tables which are referenced by the BAL

Table Name	Description
OPS$BRBD.BRDB_BRANCH_INFO	Uses EMDB_POST_OFFICE to set information such as the cto_flag, suspend distribution flag)
OPS$BRDB.BRANCH_BRANCH_NODE_INFO	Uses EMDB_MANAGED_NODE to set information such as the counter IP address, suspend distribution flag)
OPS$BRDB.BRDB_FAD_HASH_OUTLET_MAPPING	New branches are inserted into this table, uses MOD(branch_code, 128) to

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	resolve the FAD_HASH value.
OPS$BRDB.BRDB_TXN_CORR_TOOL_CTL	New branches are inserted into this table in order to allow SSC correction tools to maintain a running CURRENT_JSN value.
OPS$BRDB.BRDB_BRANCH_STOCK_UNITS	A default (DEF) stock unit is inserted for each new branch created

3.25.2.2 Rerun Action

Alert Operations on failure??

3.26 Schedule BRDB_PAUSE_LFS

This schedule is run daily at 20:00. It stops the two LFS feed processes, to allow the LFS batch jobs to run overnight without activity occurring in the relevant tables. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_PAUSE_LFS_PCOL_COPY

BRDBX011_PAUSE_LFS_PDEL_COPY

3.26.1 Dependencies

Schedule BRDB_PAUSE_LFS depends on the completion of schedule BRDB_SOB.

3.26.2 Job BRDBX011_PAUSE_LFS_PCOL_COPY

This job stops the copying of Pouch Collections to NPS, by setting a system parameter (see section 3.5).

3.26.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_PCOL_TO_LFS_STOP_YN and value “Y”.

3.26.2.2 Rerun Action

Alert Operations on failure.

3.26.3 Job BRDBX011_PAUSE_LFS_PDEL_COPY

This job stops the copying of Pouch Deliveries to NPS, by setting a system parameter (see section 3.5).

3.26.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_PDEL_TO_LFS_STOP_YN and value “Y”.

3.26.3.2 Rerun Action

Alert Operations on failure.

3.27 Schedule BRDB_EPOS_TO_TPS

This schedule is run daily. It runs the EPOSS transactions to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_EPOSS_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_EPOSS_TO_TPS is included here.

3.27.1 Dependencies

Schedule BRDB_EPOS_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_EPOSS_TO_TPS depends on jobs BRDBX003_EPOSS_TO_TPS_1…4.

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3.27.2 Job BRDBX003_EPOSS_TO_TPS_1…4

These jobs (one per node) run the feed that copies the EPOSS transactions to TPS.

3.27.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_EPOSS_TXN_TO_TPS.

3.27.2.2 Database Link Information

TPSBRDB@TPS

3.27.2.3 Rerun Action

As specified in section 03.1, alert Operations if rerun fails.

3.27.3 Job BRDBC008_CHECK_EPOSS_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.27.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_EPOSS_TXN_TO_TPS.

3.27.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.28 Schedule BRDB_APS_TO_TPS

This schedule is run daily. It runs the APS transactions to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_APS_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_APS_TO_TPS is included here.

3.28.1 Dependencies

Schedule BRDB_APS_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_APS_TO_TPS depends on jobs BRDBX003_APS_TO_TPS_1…4.

3.28.2 Job BRDBX003_APS_TO_TPS_1…4

These jobs (one per node) run the feed that copies the APS transactions to TPS.

3.28.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_APS_TXN_TO_TPS.

3.28.2.2 Database Link Information

APSBRDB@APS

3.28.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.28.3 Job BRDBC008_CHECK_APS_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

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3.28.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_APS_TXN_TO_TPS.

3.28.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.29 Schedule BRDB_NWB_TO_TPS

This schedule is run daily. It runs the NWB transactions to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_NWB_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_NWB_TO_TPS is included here.

3.29.1 Dependencies

Schedule BRDB_NWB_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_NWB_TO_TPS depends on jobs BRDBX003_NWB_TO_TPS_1…4.

3.29.2 Job BRDBX003_NWB_TO_TPS_1…4

These jobs (one per node) run the feed that copies the NWB transactions to TPS.

3.29.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_NWB_TXN_TO_TPS.

3.29.2.2 Database Link Information

TPSBRDB@TPS

3.29.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.29.3 Job BRDBC008_CHECK_NWB_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.29.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_NWB_TXN_TO_TPS.

3.29.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.30 Schedule BRDB_DCS_TO_TPS

This schedule is run daily. It runs the DCS transactions to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_DCS_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_DCS_TO_TPS is included here.

3.30.1 Dependencies

Schedule BRDB_DCS_TO_TPS depends on the completion of schedule BRDB_SOB.

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Job BRDBC008_CHECK_DCS_TO_TPS depends on jobs BRDBX003_DCS_TO_TPS_1…4.

3.30.2 Job BRDBX003_DCS_TO_TPS_1…4

These jobs (one per node) run the feed that copies the DCS transactions to TPS.

3.30.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_DCS_TXN_TO_TPS.

3.30.2.2 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.30.3 Job BRDBC008_CHECK_DCS_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.30.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_DCS_TXN_TO_TPS.

3.30.3.2 Database Link Information

TPSBRDB@TPS

3.30.3.3 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.31 Schedule BRDB_BDC_TO_TPS

This schedule is run daily. It runs the BDC transactions to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_BUREAU_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_BUREAU_TO_TPS is included here.

3.31.1 Dependencies

Schedule BRDB_BDC_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_BUREAU_TO_TPS depends on jobs BRDBX003_BUREAU_TO_TPS_1…4.

3.31.2 Job BRDBX003_BUREAU_TO_TPS_1…4

These jobs (one per node) run the feed that copies the BDC transactions to TPS.

3.31.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_BDC_TXN_TO_TPS.

3.31.2.2 Database Link Information

TPSBRDB@TPS

3.31.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

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3.31.3 Job BRDBC008_CHECK_BUREAU_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.31.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_BDC_TXN_TO_TPS.

3.31.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.32 Schedule BRDB_EVT_TO_TPS

This schedule is run daily. It runs the EPOSS events to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_EVENTS_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_EVENTS_TO_TPS is included here.

3.32.1 Dependencies

Schedule BRDB_EVT_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_EVENTS_TO_TPS depends on jobs BRDBX003_EVENTS_TO_TPS_1…4.

3.32.2 Job BRDBX003_EVENTS_TO_TPS_1…4

These jobs (one per node) run the feed that copies the EPOSS events to TPS.

3.32.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_EPOSS_EVNT_TO_TPS.

3.32.2.2 Database Link Information

TPSBRDB@TPS

3.32.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.32.3 Job BRDBC008_CHECK_EVENTS_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.32.1.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_EPOSS_EVNT_TO_TPS.

3.32.1.2 Database Link Information

TPSBRDB@TPS

3.32.1.3 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.33 Schedule BRDB_COFS_TO_TPS

This schedule is run daily. It runs the Cut Off Summaries to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above

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for details. Only the main jobs BRDBX003_COFF_SUMM_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_COFF_SUMM_TO_TPS is included here.

3.33.1 Dependencies

Schedule BRDB_COFS_TO_TPS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_COFF_SUMM_TO_TPS depends on jobs BRDBX003_COFF_SUMM_TO_TPS_1…4.

3.33.2 Job BRDBX003_COFF_SUMM_TO_TPS_1…4

These jobs (one per node) run the feed that copies the Cut Off Summaries to TPS.

3.33.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_CUTOFF_SUMM_TO_TPS.

3.33.2.2 Database Link Information

TPSBRDB@TPS

3.33.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.33.3 Job BRDBC008_CHECK_COFF_SUMM_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.33.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_CUTOFF_SUMM_TO_TPS.

3.33.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.34 Schedule BRDB_TA_FROM_TPS

This schedule is run daily. It runs the Transaction Acknowledgement from TPS interface feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX003_TA_FROM_TPS is included here.

3.34.1 Dependencies

Schedule BRDB_TA_FROM_TPS depends on the completion of schedules BRDB_SOB and TPS_TA.

3.34.2 Job BRDBX003_TA_FROM_TPS

This job runs the Transaction Acknowledgement from TPS interface feed.

3.34.2.1 Database Link Information

TPSBRDB@TPS

3.34.2.2 Implementation

This job is implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TXN_ACKS_FROM_TPS.

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3.34.2.3 Rerun Action

Alert Operations on failure.

3.35 Schedule BRDB_TC_FROM_TPS

This schedule is run daily. It runs the Transaction Corrections from TPS interface feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX003_TC_FROM_TPS is included here.

3.35.1 Dependencies

Schedule BRDB_TC_FROM_TPS depends on the completion of schedules BRDB_SOB and TPS_TC.

3.35.2 Job BRDBX003_TC_FROM_TPS

This job runs the Transaction Corrections from TPS interface feed.

3.35.2.1 Implementation

This job is implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TXN_CORR_FROM_TPS.

3.35.2.2 Rerun Action

Alert Operations on failure.

3.36 Schedule BRDB_TPS_COMPL

This schedule is run daily. It marks the end of the TPS schedule.

3.36.1 Dependencies

Schedule BRDB_TPS_COMPL depends on the completion of schedules BRDB_EPOS_TO_TPS, BRDB_APS_TO_TPS, BRDB_NWB_TO_TPS, BRDB_DCS_TO_TPS, BRDB_BDC_TO_TPS, BRDB_EVT_TO_TPS and BRDB_COFS_TO_TPS.

3.36.2 Job COMPLETE

This job simply echoes a message before exiting.

3.36.2.1 Implementation

This job is implemented by a call to the echo command.

3.36.2.2 Rerun Action

None.

3.37 Schedule BRDB_TPS_TOTALS

This schedule is run daily. It aggregates the outlet transaction totals. It performs two tasks, firstly running the aggregation itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX007_TPS_TXN_TOTALS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_TPS_TXN_TOTALS is included here.

3.37.1 Dependencies

Schedule BRDB_TPS_TOTALS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_TPS_TXN_TOTALS depends on jobs BRDBX007_TPS_TXN_TOTALS_1…4.

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3.37.2 Job BRDBX007_TPS_TXN_TOTALS_1…4

These jobs (one per node) perform the aggregation of the outlet transaction totals.

3.37.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX007.sh specifying the relevant aggregation name BRDB_TPS_TXN_TOTALS.

3.37.2.2 Database Link Information

TPSBRDB@TPS

3.37.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.37.3 Job BRDBC008_CHECK_TPS_TXN_TOTALS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.37.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant aggregation name BRDB_TPS_TXN_TOTALS.

3.37.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.38 Schedule BRDB_TOTL_TO_TPS

This schedule is run daily. It runs the Transactions Totals to TPS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_TXN_TOTALS_TO_TPS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_TXN_TOTALS_TO_TPS is included here.

3.38.1 Dependencies

Schedule BRDB_TOTL_TO_TPS depends on the completion of schedule BRDB_TPS_TOTALS.

Job BRDBC008_CHECK_TXN_TOTALS_TO_TPS depends on jobs BRDBX003_TXN_TOTALS_TO_TPS_1…4.

3.38.2 Job BRDBX003_TXN_TOTALS_TO_TPS_1…4

These jobs (one per node) run the feed that copies the Transactions Totals to TPS.

3.38.2.1 Database Link Information

TPSBRDB@TPS

3.38.2.2 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TXN_TOT_TO_TPS.

3.38.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.38.3 Job BRDBC008_CHECK_TXN_TOTALS_TO_TPS

This job checks for the successful completion of the previous job for all FAD-Hashes.

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3.38.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_TXN_TOT_TO_TPS.

3.38.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.39 Schedule BRDB_APS_TOTALS

This schedule is run daily. It aggregates the APS transaction totals. It performs two tasks, firstly running the aggregation itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX007_APS_TXN_TOTALS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_APS_TXN_TOTALS is included here.

3.39.1 Dependencies

Schedule BRDB_APS_TOTALS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_APS_TXN_TOTALS depends on jobs BRDBX007_APS_TXN_TOTALS_1…4.

3.39.2 Job BRDBX007_APS_TXN_TOTALS_1…4

These jobs (one per node) perform the aggregation of the APS transaction totals.

3.39.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX007.sh specifying the relevant aggregation name BRDB_APS_TXN_TOTALS.

3.39.2.2 Database Link Information

APSBRDB@APS

3.39.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.39.3 Job BRDBC008_CHECK_APS_TXN_TOTALS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.39.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant aggregation name BRDB_APS_TXN_TOTALS.

3.39.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.40 Schedule BRDB_TOTL_TO_APS

This schedule is run daily. It runs the Transactions Totals to APS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_TXN_TOTALS_TO_APS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_TXN_TOTALS_TO_APS is included here.

3.40.1 Dependencies

Schedule BRDB_TOTL_TO_APS depends on the completion of schedule BRDB_APS_TOTALS.

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Job BRDBC008_CHECK_TXN_TOTALS_TO_APS depends on jobs BRDBX003_TXN_TOTALS_TO_APS_1…4.

3.40.2 Job BRDBX003_TXN_TOTALS_TO_APS_1…4

These jobs (one per node) run the feed that copies the Transactions Totals to APS.

3.40.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TXN_TOT_TO_APS.

3.40.2.2 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.40.3 Job BRDBC008_CHECK_TXN_TOTALS_TO_APS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.40.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_TXN_TOT_TO_APS.

3.40.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.41 Schedule BRDB_TXNS_TO_APS

This schedule is run daily. It runs the APS transactions to APS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_TXNS_TO_APS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_TXNS_TO_APS is included here.

3.41.1 Dependencies

Schedule BRDB_TXNS_TO_APS depends on the completion of schedules BRDB_SOB and APS_BULK_HARV.

Job BRDBC008_CHECK_TXNS_TO_APS depends on jobs BRDBX003_TXNS_TO_APS_1…4.

3.41.2 Job BRDBX003_TXNS_TO_APS_1…4

These jobs (one per node) run the feed that copies the APS transactions to TPS.

3.41.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_APS_TXN_TO_APS.

3.41.2.2 Database Link Information

APSBRDB@APS

3.41.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.41.3 Job BRDBC008_CHECK_TXNS_TO_APS

This job checks for the successful completion of the previous job for all FAD-Hashes.

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3.41.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_APS_TXN_TO_APS.

3.41.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.42 Schedule BRDB_APS_COMPL

This schedule is run daily. It marks the end of the APS schedule.

3.42.1 Dependencies

Schedule BRDB_APS_COMPL depends on the completion of schedules BRDB_TXNS_TO_APS and BRDB_TOTL_TO_APS.

3.42.2 Job COMPLETE

This job simply echoes a message before exiting.

3.42.2.1 Implementation

This job is implemented by a call to the echo command.

3.42.2.2 Rerun Action

None.

3.43 Schedule BRDB_NWB_TO_DRS

This schedule is run daily. It runs the NWB transactions to DRS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_NWB_TO_DRS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_NWB_TO_DRS is included here.

3.43.1 Dependencies

Schedule BRDB_NWB_TO_DRS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_NWB_TO_DRS depends on jobs BRDBX003_NWB_TO_DRS_1…4.

3.43.2 Job BRDBX003_NWB_TO_DRS_1…4

These jobs (one per node) run the feed that copies the NWB transactions to DRS.

3.43.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_NWB_TXN_TO_DRS.

3.43.2.2 Database Link Information

DRSBRDB@DRS

3.43.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.43.3 Job BRDBC008_CHECK_NWB_TO_DRS

This job checks for the successful completion of the previous job for all FAD-Hashes.

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3.43.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_NWB_TXN_TO_DRS.

3.43.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.44 Schedule BRDB_DCS_TO_DRS

This schedule is run daily. It runs the DCS transactions to DRS feed. It performs two tasks, firstly running the feed itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX003_DCS_TO_DRS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_DCS_TO_DRS is included here.

3.44.1 Dependencies

Schedule BRDB_DCS_TO_DRS depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_DCS_TO_DRS depends on jobs BRDBX003_DCS_TO_DRS_1…4.

3.44.2 Job BRDBX003_DCS_TO_DRS_1…4

These jobs (one per node) run the feed that copies the DCS transactions to DRS.

3.44.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_DCS_TXN_TO_DRS.

3.44.2.2 Database Link Information

DRSBRDB@DRS

3.44.2.3 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.44.3 Job BRDBC008_CHECK_DCS_TO_DRS

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.44.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant feed name BRDB_DCS_TXN_TO_DRS.

3.44.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.45 Schedule BRDB_DRS_COMPL

This schedule is run daily. It marks the end of the DRS schedule.

3.45.1 Dependencies

Schedule BRDB_DRS_COMPL depends on the completion of schedules BRDB_NWB_TO_DRS and BRDB_DCS_TO_DRS.

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3.45.2 Job COMPLETE

This job simply echoes a message before exiting.

3.45.2.1 Implementation

This job is implemented by a call to the echo command.

3.45.2.2 Rerun Action

None.

3.46 Schedule BRDB_XFR_COMPL

This schedule is run daily. It marks the end of the transfer schedule.

3.46.1 Dependencies

Schedule BRDB_XFR_COMPL depends on the completion of schedules BRDB_TOTL_TO_TPS, BRDB_TXNS_TO_APS and BRDB_DRS_COMPL.

3.46.2 Job COMPLETE

This job simply echoes a message before exiting.

3.46.2.1 Implementation

This job is implemented by a call to the echo command.

3.46.2.2 Rerun Action

None.

3.47 Schedule BRDB_FEED_ERRORS

This schedule is run daily. It runs the process to raise operation exceptions for data feed errors. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX007_RAISE_FEED_DATA_EXCEPTIONS is included here.

3.47.1 Dependencies

Schedule BRDB_FEED_ERRORS depends on the completion of schedule BRDB_XFR_COMPL.

3.47.2 Job BRDBX007_RAISE_FEED_DATA_EXCEPTIONS

This job runs the process to raise operation exceptions for data feed errors.

3.47.1.1 Implementation

This job is implemented by a call to the shell script BRDBX007.sh specifying the relevant process name RAISE_FEED_DATA_EXCEPTIONS.

3.47.1.2 Rerun Action

Alert Operations on failure.

3.48 Schedule BRDB_NCU_TXN_AGG

This schedule is run daily at 1:15. It performs data aggregation for the daily summary. It performs two tasks, firstly running the aggregation itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX007_NON_CUMU_TXN_TOTALS_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active

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node; see section 0 above for details. Only the parent job BRDBC008_CHECK_NON_CUMU_TXN_AGGR is included here.

3.48.1 Dependencies

Job BRDBC008_CHECK_NON_CUMU_TXN_AGGR depends on jobs BRDBX007_NON_CUMU_TXN_TOTALS_1…4.

3.48.2 Job BRDBX007_NON_CUMU_TXN_TOTALS_1…4

These jobs (one per node) perform data aggregation for the daily summary.

3.48.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX007.sh specifying the relevant aggregation name BRDB_NON_CUMU_TXN_AGGR.

3.48.2.2 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.48.3 Job BRDBC008_CHECK_NON_CUMU_TXN_AGGR

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.48.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant aggregation name BRDB_NON_CUMU_TXN_AGGR.

3.48.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.49 Schedule BRDB_CU_TXN_AGG

This schedule is run daily. It performs data aggregation for the daily cumulative summary. It performs two tasks, firstly running the aggregation itself on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBX007_CUMU_TXN_AGGR_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_CUMU_TXN_AGGR is included here.

3.49.1 Dependencies

Schedule BRDB_CU_TXN_AGG depends on the completion of schedule BRDB_NCU_TXN_AGG.

Job BRDBC008_CHECK_CUMU_TXN_AGGR depends on jobs BRDBX007_CUMU_TXN_AGGR_1…4.

3.49.2 Job BRDBX007_CUMU_TXN_AGGR_1…4

These jobs (one per node) perform data aggregation for the cumulative daily summary.

3.49.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX007.sh specifying the relevant aggregation name BRDB_CUMU_TXN_AGGR.

3.49.2.2 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

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3.49.3 Job BRDBC008_CHECK_CUMU_TXN_AGGR

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.49.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant aggregation name BRDB_CUMU_TXN_AGGR.

3.49.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.50 Schedule BRDB_BBNI_MAINT

This schedule is run daily. It runs the BRDB utility to reset sequence numbers. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX031_JSN_USN_SSN is included here.

3.50.1 Dependencies

Schedule BRDB_BBNI_MAINT depends on the completion of schedule BRDB_CU_TXN_AGG.

3.50.2 Job BRDBX031_JSN_USN_SSN

This job runs the BRDB utility that resets the sequence numbers.

3.50.2.1 Implementation

This job is implemented by a call to the shell script BRDBX031.sh.

3.50.2.2 Rerun Action

*** Prompts for rerun – action? **

3.51 Schedule BRDB_SUMMARY_DTE

This schedule is run daily. It sets the last daily summary date. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX011_SET_DAILY_SUMMARY_DATE is included here.

3.51.1 Dependencies

Schedule BRDB_SUMMARY_DTE depends on the completion of schedule BRDB_BBNI_MAINT.

3.51.2 Job BRDBX011_SET_DAILY_SUMMARY_DATE

This job sets the last daily summary date, a system parameter.

3.51.1.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_LAST_DAILY_SUMMARY_DATE and relevant date value.

3.51.1.2 Rerun Action

Alert Operations on failure.

3.52 Schedule BRDB_GEN_REP

This schedule is run daily. It generates the reconciliation reports. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

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GENERIC_CREATE_REPORT_VIEWS

GENERIC_CREATE_RECON_REPORTS

3.52.1 Dependencies

Schedule BRDB_GEN_REP depends on the completion of schedule BRDB_REF_DATA_SLA.

Job GENERIC_CREATE_RECON_REPORTS depends on job GENERIC_CREATE_REPORT_VIEWS.

3.52.2 Job GENERIC_CREATE_REPORT_VIEWS

This job creates the generic views for reconciliation reporting.

3.52.2.1 Implementation

This job is implemented by a call to the shell script GREPX001.sh.

3.52.2.2 Rerun Action

*** Prompts for rerun – action? **

3.52.3 Job GENERIC_CREATE_RECON_REPORTS

This job creates the generic reconciliation reports.

3.52.3.1 Implementation

This job is implemented by a call to the shell script GREPX002.sh.

Outputs files to the following directories below.

Usage	BRDBBLV1 Environment Variable
Working directory	BRDB_MSU_WORKING
BRDB reports directory	BRDB_MSU_OUTPUT

Files in the working directory are immediately cleaned up on successful completion while files within the reports directory are removed after 9 days.

3.52.3.2 Rerun Action

*** Prompts for rerun – action? **

3.53 Schedule BRDB_TO_DWH

This schedule is run daily. It performs the file transfer for the BRDB Branch Migration Status data feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX020_BRDB_XFER_TO_DWH is included here.

3.53.1 Dependencies

Schedule BRDB_TO_DWH depends on the completion of schedule BRDB_GEN_REP.

3.53.2 Job BRDBX020_BRDB_XFER_TO_DWH

This job performs the file transfers for the BRDB Branch Migration Status and Reference data feeds.

3.53.2.1 Implementation

This job is implemented by a call to the shell script BRDBX020.sh.

Outputs files to the following directories below.

Usage	BRDBBLV1 Environment Variable

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BRDB reports directory	REPOSITORY

3.53.2.2 Rerun Action

Alert Operations on failure. This job may be re-runable, depending on the error (see failures below for deciding if re-runable or not).

3.53.2.2.1 Failures

"Source file <n> <filename> does not exist"

Ensure Job GENERIC_CREATE_RECON_REPORTS completed successfully and if all expected reports are present in ${BRDB_MSU_OUTPUT}

Expected reports are:

- DW_Branch_Migration_Extract.csv
- DW_Reference_Data_SLA.csv

Once the cause of the 'missing' reports is resolved, ensure the following files are removed (if present)

- ${REPOSITORY}/brdb/YYMMDD/YYMMDD00.bac
- ${REPOSITORY}/brdb/YYMMDD/YYMMDD00.bms

BRDBX020_BRDB_XFER_TO_DWH may then be rerun.

"Destination file <n> <filename> already exists"

The above error suggests that the script has already been run successfully. Alert Operations as this will require more investigation into why the script has failed.

3.54 Schedule BRDB_AGG_COMPL

This schedule is run daily. It marks the end of the aggregation schedule.

3.54.1 Dependencies

Schedule BRDB_AGG_COMPL depends on the completion of schedules BRDB_SUMMARY_DTE and BRDB_TO_DWH.

3.54.2 Job COMPLETE

This job simply echoes a message before exiting.

3.54.2.1 Implementation

This job is implemented by a call to the echo command.

3.54.2.2 Rerun Action

None.

3.55 Schedule BRDB_FROM_RDDS

This schedule is run daily at 00:10. It runs the Host Reference Data from RDDS data feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX003_REFDATA_FROM_RDDS is included here.

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3.55.1 Dependencies

Schedule BRDB_FROM_RDDS depends on the completion of schedules BRDB_SOB and RDDS_COPY_SCHED.

3.55.2 Job BRDBX003_REFDATA_FROM_RDDS

This job runs the Host Reference Data from RDDS data feed.

3.55.2.1 Implementation

This job is implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_HOST_REF_FROM_RDDS.

3.55.2.2 Database Link Information

RDDSBRDB@RDDS

3.55.2.3 Rerun Action

*** Prompts for rerun – action? **

3.56 Schedule BRDB_FROM_TPS

This schedule is run daily at 00:10. It runs the Outlets/Transaction Modes data from TPS data feed. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBX003_REFDATA_FROM_TPS is included here.

3.56.1 Dependencies

Schedule BRDB_FROM_TPS depends on the completion of schedules BRDB_SOB and TPSEOD.TPSC207.

3.56.2 Job BRDBX003_REFDATA_FROM_TPS

This job runs the Outlets/Transaction Modes data from TPS data feed.

