Transaction Processing

DPS7000

Operator Guide

TDS-HA Simplified Operations Handbook

GCOS 7

Printed in France

OBJECTIVES

The objective of this manual is to explain how to operate and monitor TDS-HA on Bull DPS 7000 systems.

INTENDED READERS

This manual is intended for operators of TDS-HA systems.

Some of the information may also be of interest to managers, application developers, and system administrators.

STRUCTURE OF THIS DOCUMENT

Section 1   introduction to TDS-HA.

Section 2   Starting the Complex shows how to start TDS-HA.

Section 3   Stopping the Complex shows how to stop TDS-HA.

Section 4   Monitoring the Complex shows how to monitor a system running TDS-HA.

Section 5   Takeovers.

Section 6   describes incidents handling.

Appendix A   gives the syntax of the CMSC commands.

RELATED DOCUMENTS

TDS-HA Documentation:

ORACLE/TDS-HA Documentation:

JAS Documentation:

GCOS 7 System Operation Documentation:

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APPENDICES

1. Introduction

This manual describes how to operate an installation running TDS-HA (TDS-High Availability). This manual is not intended to replace the other TDS-HA manuals: *High Availability Concepts* and *High Availability Administrator's Guide*.

The word "simplified" in the title means that the manual discusses normal operations and simple incidents. More complicated incidents, and in particular multiple failures, are described in the *High Availability Administrator's Guide*.

1.1   PREREQUISITES

1.1.1   Installation

This manual assumes that the TDS-HA product has been correctly installed on your site. If in doubt, consult your HA administrator.

Installing TDS-HA is the responsibility of your HA administrator. Installation is described in the *High Availability Administrator's Guide*. To verify that TDS-HA has been correctly installed, "test" Takeovers should be done.

1.1.2   Your Site

You should know the names of the TDSs which run at your site. If necessary, ask your HA administrator to supply a list of them.

Your duties will include starting and stopping these TDSs. As you get experience, you will learn how long each TDS takes to start and to stop under "normal" conditions. If a TDS takes significantly longer than "normal" to start or stop, you should suspect that there is a problem (and investigate).

This manual deals only with TDSs which use the HA feature of TDS-HA. Associated with each such TDS there is a JAS Service and there may be an ORACLE Service. This manual does not deal with TDSs which do not use the HA feature of TDS-HA.

1.2   SOME BASIC TERMS

1.2.1   Complex

To use the TDS-HA product, you need two systems. The two systems may be two separate DPS 7000s or a single DPS 7000 redundant system operating in bi-system mode. Each system in known as a Member. The two systems combined are known as a Complex.

Services run on the Complex. Services are either TDS, JAS, or ORACLE. The job or module which supports a Service is known as a Server.

There is a special Service known as the CMSC which acts as