3.56.2.1 Implementation

This job is implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_REF_COPY_FROM_TPS.

3.56.2.2 Database Link Information

TPSBRDB@TPS

3.56.2.3 Rerun Action

*** Prompts for rerun – action? **

3.57 Schedule BRDB_AUD_FEED

This schedule is run daily at 01:05. It performs journal auditing. It performs three tasks, firstly running the message journal auditing on all active nodes, with automatic waiting and rerunning; see section 3.1 above for details. Only the main jobs BRDBC002_AUDIT_1…4 are included here. The second task checks for completion of the previous task, and can be run on any active node; see section 0 above for details. Only the parent job BRDBC008_CHECK_AUDIT_FEED is included here. The third task performs Transaction Correction journal auditing, and can be run on any active node; again see section 0 above for details. Only the parent job BRDBC033_AUDIT is included here.

Additional monitoring is required so that an alert is raised if this job has not completed by 04:00. This is implemented within the BRDB_MONITOR schedule – see section 3.69.

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3.57.1 Dependencies

Schedule BRDB_AUD_FEED depends on the completion of schedule BRDB_SOB.

Job BRDBC008_CHECK_AUDIT_FEED depends on jobs BRDBC002_AUDIT_1…4.

Job BRDBC033_AUDIT depends on job BRDBC008_CHECK_AUDIT_FEED.

3.57.2 Job BRDBC002_AUDIT_1…4

These jobs (one per node) generate text files for the input day's auditable messages.

3.57.2.1 Implementation

These jobs are implemented by a call to the executable BRDBC002.

Outputs files to the following directories below.

Usage	BRDBBLV1 Environment Variable
Working directory	BRDB_AUDIT_FILE_TEMP
BRDB reports directory	BRDB_COUNTER_AUDIT_OUTPUT

3.57.2.2 Rerun Action

As specified in section 3.1, alert Operations if rerun fails.

3.57.3 Job BRDBC008_CHECK_AUDIT_FEED

This job checks for the successful completion of the previous job for all FAD-Hashes.

3.57.3.1 Implementation

This job is implemented by a call to the executable BRDBC008 specifying the relevant process name BRDBC002.

3.57.3.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.57.4 Job BRDBC033_AUDIT

This job generates text files for the input day's auditable transaction correction messages.

3.57.1.1 Implementation

This job is implemented by a call to the executable BRDBC033.

Outputs files to the following directories below.

Usage	BRDBBLV1 Environment Variable
Working directory	BRDB_TCT_FILE_TEMP
BRDB reports directory	BRDB_TCT_AUDIT_OUTPUT

3.57.1.2 Rerun Action

As specified in section 0, alert Operations if rerun fails.

3.58 Schedule BRDB_ORA_STATS

This schedule, which runs daily, gathers statistics on date range partitioned tables every Monday (excluding English bank holidays) and daily for all other tables. It consists of a single task which can be

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run on any active node; see section 0 above for details. Only the parent job BRDBX005_SCHEMA is included here.

3.58.1 Dependencies

Schedule BRDB_ORA_STATS depends on the completion of schedules BRDB_AUD_FEED, BRDB_AGG_COMPL and BRDB_XFR_COMPL.

3.58.2 Job BRDBX005_SCHEMA

This job gathers the Oracle optimiser statistics.

3.58.2.1 Implementation

This job is implemented by a call to the shell script BRDBX005.sh. The input parameters [-i & -s] are present for backward compatibility only.

Statistics for tables as per those in table BRDB_ANALYZED_OBJECTS are normally gathered on a Monday (controlled by system parameter BRDBX005_GATHER_WEEK_DAY), those statistics are then copied into future partitions every night (until the following Monday).

Statistics for tables not present in BRDB_ANALYZED_OBJECTS are gathered every night.

3.58.2.1.1 Associated BRDB System Parameters

Parameter Name	Parameter Value	Description
DEBUG_LEVEL_FOR_BRDBX005	3 [from parameter_number]	Controls detail of stdlist output
BRDBX005_ADJUST_HIGH_LOW_FLAG	Y [from parameter_text]	Controls method of copy table stats
BRDBX005_GATHER_WEEK_DAY	MON [from parameter_text]	Day to gather stats on partitioned tables
BRDBX005_EXPORT_STATS	N [from parameter_text]	Controls whether stats are copied to BRDB_OBJECT_STATS_ARC

3.58.2.2 Rerun Action

The statistics gathering job is able to resume from where it last failed so it is feasible to rerun the job (if the failure was, for example, due to a full tablespace then that would need resolving first).

3.59 Schedule BRDB_ADMIN

This schedule is run daily. It performs administration of the BRDB database. It includes two tasks which can be run on any active node; see section 0 above for details. Only the parent jobs BRDBC004 and BRDBX006 are included here. It also includes two tasks which are run on each active node by jobs named BRDB_HKP_ORAFILES1 and BRDB_HKP_ORAFILES2.

3.59.1 Dependencies

Schedule BRDB_ADMIN depends on the completion of schedules BRDB_AUD_FEED, BRDB_AGG_COMPL and BRDB_XFR_COMPL.

3.59.2 Job BRDBC004

This job runs the Audit, Archive and Purge process.

3.59.2.1 Implementation

This job is implemented by a call to the executable BRDBC004.

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3.59.2.2 Rerun Action

*** Prompts for rerun – action? **

3.59.3 Job BRDBX006

This job runs the BRDB File Housekeeping process.

3.59.3.1 Implementation

This job is implemented by a call to the shell script BRDBX006.sh.

3.59.3.2 Rerun Action

*** Prompts for rerun – action? **

3.59.4 Job BRDB_HKP_ORAFILES1

This job (run on each node) runs the Oracle File Housekeeping process for the BRDB.

3.59.4.1 Implementation

This job is implemented by a call to the shell script HouseKeepOrafiles.sh with the database name BRDB.

3.59.4.2 Rerun Action

*** Prompts for rerun – action? **

3.59.5 Job BRDB_HKP_ORAFILES2

This job (run on each node) runs the Oracle File Housekeeping process for ASM.

3.59.5.1 Implementation

This job is implemented by a call to the shell script HouseKeepOrafiles.sh with the database name "+ASM".

3.59.5.2 Rerun Action

*** Prompts for rerun – action? **

3.60 Schedule BRDB_PAUSE_FEED2

This schedule is run daily. It stops the two NPS copy processes prior to end of day processing. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_PAUSE_NPS_TT_COPY

BRDBX011_PAUSE_NPS_GREV_COPY

3.60.1 Dependencies

Schedule BRDB_PAUSE_FEED2 depends on the completion of schedules BRDB_ADMIN and BRDB_CSH_TO_LFS.

3.60.2 Job BRDBX011_PAUSE_NPS_TT_COPY

This job stops the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

3.60.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value "Y".

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3.60.2.2 Rerun Action

Alert Operations on failure.

3.60.3 Job BRDBX011_PAUSE_NPS_GREV_COPY

This job stops the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.60.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “Y”.

3.60.3.2 Rerun Action

Alert Operations on failure.

3.61 Schedule BRDB_EOD

This schedule is run daily. It runs the BRDB end of day utility. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDBC009 is included here.

Additional monitoring is required so that an alert is raised if this job has not completed by 04:00. This is implemented within the BRDB_MONITOR schedule – see section 3.69.

3.61.1 Dependencies

Schedule BRDB_EOD depends on the completion of schedule BRDB_PAUSE_FEED2.

3.61.2 Job BRDBC009

This job runs the BRDB end of day utility; resets BRDB_OPERATIONAL_INSTANCES.IS_AVAILABLE to 'Y' if the instance was previously down but is now available.

3.61.2.1 Implementation

This job is implemented by a call to the executable BRDBC009.

3.61.2.2 Rerun Action

*** Prompts for rerun – action? **

3.62 Schedule BRDB_START_FEED2

This schedule is run daily. It prepares for the running of the two NPS copy processes by reversing the changes that stopped them earlier in the schedule. It consists of two tasks which can be run on any active node; see section 0 above for details. Only the two parent jobs are included here, which are:

BRDBX011_START_NPS_TT_COPY

BRDBX011_START_NPS_GREV_COPY

3.62.1 Dependencies

Schedule BRDB_START_FEED2 depends on the completion of schedule BRDB_EOD.

3.62.2 Job BRDBX011_START_NPS_TT_COPY

This job prepares for the starting of the copying of Track and Trace transactions to NPS, by setting a system parameter (see section 3.5).

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3.62.2.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_TT_TXN_TO_NPS_STOP_YN and value “N”.

3.62.2.2 Rerun Action

Alert Operations on failure.

3.62.3 Job BRDBX011_START_NPS_GREV_COPY

This job prepares for the starting of the copying of Reversals transactions to NPS, by setting a system parameter (see section 3.5).

3.62.3.1 Implementation

This job is implemented by a call to the shell script BRDBX011.sh specifying the relevant system parameter name BRDB_REV_TXN_TO_NPS_STOP_YN and value “N”.

3.62.3.2 Rerun Action

Alert Operations on failure.

3.63 Schedule BRDB_TT_TO_NPS2

This schedule is run daily to restart the Track and Trace NPS data feed after end of day processing. It consists of a single task which is run on each active node by jobs named BRDBX003_TT_TO_NPS_1…4_NOPAGE.

3.63.1 Dependencies

Schedule BRDB_TT_TO_NPS2 depends on the completion of schedule BRDB_START_FEED2.

3.63.2 Job BRDBX003_TT_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Track and Trace transactions to NPS.

3.63.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_TT_TXN_TO_NPS.

3.63.2.2 Database Link Information

NBX_TT_HARVESTER_1@NPS2

3.63.2.3 Rerun Action

Rerun on failure.

3.64 Schedule BRDB_GREV_NPS2

This schedule is run daily to restart the Reversals NPS data feed after end of day processing. It consists of a single task which is run on each active node by jobs named BRDBX003_GREV_TO_NPS_1…4_NOPAGE.

3.64.1 Dependencies

Schedule BRDB_GREV_NPS2 depends on the completion of schedule BRDB_START_FEED2.

3.64.2 Job BRDBX003_GREV_TO_NPS_1…4_NOPAGE

These jobs (one per node) start the feed that copies the Reversals transactions to NPS.

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3.64.2.1 Implementation

These jobs are implemented by a call to the shell script BRDBX003.sh specifying the relevant feed name BRDB_REV_TXN_TO_NPS.

3.64.2.2 Database Link Information

NBX_GREV_AGENT_1@NPS1

3.64.2.3 Rerun Action

Rerun on failure.

3.65 Schedule BRDB_START_BKP

This schedule is run daily. It marks the start of the backup schedule.

3.65.1 Dependencies

Schedule BRDB_START_BKP depends on the completion of schedule BRDB_EOD.

3.65.2 Job COMPLETE

This job simply echoes a message before exiting.

3.65.2.1 Implementation

This job is implemented by a call to the echo command.

3.65.2.2 Rerun Action

None.

3.66 Schedule BRDB_BACKUP_0

This schedule is run on Sundays and Wednesdays. It performs the level 0 backup. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDB_LVL0_BACKUP is included here.

3.66.1 Dependencies

Schedule BRDB_BACKUP_0 depends on the completion of schedule BRDB_START_BKP.

3.66.2 Job BRDB_LVL0_BACKUP

This job performs the file transfer for the BRDB Branch Migration Status data feed.

3.66.2.1 Implementation

This job is implemented by a call to the shell script RMANBackup.sh with database name BRDB and level value 0.

3.66.2.2 Rerun Action

*** Prompts for rerun – action? **

3.67 Schedule BRDB_BACKUP_1

This schedule is run on every day **except** Sundays and Wednesdays. It performs the level 1 backup. It consists of a single task which can be run on any active node; see section 0 above for details. Only the parent job BRDB_LVL1_BACKUP is included here.

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3.67.1 Dependencies

Schedule BRDB_BACKUP_1 depends on the completion of schedule BRDB_START_BKP.

3.67.2 Job BRDB_LVL1_BACKUP

Kicks off an RMAN level 1 backup.

3.67.2.1 Implementation

This job is implemented by a call to the shell script RMANBackup.sh with database name BRDB and level value 1.

3.67.2.2 Rerun Action

*** Prompts for rerun – action? **

3.68 Schedule BRDB_BKP_COMPL

This schedule is run daily. It checks that the backup schedule has completed and creates a flag file via the job CREATE_BRDB_BKUP_COMPLETE_FLAG.

3.68.1 Dependencies

Schedule BRDB_BKP_COMPLETE depends on the completion of whichever of schedule BRDB_BACKUP_0 or BRDB_BACKUP_1 that applies on the appropriate day.

3.68.2 Job CREATE_BRDB_COMPLETE_FLAG

This job creates the flag file /opt/tws/FLAGS/BRDB_BKUP_complete.FLAG.

3.68.2.1 Implementation

This job is implemented by a call to the “touch” command with the relevant file name.

3.68.2.2 Rerun Action

*** Prompts for rerun – action? **

3.69 Schedule BRDB_MONITOR

This schedule is run daily. It checks that other jobs have completed by a specified time. (See section 3.4.)

3.69.1 Dependencies

None

3.69.2 Job BRDB_MON_STARTUP

This checks that the BRDB_STARTUP job has completed by the required time of 06:00.

3.69.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and time.

3.69.2.2 Rerun Action

None.

3.69.3 Job BRDB_MON_PAUSE_FEED1

This checks that the BRDB_PAUSE_FEED1 job has completed by the required time of 07:59.

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3.69.3.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and time.

3.69.3.2 Rerun Action

None.

3.69.4 Job BRDB_MON_AUD_FEED

This checks that the BRDB_AUD_FEED job has completed by the required time of 04:00 ***(or 03:00??)**.

3.69.4.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and time.

3.69.4.2 Rerun Action

None.

3.69.5 Job BRDB_MON_EOD

This checks that the BRDB_EOD job has completed by the required time of 04:00.

3.69.5.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and time.

3.69.5.2 Rerun Action

None.

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4 Backup and Recovery

The Branch Database and Branch Support Database are both backed up using Oracle RMAN. The frequency of the backups, the type of backup, the backup location and retention periods are detailed in the Branch Database High Level Design (See Section 0.4).

4.1 BRDB & BRSS Backups

4.1.1 Backup Duration

The Oracle RMAN backups, when run, tend to do so for different durations. The factors that will affect run-time could be: -

- Activity on the node executing the backup, e.g. CPU, disk, etc.
- The type of backup being run, e.g. a full backup (incremental level 0) or an incremental level 1 backup.
- The amount of archivelogs generated since the last backup (relevant to any backup level).

It is therefore important that when backups are not run for whatever reason, that they are re-scheduled to run as soon as possible.

4.1.1.1 RMAN & Streams

RMAN, by default, is configured to remove any archivelogs after a successful backup. Streams has a direct impact on whether or not RMAN is able to remove an archivelog or not. This criterion is determined by whether the archivelog is or is not needed by the Streams Capture process.

If Streams does require the archivelog, RMAN is not “allowed” to remove it and the archivelog will remain in +BRDB_FLASH/arch. An RMAN-08137 message will be reported when this is the case. It is a warning message and not a failure.

Any subsequent backups will skip each archivelog as each one already has a successful copy in a previous backup. When attempting to drop the archivelog again, the same check is made and if Streams no longer need the archivelog, it will be released for deletion by RMAN.

4.2 Restoring files with RMAN

DBAs in Ireland have standard support procedures for dealing with restores and recovery after differing failures, e.g. restoring SPFiles, controlfiles, archivelogs, datafiles, et cetera. These scripts and procedures will be used by the DBA Support Team in a recovery scenario in conjunction with this guide and support from technical leads and possibly vendor specialists, e.g. EMC, Oracle, et cetera.

WARNING: As with any activity relating to the physical dimension of restoring activities, keeping the high importance of these types of activities at the back of one’s mind is of paramount importance! Restoring datafiles or redologs using RMAN, for instance, could cause the crash of the entire Branch Database if performed in a non-disaster scenario and without the proper authorisation!

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4.3 Failure and Recovery

Failures should be detected by SMC and then escalated to the UNIX/DBA teams who, in turn where appropriate, will escalate to CS, SSC and development.

Recovery actions will be performed by the UNIX/DBA teams with the agreement of CS, SSC and development.

Business escalation should be handled by SMC.

4.3.1 Escalation and Notification

NB: In the event of a failure and subsequent recovery, the relevant Post Office Disaster Recovery escalation procedures need to be followed in conjunction with the relevant Business Continuity personnel and Fujitsu Support Teams.

The Business Continuity function along with the relevant management team(s) will have to consider the facts, weigh up the current threats and decide whether to authorise the failover to Standby or not.

In general, the hierarchy in which support teams are contacted is as follows: -

- SMC will typically coordinate all types of failures and will also be the first point of contact in most types of problems, application, networks, etc.; Responsible for monitoring Tivoli.
- SSC is responsible for supporting the application. DBA, UNIX and Network Support Teams are also responsible for support at this level
- Finally, the development teams would support all other teams in their respective areas of expertise.

4.3.2 Media Failure and Recovery

4.3.2.1 A Corrupt or Damaged Redolog Group

If an online redolog group has all of it's members damaged - regardless of how this came to be - the recovery solution will change depending on the 'state' of the online redolog group.

4.3.2.1.1 Scenario and Recovery Solution

Scenario: This failure scenario involves having all redologs of a particular redo log group, corrupted or damaged.

Solution: *Redolog Group is INACTIVE*

This redolog group will ***not*** be required for crash recovery. Clear the logfile group.

<To be expounded upon in the next version>

Redolog Group is ACTIVE

This redolog group ***is*** required for crash recovery. (i.) Issue a checkpoint and (ii.) clear the damaged redolog(s). If performing (i.) and (ii.) are unsuccessful, then the database must be restored and recovered (incomplete recovery) to a point-in-time before the redolog(s) were damaged (the most recent *available* group).

<To be expounded upon in the next version>

Redolog Group is CURRENT

This redolog group ***is*** required for crash recovery. Clear the damaged redolog(s) (do not attempt a checkpoint). If performing (i.) is unsuccessful, then the database must be

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restored and recovered (incomplete recovery) to a point-in-time before the redolog(s) were damaged (the most recent *available* group).

<To be expounded upon in the next version>

Note:

- It is important to note here that depending on our SLA with the customer (in terms of time-to-recovery), it may be more advantageous to either complete the restore and recovery or if the corruption is localised, i.e. only present on the hardware of the current site, (e.g. IRE11) then failing over the Data Centre (e.g. IRE19) may be a faster and the less troublesome route to take.
- The Database failover from PRIMARY to STANDBY is not recommended in this scenario.

4.3.3 Instance/Node Failure and Recovery

4.3.3.1 Working Assumptions

The guidance in the following sections assumes that every effort to resolve a failure – be that failure due to software, hardware, network or failures of greater magnitude – has been taken. For hardware failures this can include checking Oracle CRS logs or Linux system logs and in the case of database instance failures, alert_BRDB[1|2|3|4].log, trace files, application and process log files, CRS logs, dump files and Grid Control alert messages. This is by no means an exhaustive list.

The recovery of an Oracle Database instance is essentially automatic as Oracle provides internal mechanisms which perform instance recovery on startup.

The recovery of a pBlade within the BRDB BladeFrame is similarly automatic, in that the BladeFrame will attempt to bring the failed pBlade back online.

There is a ***very notable caveat*** to this if all 4 nodes go down, and that is that OCFS2 must be checked and verified as started (on each node). If not, the clusters will not be able to correctly communicate with each other and it has been noted (during periods of testing) that cluster timeouts can occur in this scenario and cause further cluster failures. Verifying the status of OCFS2 is critical.

To check that OCFS2 is started and has the correct configuration information, perform the following check on all affected nodes as the ***root*** user (the output should show "configured" matching "active"): -

```
$> /etc/init.d/ocfs2 status
Configured OCFS2 mountpoints:  /u02/oradata /u03/oradata /u04/oradata
Active OCFS2 mountpoints:  /u02/oradata /u03/oradata /u04/oradata
```

Oracle Cluster Ready Services (CRS), in normal operation will automatically restart any database instance on a node that is being restarted (for whatever reason). This will always include the grid control agent(s), the Oracle listener and the local ASM instance. However, the starting of the database instance – which is dependant on the ASM instance having started – will be ***disabled*** for all Branch Database Cluster Ready Services. That is, upon restart, all components required by the database instance will be restarted except for the instance itself.

What is important to note, is that within BRDB, database instances are as much a logical part of the application DNA as they are literal entities of an Oracle RAC database. Therefore when an instance or node fails, its recovery will always represent a two-fold process, logically within the application and the actual node/instance itself.

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4.3.3.2 Single BRDB Instance Crash

The instance will automatically be removed from **BRDB_OPERATIONAL_INSTANCES** by BRDBX010 which is invoked by the Fast Application Notification (FAN) mechanism at the time of the instance failure. Note that BRDBX010 is only executed by the FAN event and not by any other means.

The failed instance will need to be started manually via Grid Control or SQL*Plus. Starting the instance is an activity that needs to be thought through. The reason for this is that once the failed instance has been started manually, the cluster will once again show the full complement of instances and the listener can begin accepting connections for that instance. However the 'logical' view represented in **BRDB_OPERATIONAL_INSTANCES** will show that the instance in question is *not* available for requests from the Branch Access Layer (BAL). At this point, therefore, the physical database instance has been started, but the application will not be aware of that fact. This is done by stopping and starting, in a sequential manner, each Online Service Router (OSR) in turn (of which there are 20).

Please note: The instructions that follow, detail the updating of **BRDB_OPERATIONAL_INSTANCES** using BRDBX013 or by a manual update. It is particularly important to note that this should be done *prior* to "making the application aware", i.e. stopping and starting each OSR to reflect the change.

At the end of the online-day (after 18:00 and preferably before the overnight schedules start, but not essential), ***the recommended approach*** is to make the instances logically available, manually. This is done by either executing BRDBX013 (BRDBX013 will check the state of each instance, whether up or down, and update **BRDB_OPERATIONAL_INSTANCES** accordingly) *or* by following the instructions in the table (Table 2) below. This is especially relevant if one wants granular control of what is represented in that table, as BRDBX013 will update all rows if necessary in order to ensure that the table represents the *actual* state of the cluster and this may not be required in every case.

BRDBX013 is executed as follows: -

```
$> cd /app_sw/brdb/sh
$> BRDBX013.sh
```

Finally, at the end of the Business day, the "End Of Day" process, namely BRDBC009, will check that all available instances are logically and correctly represented in **BRDB_OPERATIONAL_INSTANCES** and if not, will update the table to reflect the correct real-world representation. Having BRDBC009 perform this task is not necessarily the best course of action as the BAL needs to be made aware that the instance mapping has changed (this is done as detailed above). Therefore, BRDBC009 should be seen as a backup action rather than the preferred.

If, for whatever reason, the failed instance, once started and open, needs to be made available to the BAL and before the end of the day, then the following must be followed. Using meaningful and accurate values for the following values, e.g.: -

<FAN Event String>: **Manual recovery by Andrew Aylward for fast recovery of instance due to unexpected node failure. Authorisation given by Graham Allen.**

<Host Name>: **lltpbdb001** (obtain by typing **hostname** or **uname -n** on the relevant node).

Step	Description	Server Execution
Assumptions	i. User is logged onto any node of the BRDB cluster as the ***brdb*** user. ii. It is ***imperative*** that there are no schedule related processes running when this manual operation is performed. There are many schedule related jobs which are fad-hash/branch code dependant and if these mappings are changed mid-schedule, significant problems could occur!	
1.		

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	Logon to SQL*Plus command-line interface as OPS$BRDB, but first set the correct Oracle SID.
	
	This will connect you to the BRDB database.
	
	Double-check that you are on the right instance, noting in particular the values for *instance_name, host_name and status*.
		`$> . oraenv`
		
		[now type in BRDB1 (assuming you're on node 1)]
		
		`$> sqlplus /`
		
		`SQL> SELECT * FROM v$instance;`

2.	Execute this DML to re-instate the availability of the instance in question.
	
	Commit your change
		`UPDATE brdb_operational_instances`
		`SET is available = 'Y',`
		`fan event = SUBSTR('<FAN Event String>', 1, 1000),`
		`update_timestamp = SYSTIMESTAMP`
		`WHERE UPPER(host name) = UPPER(SUBSTR('<Host Name>', -7));`
		
		`COMMIT;`

Table 2: BRDB_OPERATIONAL_INSTANCES Update Instructions

4.3.3.3 Single BRDB Node Crash and Restart

Failure notification will occur via the ITM Tivoli agent and will also be visible via Grid Control in terms of instance availability notification. FAN will update logical instance availability upon failure.

PAN Manager (BladeFrame operational software) will attempt to automatically restart the failed pServer. Once the pServer is initialised, the node has started, and with it the listener and ASM. The instance must be manually started.

See section 0.1.1.1 for more on re-instating logical instance availability.

4.3.3.4 Single BRDB Instance Crash - Fails to Start

See section 4.3.3.8.

4.3.3.5 Single BRDB Node Crash - Fails to Restart

Failure notification will occur via the ITM Tivoli agent and will also be visible via Grid Control in terms of instance availability notification. FAN will update logical instance unavailability upon failure.

If the BladeFrame cannot automatically restart the failed pServer, the PAN manager will flag an error. An attempt will be made at restarting the pServer on the spare pBlade. If unsuccessful, Support will then need to follow it up and resolve accordingly. Either solving the problem or replacing the pBlade and attempting another restart.

The BAL will not have "use" of the now unavailable instance until such time as the node's failure has been resolved and the instance is made available on the new/repaired node, by Support. As well as the instance being logically made available by either the EOD process (BRDBC009) or through manual intervention (described in section 0.1.1.1). BRDBC009 will continue to report in BRDB_OPERATIONAL_EXCEPTIONS, that the instance is unavailable.

4.3.3.6 Two or More BRDB Instances Crash

As mentioned in section 0.1.1.1, the BAL will not have "use" of the now unavailable instances until such time as each instance is available and either the EOD process (BRDBC009) has run or through manual intervention.

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Each failed instance will need to be started manually via Grid Control or SQL*Plus.

If the instances restart successfully, then Support must make the instances "logically" available by the manual process specified in section 0.1.1.1, for ***each instance***.

Depending on the consensus of Support personnel, making "logically" available the newly started instances can be done at this point. The reason for either making the instances available or not is simply to do with the load on the remaining nodes and whether it is perceived that they are able to cope.

If, however, the instances are unable to restart or do restart but have further problems presenting themselves, e.g. they aren't accepting requests, there are network issues, loss of ASM diskgroups, et cetera, then the instances should be treated as ***non-restartable*** and the relevant escalation process should be followed (see Section 4.3.1).

4.3.3.7 Two or More BRDB Nodes Crash and Restart

Failure notification will occur via the ITM Tivoli agent and will also be visible via Grid Control in terms of instance availability notification. FAN will update logical instance unavailability upon failure.

The BladeFrame will attempt to automatically restart the failed pServers (on related pBlades) as defined by the LPAN configuration. Once the blades are initialised and the nodes have restarted, normal behaviour would dictate that the related database instances are started again automatically. As with the scenario presented in section 4.3.3.3, the instances must be manually started and then made available to the BAL as the cluster will not bring them up automatically.

Depending on the consensus of Support personnel, making "logically" available the newly started instances can be done at this point. The reason for either making the instances available or not is simply to do with the load on the remaining nodes and whether it is perceived that they are able to cope.

See section 0.1.1.1 for more on re-instating logical instance availability. This applies for every instance.

4.3.3.8 Two or More BRDB Instances Crash – Fail to Restart

It must be assumed that every effort has been employed in restarting the instance(s) within the agreed SLA. If this two-or-more-instance-failure persists, then the following logic in determining an outcome should apply.

Has the problem occurred *outside core* business hours?

If ***yes***, and there are at least two RAC instance(s) in full operation, then there may be sufficient throughput available for the effective servicing of reduced business traffic. In such cases, it is often more beneficial to continue to use BRDB (the primary database), rather than initiate the failover procedure (see Section 0) which details the failing over of all users to SBRDB (the standby database) as this involves a coordinated, multi-team effort (for escalation see Section 4.3.1). In addition it will also allow more time for the resolution of the main reason for failure, be it software or hardware related.

If ***no*** or there are more than two instance failures, then the very real possibility that severe degradation in transaction throughput will present itself. At this point then the instances should be treated as ***non-restartable*** and the relevant escalation process should be followed (see Section 4.3.1).

4.3.3.9 Two or More BRDB Nodes Crash – Fail to Restart

Similar in resolution to section 4.3.3.8

It must be assumed that every effort has been employed in restarting the failed pBlades and have them correctly integrated into the cluster within the agreed SLA. If this two-or-more-node-failure persists, then the following logic in determining an outcome should apply.

Has the problem occurred *outside core* business hours?

If ***yes***, and there are at least two nodes of the RAC cluster still in full operation, then there may be sufficient throughput available for the reduced business traffic. In such cases, it is often more beneficial to continue to use the BRDB (primary database) cluster, rather than initiate the failover procedure (See Appendix A) which details the failing over of all users to the SBRDB (standby database) cluster as this

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involves a coordinated, multi-team effort. In addition it will also allow the resolution of the main reason for failure, be it hardware related or not.

If ***no*** or there is only a single node available, then the very real possibility that severe degradation in transaction throughput will present itself. The Business Continuity function along with the relevant management team will have to consider the facts, weigh up the current threats and decide whether to authorise the failover to the Standby cluster or not.

See section 4.3.1 for the service team/support team contact and escalation hierarchy.

Complete failover could be manually initiated and if so will need to follow the steps outlined in Section 6.

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5 General and Troubleshooting Notes

5.1 Database

5.1.1 Oracle Database Listeners

The database listeners on all branch database nodes have been set up in the following way. This section provides a short explanation of how they are set up, how to interact with them and the expected status outputs.

The listeners are configured as follows: -

- The name of the listener will be of the form ***LISTENER_<node name>***, e.g. ***LISTENER_LPRPBDB001***
- The port the listener has been configured to use is ***1529***
- The node (and in turn the IP) the listener has been configured to accept connections for is ***lprp<type>00[1234]-vip***, e.g. for BDB node 1 the node name is ***lprpbdb001-vip***

In terms of Oracle Net and it's configuration files, there should always be one of each on every node, namely `sqlnet.ora`, `tnsnames.ora` and the `listener.ora` (found in `$ORACLE_HOME/network/admin`)

5.1.1.1 Oracle Net Config. Files

The files have been formerly delivered by Tivoli Provisioning Manager and won't be needed to be changed unless there is a specific problem. The following, shows a few excerpts of what the files could look like as of October 2009 (note that these values are not representative of those in the LIVE environment and are merely for reference): -

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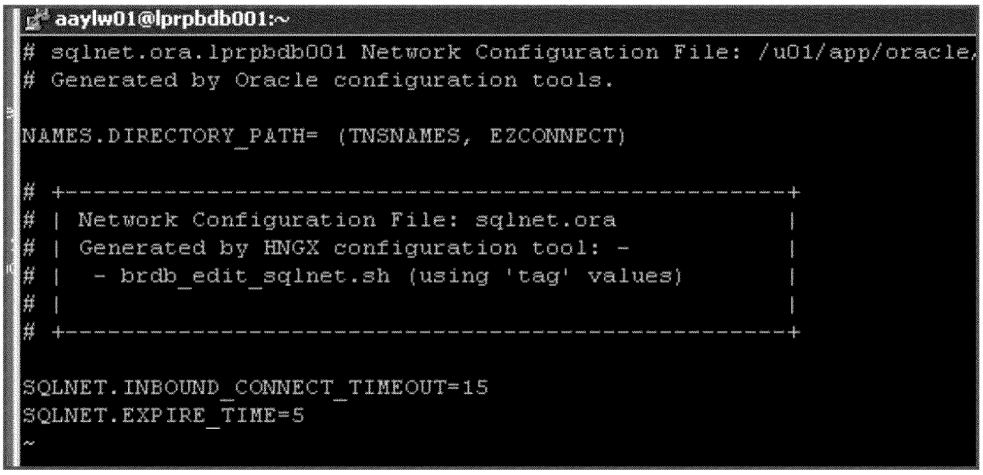
sqlnet.ora

SQLNET.INBOUND_CONNECT_TIMEOUT=15 performs the same function and behaves in the same way as the parameter configured for the listener, only waits longer.

SQLNET.EXPIRE_TIME=5 determines the number of ***minutes*** that Oracle will allow connections which are not in use, to exist, before terminating the process. This normally applies to connections which have abnormally ended.



tnsnames.ora

The tnsnames.ora would ordinarily only have entries that are applicable to the instance(s) which exist on that node alone. However, the build process uses a single tnsnames.ora for all nodes. This is not ideal, but is how it has been delivered.

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listener.ora

`INBOUND_CONNECT_TIMEOUT_LISTENER_LPRPBDB001 = 10` determines the number of ***seconds*** Oracle will wait to receive authentication from the client making the connection. Otherwise denies the request.

`ADMIN_RESTRICTIONS_LISTENER_LPRPBDB001 = ON` enforces the administration of the listener to an authorised user only, i.e. ***oracle***

```
# | Generated by HNGX configuration tool: -           |
# |  - brdb_edit_listener.sh (using 'tag' values)     |
# |                                                   |
# +---------------------------------------------------+

LISTENER_LPRPBDB001 =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = IRRELEVANT)(IP = FIRST))
      (ADDRESS = (PROTOCOL = TCP)(HOST = IRRELEVANT) = FIRST))
      #(ADDRESS = (PROTOCOL = IPC)(KEY = extproc))
    )
  )

STARTUP_WAIT_TIME_LISTENER_LPRPBDB001 = 0
INBOUND_CONNECT_TIMEOUT_LISTENER_LPRPBDB001 = 10
ADMIN_RESTRICTIONS_LISTENER_LPRPBDB001 = ON

SID_LIST_LISTENER_LPRPBDB001 =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = +ASM1)
      (ORACLE_HOME = /u01/app/oracle/product/10.2.0/db_1)
    )
    #(SID_DESC =
    #  (SID_NAME = PLSExtProc)
    #  (ORACLE_HOME = /u01/app/oracle/product/10.2.0/db_1)
    #  (PROGRAM = extproc)
    #)
  )
```

5.1.1.2 Interaction with the Listener

Starting and stopping the listener is done via Oracle CRS as follows: -

```
$> srvctl stop listener -n lprpbdb001
```

```
$> srvctl start listener -n lprpbdb001
```

Checking the status of the listener and it's services is done as follows: -

```
$> lsnrctl status LISTENER_LPRPBDB001
```

```
Listener Parameter File   /u01/app/oracle/product/10.2.0/db_1/network/admin/listener.ora
Listener Log File         /u01/app/oracle/product/10.2.0/db_1/network/log/listener_lprpbdb001.log
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)IRRELEVANT
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)IRRELEVANT
Services Summary...
Service "+ASM1" has 1 instance(s).
  Instance "+ASM1", status UNKNOWN, has 1 handler(s) for this service...
Service "BRDB" has 1 instance(s).
  Instance "BRDB1", status READY, has 1 handler(s) for this service...
Service "BRDB_DGB" has 1 instance(s).
  Instance "BRDB1", status READY, has 1 handler(s) for this service...
Service "BRDB_XPT" has 1 instance(s).
  Instance "BRDB1", status READY, has 1 handler(s) for this service...
Service "SYS$STRADMIN.BRDB_CAPTQ.BRDB" has 1 instance(s).
```

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```
  Instance "BRDB1", status READY, has 1 handler(s) for this service...
The command completed successfully
```

Executing `lsnrctl services LISTENER_LPRPBDB001` will show a little more information for each service than the `status` command.

The important services used are listed as follows: -

`+ASM[1234]` This service is required for Grid Control and allows access to ASM.

`BRDB` This service is generally required for the BAL and TWS and allows those applications to connect without specifying an individual instance.

`BRDB_DGB` and `SYS$STRADMIN.BRDB_CAPTQ.BRDB` are Oracle defined services and relate to and are used by Data Guard and Streams respectively.

If any services are not created, then client connections which use those services will be unable to connect. This is similar to the status of the listener itself in that unless it is continually being monitored, the only way one will really know there is an issue, is with the inability to connect.

5.1.2 General Recommendations

5.1.2.1 Logs and Trace Files.

From time to time there will be important log files, trace files and background process dump files that will be needed for support purposes and would have been explicitly renamed and "saved" by support personnel. These files, if found in a "house kept" directory, will be removed by the housekeeping processes after the retention period has been exceeded. For quick reference those directories are: -

- /u01/admin/<DB>/adump
- /u01/admin/<DB>/bdump
- /u01/admin/<DB>/cdump
- /u01/admin/<DB>/udump
- $ORACLE_HOME/network/log
- $ORACLE_HOME/rdbms/log

The database alert log and the listener log files are always being written to and are important files. It is highly recommended that these files are kept manageable. A good way of doing this would be to copy the files every month or fortnightly in order to keep a history and keep their sizes at a manageable level.

5.1.3 Password Management

In general all Branch Database and Branch Support Database passwords fall into one of three categories: -

- The users are locked (within the database) and even if the password is known, logging on is not a possibility.
- The passwords are managed by Microsoft Active Directory. This is possible because the users that this applies to are "externally identified" and in order to logon, one must be logged onto the server as an OS user and then log onto the database, thereby relying on OS authentication.
- The passwords are set by privileged users and known to only secure/trusted personnel. This can only apply to privileged users, e.g. SYSTEM, SYS, DBSNMP, etc. The following table shows interdependencies of database users of this type: -

User	Interdependencies	Risk If Changed
SYS (See Section 5.1.3.1)	Oracle Grid Control Oracle Data Guard	Grid Control Agents will be unable to logon Standby Database log shipping and coordination will fail

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SYSTEM	None	None
DBSNMP	Oracle Grid Control	Grid Control Agents will be unable to logon
AUDITUSER	The Audit Server	Audit Server will fail to logon
BMC_USERLV BMC_USERTR	BMC Patrol	None
BRDBRDDS	RDDS Feeds	None
BRDBRDMC	RDMC Feeds	None
DELTRUSER	Counter Training	None
EMDB_SUP OMDBUSER	The EMDB Interface The OMDB Interface	EMDB Interface will fail to refresh branch info OMDB Interface will fail to refresh branch info
LVBALUSER[1-4]	Live Counter Connections	The BAL OSR will fail to startup correctly
ORAEXCPLV	BRDB Exception logging	In the event of a failure, BRDB processes will not be able to log exceptions
REP_GEN	Generic Reporting	Reports will fail to generate
STRADMIN	Oracle Streams	Streams administration will not be possible after change
TRBALUSER[1-4]	Training Counter Connections	Counter training will not be possible
TWS TWSSUP	The TWS Scheduler	All schedules will fail to run

5.1.3.1 Changing the SYSDBA Password

The SYS passwords have related *sysdba* password files for both the main application instance and ASM instance on *all nodes* of any Online RAC Cluster. The significance of the password file is that the password internal to the database (for the SYS user) must match the password with which the password file was created. If either of them changes without the other, all remote logons will fail with an "Insufficient Privileges" ORA- error.

When these passwords are changes, for whatever reason, the changes when done, ***must*** be done in sync with the respective password file(s). Oracle Grid Control and Oracle Data Guard rely on being able to logon remotely as privileged users.

The instances affected on ***BDB*** are as follows: -

BRDB[1|2|3|4] and +ASM[1|2|3|4]

The instances affected on ***BDS*** are as follows: -

SBRDB[1|2|3|4] and +ASM[1|2|3|4]

The instances affected on ***BRS*** are as follows: -

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BRSS[1] and +ASM[1]

Then on every node a password file will exist in `<ORACLE_HOME>/dbs` of the form `orapw<ORACLE_SID>`, for each instance above.

For example should one wish to change the 'SYS' password on BDB node 3 to 'b0bsy0uruncl3', one would perform the following tasks as the ***oracle*** user logged onto ***node 3***: -

Logon to BRDB3 and change the password:

```
$> sqlplus '/as sysdba'
SQL> ALTER USER SYS IDENTIFIED BY b0bsy0uruncl3;
SQL> EXIT;
```

Recreate the password file:

```
$> cd $ORACLE_HOME/dbs
$> orapwd file=/u01/app/oracle/product/10.2.0/db_1/dbs/orapwBRDB3
password=b0bsy0uruncl3 entries=5
```

Note: The process for changing the ASM password is the same as that for the database instance.

5.1.3.2 Listener Password

The database listeners (one on each node) have their access restricted by privileged users only, e.g. root or oracle. The listeners are not password protected.

5.2 Backups

5.2.1 Database Backups

See Section 4 for more detail.

5.2.2 Disk Backups

Most disks in the BladeFrame(s) are protected by either being mirrored or the disks will be replicated via SRDF (EMC^2 DMXs only).

5.3 Partition Management

5.3.1 Introduction

This section does not detail specific functionality but is intended to provide an overview of how the use of physical partitions works and to handle the partition creation failure. The partition management describes in this section applied to both the BRDB and BRSS.

Note this section does NOT include how partitions are created and archived off though where appropriate, reference is made to interactions.

5.3.2 Assumptions

It is assumed physical partitions exist for each partitioned table for the desired processing date.

5.3.3 Overview

The creation and removed physical partitions for each partitioned table is performed by start of day job; i.e. BRDBC001 and BRSSC001.

The operation of the start of day process is defined in LLD.

5.3.3.1 Partition Metadata

The operation of the partition table is driven by the following metadata:

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5.3.3.1.1 <BRDB/BRSS>_PARTITION_CREATES

This table is used to record the creation, status change and removal of partitions by the Start of Day housekeeping for support and audit purposes.

5.3.3.1.2 <BRDB/BRSS>_PARTITION_STATUS_HISTORY

This table is used to record the history of the created partition. The entry is inserted by Start of the Day process (<BRDB/BRSS>C0001).

5.3.3.1.3 <BRDB/BRSS>_SUBPARTITION_RANGES

The entry in this table will contain the next partition (range value) that will be created by Start of Day process (<BRDB/BRSS>C0001). The partition range value will be increment by 1 at the end of the process.

5.3.3.1.4 <BRDB/BRSS>_PROCESS_CONTROL

This table holds process run information and in this case it contains the partition creation information for each table. This table is used for re-run of the Start of the day process for the failure partition.

5.3.4 Troubleshooting

The Start of Day (BRDBC0001/BRSSC001) process creates physical partitions for the next day, therefore this process would have to fail twice in succession and not have been corrected in order for the partitions to be missing for the current day. This most likely occurs due to insufficient space available in the corresponding tablespace for which an Operational Exception would be generated. The process can be restarted after rectifying the cause of failure.

Note that it is possible due to the unavoidable implicit database commit performed when adding/dropping table partitions that, in some esoteric failure scenarios, the partition metadata will be out of sync with the actual partitions. In this situation, re-running the SOD process will potentially fail.

In this scenario it will be necessary to confirm whether the metadata/partitions are inconsistent by running a script provided by development.

If the partitions/metadata is inconsistent it will be necessary to manipulate either to remedy the situation. Given that the remedial activity will be dependent on a number of variables including whether any data has been written to the new partitions etc, a call should be raised with 4th line support.

In some situations, typically in test, it is desirable to run BRDBC001/BRSSC001 more than once in a calendar day. The default (build) value of the PROCESS_DAY_MULTIPLE_RUNS_YN flag in the <BRDB/BRSS>_PROCESSES table for the <BRDB/BRSS>C001 process is 'N' so would prevent this. Therefore the PROCESS_DAY_MULTIPLE_RUNS_YN flag should be changed to 'Y' to allow this if required.

WARNING – This should only be done in Live at the guidance of development.

The following is a checklist in the event the <BRDB/BRSS>C001 job fails (to be done before re-running the job): -

i. Check the entry in <BRDB/BRSS>_OPERATIONAL_EXCEPTONS and this will show the error(s) that cause the job to failure.

ii. Check the 'parameter value for 'BRDB SYSTEM DATE' from '<BRDB/BRSS>_SYSTEM_PARAMETERS table. It should set to (N – 1) where N is current system date.

iii. Check the column 'SYSTEM_DATE','START_DATE' and 'END_DATE' in the <BRDB/BRSS>_PROCESS_CONTROL table. This table is used to control the process for each Table-Group and table affected.

SYSTEM_DATE should equal to the '<BRDB/BRSS> SYSTEM DATE' from the <BRDB/BRSS>_SYSTEM_PARAMETER table

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END_DATE should have the NULL value for the failure partition table.

iv. Check the 'RANGE_VALUE' from the <BRDB/BRSS>_SUBPARTITION_RANGES table. This value should equal to '<BRDB/BRSS> SYSTEM DATE' + 2 in the format of 'YYYYMMDD'

v. Check the table <BRDB/BRSS>_PARTITION_CREATES and <BRDB/BRSS>_PARITION_STATUS_HISTORY. The failure partition_range_value for the partition table must not exist in the above tables.

vi. Check the value of the PROCESS_DAY_MULTIPLE_RUNS_YN flag in the <BRDB/BRSS>_PROCESSES table for the <BRDB/BRSS>C001 process is 'N'.

There is another option to fix a single partition by passing the parameters to the Start of Day; i.e.

<BRDB/BRSS>C001 [<Table-Group> <Table-Name> <Partition-Date (YYYYMMDD)>] <SYSTEM_DATE(YYYYMMDD)>

Where SYSTEM_DATE is optional when exist and this value will set in '<BRDB/BRSS> SYSTEM DATE'.

5.3.4.1 Useful Queries

The below scripts reconcile differences between physical partitions and partition metadata maintained by the BRDB/BRSS application.

These scripts should not be run unless directed by Development support staff.

Updates status for records in <BRDB/BRSS>_PARTITION_CREATES table to 'ARCH' where the Status is set to 'DEL' and the partition exists in the database: -

```
UPDATE     <brdb/brss>_partition_creates bpc
SET        bpc.status = 'ARCH'
WHERE      bpc.status = 'DEL'
AND        EXISTS (SELECT 'x'
                   FROM   all_tab_partitions atp,
                          <brdb/brss>_partitioned_tables bpt
                   WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
                   AND    atp.table_name = bpc.table_name
                   AND    atp.table_name = bpt.table_name
                   AND    atp.partition_name = bpt.partition_root_name || '_'
                          || bpc.partition_range_value);
```

Updates status for records in <***BRDB/BRSS***>_PARTITION_STATUS_HISTORY table to 'ARCH' where the Status is set to 'DEL' and the partition exists in the database: -

```
UPDATE     <brdb/brss>_partition_status_history bpsh
SET        bpsh.status = 'ARCH'
WHERE      bpsh.status = 'DEL'
AND        EXISTS (SELECT 'x'
                   FROM   all_tab_partitions atp
                   WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
                   AND    atp.table_name = bpsh.table_name
                   AND    atp.partition_name = bpsh.partition_name) ;
```

Updates mismatched records in <***BRDB/BRSS***>_PARTITION_CREATES table to 'DEL': -

```
UPDATE     <brdb/brss>_partition_creates bpc
SET        bpc.status = 'DEL'
WHERE      bpc.status != 'DEL'
```

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```
AND       NOT EXISTS (SELECT 'x'
                      FROM   all_tab_partitions atp,
                             <brdb/brss>_partitioned_tables bpt
                      WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
                      AND    atp.table_name = bpc.table_name
                      AND    atp.table_name = bpt.table_name
                      AND    atp.partition_name = bpt.partition_root_name ||
                              '_' || bpc.partition_range_value) ;
```

Updates mismatched records in <BRDB/BRSS>_PARTITION_STATUS_HISTORY table to 'DEL'

```
UPDATE    <brdb/brss>_partition_status_history bpsh
SET       bpsh.status = 'DEL'
WHERE     bpsh.status != 'DEL'
AND       NOT EXISTS (SELECT 'x'
                      FROM   all_tab_partitions atp
                      WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
                      AND    atp.table_name = bpsh.table_name
                      AND    atp.partition_name = bpsh.partition_name)
AND       create_date = (SELECT   MAX(bpsh1.create_date)
                         FROM     <brdb/brss>_partition_status_history bpsh1
                         WHERE    bpsh1.table_name = bpsh.table_name
                         AND     bpsh1.partition_name = bpsh.partition_name);
```

Inserts missing records into <***BRDB/BRSS***>_PARTITION_CREATES table: -

```
INSERT INTO <brdb/brss>_partition_creates
       (table_name,
        partition_range_value,
        status,
        status_date)
SELECT atp.table_name,
       substr(atp.partition_name,
       LENGTH(npt.partition_root_name) + 2) partition_range_value,
       'NEW',
       SYSDATE
  FROM   all_tab_partitions atp,
       <brdb/brss>_partitioned_tables bpt
 WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
   AND    atp.table_name = bpt.table_name
   AND    NOT EXISTS (SELECT 'x'
                        FROM <brdb/brss>_partition_creates bpc
                       WHERE bpc.table_name = atp.table_name
                         AND bpc.partition_range_value =
SUBSTR(atp.partition_name,
                             LENGTH(bpt.partition_root_name) + 2));
```

Inserts missing records into <***BRDB/BRSS***>_PARTITION_STATUS_HISTORY table: -

```
INSERT INTO <brdb/brss>_partition_status_history (
                    table_name, partition_name,
                    create_date, status, sql_statement)
SELECT atp.table_name,
       atp.partition_name,
       SYSDATE,
```

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```
       'NEW',
       'METADATA CORRECTION UTILITY FROM SUPPORT GUIDE'
FROM   all_tab_partitions atp,
       <brdb/brss>_partitioned_tables bpt
WHERE  atp.table_owner = 'OPS$<BRDB/BRSS>'
AND    atp.table_name = bpt.table_name
AND    NOT EXISTS (SELECT   'x'
                   FROM     <brdb/brss>_partition_status_history bpsh
                   WHERE    bpsh.table_name     = atp.table_name
                   AND      bpsh.partition_name = atp.partition_name);
```

Check the partition that will .be created when BRDBC001/BRSSC001 next run: -

```
SELECT table_name,
       range_value
FROM   <brdb/brss>_subpartition_ranges;
```

Check the latest partition created in the system: -

```
SELECT   table_name,
         max(partition_range_value),
FROM     <brdb/brss>_partition_creates
GROUP BY table_name
ORDER BY table_name;
```

"pt_clean.sh" shell script can be used to rebuilt the meta partition tables (<***brdb/brss***>_partition_creates,

<***brdb/brss***>_subpartition_ranges and <***brdb/brss***>_partition_status_history) from the database. This shell script can be found in /app_sw/brdb/build/schema or /app_sw/brss/build/schema.

NB. This script will set status to 'ARCH' in the <***brdb/brss***>_partition_creates and all the partitions will be deleted when the <***BRDB/BRSS***>C0001 next run.

5.4 Standby Database

5.4.1 Introduction

The build of and theory surrounding the BRDB Standby database (SBRDB) is detailed extensively in the Standby Database Low Level Design [DES/APP/LLD/0152].

5.4.2 Assumptions

The Primary Database BRDB will be running on a 4-node cluster and the Standby Database on a 1-node cluster configuration.

The Data Guard Configuration has been successfully built and running without errors.

5.4.3 Troubleshooting

The very first thing one should consider when troubleshooting is to consider the status of the architectural components surrounding the solution, e.g. the network, the SAN, the BladeFrame, etc. (see Section 5.4.3.1)

Oracle has a number of processes on both the Primary database and the Standby database monitoring the sending, the transportation and the receiving of replicated redo from source to the destination.

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It is important to note that the Data Guard Broker is key to the monitoring of the solution without which, the seamless failover to Standby from Primary would not be possible nor would the trouble free monitoring through Grid Control be possible.

5.4.3.1 Checklist

Is the database in recovery mode or is it down (all nodes)?

Is there enough storage space, e.g. check `+SBRDB_FLASH, /archredo`? Do all the file systems have sufficient free space?

Is the network up?

Have you checked the Data Guard Monitor status, e.g. `dgmgrl … show configuration`? Is it showing `SUCCESS` (see Section 5.4.3.3)?

Have you checked the Data Guard logs on Standby and Primary, e.g., `/u01/admin/SBRDB/bdump/drcSBRDB1.log`?

5.4.3.2 Useful Queries

This query will help identify Data Guard problems (On BRDB or SBRDB).

```
SET lines 100
SET pages 45
ALTER SESSION SET NLS_DATE_FORMAT='DD-MON HH24:MI:SS';
SELECT facility,
       error_code,
       TIMESTAMP,
       message
  FROM v$dataguard status
 ORDER BY message_num;
```

This query will help with determining if any Standby Logs are not in use when they should be (On SBRDB). It does not matter what group the standby logs belong to, but one should see 1 log for every primary instance, e.g. 1, 2, 3 and 4 in LIVE.

```
SET lines 100
SET pages 45
ALTER SESSION SET NLS_DATE_FORMAT='DD-MON HH24:MI:SS';
SELECT group#,
       thread#,
       sequence#,
       archived,
       status,
       last time
  FROM v$standby_log WHERE status <> 'UNASSIGNED';
```

5.4.3.3 Useful Tools

Data Guard Monitor is very important for monitoring the status of the Data Guard Configuration and is not possible without the Data Guard Broker. The broker is started automatically – at instance startup - by setting the database initialisation parameter **`dg_broker_start`** to **`TRUE`**. The broker is in essence the DMON process and writes information to a log called **`/u01/admin/[S|B]RDB/bdump/drc[S|]BRDB[1-4].log`** in which all status and error information can be monitored/viewed.

The Data Guard Monitor Command-line Utility or DGMGRL can be used to get useful feedback from the configuration, e.g. …

```
$> dgmgrl
DGMGRL for Linux: Version 10.2.0.4.0 - 64bit Production
```

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```
Copyright (c) 2000, 2005, Oracle. All rights reserved.

Welcome to DGMGRL, type "help" for information.
DGMGRL> connect /
Connected.
DGMGRL> show configuration

Configuration
  Name:                BRDB_DATAGUARD_CFG
  Enabled:             YES
  Protection Mode:     MaxPerformance
  Fast-Start Failover: DISABLED
  Databases:
    BRDB  - Primary database
    SBRDB - Physical standby database

Current status for "BRDB_DATAGUARD_CFG":
SUCCESS
```

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5.5 Oracle Streams

5.5.1 Introduction

Streams configuration and activation for BRDB and BRSS are detailed extensively in the BRDB High Level Design [DES/APP/HLD/0020], BRSS High Level Design [DES/APP/HLD/0023] and Low Level Design [DES/APP/LLD/0151].

5.5.2 Assumptions

A single-source replication environment is configured and has the following characteristics:

- One Capture process named BRDB_CAPTURE located in BRDB node 1
- One Propagation process named BRDB_PROPG located in BRDB node 1.
- One Apply process named BRSS_APPY located in BRSS node 1.

5.5.3 Overview

This section only cover the diagnostics are required by the support persons when troubleshooting the Streams processes.

5.5.4 Troubleshooting

The following is a list of tables and views that are useful, in troubleshooting Streams issues. This is basically "reference" information (more detailed information can be found in the Oracle Streams administration guide):

Capture Process
dba_capture: basic status, error info
v$streams_capture: detailed current status info
dba_capture_parameters: configuration information

Propagate Process
dba_propagation: basic status, error info
v$propagation_sender: detailed current status

Apply Process
dba_apply: basic status, error info
v$streams_apply_reader: status of the current apply reader
v$streams_apply_server: status of current apply server(s)
v$streams_apply_coordinator: overall status, latency info
dba_apply_progress
dba_apply_parameters: configuration information

"Miscellaneous" Tables and Views
v$buffered_queues: view that displays the current and cumulative number of messages enqueued and spilled, for each buffered queue.
sys.streams$_apply_spill_msgs_part: table that the apply process uses, to "spill" messages from large transactions to disk.
system.logmnr_restart_ckpt$: table that holds capture process "checkpoint" information.

Whenever there is an error or performance problems present themselves, the first place to check will be to note any Grid Control errors, then the alert_<SID>.log and finally the relevant database instance trace files. Messages about each capture process, propagation, and apply process are recorded in trace files for the database in which the processes are running.

- Capture - BRDB1

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alert files = /u01/admin/BRDB/bdump/alert_BRDB1.log
trace files = /u01/admin/BRDB/bdump/brdb1_c***nnn_iiiii***.trc

- Propagation - BRDB1
  alert files = /u01/admin/BRDB/bdump/alert.log
  trace files = /u01/admin/BRDB/bdump/brdb1_j***nnn_iiiii***.trc
- Apply - BRSS1
  alert files = /u01/admin/BRSS/bdump/alert.log
  trace files = /u01/admin/BRSS/bdump/brdb1_p***nnn_iiiii***.trc

NOTE

nnnn: refers to the Oracle process.
iiii: refers to the UNIX process number.

e.g. **`brdb1_cjq0_14883.trc`**

5.5.4.1 Troubleshooting Capture Problems

The Oracle Streams Capture process resides within the Branch Database. It captures all data (DML/DDL) changes to objects own by OPS$BRDB. The Capture process may stop capturing changes or start running very slowly on an intermittent basis. Some of the useful methods describes in this section can use to diagnose the problem and resolve them: -

Check capture process status:

The Capture Process captures changes only when it is ***ENABLED***. One can check whether the process is enabled, disabled, or aborted by querying the ***DBA_CAPTURE*** data dictionary view:

```
SELECT status FROM dba_capture WHERE capture_name = 'BRDB_CAPTURE';
```

If the capture process is disabled, then try restarting it.

If the capture is aborted, then it needs to correct an error before restarting it. The following query shows when the capture process aborted and the error that caused it to abort:

```
SELECT status_change_time, error_message
  FROM dba_capture
 WHERE status = 'ABORTED' AND capture_name = 'BRDB_CAPTURE';
```

Check Capture current status: -

The state of a capture process describes what the capture process is doing currently. One can view the state of a capture process by querying the STATE column in the V$STREAMS_CAPTURE dynamic performance view.

```
SELECT state
  FROM v$streams_capture
 WHERE capture_name = 'BRDB_CAPTURE';
```

The following capture process states are possible: -

`INITIALIZING`: Starting up.

`CAPTURING CHANGES`: Scanning the redo log for changes that evaluate to TRUE against the capture process rule sets.

`EVALUATING RULE`: Evaluating a change against a capture process rule set.

`CREATING LCR`: Converting a change into an LCR.

`ENQUEUING MESSAGE`: Enqueuing an LCR that satisfies the capture process rule sets into the capture process queue.

`SHUTTING DOWN:` Stopping.

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WAITING FOR DICTIONARY REDO: Waiting for redo log files containing the dictionary build related to the first SCN to be added to the capture process session. A capture process cannot begin to scan the redo log files until all of the log files containing the dictionary build have been added.

DICTONARY INITIALIZATION: Processing a dictionary build.

MINING (PROCESSED SCN = scn_value): Mining a dictionary build at the SCN scn_value.

LOAD (step X 0f Y): Processing information from a dictionary build and currently at step X in a process that involves Y steps, where X and Y are number.

PAUSED FOR FLOW CONTROL: Unable to enqueue LCRs either because of low memory or because propagations and apply processes are consuming messages slower than the capture process is creating them. This state indicates flow control that is used to reduce spilling of captured messages when propagation or apply has fallen behind or is unavailable.

Common capture issues: -

1. ORA-01291: missing logfile.

   A missing redo is possible when a logfile is dropped for any administrative reasons. The v$logmnr_logs can be checked to determine the missing SCN range and add the relevant redo log files

   Query the REQUIRED_CHECKPOINT_SCN column in the DBA_CAPTURE to determine the required checkpoint SCN for a captured. Then restore the redo log file that includes the required checkpoint SCN and all subsequent redo log files.

2. Capture process loops on startup.

   This may be a missing logfile which cannot be opened. All logs from the BRDB nodes (1|2|3|4) have to be present with respect to the required_checkpoint_scn.

3. Capture process is in “PAUSED FOR FLOW CONTROL” or “ENQUEUING MESSAGE” status.

   - Check the source queue, as there is probably a large amount of LCRs being spilled to disk.
   - Check if the destination site is down.
   - Check the propagation and apply status’.

5.5.4.2 Troubleshooting Propagation Problems

The Oracle Streams propagation process resides within the Branch Database. It propagates the captured events to the destination queue in the target database (BRSS). Some of the useful methods describes in this section can use to diagnose the propagation problem and resolve them.

- Check the database link is configured correctly and active.
- Check whether a propagation job status is enabled, disabled or aborted by querying the DBA_PROPAGATION dictionary view:

```
select status from dba_propagation where propation_name = 'BRDB_PROPG'';
```

If status is ‘disabled’ or ‘aborted’ then check the error message:

```
select status,destination_dblink,error_date, error_message
from dba_propagation
where propation_name = 'BRDB_PROPG'';
```

Correct the error and restart the propagation process

```
begin
```

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```
    DBMS_PROPAGATION_ADM.START_PROPAGATION(  'BRDB_PROPG');
end;
```

- If the propagation job is enabled, but is not propagating messages, then try stopping and restarting the propagation.
- Check propagation schedule is enabled and associated with a job queue process, any failures or errors received, the date and time the propagation schedule will be started

```
select SCHEDULE_DISABLED,PROCESS_NAME,
          LAST_RUN_DATE,NEXT_RUN_DATE,
          TOTAL_NUMBER,FAILURES,
          LAST_ERROR_TIME,LAST_ERROR_MSG,
from     dba_queue_schedules s, dba_propagation p
where   s.DESTINATION = p.destination_dblink ;
```

SCHEDULE_DISABLE = 'N' Enable

SCHEDULE_DISABLE = 'Y' Disable

- Determine the number of messages sent and the number of messages that have been acknowledged.

```
select queue_name,schedule_status,
          high_water_mark,acknowledgement
 from v$propagation_sender;
```

5.5.4.3 Troubleshooting Apply Problems

The Oracle Streams Apply process resides within the Branch Support Database. It dequeues all the captured data and applies them to the OPS$BRDB schema. Some of the useful methods describes in this section can use to diagnose the apply problem and resolve them.

Check apply process status:

An apply process applies changes only when it is enabled. Query the STATUS column in DBA_APPLY to determine the state of the apply process: -

```
SELECT  status
  FROM  dba_apply
 WHERE  apply_name = 'BRSS_APPY';
```

The possible values are ENABLED, DISABLED and ABORTED.

If the apply process is disabled, then try restarting it: -

```
DBMS_APPLY_ADM.START_APPLY( apply_name => 'BRSS_APPY');
```

If the apply process is aborted, then correct an error before restart the apply process. The following query shows when the apply process and the error that caused it to abort: -

```
SELECT status_change_time,error_message
  FROM dba_apply
 WHERE status     = 'ABORTED'
   AND apply_name = 'BRSS_APPY';
```

If the apply process is enabled, but changes are not applied: -

Check that the apply process queue is receiving the messages to be applied using v$buffered_queues: -

```
SELECT queue_id,(num_msgs - spill_msgs) mem_msgs,
       spill_msgs
```

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```
  FROM v$buffered_queues
 WHERE queue_name = 'BRSS_APPLQ';
```

Or using the v$streams_apply_coordinator view: -

```
SELECT total_received,
       total_applied,
        total_errors,(total_assigned - total_rollbacks + total_applied))
being_applied
  FROM v$streams_apply_coordinator
 WHERE apply_name = 'BRSS_APPY';
```

Check the Error Queue

When an apply process cannot apply a message, it moves the event and all the other events in the same transaction into the error queue.

Query DBA_APPLY_ERROR to determine if there are errors in the error queue.

```
SELECT local_transaction_id,
       meesage_number,error_message
  FROM    dba_apply_error
 WHERE apply_name = 'BRSS_APPY';
```

If there are apply errors, then you can either try to re-execute the transactions that encountered the errors, or you can delete the transactions. If you want to re-execute a transaction that encountered an error, then first correct the condition that caused the transaction to raise an error.

The execute_error procedure re-executes the specified error transaction.

Syntax:

```
DBMS_APPLY_ADM.EXECUTE_ERROR(local_transaction_id IN  VARCHAR2,
                             execute_as_user   IN BOOLEAN DEFAULT false);
```

The error transaction can be dropped from the from the error queue by invoking the delete_error procedure. The delete_error procedure deletes the specified error transaction.

Syntax:

```
DBMS_APPLY_ADM.DELETE_ERROR(local_transaction_id IN VARCHAR2);
```

5.5.4.4 Working with Apply Errors

The Oracle Streams Apply process will store all rows of every transaction that fails to apply. These failed transactions with their associated errors are available to query from DBA_APPLY_ERROR. Errorred transactions can be applied once the problem that caused the failure has been rectified (if possible). The following is a little help in finding them and extracting them to help with their resolution: -

```
set lines 140
set pages 45
SELECT TO_CHAR(error_creation_time,'YYYY/MM/DD') created,
       error_number,
       COUNT(1)
  FROM dba_apply_error
 GROUP BY error_number, TO_CHAR(error_creation_time,'YYYY/MM/DD')
 ORDER BY 1, 2;


CREATED    ERROR_NUMBER   COUNT(1)
---------- ------------ ----------
2009/06/23         1403          6
```

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```
2009/06/24          1403          6
```

Once you have the list of errors, choose whichever error you may be interested in and use it in the following query, which will provide you with the **error_message** and the **local_transaction_id**: -

```
SET lines 140
SET pages 80
col error_message FOR a70
SELECT local_transaction_id, error_message
  FROM dba apply error
 WHERE error_number = 1403;


LOCAL_TRANSACTION_ID   ERROR_MESSAGE
---------------------- ----------------------------
23.28.244              ORA-01403: no data found
                       ORA-01403: no data found
3.33.140771            ORA-01403: no data found
17.30.370              ORA-01403: no data found
```

Using the **local_transaction_id** you can perform the following procedure execution of PKG_BRSS_STREAMS.PR_PRINT_TRANSACTION, which will show every record affected by the error in question, information such as the table, the columns affected the before and after values, etc. are shown: -

```
SET SERVEROUTPUT ON
BEGIN
   stradmin.pkg_brss_streams.pr_print_transaction('3.33.140771');
END;
/

----- Local Transaction ID: 3.33.140771
----- Source Database: BRDB
----Error in Message: 1
----Error Number: 1403
----Message Text: ORA-01403: no data found

--message: 1
type name: SYS.LCR$_ROW_RECORD
source database: BRDB
owner: OPS$BRDB
object: BRDB_SYSTEM_PARAMETERS
is tag null: Y
command_type: UPDATE
old(1): PARAMETER_NAME
BRDB_PDEL_TO_LFS_STOP_YN
old(2): VERSION_NUMBER
1
old(3): UPDATE_TIMESTAMP
typename is SYS.TIMESTAMP
old(4): PARAMETER_TEXT
N
new(1): UPDATE_TIMESTAMP
typename is SYS.TIMESTAMP
new(2): PARAMETER_TEXT
Y
transaction name:
--message: 2
type name: SYS.LCR$_ROW_RECORD
source database: BRDB
```

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```
owner: OPS$BRDB
object: BRDB_PROCESS_CONTROL
is tag null: Y
command_type: UPDATE
old(1): INSTANCE_NAME
BRDB_PDEL_TO_LFS_STOP_YN
old(2): RUN_NUMBER
2
old(3): PROCESS_NAME
BRDBX011
old(4): SYSTEM_DATE
23-JUN-09
old(5): END_DATE
new(1): END_DATE
23-JUN-09
transaction name:
--message: 3
type name: SYS.LCR$_ROW_RECORD
source database: BRDB
owner: OPS$BRDB
object: BRDB_PROCESS_AUDIT
is tag null: Y
command_type: INSERT
new(1): PROCESS_SEQUENCE_NUMBER
432918
new(2): INSTANCE_NAME
BRDB_PDEL_TO_LFS_STOP_YN
new(3): PROCESS_NAME
BRDBX011
new(4): BLOCK_CHANGES
new(5): BLOCK_GETS
new(6): CONSISTENT_CHANGES
new(7): CONSISTENT_GETS
new(8): ORACLE_SERIAL#
new(9): ORACLE_SID
new(10): RUN_NUMBER
new(11): PHYSICAL_READ
new(12): UNIX_PID
new(13): INSERT_DATE
23-JUN-09
new(14): SYSTEM_DATE
23-JUN-09
new(15): START_FINISH_INDICATOR
F
new(16): USER_NAME
OPS$BRDBBLV2
transaction name:
```

Once again, the errorred transaction can be applied once the cause of the failed apply has been identified.

```
exec dbms_apply_adm.execute_error('3.33.140771');
```

One could also print all the current errors by executing PKG_BRSS_STREAMS.PR_PRINT_ERRORS. This procedure prints ***all*** errorred transactions regardless of **`transaction_id`** or **`error_number`**.

```
BEGIN
   stradmin.pkg_brss_streams.print_all_errors;
END;
/
```

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5.5.4.5 Useful Queries

i. *The following query displays the current status of the capture process*

```
set lines 100
column capture_name            heading 'Capture|Name' format A12
column process_name            heading 'Capture|Process|Number' format A7
column sid                     heading 'Session|ID' format 999999
column serial#                 heading 'Session|Serial|Number' format 9999999
column state                   heading 'State' format A27
column  total_messages_captured  heading  'Redo|Entries|Evaluated|In  Detail'
format 9999999
column total_messages_enqueued heading 'Total|LCRs|Enqueued' format 999999

SELECT c.capture_name,
       substr(s.program,instr(s.program,'(')+1,4) process_name,
       c.sid,
       c.serial#,
       c.state,
       c. total_messages_captured,
       c. total_messages_enqueued
  FROM v$streams_capture c, v$session s
 WHERE c.sid = s.sid
   AND c.serial# = s.serial#;
```

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ii. Minimum Archive Log Necessary to Restart Capture

```
set lines 300
set pages 9999
set serveroutput on

DECLARE
  hScn number := 0;
  lScn number := 0;
  sScn number;
  ascn number;
  alog varchar2(1000);
BEGIN
  select min(start_scn), min(applied_scn) into sScn, ascn
    from dba_capture
   where capture_name = 'BRDB_CAPTURE';

  DBMS_OUTPUT.ENABLE(2000);

  for cr in (select distinct(a.ckpt_scn)
               from system.logmnr_restart_ckpt$ a
              where a.ckpt_scn <= ascn and a.valid = 1
                and exists (select * from system.logmnr_log$ l
                                where a.ckpt_scn between l.first_change# and
l.next_change#)
              order by a.ckpt_scn desc)
  loop
    if (hScn = 0) then
       hScn := cr.ckpt_scn;
    else
       lScn := cr.ckpt_scn;
       exit;
    end if;
  end loop;

  if lScn = 0 then
    lScn := sScn;
  end if;

 dbms_output.put_line('Capture will restart from SCN ' || lScn ||' in the
following file:');
   for cr in (select name, first_time
                from DBA_REGISTERED_ARCHIVED_LOG
               where lScn between first_scn and next_scn order by thread#)
   loop
     dbms_output.put_line(cr.name||' ('||cr.first_time||')');
   end loop;
end;
/
```

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iii. *Display Capture Status Error Message*

```
set serveroutput on size 950000
set verify off
set feedback off
set lines 180
set pages 9999
prompt +============================================================+
prompt |Display Capture Status Error Message                        |
prompt +============================================================+

column capture_name        heading 'Capture|Process|Name' format A10
column status_change_time  heading 'Abort Time'
column error_number        heading 'Error Number' format 99999999
column error_message       heading 'Error Message' format A40 wrap

SELECT  capture_name, status_change_time  , error_number, error_message
 FROM     dba_capture
 WHERE  status='ABORTED'
  AND       capture_name = 'BRDB_CAPTURE' ;
```

iv. *This query will help to Display Information about the Reader Server for Each Apply Process*

```
column apply_name               heading 'Apply Process|Name' format A15
column apply_captured             heading 'Dequeues Captured|Messages?' format
A17
column process_name             heading 'Process|Name' format A7
column state                    heading 'State' format A17
column  total_messages_dequeued    heading  'Total  Messages|Dequeued'  format
99999999

SELECT r.apply_name,
       ap.apply_captured,
       substr(s.program,instr(s.program,'(')+1,4) process_name,
       r.state,
       r. total_messages_dequeued
  FROM v$streams_apply_reader r, v$session s, dba_apply ap
 WHERE r.sid = s.sid
   AND r.serial# = s.serial#
   AND r.apply_name = ap.apply_name;
```

v. *The following query displays the information about each transaction currently being applied for which the apply process has spilled messages:*

```
column apply_name        heading 'Apply Name' format A20
column 'Transaction ID'  heading 'Transaction ID' format A15
column first_scn         heading 'First SCN'   format 99999999
column message_count     heading 'Message Count' format 99999999

SELECT apply_name,
       xidusn ||'.'||
       xidslt ||'.'||
       xidsqn "Transaction ID",
       first_scn,
       message_count
  FROM dba_apply_spill_txn;
```

vi. *The following query displays information about the transactions received, applied, and being applied by the apply process:*

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```
column apply_name     heading 'Apply Process Name'        format A25
column total_received heading 'Total|Trans|Received'      format 99999999
column total_applied  heading 'Total|Trans|Applied'       format 99999999
column total_errors   heading 'Total|Apply|Errors'        format 9999
column being_applied  heading 'Total|Trans Being|Applied' format 99999999
column total_ignored  heading 'Total|Trans|Ignored'       format 99999999

  SELECT apply_name,
         total_received,
         total_applied,
         total_errors,
         (total_assigned  - (total_rollbacks + total_applied)) being_applied,
         total_ignored
    FROM v$streams_apply_coordinator;
```

5.6 SCC Transaction Correction Tools

5.6.1 BRDBX015 – Transaction Correction Tool

The transaction correction tool module BRDBX015.sh will allow Support Service Centre to correct transactions by inserting balancing records to transactional/accounting/stock tables in the BRDB system. It takes two parameters, the file name containing the insert statement and the branch code. If the process completes successfully, the insert statement is audited in BRDB_TXN_CORR_TOOL_JOURNAL. If there is an error, the entire transaction is rolled back and nothing is written to the database. The module uses process audit and does not use process control (allows multiple runs).

The file containing the insert statement must be copied to the /app/brdb/trans/support/brdbx015/input directory on the Linux box, and the module run from the directory /app/brdb/trans/support/brdbx015. If the module completes successfully, the file will be moved to /app/brdb/trans/support/brdbx015/output. A log file will be written to /bvnw01/brdb/brdbx015/log using the file name template <transaction_file>_<CCYYMMDDHHMISS>.log

This module can be run only by the Linux user “supporttooluser” which has only the necessary privileges required to run the module. The module will call a package procedure which runs under Oracle user ‘OPS$SUPPORTTOOLUSER’ which allows inserts only into selected tables. This is a powerful tool which has inherent risks and care must be taken when constructing the insert statement. The SQL statement must begin with an ‘INSERT INTO’ clause and can only insert one row into the corresponding transactional table. This is validated in the tool and will raise an error if the condition is not met.

The format of the SQL statement should be based on the templates supplied in Appendix C.

The following tables have been granted insert privileges to OPS$SUPPORTTOOLUSER:-

BRDB_RX_APS_TRANSACTIONS
BRDB_RX_BUREAU_TRANSACTIONS
BRDB_RX_CUT_OFF_SUMMARIES
BRDB_RX_DCS_TRANSACTIONS
BRDB_RX_EPOSS_EVENTS
BRDB_RX_EPOSS_TRANSACTIONS
BRDB_RX_NWB_TRANSACTIONS
BRDB_RX_REP_EVENT_DATA
BRDB_RX_REP_SESSION_DATA

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5.6.1.1 Parameters

The tool must be supplied with 2 parameters:

- Transaction File Name (not including path) e.g. t1.sql
- Branch Code (numeric) e.g. 8009

5.6.1.2 Scheduling

This task is scheduled on an ad hoc basis, as and when transaction corrections need to be applied.

5.6.1.3 Sample output

This is an example of the output written to standard output and the log file when the module is successful:

```
Wed 21-Oct-2009 14:35:08 Starting BRDBX015.sh
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: Debug message level for this program is 0
Wed 21-Oct-2009 14:35:08 BRDBX015.sh:
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: In check_parameters()
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: ORACLE_HOME = /u01/app/oracle/product/10.2.0/db_1
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: ORACLE_SID  = BRDB1
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: TRANS_FILE  = ./input/t1.sql
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: BRANCH_CODE = 9004
Wed 21-Oct-2009 14:35:08 BRDBX015.sh:
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: Script <BRDBX015.sh> started on Wed Oct 21 14:35:08 BST
2009
Wed 21-Oct-2009 14:35:08 BRDBX015.sh:
Wed 21-Oct-2009 14:35:08.750 Started PKG_BRDB_TXN_CORRECTION.LOAD_DATA
Wed 21-Oct-2009 14:35:08.750 Version information: $Logfile: /HNG-
X/035.CTR020[00.90]/BRDB/Database and Schema Build/PLSQL Objects/pkg_brdb_txn_correction_body.sql
$$Revision: 29 $
Wed 21-Oct-2009 14:35:08.750 This Feed does not use process control
Wed 21-Oct-2009 14:35:08.995 Number of rows inserted = 1
Wed 21-Oct-2009 14:35:09.011 Completed PKG_BRDB_TXN_CORRECTION.LOAD_DATA

PL/SQL procedure successfully completed.

Wed 21-Oct-2009 14:35:08 Return code is 0
Wed 21-Oct-2009 14:35:08 BRDBX015.sh:
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: BRDBX015.sh ran successfully
Wed 21-Oct-2009 14:35:08 exit 0
Wed 21-Oct-2009 14:35:08 BRDBX015.sh:
Wed 21-Oct-2009 14:35:08 BRDBX015.sh: Finished on Wed Oct 21 14:35:09 BST 2009
Wed 21-Oct-2009 14:35:08
```

5.6.1.4 Diagnostics

The module may fail for one of the following reasons

- May not be logged in as the SSC user.
- Transaction file containing SQL statement is not present in `/app/brdb/trans/support/brdbx015/input` directory.
- The Oracle directory name 'BRDBX015_DIR' must be mapped to physical directory `/app/brdb/trans/support/brdbx015/input`. Connect to the Linux box as user 'supporttooluser'. Login to SQL and run the following command:-

  ```
  SELECT owner, substr(directory_path,1,40) directory_path
  FROM   all_directories
  WHERE  directory_name = 'BRDBX015_DIR'
  /
  ```

  The above statement must return 1 row.

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- SQL statement does not begin with 'INSERT INTO' statement or contains more than one insert statement.
- The following in-line select statement has not been added to the end of the insert statement

```
(SELECT fhom.branch_accounting_code,
        fhom.fad_hash,
        tctc.current_jsn
FROM    ops$brdb.brdb_fad_hash_outlet_mapping fhom,
        ops$brdb.brdb_txn_corr_tool_ctl tctc
WHERE   fhom.branch_accounting_code = :bind_branch_code
AND     tctc.branch_accounting_code = fhom.branch_accounting_code) A;
```

- Check the insert statement for any syntax errors.

5.6.2 BRDB Clear Stock Unit Lock (clear_su_lock.sh)

This tool allows members of the SSC group to unlock stock units for any given branch accounting code, locking user and stock unit. Any attempt to run the tool will be audited as well as the actual changes made and running user. The SSC user must have been granted the SSC role within the BRDB database prior to running this tool.

Validation and processing occurs in an Oracle package (OPS$SUPPORTTOOLUSER.PKG_BRDB_CLEAR_SU_LOCK) while the package is initially called by a shell script (clear_su_lock.sh) on the BRDB server.

The script is located in /app/brdb/trans/support/brdbx015/clear_su_lock.sh

See DES/APP/LLD/0202 for more information.

5.6.2.1 Parameters

The tool must be supplied with 3 switches, each with a parameter:

Parameter	Parameter Name	Datatype	Example	Valid Input
-b	Branch Accounting Code	Number	999999	1 – 999999
-u	Lock Holder Username	STRING	USR123	A [1-15 chr]
-s	Stock Unit	STRING	DEF	0 - zzz

5.6.2.2 Executing

```
./clear_su_lock.sh -b <BRANCH_CODE> -u <LOCK_USER> -s <STOCK_UNIT>
```

5.6.2.3 Scheduling

This task is scheduled on an ad hoc basis, as and when stock units need to be unlocked.

5.6.2.4 Audit Records/Logging

Start and finish records are inserted into OPS$BRDB.BRDB_PROCESS_AUDIT with a process_name of 'BRDB_CLEAR_SU_LOCK'.

Each update to OPS$BRDB.BRDB_BRANCH_STOCK_UNITS is audited in OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL.

Any exceptions will be logged to OPS$BRDB.BRDB_OPERATIONAL_EXCEPTIONS with an exception code of 'BRDB_SU_LOCK' and process_name (package name) of 'PKG_BRDB_CLEAR_SU_LOCK'.

The script verbosity level is controlled by BRDB system parameter BRDB_CLEAR_SU_LOCK_DEBUG_LEVEL (parameter_number set to 1 initially), set parameter_number to 2 in order to view the SQL update statement as well as the XML string.

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Log files from each run are stored in /app/brdb/trans/support/brdbx015/log.

5.6.2.5 Sample output

This is an example of the output written to standard output and the log file when the module is successful:

```
01 Dec 14:54:10 writelock...: Starting
01 Dec 14:54:10 writelock...:    Lock file /tmp/clear_su_lock.run.lock created
01 Dec 14:54:10 writelock...: Complete.
01 Dec 14:54:10
01 Dec 14:54:10 check_env...: Starting
01 Dec 14:54:10 check_env...: Complete.
01 Dec 14:54:10
01 Dec 14:54:10 Main........: Environment OK
01 Dec 14:54:10
01 Dec 14:54:10 view_gvar...: Starting
01 Dec 14:54:10 view_gvar...:    WHOAMI.................  gseem01
01 Dec 14:54:10 view_gvar...:    PROGNAME...............  clear_su_lock.sh
01 Dec 14:54:10 view_gvar...:    SCRIPT.................  clear_su_lock
01 Dec 14:54:10 view_gvar...:    THISDIR................  /app/brdb/trans/support/brdbx015
01 Dec 14:54:10 view_gvar...:    LOG_FILE..............
/app/brdb/trans/support/brdbx015/log/clear_su_lock_20091201_145410.log
01 Dec 14:54:10 view_gvar...:    LOCK_FILE.............  /tmp/clear_su_lock.run.lock
01 Dec 14:54:10 view_gvar...:    TSTMP.................  20091201_145410
01 Dec 14:54:10 view_gvar...:    VERBOSE...............  ON
01 Dec 14:54:10 view_gvar...:    APP...................  BRDB
01 Dec 14:54:10 view_gvar...:    ORACLE_SID............  BRDBA1
01 Dec 14:54:10 view_gvar...:    BRANCH_CODE...........  2007
01 Dec 14:54:10 view_gvar...:    LOCK_USER.............  X
01 Dec 14:54:10 view_gvar...:    STOCK_UNIT............  DEF
01 Dec 14:54:10 view_gvar...: Complete.
01 Dec 14:54:10
01 Dec 14:54:10 unlock......: Starting
01 Dec 14:54:10
Enabling ssc role
Tue 01-Dec-2009 14:54:10.619 Set DEBUG LEVEL to 1
Tue 01-Dec-2009 14:54:10.619 Starting pkg_brdb_clear_su_lock.update_data
Tue 01-Dec-2009 14:54:10.619  Starting pkg_brdb_clear_su_lock.process_audit
Tue 01-Dec-2009 14:54:10.620  Completed pkg_brdb_clear_su_lock.process_audit
Tue 01-Dec-2009 14:54:10.620   INFO: Parameter p_branch_code = 2007
Tue 01-Dec-2009 14:54:10.620   INFO: Parameter p_rollover_lock_user = X
Tue 01-Dec-2009 14:54:10.620   INFO: Parameter p_stock_unit: DEF
Tue 01-Dec-2009 14:54:10.620 Starting pkg_brdb_clear_su_lock.validate_parameters
Tue 01-Dec-2009 14:54:10.621   INFO: Validating branch_accounting_code
Tue 01-Dec-2009 14:54:10.623   OK: Branch Accounting Code: 2007 is open and exists in
OPS$BRDB.BRDB_BRANCH_INFO
Tue 01-Dec-2009 14:54:10.623   OK: Branch Accounting Code: 2007 exists in
OPS$BRDB.BRDB_TXN_CORR_TOOL_CTL
Tue 01-Dec-2009 14:54:10.628   OK: Stock unit DEF is locked for branch accounting code 2007
Tue 01-Dec-2009 14:54:10.628   OK: Stock unit DEF is locked by X
Tue 01-Dec-2009 14:54:10.629   OK: OPS$SUPPORTTOOLUSER is allowed to update
BRDB_BRANCH_STOCK_UNITS
Tue 01-Dec-2009 14:54:10.629   OK: Input parameters validated successfully
Tue 01-Dec-2009 14:54:10.629 Completed pkg_brdb_clear_su_lock.validate_parameters
Tue 01-Dec-2009 14:54:10.629 Starting pkg_brdb_clear_su_lock.reset_lock
Tue 01-Dec-2009 14:54:10.629   OK: Derived FAD_HASH for branch accounting code 2007 is: 96
Tue 01-Dec-2009 14:54:10.629   OK: Updated 1 row in table OPS$BRDB.BRDB_BRANCH_STOCK_UNITS
Tue 01-Dec-2009 14:54:10.630 Completed pkg_brdb_clear_su_lock.update_data
Tue 01-Dec-2009 14:54:10.630 Starting pkg_brdb_clear_su_lock.audit_update
Tue 01-Dec-2009 14:54:10.630   INFO: BRDB INSTANCE NAME: BRDBA1
Tue 01-Dec-2009 14:54:10.630   INFO: UNIX USER: gseem01
Tue 01-Dec-2009 14:54:10.630   INFO: ORACLE USER: SUPPORTTOOLUSER
Tue 01-Dec-2009 14:54:10.630   INFO: CURRENT_JSN: 48 for branch accounting code 2007
Tue 01-Dec-2009 14:54:10.630   OK: Inserted 1 row into OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL
Tue 01-Dec-2009 14:54:10.630 Completed pkg_brdb_clear_su_lock.audit_update
Tue 01-Dec-2009 14:54:10.630  Starting pkg_brdb_clear_su_lock.process_audit
Tue 01-Dec-2009 14:54:10.631  Completed pkg_brdb_clear_su_lock.process_audit
Tue 01-Dec-2009 14:54:10.631 Completed pkg_brdb_clear_su_lock.update_data
01 Dec 14:54:10
01 Dec 14:54:10 unlock......: Complete
```

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```
01 Dec 14:54:10
01 Dec 14:54:10 Main........: Unlocked stock unit DEF for branch code 2007
01 Dec 14:54:10
01 Dec 14:54:10 cleanup.....: Cleaning up ...
01 Dec 14:54:10 cleanup.....:    Lock file /tmp/clear_su_lock.run.lock freed.
01 Dec 14:54:10
01 Dec 14:54:10 cleanup.....: _________________  Processing Complete  _________________
```

5.6.2.6 Diagnostics

The module may fail for one of the following reasons

- The SSC user may not be logged in with their SSC unix login.
- The SSC user's Oracle login may not have been granted the SSC role.
- One or more of the parameters are invalid

5.6.3 BRDB Clear Rollover Lock (clear_ro_lock.sh)

This tool allows members of the SSC group to clear branch rollover locks for any given branch accounting code and locking user. Any attempt to run the tool will be audited as well as the actual changes made and running user.

Validation and processing occurs in an Oracle package (OPS$SUPPORTTOOLUSER.PKG_BRDB_CLEAR_RO_LOCK) while the package is initially called by a shell script (clear_ro_lock.sh) on the BRDB server.

The script is located in /app/brdb/trans/support/brdbx015/clear_ro_lock.sh

See DES/APP/LLD/0203 for more information.

5.6.3.1 Parameters

The tool must be supplied with 2 switches, each with a parameter:

Parameter	Parameter Name	Script Variable Name	Datatype	Valid Input
-b	Branch Accounting Code	BRANCH_CODE	Number	1 – 999999
-u	Lock Holder Username	LOCK_USER	STRING	A [1-15 chr]

5.6.3.2 Executing

```
./clear_ro_lock.sh -b <BRANCH_CODE> -u <LOCK_USER>
```

5.6.3.3 Scheduling

This task is scheduled on an ad hoc basis, as and when branch rollover locks need to be unlocked.

5.6.3.4 Audit Records/Logging

Start and finish records are inserted into OPS$BRDB.BRDB_PROCESS_AUDIT with a process_name of 'BRDB_CLEAR_RO_LOCK'.

Each update to OPS$BRDB.BRDB_BRANCH_INFO is audited in OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL.

Any exceptions will be logged to OPS$BRDB.BRDB_OPERATIONAL_EXCEPTIONS with an exception code of 'BRDB_RO_LOCK' and process_name (package name) of 'PKG_BRDB_CLEAR_RO_LOCK'.

The script verbosity level is controlled by BRDB system parameter BRDB_CLEAR_RO_LOCK_DEBUG_LEVEL (parameter_number set to 1 initially), set parameter_number to 2 in order to view the SQL update statement as well as the XML string.

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Log files from each run are stored in /app/brdb/trans/support/brdbx015/log.

5.6.3.5 Sample output

This is an example of the output written to standard output and the log file when the module is successful:

```
03 Dec 15:06:55 writelock...: Starting
03 Dec 15:06:55 writelock...:    Lock file
/app/brdb/trans/support/brdbx015/log/clear_ro_lock.run.lock created
03 Dec 15:06:55 writelock...: Complete.
03 Dec 15:06:55
03 Dec 15:06:55 check_env...: Starting
03 Dec 15:06:55 check_env...: Complete.
03 Dec 15:06:55
03 Dec 15:06:55 Main........: Environment OK
03 Dec 15:06:55
03 Dec 15:06:55 view_gvar...: Starting
03 Dec 15:06:55 view_gvar...:    WHOAMI.............  gseem01
03 Dec 15:06:55 view_gvar...:    PROGNAME...........  clear_ro_lock.sh
03 Dec 15:06:55 view_gvar...:    SCRIPT.............  clear_ro_lock
03 Dec 15:06:55 view_gvar...:    THISDIR............  /app/brdb/trans/support/brdbx015
03 Dec 15:06:55 view_gvar...:    LOG_FILE...........
/app/brdb/trans/support/brdbx015/log/clear_ro_lock_20091203_150655.log
03 Dec 15:06:55 view_gvar...:    LOCK_FILE..........
/app/brdb/trans/support/brdbx015/log/clear_ro_lock.run.lock
03 Dec 15:06:55 view_gvar...:    TMP_FILE...........
/app/brdb/trans/support/brdbx015/log/clear_ro_lock.tmp
03 Dec 15:06:55 view_gvar...:    TSTMP..............  20091203_150655
03 Dec 15:06:55 view_gvar...:    VERBOSE............  ON
03 Dec 15:06:55 view_gvar...:    APP................  BRDB
03 Dec 15:06:55 view_gvar...:    ORACLE_SID.........  BRDBA1
03 Dec 15:06:55 view_gvar...:    BRANCH_CODE........  2007
03 Dec 15:06:55 view_gvar...:    LOCK_USER..........  X
03 Dec 15:06:55 view_gvar...: Complete.
03 Dec 15:06:55
03 Dec 15:06:55 unlock......: Starting
03 Dec 15:06:55
Enabling ssc role
Thu 03-Dec-2009 15:06:55.541 Set DEBUG LEVEL to 1
Thu 03-Dec-2009 15:06:55.541 Starting BRDB_CLEAR_RO_LOCK.update_data
Thu 03-Dec-2009 15:06:55.541  Starting BRDB_CLEAR_RO_LOCK.process_audit
Thu 03-Dec-2009 15:06:55.542  Completed BRDB_CLEAR_RO_LOCK.process_audit
Thu 03-Dec-2009 15:06:55.542   INFO: Parameter p_bac = 2007
Thu 03-Dec-2009 15:06:55.542   INFO: Parameter p_rollover_lock_user = X
Thu 03-Dec-2009 15:06:55.542 Starting BRDB_CLEAR_RO_LOCK.validate_parameters
Thu 03-Dec-2009 15:06:55.542   INFO: Validating branch_accounting_code
Thu 03-Dec-2009 15:06:55.546   OK: Branch Accounting Code: 2007 is open and exists in
OPS$BRDB.BRDB_BRANCH_INFO
Thu 03-Dec-2009 15:06:55.547   OK: Branch Accounting Code: 2007 exists in
OPS$BRDB.BRDB_TXN_CORR_TOOL_CTL
Thu 03-Dec-2009 15:06:55.549   OK: Branch Accounting Code 2007 is locked
Thu 03-Dec-2009 15:06:55.549   OK: Lock on Branch Accounting Code 2007 is locked by X
Thu 03-Dec-2009 15:06:55.549   OK: OPS$SUPPORTTOOLUSER is allowed to update BRDB_BRANCH_INFO
Thu 03-Dec-2009 15:06:55.549   OK: Input parameters validated successfully
Thu 03-Dec-2009 15:06:55.549 Completed BRDB_CLEAR_RO_LOCK.validate_parameters
Thu 03-Dec-2009 15:06:55.549 Starting BRDB_CLEAR_RO_LOCK.reset_lock
Thu 03-Dec-2009 15:06:55.549   OK: Derived FAD_HASH for Branch Accounting Code 2007 is: 96
Thu 03-Dec-2009 15:06:55.552   OK: Updated 1 row in table OPS$BRDB.BRDB_BRANCH_INFO
Thu 03-Dec-2009 15:06:55.552 Completed BRDB_CLEAR_RO_LOCK.update_data
Thu 03-Dec-2009 15:06:55.552 Starting BRDB_CLEAR_RO_LOCK.audit_update
Thu 03-Dec-2009 15:06:55.563   INFO: BRDB INSTANCE NAME: BRDBA1
Thu 03-Dec-2009 15:06:55.563   INFO: UNIX USER: gseem01
Thu 03-Dec-2009 15:06:55.563   INFO: ORACLE USER: SUPPORTTOOLUSER
Thu 03-Dec-2009 15:06:55.563   INFO: CURRENT_JSN: 67 for branch accounting code 2007
Thu 03-Dec-2009 15:06:55.564   OK: Inserted 1 row into OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL
Thu 03-Dec-2009 15:06:55.564 Completed BRDB_CLEAR_RO_LOCK.audit_update
Thu 03-Dec-2009 15:06:55.564  Starting BRDB_CLEAR_RO_LOCK.process_audit
Thu 03-Dec-2009 15:06:55.564  Completed BRDB_CLEAR_RO_LOCK.process_audit
Thu 03-Dec-2009 15:06:55.564 Completed BRDB_CLEAR_RO_LOCK.update_data
03 Dec 15:06:55
```

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```
03 Dec 15:06:55 unlock......: Complete
03 Dec 15:06:55
03 Dec 15:06:55 Main........: Unlocked branch rollover for branch code 2007
03 Dec 15:06:55
03 Dec 15:06:55 cleanup.....: Cleaning up ...
03 Dec 15:06:55 cleanup.....:    Lock file
/app/brdb/trans/support/brdbx015/log/clear_ro_lock.run.lock freed.
03 Dec 15:06:55
03 Dec 15:06:55 cleanup.....: _________________  Processing Complete  _________________
```

5.6.3.6 Diagnostics

The module may fail for one of the following reasons

- The SSC user may not be logged in with their SSC unix login.
- The SSC user's Oracle login may not have been granted the SSC role.
- One or more of the parameters are invalid

5.6.4 BRDB Update Outstanding Recovery Transaction Tool (upd_rvy_txn.sh)

This tool allows members of the SSC group to mark outstanding recovery transactions as processed in table OPS$BRDB.BRDB_RX_RECOVERY_TRANSACTIONS for any given branch accounting code, node ID, transaction start date and unique sequence number (USN). Any attempt to run the tool will be audited as well as the actual changes made and running user.

Validation and processing occurs in an Oracle package (OPS$SUPPORTTOOLUSER.PKG_BRDB_UPD_RVY_TXN) while the package is initially called by a shell script (upd_rvy_txn.sh) on the BRDB server.

The script is located in /app/brdb/trans/support/brdbx015/upd_rvy_txn.sh

See DES/APP/LLD/0203 for more information.

5.6.4.1 Parameters

The tool must be supplied with 4 switches, each with a parameter:

Parameter	Parameter Name	Script Variable Name	Datatype	Valid Input/Format
-b	Branch Accounting Code	BRANCH_CODE	NUMBER	1-999999
-n	Node ID	NODE_ID	NUMBER	1-99
-t	Transaction Start Date	TXN_STRT_DATE	STRING	DD/MM/YYYY
-u	Unique Sequence Number	SEQ_NUM	NUMBER	> 0

5.6.4.2 Executing

```
./upd_rvy_txn.sh -b <BRANCH_CODE> -n <NODE_ID> -t <DD/MM/YYYY> -u <SEQ_NUM>
```

5.6.4.3 Scheduling

This task is scheduled on an ad hoc basis, as and when recovery transactions need to be marked as processed.

5.6.4.4 Audit Records/Logging

Start and finish records are inserted into OPS$BRDB.BRDB_PROCESS_AUDIT with a process_name of 'BRDB_UPD_RVY_TXN'.

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Each update to OPS$BRDB.BRDB_RX_RECOVERY_TRANSACTIONS is audited in OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL.

Any exceptions will be logged to OPS$BRDB.BRDB_OPERATIONAL_EXCEPTIONS with an exception code of 'UPD_RVY_TXN' and process_name (package name) of 'PKG_BRDB_UPD_RVY_TXN'.

The script verbosity level is controlled by BRDB system parameter BRDB_UPD_RVY_TXN_DEBUG_LEVEL (parameter_number set to 1 initially), set parameter_number to 2 in order to view the SQL update statement as well as the XML string.

Log files from each run are stored in /app/brdb/trans/support/brdbx015/log.

5.6.4.5 Sample output

This is an example of the output written to standard output and the log file when the module is successful:

```
02 Dec 14:30:44 writelock...: Starting
02 Dec 14:30:44 writelock...:    Lock file /tmp/upd_rvy_txn.run.lock created
02 Dec 14:30:44 writelock...: Complete.
02 Dec 14:30:44
02 Dec 14:30:44 check_env...: Starting
02 Dec 14:30:44 check_env...: Complete.
02 Dec 14:30:44
02 Dec 14:30:44 Main........: Environment OK
02 Dec 14:30:44
02 Dec 14:30:44 view_gvar...: Starting
02 Dec 14:30:44 view_gvar...:    WHOAMI.............  gseem01
02 Dec 14:30:44 view_gvar...:    PROGNAME...........  upd_rvy_txn.sh
02 Dec 14:30:44 view_gvar...:    SCRIPT.............  upd_rvy_txn
02 Dec 14:30:44 view_gvar...:    THISDIR............  /app/brdb/trans/support/brdbx015
02 Dec 14:30:44 view_gvar...:    LOG_FILE...........
/app/brdb/trans/support/brdbx015/log/upd_rvy_txn_20091202_143044.log
02 Dec 14:30:44 view_gvar...:    LOCK_FILE..........  /tmp/upd_rvy_txn.run.lock
02 Dec 14:30:44 view_gvar...:    TSTMP..............  20091202_143044
02 Dec 14:30:44 view_gvar...:    VERBOSE............  ON
02 Dec 14:30:44 view_gvar...:    APP................  BRDB
02 Dec 14:30:44 view_gvar...:    ORACLE_SID.........  BRDBA1
02 Dec 14:30:44 view_gvar...:    BRANCH_CODE........  2007
02 Dec 14:30:44 view_gvar...:    NODE_ID............  1
02 Dec 14:30:44 view_gvar...:    TXN_STRT_DATE......  06/10/2009
02 Dec 14:30:44 view_gvar...:    USN................  123
02 Dec 14:30:44 view_gvar...: Complete.
02 Dec 14:30:44
02 Dec 14:30:44 unlock......: Starting
02 Dec 14:30:44
Enabling ssc role
Wed 02-Dec-2009 14:30:44.809 Set DEBUG LEVEL to 1
Wed 02-Dec-2009 14:30:44.809 Starting pkg_brdb_upd_rvy_txn.update_data
Wed 02-Dec-2009 14:30:44.809  Starting pkg_brdb_clear_su_lock.process_audit
Wed 02-Dec-2009 14:30:44.810  Completed pkg_brdb_clear_su_lock.process_audit
Wed 02-Dec-2009 14:30:44.810   INFO: Parameter p_bac = 2007
Wed 02-Dec-2009 14:30:44.810   INFO: Parameter p_node_id = 1
Wed 02-Dec-2009 14:30:44.810   INFO: Parameter p_txn_strt_date: 06-OCT-2009
Wed 02-Dec-2009 14:30:44.810   INFO: Parameter p_usn: 123
Wed 02-Dec-2009 14:30:44.810 Starting pkg_brdb_upd_rvy_txn.validate_parameters
Wed 02-Dec-2009 14:30:44.810   INFO: Validating branch_accounting_code
Wed 02-Dec-2009 14:30:44.812   OK: Branch Accounting Code: 2007 is open and exists in
OPS$BRDB.BRDB_BRANCH_INFO
Wed 02-Dec-2009 14:30:44.813   OK: Branch Accounting Code: 2007 exists in
OPS$BRDB.BRDB_TXN_CORR_TOOL_CTL
Wed 02-Dec-2009 14:30:44.813   OK: USN 123 is outstanding for branch accounting code 2007
Wed 02-Dec-2009 14:30:44.813   OK: OPS$SUPPORTTOOLUSER is allowed to update
BRDB_RX_RECOVERY_TRANSACTIONS
Wed 02-Dec-2009 14:30:44.813   OK: Input parameters validated successfully
Wed 02-Dec-2009 14:30:44.813 Completed pkg_brdb_upd_rvy_txn.validate_parameters
Wed 02-Dec-2009 14:30:44.813 Starting pkg_brdb_upd_rvy_txn.reset_outstanding
Wed 02-Dec-2009 14:30:44.813   OK: Derived FAD_HASH for branch accounting code 2007 is: 96
Wed 02-Dec-2009 14:30:44.814   OK: Updated 1 row in table OPS$BRDB.BRDB_RX_RECOVERY_TRANSACTIONS
Wed 02-Dec-2009 14:30:44.814 Completed pkg_brdb_rvy_txn.update_data
```

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```
Wed 02-Dec-2009 14:30:44.814 Starting pkg_brdb_clear_su_lock.audit_update
Wed 02-Dec-2009 14:30:44.814   INFO: BRDB INSTANCE NAME: BRDBA1
Wed 02-Dec-2009 14:30:44.814   INFO: UNIX USER: gseem01
Wed 02-Dec-2009 14:30:44.814   INFO: ORACLE USER: SUPPORTTOOLUSER
Wed 02-Dec-2009 14:30:44.814   INFO: CURRENT_JSN: 54 for branch accounting code 2007
Wed 02-Dec-2009 14:30:44.815   OK: Inserted 1 row into OPS$BRDB.BRDB_TXN_CORR_TOOL_JOURNAL
Wed 02-Dec-2009 14:30:44.815 Completed pkg_brdb_clear_su_lock.audit_update
Wed 02-Dec-2009 14:30:44.815  Starting pkg_brdb_clear_su_lock.process_audit
Wed 02-Dec-2009 14:30:44.815  Completed pkg_brdb_clear_su_lock.process_audit
Wed 02-Dec-2009 14:30:44.815 Completed pkg_brdb_clear_su_lock.update_data
02 Dec 14:30:44
02 Dec 14:30:44 unlock......: Complete
02 Dec 14:30:44
02 Dec 14:30:44 Main........: Unlocked stock unit  for branch code 2007
02 Dec 14:30:44
02 Dec 14:30:44 cleanup.....: Cleaning up ...
02 Dec 14:30:44 cleanup.....:    Lock file /tmp/upd_rvy_txn.run.lock freed.
02 Dec 14:30:44
02 Dec 14:30:44 cleanup.....: _________________  Processing Complete  _________________
```

5.6.1.6 Diagnostics

The module may fail for one of the following reasons

- The SSC user may not be logged in with their SSC unix login.
- The SSC user's Oracle login may not have been granted the SSC role.
- One or more of the parameters are invalid

5.7 BRDB Software Updates/Installation

If a total service outage is possible due to the application of software to BRDB (whether that software is an Oracle patch, proprietary code for BRDB, etc.) then the following should be observed:

- Ensure the delivery handover notes clearly state a system outage is required
- CS should communicate the date/time of the planned service outage to POL (and hence the branches)
- Access to the BRDB database should be controlled by disabling/re-enabling access via the ACE.
- The OSR instances may need to be restarted if there are changes that have a direct impact on the OSRs (for example a change to BAL SQL statements)

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6 Appendix A – Standby Database

The build of and theory surrounding the BRDB Standby database (SBRDB) is detailed extensively in the Standby Database Low Level Design [DES/APP/LLD/0152]. This section details the failover procedures in changing the role of a database, in our case BRDB or SBRDB. The method described in sections 6.1 and 6.2, is known as *complete failover* and must be executed as described in order to ensure no data loss.

It is very important to note – as detailed in the Branch Database High Level Design [DES/APP/HLD/0020] – that the changing of roles of the Standby to Primary is utterly *irreversible*! The term "switchover", which is a temporary role change is *not* supported. Section 6.3.1 therefore, details the temporary opening of the Standby Database for read-only purposes.

Without the broker, you perform role transitions by first determining if a role transition is necessary and then issuing a series of SQL statements (as described later in this section). After failover to a physical standby database, the original primary database must be re-enabled to act as a standby database for the new primary database.

Note: The procedure described in section 6.1 is the recommended course of action. Section 6.2 has been provided for, in the event that the Data Guard Broker is unavailable.

6.1 Oracle Data Guard Broker (DGMGRL) Failover

The broker simplifies failovers by allowing you to invoke them using a single command in the DGMGRL command-line interface, e.g. a manual failover. The method described in this manual procedure is known as complete failover and must be executed as described in order to ensure no data loss.

Step	Description	Server Execution
Assumptions	i. User is logged onto the Standby Database Server as ***oracle***. ii. After determining that there is no possibility of recovering the primary database in a timely manner, ensure that the primary database is shut down (if not already) and then begin the failover operation.	

1.	Logon to DGMGRL command-line interface.
	
	<sys password> is always required as this is a "sysdba" connection. This will connect you via the Data Guard Broker to the Standby Database.
		`$> . oraenv`
		
		[now type in SBRDB1]
		
		`$> dgmgrl`
		`DGMGRL> CONNECT sys/<sys password>`

2.	On the target standby database, issue the FAILOVER command to invoke a complete failover, specifying the name of the standby database that you want to change into the primary role.	`DGMGRL> FAILOVER TO 'SBRDB';`

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How the Broker Performs a Complete Failover Operation Once you start a complete failover, the broker: i. Checks to see if the primary database is still available and, if so, issues a warning message asking whether you want to continue with the failover operation. ii. Verifies that the target standby database is enabled. If the database is not enabled, you will not be able to perform a failover to this database. The broker shuts down all RAC instances except the apply instance assuming they are up. This is unlikely in Branch Standby Database as only one node is configured to be active at any one time. iii. Waits for the target standby database to finish applying any remaining archived redo logs before stopping Redo Apply or SQL Apply. iv. Transitions the target standby database into the primary database role by opening the new primary database SBRDB, in read/write mode.		

3.	Issue the SHOW CONFIGURATION command to verify the failover.	`DGMGRL> SHOW CONFIGURATION;`
		
		You should see …
		
		`Configuration`
		`  Name:  BRDB_DATAGUARD_CFG`
		`  Enabled:  YES`
		`  Protection Mode:  MaxPerformance`
		`  Fast-Start Failover: DISABLED`
		`  Databases:`
		`  BRDB - Physical standby database (disabled)`
		`  SBRDB - Primary database`
		
		`Current status for "BRDB_DATAGUARD_CFG":`
		`SUCCESS`

4.	Issue the SHOW DATABASE command to see that the former (failed) primary database was disabled by the broker as a consequence of the failover. Remember, it must be re-enabled.	`DGMGRL> SHOW DATABASE 'BRDB';` *You should see "*`Enabled: NO`*" and a message returned, similar to "*`Current status for "BRDB": Error: ORA-16661: the standby database needs to be reinstated`*".*

5.	Check that all the indexes – database wide – are available for use.
	
	If any indexes are marked as 'UNUSABLE' they need to be rebuilt. See example to the right of this cell.
		`SQL> SELECT owner, index_name`
		`  FROM dba_indexes`
		`  WHERE status = 'UNUSABLE';`
		
		`SQL> ALTER INDEX <OWNER>.<index> REBUILD ONLINE [ PARALLEL <# CPU's> ];`

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6a.	Depending on the timing of the failover to Standby, there is a possibility that the BladeFrame may not have the full complement of four pBlades configured and started for the Standby cluster. If not already done, add the 3 additional pBlades into the BladeFrame: - 1. Physically "plug" the pBlades into the frame. 2. Configure and start the pServers. 3. Once you're able to log on as ***oracle***, bring up the remaining database instances starting with SBRDB2, e.g. `srvctl start instance -d SBRDB -i SBRDB2`

6b.	The following SBRDB database initialisation parameters need to be checked and if not correct, need to be set correctly after the Standby database (SBRDB) has been successfully transitioned from Standby to it's new role as Primary.
	
	This information can be double-checked by comparing the initialisation parameters from Primary with those of Standby. The comparison can be done against pfiles generated from both nodes. Follow Step [6b.] to accomplish this.
	
	The following parameters should be checked and the values shown below should be reflected in SBRDB for all new instances. This is done by executing a statement of the form "`ALTER SYSTEM SET <parameter>=<value> SCOPE=<scope> SID='*';`".
	
	Parameter / Future Value / Likely Current Value
	`audit_trail` — `DB` — `NONE`
	`cluster_database_instances` — `4` — `1`
	`control_file_record_keep_time` — `21` — *NULL*
	`instance_number` — `1-4` — <See action 1 below>
	`instance_name` — *NULL* — <See action 2 below>
	`local_listener` — `LISTENER_<node>` — <See action 3 below>
	`log_archive_dest_3` — *NULL* — `'LOCATION=/archredo/<DB> OPTIONAL'`
	`log_archive_dest_state_3` — *NULL* — `'ENABLE'`
	`sessions` — `2205` — `610`
	`thread` — `1-4` — <See action 4 below>
	
	[1] An "`ALTER SYSTEM … SID='SBRDB2'`" statement required on ***each*** instance, e.g. `instance_number=2` for node 2, `3` for node 3, et cetera.
	
	[2] An "`ALTER SYSTEM … SID='SBRDB2'`" statement required on ***each*** instance, e.g. `instance_name='SBRDB2'` for node 2, `'SBRDB3'` for node 3, et cetera.
	
	[3] An "`ALTER SYSTEM … SID='SBRDB2'`" statement required on ***each*** instance, e.g. `local_listener='LISTENER_<node002>'` for node 2, '`LISTENER_<node003>'` for node 3, etc.
	
	[4] An "`ALTER SYSTEM … SID='SBRDB2'`" statement required on ***each*** instance, e.g. `thread=2` for node 2, `3` for node 3, et cetera.

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6c.	Create a text file "copy" of the current spfile (server parameter file) on both the Primary (BRDB) and the Standby SBRDB nodes.
	
	Copy the files to a location where they can be compared and compare them either by using the UNIX diff command or a Windows compare tool, e.g.
		`. oraenv`
		
		[Now type BRDB1 (on node1)]
		
		`sqlplus '/as sysdba'`
		
		`SQL> CREATE PFILE='<some_dir>/pfile<DATABASE>.ora' FROM SPFILE;`
		
		[Now do the same for SBRDB on the Standby node.]
		
		`diff pfileBRDB.ora pfileSBRDB.ora`

7.	After failover, the "new" Primary database cluster (lprpbds001 - 4) and database, SBRDB, must accept connections from all applications without changing any application connection properties. Therefore, in order to accomplish this, a new database service must be created for BRDB.
	
	On the ***first*** node: -
	
	The service should already be enabled, so all that needs to be done is to start the service.
	
	If starting the service is unsuccessful for some reason, then try enabling the service.
	
	Once again, after enabling the service, try starting the service again.
	
	With the service having been correctly created, check the CRS status to see the state of the services as well as the listener control utility.
		Syntax
		`srvctl add service -d <db_unique_name> -s <service_name> -r <preferred_list>`
		
		Command
		`srvctl add service -d SBRDB -s BRDB -r SBRDB1,SBRDB2,SBRDB3,SBRDB4`
		
		`srvctl start service -d SBRDB -s BRDB`
		
		`srvctl enable service -d SBRDB -s BRDB`
		
		[A.] `crs_stat -t`
		
		[B.] `lsnrctl status listener_lprpbds001`

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The correct output seen, should be similar to the following: -

[A.]

```
Name           Type           Target    State     Host
------------------------------------------------------------
ora....DB1.srv application    ONLINE    ONLINE    lprpbds001
ora....DB2.srv application    ONLINE    ONLINE    lprpbds002
ora....DB3.srv application    ONLINE    ONLINE    lprpbds003
ora....DB4.srv application    ONLINE    ONLINE    lprpbds004
ora....BRDB.cs application    ONLINE    ONLINE    lprpbds001
```

[B.]

```
LSNRCTL for Linux: Version 10.2.0.4.0 - Production on ...
Copyright (c) 1991, 2007, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=lprpbds001-
vip)(PORT=1529)(IP=FIRST)))
STATUS of the LISTENER
------------------------
Alias                     LISTENER_LPRPBDS001
Version                   TNSLSNR for Linux: Version 10.2.0.4.0 - Production
Services Summary
…
Service "BRDB" has 1 instance(s).
  Instance "SBRDB1", status READY, has 1 handler(s) for this service
…
```

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8.	The Primary database cluster (lprpbdb001 – 4) after failover will be the former Standby database cluster (lprpbds001 - 4), so as a result of the BRDB failover to the BDS cluster, it will be necessary to re-configure DNS to seamlessly make this change, thereby allowing all applications that reference the Primary database cluster to instead reference the Standby database cluster.
	
	In order to accomplish this, the following should be followed: -
	
	[1.] Update ACD001 to change the PBDB00X-VIP alias to point to associated BDS servers, e.g. (lprpbds001 - 4)
	
	[2.] Flush DNS cache on all Linux DNS servers (DNP and DNS)
	
	`/usr/sbin/rndc flush`
	
	[3.] Clear the DNS cache on all servers that address BDB on VIP alias
	
	`/usr/sbin/nscd --invalidate=hosts`
	
	[4.] Once the DNS switch is complete perform a set of 'ping' sanity checks to ensure that client applications (DAT, BAL/OSR, etc) are referencing the "new" Primary server IP addresses.
	
	[5.] In addition to [4.] above, perform a quick test to ensure that one is connecting to the correct database and that the newly created service (Step 7. above) is accepting connections.
	
	`sqlplus lvbaluser1/<lvbaluser1 password>@BRDB`
	
	[6.] To allow TWS to access and run schedules on the new Primary nodes: -
	
	Update `TWS.cpu` to point AGBRDB[1234] to PBDS00[1234]
	Update DNS to point PBDB00[1234] to LPRPBDS00[1234]
	
	WARNING
	Any subsequent DNS deliveries may reset the IP addresses back to the original BRDB1..4 servers. It may be necessary to raise an OCP along with a DNS delivery to set the IP addresses back to the fail-over servers.	

9.	WARNING On the new Primary server, e.g. the BDS Cluster (***on each node, e.g. 1 – 4***), the cron jobs which run on these nodes in the absence of any TWS schedules need to be stopped. Edit the crontab. Once the crontab has loaded (output should reflect schedule shown below). Use ***`vi`*** commands to add a "**#**" in front of every line where one does not exist. Then save and quit the file.	As the ***`oracle`*** user … `$> crontab -e`

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	`# HouseKeeping`
	`0 6  * * *  /app_sw/brdb/sh/HousekeepWrapper.sh SBRDB > cron.sbrdb.out 2>&1`
	`5 6  * * *  /app_sw/brdb/sh/HousekeepWrapper.sh +ASM  > cron.asm.out   2>&1`
	`#`
	`# RMANBackup`
	`#0 4  * * Sun /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 0 > cron.rb.sun.out 2>&1`
	`#0 4  * * Mon /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 1 > cron.rb.mon.out 2>&1`
	`#0 4  * * Tue /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 1 > cron.rb.tue.out 2>&1`
	`#0 4  * * Wed /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 0 > cron.rb.wed.out 2>&1`
	`#0 4  * * Thu /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 1 > cron.rb.thu.out 2>&1`
	`#0 4  * * Fri /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 1 > cron.rb.fri.out 2>&1`
	`#0 4  * * Sat /app_sw/brdb/sh/RMANBackupWrapper.sh SBRDB 1 > cron.rb.sat.out 2>&1`
	`#`

10.	To maintain a viable disaster-recovery solution in the event of another disaster you must reinstate the original primary database to act as a standby database in the new configuration. This can be accomplished by following the notes in Section 6.3, as one must re-create the primary database from a copy of the new primary database.
	Manual *Complete* Failover through **DGMGRL** is complete.

Table 3: Data Guard Failover Procedure.

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6.2 SQL*Plus Failover

Perform role transitions by first determining if a role transition is necessary and then issuing the following series of SQL statements. The method described in this procedure is also known as complete failover and must be executed as described in order to ensure no data loss.

Step	Description	Server Execution
Assumptions	i. User is logged onto the Standby Database Server as ***oracle***. ii. After determining that there is no possibility of recovering the primary database in a timely manner, ensure that the primary database is shut down (if not already) and any other standby database instances that may be started, then begin the failover operation.	

1.	Logon to SQL*Plus command-line interface as SYSDBA, but first set the correct Oracle SID.
	
	This will connect you to the Standby Database.
	
	Double-check that you are on the right instance, noting in particular the values for *instance_name*, *host_name* and *status*.
		`$> . oraenv`
		
		[now type in SBRDB1]
		
		`$> sqlplus '/as sysdba'`
		
		`SQL> SELECT * FROM v$instance;`

2.	Initiate the failover by issuing the following. *Note: Include the **FORCE** keyword to ensure that the RFS processes on the standby database will fail over without waiting for the network connections to time out through normal TCP timeout processing before shutting down.*	`SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE FINISH FORCE;`
3.	Convert the physical standby database to the production role. *Note: Don't get confused by the word "switchover" as this command is part of a complete manual primary failover and not a role switch as may be interpreted by this word.*	`SQL> ALTER DATABASE COMMIT TO SWITCHOVER TO PRIMARY;`

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4a.	Open the new production (primary) database by issuing the following statement.	`SQL> ALTER DATABASE OPEN;`

4b.	Only complete the following if the condition below is met! ***Otherwise do not.*** This can be verified by checking for this value. Run the following SQL to do so.
	
	Condition:
	If the physical standby database has been opened in read-only mode since the last time it was started, shut down the standby database (now primary database) and restart it.
		`SQL> SELECT value`
		`  FROM v$dataguard_stats`
		`  WHERE name = 'standby has been open';`
		
		`SQL> SHUTDOWN IMMEDIATE;`
		`SQL> STARTUP;`

5.	Check that all the indexes – database wide – are available for use.	See Step [5.] of Section 6.1
6.	The database initialisation parameters need to be checked and if not correct, need to be set correctly after the Standby database has been successfully transitioned from Standby to it's new role as Primary.	See Step [6.] of Section 6.1
7.	After failover, the "new" Primary database cluster (lprpbds001 - 4) and database, SBRDB, must accept connections from all applications without changing any application connection properties. Therefore, in order to accomplish this, [i.] a new database service must be created for BRDB and [ii.] the DNS settings for both servers need to be reconfigured.	See Steps [7.] and [8.] of Section 6.1
8.	To maintain a viable disaster-recovery solution in the event of another disaster you must reinstate the original primary database to act as a standby database in the new configuration. This can be accomplished by following the original Standby Database deployment handover notes as one must re-create the primary database from a copy of the new primary database.	
	Manual *Complete* Failover through **SQL*Plus** is complete.	

Table 4: SQL*Plus Failover Procedure.

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6.3 Standby Database Re-instantiation

As explained and demonstrated in the preceding sections of this chapter, the original primary database, namely BRDB, would have now failed over to the standby database, namely SBRDB. Therefore in order to ensure a viable and highly available configuration once again, the old primary must be re-instated as the new standby.

The database is setup correctly. All that is required is getting a duplicate of the new primary database back onto the server in order to start the new standby in managed recovery mode. This is that process.

Step	Description	Server Execution
Assumptions	i. User is logged onto the Standby Database Server as ***oracle***. ii. This procedure is only applicable after having completed a failover of Primary (BRDB) to Standby (SBRDB) as detailed in sections 5.1 and 5.3. iii. Only one node should be used as the new standby database node.	

1.	New Prim Server
	
	Backup the new primary (SBRDB) database using RMAN. Ensure there is sufficient space on the device you specify as <RMAN DIR>.
	
	Logon to RMAN.
	
	Execute the backup commands as they appear, e.g. `run { … }`
	
	Exit RMAN and change directory to the <RMAN DIR> and make sure the backup is as you expect. This can be confirmed by listing the backup in RMAN, e.g. `list backup summary;`
		`$> . oraenv`
		
		[now type in SBRDB1]
		
		`$> $ORACLE_HOME/bin/rman NOCATALOG TARGET /`
		
		`RMAN> run`
		`{`
		` backup`
		`  current controlfile`
		`  for standby`
		`  format '<RMAN DIR>/%d_%U';`
		` backup`
		`  format '<RMAN DIR>/%d_%U'`
		`  database;`
		` backup`
		`  format '<RMAN DIR>/%d_%U'`
		`  archivelog all`
		`  not backed up 1 times;`
		`}`
		
		`$> cd <RMAN DIR>`
		`$> ls -l`

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2.	New Prim Server Ensure the entire backup, which will consist of a number of files is copied across from this server to the new standby server. **Note:** The backup must exist in the same location on both servers!	`$> scp <RMAN DIR>/* pbdb001<RMAN DIR>`

3.	Old Prim Server (node 1)
	
	Cleanup the old archive directory as it would be full of files that are no longer needed. Type `YES`, if prompted.
	
	Note: The "rm -r" is extremely destructive! Make sure you're on the correct server and that BRDB most definitely has been failed over.
		`$> . oraenv`
		
		[now type in +ASM1]
		
		`$> asmcmd -p`
		
		`ASMCMD [+] > cd BRDB_FLASH/arch`
		
		`ASMCMD [+BRDB_FLASH/arch] > rm -r brdb*.arc`

4.	Old Prim Server (node 1)
	
	Set the environment for the new standby database.
	
	Log onto RMAN and execute the restore of the new primary as the new standby.
	
	Ensure there are no errors in this restore. Otherwise, fix the errors and run again.
		`$> . oraenv`
		
		[now type in BRDB1]
		
		`$> $ORACLE_HOME/bin/rman TARGET=sys/<SYS_PASSWD>@sbrdb AUXILIARY /`
		
		`RMAN> duplicate target database for standby;`

5.	Old Prim Server (node 1) The standby database ***should already be mounted***, but if not, mount the new standby database.	`SQL> ALTER DATABASE MOUNT STANDBY DATABASE;`

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6.	Old Prim Server (node 1)
	
	Start the standby database in managed recovery mode.
	
	This must have completed successfully. To check that it has, query `v$dataguard_status`.
	
	Also, check that the application of logs is performing well, query `v$dataguard_stats`.
		`SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE USING CURRENT LOGFILE DISCONNECT FROM SESSION PARALLEL 8;`
		
		`SQL> SELECT * FROM v$dataguard_status ORDER BY message_num DESC;`
		
		`SQL> SELECT * FROM v$dataguard_stats;`

7.	New Prim Server Ensure that the tnsnames.ora has an entry for the new primary.	`$> cd /app_sw/sbrdb/standby` `$> SBRDB_edit_tnsnames.sh -v -s lprpbds001`

8.	**Note:** The following files should already be available and configured correctly from the previous installation of the old Primary database. If for whatever reason, they are not, configure accordingly: -
	`$ORACLE_HOME/dbs/orapwBRDB`
	`$ORACLE_HOME/network/admin/tnsnames.ora`
	`$ORACLE_HOME/network/admin/listener.ora`
	`/u02/oradata/BRDB/spfileBRDB.ora`
	`/u02/oradata/BRDB/dr1BRDB.dat`
	`/u02/oradata/BRDB/dr2BRDB.dat`	

	Manual re-instantiation of Standby Database Complete.	

Table 5: Primary Re-instatiation Procedure.

6.3.1 Tripwire Configuration

The Tripwire targeting on the EMS platform needs to be edited to:

- Comment out the BDB platforms
- Uncomment the BDS platforms

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6.4 Opening Standby Database "READ ONLY"

As explained earlier, the changing of roles of the Standby to Primary is irreversible, so in a scenario where, for whatever reason, the Standby database needs to be read to check data available only in an "OPEN" state then the steps in the following table will apply.

There is a (an extremely critical) caveat to performing this operation. This operation opens the SBRDB database in "READ ONLY" mode. Oracle Data Guard is aware that this operation would have taken place and keeps a record of each time this is done. It is important to note that performing this operation changes the way the database is recovered if it ever becomes Primary. This is noted by the step detailed in [4b.] of Section 6.2.

Step	Description	Server Execution
Assumptions	i. User is logged onto the Standby Database Server as ***oracle***. ii. The application of archivelogs/redo on the Standby Database will be cancelled and will therefore fall behind Primary for the period the database is in a "READ ONLY" state and that the relevant authority to perform this task has been sought, being completely aware of the consequences detailed above. Recommendation: Open a second terminal session to the Standby Server and `"tail -f"` the SBRDB alert log.	

1.	Logon to the database as SYSDBA.
	
	Check that the standby database is applying logs at good rate, i.e. ensure that the lag isn't too great.
		`$> . oraenv`
		
		[now type in SBRDB1]
		
		`$> sqlplus '/as sysdba'`
		`SQL> set lines 140`
		`SQL> set pages 45`
		`SQL> col value for a20`
		`SQL> select * from v$dataguard_stats;`

2.	Cancel the real-time apply of archivelogs to standby. The alert log will show the following error which can safely be ignored: - `"ORA-16037: user requested cancel of managed recovery operation"`	`SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE CANCEL;`
3.	Open the Standby database in "READ ONLY" mode. The database is now open for any "SELECT" queries that may be run against it.	`SQL> ALTER DATABASE OPEN READ ONLY;`

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4.	After having queried the information required, shutdown the database once again.	`SQL> SHUTDOWN IMMEDIATE;`
4a.	At this point it is possible that you may experience symptoms of the following bugs for Oracle 10.2.0.4: - 6737051 - 7677840 (base bug is 6737051) - 8533262 (base bug is 7677840) The ORA-00600 messages (see 4b. below) in the alert log can be ignored at this point, as at the time of the authoring of this document (June 2009) a fix for these bugs has not yet been released. In addition continuing with step 5. below does not reveal any additional "ORA-" errors and real-time apply continues as expected without hiccups.	`SQL> SHUTDOWN IMMEDIATE;`

4b.	The following are the messages you may see in the alert log: -
	
	`ORA-00600: internal error code, arguments: [kjcvg04], [], [], [], [], [], [], []`
	
	`ORA-00600: internal error code, arguments: [kjr_pool_free_all:resp], [0x0B4E44B98], [0x0BF73B138], [0x0BF73B138], [0], [8], [], []`	

5.	Bring the Standby database back up into a "MOUNTED" state.
	
	The Data Guard broker should take over at this point and start the real-time apply automatically. To check that this has indeed taken place, check that the following is evident in the alert log: -
	`"Completed: ALTER DATABASE RECOVER MANAGED STANDBY DATABASE THROUGH ALL SWITCHOVER DISCONNECT USING CURRENT LOGFILE"`
	
	Double-check that the database is correctly applying as expected. Using the dataguard broker check the status of the configuration. You should see: -
	`Current status for "BRDB_DATAGUARD_CFG": SUCCESS`
		`SQL> CONNECT /as sysdba`
		`SQL> STARTUP NOMOUNT`
		`SQL> ALTER DATABASE MOUNT STANDBY DATABASE;`
		
		`$> dgmgrl`
		`DGMGRL> connect /`
		`DGMGRL> show configuration;`

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6.	If the above checks are inconclusive, start the real-time apply by manually. Check the alert log that messages similar to the following are being successfully logged: - "Media Recovery Log +SBRDB_FLASH/arch/brdb_000…"	SQL> ALTER DATABASE RECOVER MANAGED STANDBY DATABASE USING CURRENT LOGFILE DISCONNECT FROM SESSION PARALLEL 8;
	Manual opening of Standby in *READ ONLY* mode is complete.	

Table 6: Opening Standby Database Read-only

6.5 Standby Cluster – Software Installation

The Standby Database BladeFrame has been configured (for the first release) to make use of a single active pServer and 3 inactive (i.e. 1 pBlade plugged in and active with the remaining pBlades utilized elsewhere). This setup effectively makes the cluster run as single-node RAC cluster, but at the point where a failover is required, the remaining pBlades are activated allowing the cluster the full compliment of nodes.

Having this configuration is sufficient for running in an environment where there is no need for software updates. However, the likelihood of there needing to be software installations, UNIX patches, database software upgrades, database patches, etc. is high.

Therefore the following describes a possible means of accomplishing a software update across all standby nodes in order to keep them functionally in sync with ***lprpbds001*** (node 1).

There are two possibilities, both of which will require a period of downtime, so ideally this would be after working hours each day or on the weekend. The first, "Alternative A", will allow the software update to be accomplished fairly quickly but renders the primary cluster without throughput, which may be considered a problem if batch schedules run at the same time. The second possibility will be accomplished a lot slower, but leaves the primary cluster with the ability to carry most of the operational workload.

Both possibilities are in essence the same set of steps, just executed in differing combinations of pBlades.

Alternative	Implementation Description
NOTE These alternatives are presented at a high level and the level of detail required, is beyond the scope of this document. The steps mentioned below will need to be coordinated by more than one team; At first glance, those teams would likely be UNIX Support, DBA Support and cooperation from Tivoli/Schedule Support (SMC).	

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Alternative A.	Primary Cluster i. SMC: Give the go-ahead that all schedules are held for the affected node(s) ii. DBA: Using Grid Control, initiate a blackout of all components on the affected nodes, e.g. agents, listeners, database instances, etc. iii. UNIX: Using the BladeFrame PAN Manager, shutdown the pServers which correspond to nodes 2, 3 and 4, e.g. *lprpbdb002 - 004* Standby Cluster iv. UNIX: Using the BladeFrame PAN Manager, startup (logically switch) the pServers which correspond to nodes 2, 3 and 4, e.g. *lprpbds002 – 004* v. DBA/UNIX/3rd Party: Perform the required change, installation, patch, etc. Once the required changes are complete, reverse the process of implementation and restore the pBlades to their original BladeFrame, thereby returning the Primary Cluster to it's former, fully operational state, including all Grid Control blackouts and notification to SMC. There must be no unresolved Grid Control alerts or exceptions in BRDB_OPERATIONAL_EXCEPTIONS at the end of this process. Finally, if the "End of Day" process is not, for whatever reason, going to be run by the time all nodes will be required, then one needs to use the process defined in Section 0.1.1.1 to logically bring the nodes/instances back into operation.
Alternative B	No viable alternatives have currently been agreed upon.

Table 7: Alternatives for Managing Software Installations on BDS nodes.

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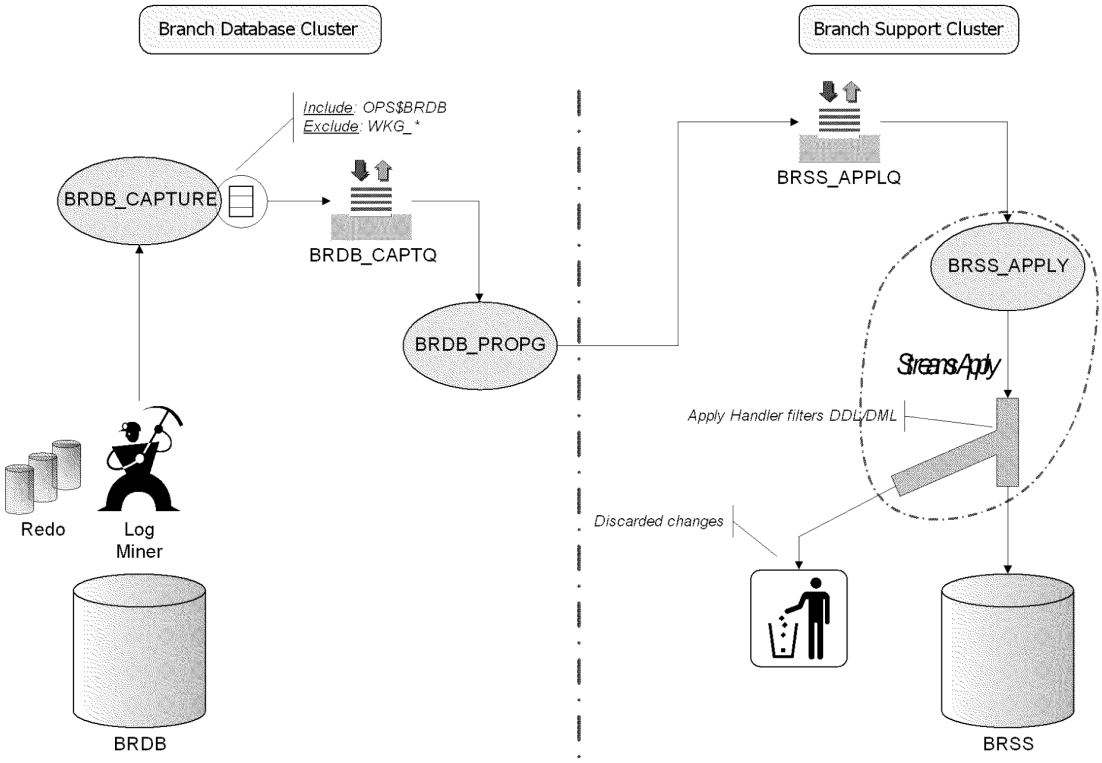
7 Appendix B – Branch Support

The Branch Support Database is a database used in supporting the main BRDB application by providing access to all data found in the main database but without having access to it. The means by which the data is replicated from BRDB to BRSS is via Oracle Streams. Oracle Streams is inherently complex and therefore has multiple facets to consider when supporting it day-to-day and troubleshooting any problems that arise.

The following procedures detail the rather destructive process of cleaning out all the Streams queue tables, queues, rules and configuration and then re-creating it. This is ***extremely destructive and cannot be recovered*** without restoring both the Branch Database and the Support Database, unless this is an intended action (see Section 7.1.2).



7.1 Cleanup and Re-instantiation of Oracle Streams

7.1.1 Assumptions

Oracle Streams, as mentioned before, is an extremely effective replication technology but is rather complex. The cleaning up of streams is an action of ***last resort***! Therefore you must have exhausted every other means of resolution before attempting the steps in the following procedure.

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7.1.2 Cleanup and Re-instantiation Procedure

The procedure …

Step	Description	Server Execution
	Assumptions User is logged on as ***oracle***, on both the BRDB and BRSS servers, i.e. 2 sessions. Sections and Scenarios *Steps 1 – 3 Pre-build Section:* *This section is related to a scenario where BRDB has been built to phase x and a period of 12 hours or more occurs, such that the partitions are moved forward out-of-sync with BRSS. BRSS will also need to be built to phase x, but with the correct dates.* *Steps 4 – 11 Main:* *This section is related to general cleanup and re-creation of the Streams configuration and associated objects.* *Step/Section A:* *Specific cleanup scenario related to **Step 5b**.* *Step/Section B:* *Streams recovery section with resolution of the following scenarios:-* *Scenario 1 - BDB has "moved on" in terms of partition management and BRS has fallen behind. There will be a number of partitions that exist in BDB for a particular table, but not in BRS. As a result data inserted into that table will fail in BRS as the required partition is missing.* *Section 7.2.4:* *Scenario 2 - Scenario 1 is a confirmed case and required archivelogs, i.e. any single archivelog or a number of, or all archivelogs created after `required_checkpoint_scn` are permanently missing and hence Streams cannot recover.* *Scenario 3 - It has been determined that Streams has fallen behind to an unacceptable level and a decision has been made to re-instantiate the Streams configuration.*	

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1.	BDB: Login into the database (as oracle) Run the following SQL. Find the oldest partition date which exists in the output as "MIN_PARTS". In this example it is "20080803"	. oraenv [now type in BRDB1] sqlplus '/as sysdba' SET lines 120 SET pages 45 SELECT table_name, MIN(SUBSTR(partition_name,LENGTH(partition_name)-7,9)) min_parts, MAX(SUBSTR(partition_name,LENGTH(partition_name)-7,9)) max_parts, COUNT(SUBSTR(partition_name,LENGTH(partition_name)-7,9)) count_parts FROM all_tab_partitions WHERE table_owner = 'OPS$BRDB' AND composite = 'YES' GROUP BY table_name ORDER BY table_name; TABLE_NAME MIN_PARTS MAX_PARTS COUNT_PARTS ---------- --------- --------- ----------- BRDB_DAILY_CUMULATIVE_SUMMARY 20080803 20080927 56 BRDB_DAILY_SUMMARY 20080927 20080927 1 … BRDB_RX_REP_EVENT_DATA 20080923 20080927 5 BRDB_RX_REP_SESSION_DATA 20080803 20080927 56 BRDB_TX_TRANSACTION_TOTALS 20080923 20080927 5
2.	BRS: Now continue with the build instructions as described in the software handover note, but using the oldest partition date from (1.) as the input.	BRSSSchemaBuild.sh -p 20080803

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3.	BRS: Using "BRSS Start of Day" BRSSC001, roll the database forward to the present day, i.e. the same date known to be configured for BRDB. This is most likely the greatest value of the "MAX_PARTS" column from the output shown in (1.). In this example it is "20080927". ***Note: BRDB and BRSS should now both be in sync.***	TABLE_NAME MIN_PARTS MAX_PARTS COUNT_PARTS ---------- --------- --------- ----------- BRDB_DAILY_CUMULATIVE_SUMMARY 20080803 20080927 56 BRDB_DAILY_SUMMARY 20080927 20080927 1 … … BRDB_RX_REP_EVENT_DATA 20080923 20080927 5 BRDB_RX_REP_SESSION_DATA 20080803 20080927 56 BRDB_TX_TRANSACTION_TOTALS 20080923 20080927 5
4a.	BRS: If at this point, Streams exists and you're unable to continue with [4b.], skip to [5a.].	Skip to [5a.]
4b.	BRS: Now continue with the build instructions as described in the handover note and run the BRSS Streams installation.	From /app_sw/brss/build/streams … run … brdbStreams.sh -a BRSS -d +BRSS_FLASH -s <Streams Tablespace Size>

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5a.	BDB:
	
	As in [4b.] complete the configuration of streams on BRDB. However, if Streams has already been configured, then the old components need to be removed first.
		. oraenv
		[now type BRDB1]
		
		sqlplus stradmin/<stradmin_password>
		[at the "SQL>" prompt, run the following]
		
		SELECT propagation_name FROM dba_propagation;
		[BRDB_PROPG should be returned]
		
		exec dbms_propagation_adm.drop_propagation('BRDB_PROPG');
		exec dbms_streams_adm.remove_streams_configuration;
		
		col object_name for a40
		SELECT object_name, object_type FROM user_objects WHERE object_name like '%BRDB%';
		
		[If any queue tables exist, remove them by running the following]
		exec dbms_aqadm.drop_queue_table(queue_table => 'STRADMIN.BRDB_CAPT_QUEUE_TABLE', force => TRUE);
		
		[Then run this again]
		exec dbms_streams_adm.remove_streams_configuration;
		SELECT object_name, object_type FROM user_objects WHERE object_name like '%BRDB%';
		
		[Then repeat the process … if any queue tables exist, remove them. However, if any other objects exist, then follow [5b.] and the Oracle Metalink Note: 356323.1]

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5b.	BDB: ***Oracle Metalink Note 356323.1*** → [*Shown in item **"A"** at the end of this procedure.*]	Oracle Metalink Note: 356323.1 leads to --> OM Note: 203225.1 which explains more on the symptoms and how to resolve issues for 10g (else OM Note: 236898.1 for 9.2).
5c.	BDB: Continue with the cleanup, e.g. drop the STRADMIN user and then drop the old tablespace.	[Now logout and log back in as ***sysdba***] DROP USER stradmin CASCADE; DROP TABLESPACE brdb_streams_data INCLUDING CONTENTS AND DATAFILES;
5d.	BRS: At this point [4b.] needs to be complete before continuing. Once complete, continue with [5e.]	Complete [4b.]
5e.	BDB: Once the cleanup is 100% complete. Run the BRDB Streams installation.	From /app_sw/brdb/build/streams/ … run … brdbStreams.sh -a BRDB -d +BRDB_FLASH -s <Streams Tablespace Size>
6.	BDB: Check that Streams was successfully installed.	… su back to oracle … . oraenv [now type BRDB1] sqlplus stradmin/<stradmin_password> [at the "SQL>" prompt, run the following] SELECT SYSDATE FROM dual@BRSS; [If you don't see the system time, the installation failed. Retry.]

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7.	BDB: Activate the Streams configuration.	From /app_sw/brdb/build/streams/ … run … streams_start.sh
8.	BDB: Check that Streams has activated. STATUS should be "ENABLED" Continue to Step 9 …	sqlplus '/as sysdba' SELECT capture_name, queue_name, status, logminer_id, error_number, error message FROM dba_capture
	The following steps (Steps 9 – 11), are required to "install" releases of Streams which were delivered subsequent to the original build. These releases were made in order that capture and apply processes perform better as well as introduce additional DML and DDL filters.	
9.	BRS: Execute the following DML in order to "reset" the patch release data. This will enable the re-running of the required database patch, BRSSPatch0035.sh, in order to install the change. One should only see ***7 rows deleted.*** As ***oracle*** execute the script …	DELETE FROM OPS$BRSS.patch_release_management WHERE patch_name = 'BRSSPatch0035.sh' AND patch_step IN (2,4,20,21,22,23,24,25,26); -- Commit when you're ready --COMMIT; BRSSPatch0035.sh -v -i BRSS1 -s OPS\$BRSS

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10.	BRS:
	
	Execute the following DML. The patch, BRSSPatch0029.sh will install the change.
	
	One should only see ***14 rows deleted.***
	
	As ***oracle*** execute the script …
	
	After the patch is complete, execute the following SQL. One should see ***a count of 45***.
		DELETE
		  FROM OPS$BRSS.patch_release_management
		 WHERE patch_name = 'BRSSPatch0029.sh';
		
		-- Commit when you're ready
		--COMMIT;
		
		BRSSPatch0029.sh -v -i BRSS1 -s OPS\$BRSS
		
		SELECT COUNT(1)
		  FROM dba_apply_dml_handlers
		 WHERE object_owner = 'OPS$BRDB';

11.	BRS:
	
	Execute the following DML. The patch, BRSSPatch0037.sh will install the change.
	
	As ***oracle*** execute the script …
	
	After the patch is complete, execute the following SQL. One should see ***a count of 27***.
		DELETE
		  FROM OPS$BRSS.patch_release_management
		 WHERE patch_name = 'BRSSPatch0037.sh';
		
		-- Commit when you're ready
		--COMMIT;
		
		BRSSPatch0037.sh -v -i BRSS1 -s OPS\$BRSS
		
		SELECT COUNT(1)
		  FROM dba_apply_dml_handlers
		 WHERE object_owner = 'OPS$BRDB'
		  AND assemble_lobs = 'Y';

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12.	BDB: Execute the following DML. The patch, BRDBPatch0208.sh will install the change. One should only see 5 ***rows deleted*** As ***oracle*** execute the script …	DELETE FROM OPS$BRDB.patch_release_management WHERE patch_name = 'BRDBPatch0208.sh'; -- Commit when you're ready --COMMIT; BRDBPatch0208.sh -v -i BRDB1 -s OPS\$BRDB

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A.	Following Metalink Note: 203225.1, here is an example of the sequence of commands used in a previous resolution to a streams-cleanup problem: - SQL> col OBJECT_NAME format a30 SQL> SELECT object_name, object_type FROM user_objects WHERE object_name like '%BRDB%'; OBJECT_NAME OBJECT_TYPE ------------------------------ ------------- AQ$_BRDB_CAPT_QUEUE_TABLE_C TABLE AQ$_BRDB_CAPT_QUEUE_TABLE_Y INDEX SQL> ALTER SESSION SET EVENTS '10851 trace name context forever, level 2'; Session altered. SQL> drop table AQ$_BRDB_CAPT_QUEUE_TABLE_C cascade constraints; Table dropped. SQL> SELECT object_name, object_type FROM user_objects WHERE object_name like '%BRDB%'; no rows selected SQL> select object_name, object_type from dba_objects where owner = 'STRADMIN'; OBJECT_NAME OBJECT_TYPE ------------------------------ --------------- BRSS DATABASE LINK SQL> exit

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B.	Item B is a section of this document which deals with a few scenarios of Streams Failure and Recovery.	

B1.	BDB and BRS:
	
	The OPS$BRDB schema on both BDB and BRS are not the same, in terms of structure, for whatever reason and need to be synchronised. ***With the assumption that historical data and partitions are not required***.
	
	Repeat all steps until there are no structural differences. When Streams is re-activated there can be no differences which will cause data to error on insertion to BRS.
		Export the OPS$BRDB schema on both databases:
		`exp system@brdb OWNER=ops\$brdb FILE=<BRDB Export>.dmp LOG=<BRDB Export>.log ROWS=N BUFFER=10485760 COMPRESS=N GRANTS=N STATISTICS=NONE`
		
		`exp system@brss OWNER=ops\$brdb FILE=<BRSS Export>.dmp LOG=<BRSS Export>.log ROWS=N BUFFER=10485760 COMPRESS=N GRANTS=N STATISTICS=NONE`
		
		Create two users, e.g. BDB_COMP and BRS_COMP, on some other temporary database where it is safe to perform an investigation. Then import the OPS$BRDB schema exports into the new schemas:
		`imp system@brdb FILE=<BRDB Export>.dmp LOG=<BRDB_COMP Import>.log FROMUSER=OPS\$BRDB TOUSER=BDB_COMP BUFFER=10485760 IGNORE=Y`
		
		`imp system@brss FILE=<BRSS Export>.dmp LOG=<BRSS_COMP Import>.log FROMUSER=OPS\$BRDB TOUSER=BRS_COMP BUFFER=10485760 IGNORE=Y`
		
		Now perform an investigation/comparison of both schemas. Produce a script to run, in order to synchronise OPS$BRDB on BRSS with that of BRDB.

B2.	BDB and BRS: Again, ***with the assumption that historical data and partitions are not required***, complete Steps [5a.] to [5e.]	`Complete Steps [5a.], [5b.], [5c.], [5d.] and [5e.]`

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B3.	BRS: The schemas should structurally now be the same. WARNING!!! DATA LOSS WILL OCCUR DURING THIS STEP. If the current failure of Streams was caused by the schedules not being run and you're sure that cleaning out partition and schedule related data won't be a problem, then continue… Clean out all metadata related to the partitions in OPS$BRDB, stored in the OPS$BRSS schema, and correctly populate the metadata, including setting the business date to SYSDATE. The relevant metadata tables are shown below. Check them to see how the scripts affect the metadata.	su - brss From /app_sw/brss/build/schema/ … run … pt_cleanup.sh BRSS Query the tables below …

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	These tables include amongst others: - BRSS_OPERATIONAL_EXCEPTIONS: This shows the exceptions that may have occurred. BRSS_PARTITION_CREATES: Shows partitions created and when. Order by table_name, partition_range_value. BRSS_PARTITION_STATUS_HISTORY: Shows the history of partition maintenance. Order by table_name, partition_name. BRSS_SUBPARTITION_RANGES: Shows the range upper bound required at next run. Relevant column is range_value.	
B4.	BRS: Now, envoke the Start of Day process to create the required partitions for "today" and "tomorrow", correctly updating all partition metadata. Check the metadata tables again, ensuring the metadata is as you expect it to be.	su - brss From /app_sw/brss/build/schema/ … run … ptcatchup.sh BRSS
B5.	BDB: WARNING!!! DATA LOSS WILL OCCUR DURING THIS STEP. If and only if you're sure that there is a major problem with the schedules or there is no other way around the cleanup of partition metadata, then do the same to BDB as in [B3.].	!!! THIS STEP SHOULD NEVER BE RUN IN LIVE !!! su - brdb From /app_sw/brdb/build/schema/ … run … pt_cleanup.sh BRDB

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B6.	BDB: Do the same for BDB as in [B4.].	!!! THIS STEP SHOULD NEVER BE RUN IN LIVE !!! su - brdb From /app_sw/brdb/build/schema/ … run … ptcatchup.sh BRDB
B7.	BDB: Complete steps [6.] and [7.].	Complete Steps [6.] and [7.]
	All done. **Note**: There may be errors detected on the application of Streams data on the "apply" queue [DBA_APPLY_ERRORS], due to the mismatch of data and partitions. A very good example is the fact that a DELETE may occur on BDB, but the DML fails because the associated row does not exist on BRS. These are acceptable errors. However, similar errors may occur due to a mismatch of partitions. This is not acceptable and must be rectified. See Section 5.5.4.4 for additional information on working with and resolving these errors.	

Table 8: BRSS Support Procedure

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7.2 Managing Streams Lag

7.2.1 Context and Assumptions

Oracle Streams is in essence, a set of components which capture changes at a source database, propagate those changes and then apply them on a target database. Oracle Streams, in most cases, manages the capture-propagate-apply flow of changes fairly well, provided the flow of changes is applied in good time.

Oracle Streams attempts to manage the flow of changes by putting the capture process into a state of "flow control" or by getting the apply process to "spill" changes to disk and in most cases this ends up to be a combination of both.

Flow control, simply means that the capture process stops capturing and put into a "paused" state until the message which caused the pause is either applied or is spilled.

Problems with the rate that the changes are applied comes to bear if transaction sizes are: -

i. Too large, i.e. greater than 500,000 records.
ii. Last too long, i.e. longer than 5 minutes.

In these cases, the apply process will spill the LCRs (Logical Change Records) to disk, and will continue to do so for that entire transaction, however long that might take. In addition the apply server (an apply sub-process) that begins the spill and apply will have to complete it before any of the other processes may continue – at great cost.

The assumptions for the rest of this section are therefore that the Streams process has had to either spill transactions or is in a continual state of "PAUSED FOR FLOW CONTROL", or both. In addition the apply process has reached a period of unacceptable lag (see Section 7.2.2) and a decision has been made to re-instantiate Streams.

This re-instantiation is assumed to save all data and the only part of the solution being recreated is Streams and it's constituent components.

7.2.2 Lag Evaluation and Escalation

There are a number of factors to consider when deciding whether or not to re-instantiate Streams. The escalation procedures will need to be followed in the first instance and a decision can be made, considering the facts and reasons for the lag.

Our recommendation is that at the following periods the appropriate action is performed, bearing in mind that as the solution matures, the responses might change or even the periods at which escalation/investigation begins, might change: -

Lag Period	Action
4 hrs.	DBA Support notified in order to understand the transactions responsible and continue to monitor apply progress.
8 hrs.	DBA Support notified. Are the original problems reoccurring? Is it the same or a similar transaction?
12 hrs	DBA Support notified. Are the original problems reoccurring? 4th-Line Support notified of the cause and progress.

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16 – 20 hrs.	DBA Support notified. Are the original problems reoccurring?

24 hrs.	DBA Support notified.
	4th-Line Support notified.
	Appropriate business owner notified.
	At this point, there are ***x*** number of days (currently 4) which remain in which to continue the investigation or to put in place a fix and prepare for Streams re-instantiation, should the decision be made to do so.
	Note that ***x is defined as the lowest number of days for data retention of any table on BRDB.*** The following query shows the result:
	`SELECT MIN(retention_period)`
	`  FROM brdb_archived_tables`
	`  WHERE retention_period <> 0`
	`  AND additional_criteria IS NULL;`

48 hrs.	Re-evaluate the situation and prepare for re-instantiation providing all the approvals have been received.

7.2.3 Lag Assessment and Action Procedure

Step	Description	Server Execution
Assumptions User is logged onto the respective Database Server(s) as ***oracle*** and into the database as SYSDBA.		
1.	**BDB** After logging on to the database as SYSDBA. Use Section 5.5.4.1 to check the state of the ***capture process***. For a concise capture summary use Query [i.] of Section 5.5.4.5. For capture errors use Query [iii.] of the same section. For capture latency with mining the logs then run [A.] below. For capture latency with enqueuing messages then run [B.] below. For capture memory usage then run [C.] below. For long running transactions (greater than 10 mins), run [D.] below. Ignore the capture of a particular transaction by following Step 4.	

	[A] Likely to change with every transaction …
	`COLUMN CAPTURE_NAME HEADING 'Capture|Process|Name' FORMAT A12`
	`COLUMN LATENCY_SECONDS HEADING 'Latency|in|Seconds' FORMAT 999999`
	`COLUMN LAST_STATUS HEADING 'Seconds Since|Last Status' FORMAT 999999`
	`COLUMN CAPTURE_TIME HEADING 'Current|Process|Time'`
	`COLUMN CREATE_TIME HEADING 'Message|Creation Time' FORMAT 999999`
	`SELECT`	

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```
  CAPTURE_NAME,
  ((SYSDATE - CAPTURE_MESSAGE_CREATE_TIME)*86400) LATENCY_SECONDS,
  ((SYSDATE - CAPTURE_TIME)*86400) LAST_STATUS,
  TO_CHAR(CAPTURE_TIME, 'HH24:MI:SS MM/DD/YY') CAPTURE_TIME,
  TO_CHAR(CAPTURE_MESSAGE_CREATE_TIME, 'HH24:MI:SS MM/DD/YY') CREATE_TIME
 FROM V$STREAMS_CAPTURE;
```

[B]

```
COLUMN CAPTURE_NAME HEADING 'Capture|Process|Name' FORMAT A12
COLUMN LATENCY_SECONDS HEADING 'Latency|in|Seconds' FORMAT 999999
COLUMN CREATE_TIME HEADING 'Message Creation|Time' FORMAT A20
COLUMN ENQUEUE_TIME HEADING 'Enqueue Time' FORMAT A20
COLUMN ENQUEUE_MESSAGE_NUMBER HEADING 'Message|Number' FORMAT 999999999999
SELECT
  CAPTURE_NAME,
  (ENQUEUE_TIME-ENQUEUE_MESSAGE_CREATE_TIME)*86400 LATENCY_SECONDS,
  TO_CHAR(ENQUEUE_MESSAGE_CREATE_TIME, 'HH24:MI:SS MM/DD/YY') CREATE_TIME,
  TO_CHAR(ENQUEUE_TIME, 'HH24:MI:SS MM/DD/YY') ENQUEUE_TIME,
  ENQUEUE_MESSAGE_NUMBER
 FROM V$STREAMS_CAPTURE;
```

[C]

```
set pages 100
col "capture Process" for a25
col "capture Name" for a25
SELECT
  p.spid Spid,
  'C00'||c.capture#||' '||UPPER(lp.ROLE) "Capture Process",
  c.capture_name "Capture Name",
  p.pga_used_mem "PGA Memory Used",
  p.pga_alloc_mem "PGA Memory Allocated",
  p.pga_max_mem "PGA Maximum Memory"
 FROM v$streams_capture c, v$logmnr_process lp, v$session s, v$process P
WHERE c.logminer_id = lp.session_id
  AND lp.ROLE IN ('reader','preparer','builder')
  AND lp.SID = s.SID
  AND lp.serial# = s.serial#
  AND s.paddr = P.addr
UNION
SELECT p.spid,
  'C00'||c.capture#||' Coordinator',
  c.capture_name,
  p.pga_used_mem,
  p.pga_alloc_mem,
  p.pga_max_mem
 FROM v$streams_capture c, v$session s, v$process P
WHERE c.SID = s.SID
  AND c.serial# = s.serial#
  AND s.paddr = P.addr
ORDER BY 6,5;
```

[D]

```
col runlength HEAD 'Txns Open|Minutes' format 9999.99
col sid HEAD 'Session' format a13
col xid HEAD 'Transaction|ID' format a18
col terminal HEAD 'Terminal' format a10
col program HEAD 'Program' format a27 wrap
SELECT t.inst_id,
       sid || ',' || serial# sid,
       xidusn || '.' || xidslot || '.' || xidsqn xid,
       (SYSDATE - start_date) * 1440 runlength,
       terminal,
       program
```

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```
 FROM gv$transaction t, gv$session s
WHERE t.addr = s.taddr AND (SYSDATE - start_date) * 1440 > 10;
```

2. **BDB**

Use Section 5.5.4.2 to check the state of the ***propagation process***.

For latency in propagation of new messages then run [E.] below.

[E]

```
PROMPT Maximum Wait Time to Propagate a New Message Latency
COLUMN START_DATE HEADING 'Start Date'
COLUMN PROPAGATION_WINDOW HEADING 'Duration|in Seconds' FORMAT 99999
COLUMN NEXT_TIME HEADING 'Next|Time' FORMAT A8
COLUMN LATENCY HEADING 'Latency|in Seconds' FORMAT 99999
COLUMN SCHEDULE_DISABLED HEADING 'Status' FORMAT A8
COLUMN PROCESS_NAME HEADING 'Process' FORMAT A8
COLUMN FAILURES HEADING 'Number of|Failures' FORMAT 99

SELECT
  DISTINCT TO_CHAR(s.START_DATE, 'HH24:MI:SS MM/DD/YY') START_DATE,
  s.PROPAGATION_WINDOW,
  s.NEXT_TIME,
  s.LATENCY,
  DECODE(s.SCHEDULE_DISABLED,
       'Y', 'Disabled',
       'N', 'Enabled') SCHEDULE_DISABLED,
  s.PROCESS_NAME,
  s.FAILURES
 FROM DBA_QUEUE_SCHEDULES s, DBA_PROPAGATION p
WHERE p.PROPAGATION_NAME = 'BRDB_PROPG'
  AND p.DESTINATION_DBLINK = s.DESTINATION
  AND s.SCHEMA = p.SOURCE_QUEUE_OWNER
  AND s.QNAME = p.SOURCE_QUEUE_NAME;
```

3. **BRS**

Use Section 5.5.4.3 to check the state of the ***apply process***.

For Apply dequeuing info use Query [iv.] of Section 5.5.4.5.

For tracking the applying of transactions use Query [v.] of Section 5.5.4.5. And Use [vi.] for more detail of a particular transaction.

For latency from capture to dequeue at the apply, then run [F.] below.

For latency from capture to actual message apply, then run [G.] below.

For a better idea of the types and number of apply errors occurring, run [H.] below.

[F]

```
COLUMN APPLY_NAME HEADING 'Apply Process|Name' FORMAT A17
COLUMN LATENCY HEADING 'Latency|in|Seconds' FORMAT 9999
COLUMN CREATION HEADING 'Message Creation' FORMAT A17
COLUMN LAST_DEQUEUE HEADING 'Last Dequeue Time' FORMAT A20
COLUMN DEQUEUED_MESSAGE_NUMBER HEADING 'Dequeued|Message Number' FORMAT
999999999999
SELECT
  APPLY_NAME,
  (DEQUEUE_TIME-DEQUEUED_MESSAGE_CREATE_TIME)*86400 LATENCY,
  TO_CHAR(DEQUEUED_MESSAGE_CREATE_TIME,'HH24:MI:SS MM/DD/YY') CREATION,
  TO_CHAR(DEQUEUE_TIME,'HH24:MI:SS MM/DD/YY') LAST_DEQUEUE,
  DEQUEUED_MESSAGE_NUMBER
FROM V$STREAMS_APPLY_READER;
```

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[G]

```
COLUMN APPLY_NAME HEADING 'Apply Process|Name' FORMAT A17
COLUMN 'Latency in Seconds' FORMAT 999999
COLUMN 'Message Creation' FORMAT A17
COLUMN 'Apply Time' FORMAT A17
COLUMN APPLIED_MESSAGE_NUMBER HEADING 'Applied|Message|Number' FORMAT 999999
SELECT
  apply_name,
  (apply_time - applied_message_create_time)*86400 "Latency in Seconds",
  TO_CHAR(applied_message_create_time,'HH24:MI:SS MM/DD/YY')"Message Creation",
  TO_CHAR(apply_time,'HH24:MI:SS MM/DD/YY') "Apply Time",
  applied_message_number
 FROM dba_apply_progress;
```

[H]

```
set pages 45
SELECT TO_CHAR(error_creation_time,'YYYY/MM/DD') created,
       error_number,
       COUNT(1) error_count
  FROM dba_apply_error
 GROUP BY error_number,
          TO_CHAR(error_creation_time,'YYYY/MM/DD')
 ORDER BY 1, 2;
```

4.

BDB

Once a transaction has been identified as problematic and can safely be assumed to not be a problem if ignored, then the following steps will help in allowing the capture process to ignore that transaction. This is providing of course that the transaction has not already begun to be mined by the capture process.

Identifying the problematic/long running transaction can be done by running query **[D.]** of **step 1** of this procedure.

Then run the steps which follow as STRADMIN. Note that `<TXN_ID>` below refers to the actual transaction id of the transaction you wish to ignore.

```
EXECUTE dbms_capture_adm.stop_capture('BRDB_CAPTURE');

EXECUTE dbms_capture_adm.set_parameter('BRDB_CAPTURE',
'_ignore_transaction', '<TXN_ID>');

EXECUTE dbms_capture_adm.start_capture('BRDB_CAPTURE');
```

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7.2.4 Post Lag Action Procedure

Step	Description	Server Execution
	Assumptions - User is logged onto the respective Database Server(s) as ***oracle*** and where possible as SYSDBA - The TWS schedules can continue to run and won't need to be stopped during this procedure. - "Partition Managed Tables" simply means those tables managed by BR*[DB | SS]*C001. ***Applicable Scenario*** The Branch Support Database has been determined to have unacceptable levels of lag and a decision has been made to re-instantiate Streams. The scenario is as follows - The decision to re-instantiate Streams was made "TODAY" - Streams has been lagging for less than 24 hrs. - The data for BRSS partitions of date "TODAY" are lagging. - The data for BRSS partitions of date "YESTERDAY" have replicated without issue. This procedure should therefore be executed approximately 30 – 15 minutes before midnight "TODAY" (before."TOMORROW") and ***Step 1a MUST be complete before 00:00*** (i.e. before "TOMORROW"). NOTE Throughout this procedure, "YESTERDAY", "TODAY" and "TOMORROW" will remain specific dates in order to avoid confusion, e.g. 28th, 29th and 30th even though this procedure, in reality, will be used before and after midnight and therefore create confusion..	
1a.	**BDB** and **BRS** Re-instantiate Streams by following the methodology presented in Section 7.1.2, executing Steps 5a. – 7 This will recreate the Streams Configuration and will not affect the data that has already been mined.	
1b.	Following from 1a. above, Steps 8 – 11 of Section 7.1.2, must follow *as soon as possible!*	
2.	**BDB** Determine whether the partitions created on BRDB are the same as those on BRSS. This should always be the case, but double-check. There should be *no rows returned* … (i.e. the output to the first sub-query should be the same as the second).	
	Please run just these queries as *STRADMIN*: - SELECT dtp.table_name, MAX(dtp.partition_name) max_part_name FROM dba_tab_partitions dtp, brdb_partition_creates bpc, brdb_partitioned_tables brt WHERE dtp.table_name = bpc.table_name (+) AND dtp.table_name = brt.table_name (+) AND dtp.table_owner = 'OPS$BRDB' AND bpc.status = 'NEW' AND dtp.partition_name = brt.partition_root_name||'_'||bpc.partition_range_value GROUP BY dtp.table_name	

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```
MINUS
SELECT sdtp.table_name, MAX(sdtp.partition_name) max_part_name
  FROM dba_tab_partitions@brss               sdtp,
       ops$brss.brss_partition_creates@brss  sbpc,
       ops$brss.brss_partitioned_tables@brss sbrt
 WHERE sdtp.table_name  = sbpc.table_name (+)
   AND sdtp.table_name  = sbrt.table_name (+)
   AND sdtp.table_owner = 'OPS$BRDB'
   AND sbpc.status      = 'NEW'
   AND sdtp.partition_name =
sbrt.partition_root_name||'_'||sbpc.partition_range_value
 GROUP BY sdtp.table_name
```

3.

BDB

1. Determine the list of partitions to export from BRDB (for a later import into BRSS)
2. Perform the export(s) – ensure you have the password for SYSTEM
3. Transport the export dump files to ***lprpbrs001***

Find a directory that has enough space to store the export dump files. The create a directory object as follows (SQL*Plus): -

```
CREATE OR REPLACE DIRECTORY <dump_directory_name> AS '/<dump_directory>';
```

Create a parfile (`vi <parfile_name>.par`) with the output from the following query (SQL*Plus): -

```
set pages 0
set trimspool ON
set feedback off
set echo off
SELECT DECODE(ROWNUM,1,'CONTENT=ALL
TABLES=('||CHR(39)||dtp.table_owner||'.'||dtp.table_name||'.'||dtp.partition_nam
e||CHR(39)
,18,','||CHR(39)||dtp.table_owner||'.'||dtp.table_name||'.'||dtp.partition_name|
|CHR(39)||')'
,','||CHR(39)||dtp.table_owner||'.'||dtp.table_name||'.'||dtp.partition_name||CH
R(39))
  FROM dba_tab_partitions       dtp,
       brdb_partition_creates   bpc,
       brdb_partitioned_tables  brt
 WHERE dtp.table_name  = bpc.table_name (+)
   AND dtp.table_name  = brt.table_name (+)
   AND dtp.table_owner = 'OPS$BRDB'
   AND bpc.partition_range_value = TO_CHAR(TRUNC(SYSDATE),'YYYYMMDD')
   AND dtp.partition_name =
brt.partition_root_name||'_'||bpc.partition_range_value;
```

Export the tables by using the following datapump command, substituting the required values: -

```
expdp system DIRECTORY=<dump_directory_name> PARFILE=<parfile_name>.par
DUMPFILE=<dumpfile_name>.dmp LOGFILE=<logfile_name>.log
```

Remote copy or FTP the `<dumpfile_name>.dmp` dump file to the BRS server. The quickest way to accomplish this may be to create an NFS or NAS mount between the servers.

4.

BRS – *Partition Managed Tables ONLY*

1. Truncate the partitions for "TODAY" only, using the SQL provided.
2. Import the partitions exported from BRDB (see Step 3 above) for "TODAY" only.

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	SQL to be defined in later version impdp command to be defined in later version
5.	**BDB** – *Non-partition Managed Tables ONLY* 1. Merge the data from the Branch Database into those of the Branch Support Database.
	INSERT INTO x@BRSS SELECT * FROM x WHERE y BETWEEN YESTERDAY AND TOMORROW; ...
6.	**BDB** 1. Run a comparison between the two database schemas.
	SELECT table_name, partition_name, num_rows, … FROM dba_tab_partitions WHERE ...

7.3 BRSS Scheduling

7.3.1 Schedule BRSS_TRACE_STOP1

This schedule is run daily (07:30 a.m.).

7.3.1.1 Dependencies

None.

7.3.1.2 Job BRSSX011_TRACE_PAUSE_1

Updates the BRSS_SYSTEM_PARAMETERS table, sets parameter BRSS_C002_STOP_YN flag to 'Y'.

7.3.1.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.1.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.2 Schedule BRSS_SOD

This schedule is run daily (08:00 a.m.).

7.3.2.1 Dependencies

Flag in " /opt/tws/FLAGS/BRSS_COMPLETE.flag" present.

7.3.2.2 Job BRSS_RM_COMPLETE_FLAG

Removes BRSS_COMPLETE.flag.

7.3.2.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

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7.3.2.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.3 Schedule BRSS_SLT

This schedule is run daily. The TWS scheduled job executes module BRSSX002 to produce SLT reports from BRDB audit data produced on BRDB. Once schedule BRDB_AUD_FEED has completed BRSSX002 processes the aud files on the NAS share to extract SLT data and writes this out to the SLT reports NAS directory.

7.3.3.1 Dependencies

Schedule BRSS_SLT depends on the completion of schedules BRSS_SOD, BRDB_AUD_FEED.

7.3.3.2 Job BRSSX002_SLT

Extracts statistics data from Counter audit files and load them in to BRSS.

7.3.3.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

BRSSX002.sh uses the following directories

Usage	BRDBBLV1 Environment Variable
Working directory	BRSS_AUDIT_FILE_TEMP
Source file directory	BRDB_COUNTER_AUDIT_OUTPUT

7.3.3.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.3.2.3 If Rerun Fails

If the BRSS_SLT rerun fails due to SQL*Loader being unable to load a particular file from /counteraudit/ then it may be necessary to use the following workaround to allow the schedule to continue:

1. Save for evidence the files from /counteraudit/working (.dat, .tmp, .log, .stats, .bad) and the failed .gz file from /counteraudit
2. Move or rename the failed *.gz file from /counteraudit
3. Re-run the job.

7.3.3.2.4 Example failed stdout

Fri 18-Jun-2010 01:17:04 BRSSX002.sh:
*Fri 18-Jun-2010 01:17:04 BRSSX002.sh: SQL*Loader failed to load /counteraudit/working/AUDIT_20100617_031_001.dat*
Fri 18-Jun-2010 01:17:04 BRSSX002.sh:
Fri 18-Jun-2010 01:17:04 BRSSX002.sh: Exiting with error 2
AWSBIS308I End of job

7.3.4 Schedule BRSS_TRACE_STRT1

This schedule is run daily (at 8:10). Allows BRSSC002 to restart by resetting the start/stop flag.

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7.3.4.1 Dependencies

Schedule BRSS_TRACE_STRT1 depends on the completion of schedule BRSS_SOD.

7.3.4.2 Job BRSSX011_TRACE_RESUME

Updates the BRSS_SYSTEM_PARAMETERS table, sets parameter BRSS_C002_STOP_YN flag to 'N'.

7.3.4.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.4.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.5 Schedule BRSS_JRNL_TRACE1

This schedule is run daily.

7.3.5.1 Dependencies

Schedule BRSS_JRNL_TRACE1 depends on the completion of schedule BRSS_TRACE_STRT1.

7.3.5.2 Job BRSSC002_JRNL_TRACE1

The message journal tracing process (BRSSC002) will generate text files for a given day's journalised messages by reading records from the message journal table (BRDB_RX_MESSAGE_JOURNAL). The process will run throughout the day as a Unix daemon. This process is essentially a clone of BRDBC002 without the check that sequence numbers are a dense set.

7.3.5.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

Outputs files to the following directory below.

Usage	Environment Variable
BRSS output directory	BRSS_COUNTER_AUDIT_OUTPUT

7.3.5.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.6 Schedule BRSS_TRACE_STOP2

This schedule is run daily. Allows the BRSSC002 deamon to shutdown via the reset of the start/stop flag in the system parameters table.

7.3.6.1 Dependencies

Schedule BRSS_TRACE_STOP2 depends on the completion of schedules BRSS_SOD and BRDB_AUD_FEED.

7.3.6.2 Job BRSSX011_TRACE_PAUSE

Updates the BRSS_SYSTEM_PARAMETERS table, sets parameter BRSS_C002_STOP_YN flag to 'Y'.

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7.3.6.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.6.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.7 Schedule BRSS_TRACE_STRT2

This schedule is run daily. Allows the BRSSC002 deamon to restart when requested by resetting the start/stop flag in the system parameters table.

7.3.7.1 Dependencies

Schedule BRSS_TRACE_STRT2 depends on the completion of schedule BRSS_TRACE_STOP2.

7.3.7.2 Job TWENTY_MIN_WAIT

Issues sleep command with a parameter of 20 minutes.

7.3.7.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.7.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.7.3 Job BRSSX011_TRACE_RESUME

Updates the BRSS_SYSTEM_PARAMETERS table, sets parameter BRSS_C002_STOP_YN flag to 'N'.

7.3.7.3.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.7.3.2 Rerun Action

*** Prompts for rerun – action? **

7.3.8 Schedule BRSS_JRNL_TRACE2

This schedule is run daily. The message journal tracing process (BRSSC002) will generate text files for a given day's journalised messages by reading records from the message journal table (BRDB_RX_MESSAGE_JOURNAL). The process will run throughout the day as a Unix daemon. This process is essentially a clone of BRDBC002 without the check that sequence numbers are a dense set.

7.3.8.1 Dependencies

Schedule BRSS_JRNL_TRACE2 depends on the completion of schedule BRSS_TRACE_STRT2.

7.3.8.2 Job BRSSC002_JRNL_TRACE2

Calls binary BRSSC002 with the TWS business date.

7.3.8.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

Outputs files to the following directory below.

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Usage	Environment Variable
BRSS output directory	BRSS_COUNTER_AUDIT_OUTPUT

7.3.8.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.9 Schedule BRSS_GEN_REP

This schedule is run daily (20:00).

7.3.9.1 Dependencies

Schedule BRSS_GEN_REP depends on the completion of schedule BRSS_SOD.

7.3.9.2 Job GENERIC_CREATE_REPORT_VIEWS

Calls shell script GREPX001.sh with the TWS business date.

7.3.9.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

7.3.9.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.9.3 Job GENERIC_CREATE_REPORTS

Calls shell script grepx002.sh with the system name (BRSS), outputs text based report files.

Outputs files to the following directories below.

Usage	BRDBBLV1 Environment Variable
Working directory	BRSS_MSU_WORKING
BRSS reports directory	BRSS_MSU_OUTPUT

7.3.9.3.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.9.3.2 Rerun Action

*** Prompts for rerun – action? **

7.3.10 Schedule BRSS_ORA_STATS

This schedule is run daily (01:05).

7.3.10.1 Dependencies

Schedule BRSS_ORA_STATS depends on the completion of schedule BRSS_SOD.

7.3.10.2 Job BRSSX005_SCHEMA

Gathers statistics on all objects within the OPS$BRSS and OPS$BRDB schemas.

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7.3.10.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

7.3.10.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.11 Schedule BRSS_ADMIN

This schedule is run daily (01:15).

7.3.11.1 Dependencies

Schedule BRSS_ADMIN depends on the completion of schedule BRSS_SOD.

7.3.11.2 Job BRSSC004

Calls binary BRSSC004 to housekeep BRSS.

7.3.11.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

7.3.11.2.2 Rerun Action

*** Prompts for rerun – action? **

7.3.11.3 Job BRSSX006

Calls binary BRSSX006 to housekeep BRSS directories.

7.3.11.3.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

7.3.11.3.2 Rerun Action

*** Prompts for rerun – action? **

7.3.11.4 Job BRSS_HkP_Orafiles1

Calls script HousekeepOrafiles.sh to housekeep Oracle files.

7.3.11.4.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

7.3.11.4.2 Rerun Action

*** Prompts for rerun – action? **

7.3.11.5 Job BRSS_HkP_Orafiles2

Calls script HousekeepOrafiles.sh to housekeep Oracle ASM files.

7.3.11.5.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameter.

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7.3.11.5.2Rerun Action

*** Prompts for rerun – action? **

7.3.12 Schedule BRSS_START_BKP

This schedule is run daily (with an alert if not started by 04:00).

7.3.12.1 Dependencies

Schedule BRSS_START_BKP depends on the completion of schedule BRSS_ADMIN.

7.3.12.2 Job MARKER

Writes marker.

7.3.12.2.1Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and date.

7.3.12.2.2Rerun Action

CONTINUE

7.3.13 Schedule BRSS_BACKUP_0

This schedule is run every 4th Sunday.

7.3.13.1 Dependencies

Schedule BRSS_BACKUP_0 depends on the completion of schedule BRSS_START_BKP.

7.3.13.2 Job BRSS_LVL0_BACKUP

Carries out level 0 RMAN backup.

7.3.13.2.1Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

7.3.13.2.2Rerun Action

*** Prompts for rerun – action? **

7.3.14 Schedule BRSS_BACKUP_1

This schedule is run daily except 4th Sunday.

7.3.14.1 Dependencies

Schedule BRSS_BACKUP_1 depends on the completion of schedule BRSS_START_BKP.

7.3.14.2 Job BRSS_LVL1_BACKUP

Carries out level 1 RMAN backup.

7.3.14.2.1Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

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7.3.14.2.2Rerun Action

*** Prompts for rerun – action? **

7.3.15 Schedule BRSS_STARTUP

This schedule is run daily (raises alert if not started by 06:00).

7.3.15.1 Dependencies

Schedule BRSS_STARTUP depends on the completion of schedule BRSS_BACKUP_0 or BRSS_BACKUP_1.

7.3.15.2 Job BRSSC001

Calls start of day process BRSSC001 to generate the next day's partitions.

7.3.15.2.1Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

7.3.15.2.2Rerun Action

*** Prompts for rerun – action? **

7.3.16 Schedule BRSS_COMPLETE

This schedule is run daily.

7.3.16.1 Dependencies

Schedule BRSS_COMPLETE depends on the completion of schedules BRSS_STARTUP, BRSS_TRACE_STOP1 and BRSS_GEN_REP.

7.3.16.2 Job BRSS_COMPLETE_FLAG

Creates complete flag.

7.3.16.2.1Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

7.3.16.2.2Job Dependency

This job is dependent on job BRSSC001.

7.3.16.2.3Rerun Action

*** Prompts for rerun – action? **

7.3.17 Schedule BRSS_MONITOR

This schedule is run daily.

7.3.17.1 Dependencies

None

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7.1.1.2 Job BRSS_MON_STARTUP

Calls maestro script monitor_schedule.sh

7.1.1.2.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

7.1.1.2.2 Rerun Action

CONTINUE

7.1.1.3 Job BRSS_MON_BKP

Calls maestro script monitor_schedule.sh

7.1.1.1.1 Implementation

This job is implemented by a call to the Maestro monitor schedule command with the relevant job name and parameters.

7.1.1.1.2 Rerun Action

CONTINUE

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8 Appendix C – Transaction Correction Templates

Section 5.6.1 describes the use of the transaction correction tool BRDBX015.sh. This is used by SSC to correct transactions by inserting balancing records to transactional/accounting/stock tables in the BRDB system. The tool must be supplied with a file containing a SQL statement that performs the require insert. This statement must be of a particular form, and should be based on one of the templates shown here.

Separate templates are given for each given target table, which reflect the columns of the target table.

8.1 Templates

The following templates are available on the live estate in /app/brdb/trans/support/brdbx015/input

Table to Correct	Template File
BRDB_RX_REP_SESSION_DATA	brdb_rx_rep_session_data.file
BRDB_RX_REP_EVENT_DATA	brdb_rx_rep_event_data.file
BRDB_RX_NWB_TRANSACTIONS	brdb_rx_nwb_transactions.file
BRDB_RX_EPOSS_TRANSACTIONS	brdb_rx_eposs_transactions.file
BRDB_RX_EPOSS_EVENTS	brdb_rx_eposs_events.file
BRDB_RX_DCS_TRANSACTIONS	brdb_rx_dcs_transactions.file
BRDB_RX_CUT_OFF_SUMMARIES	brdb_rx_cut_off_summaries.file
BRDB_RX_BUREAU_TRANSACTIONS	brdb_rx_bureau_transactions.file
BRDB_RX_APS_TRANSACTIONS	brdb_rx_aps_transactions.file

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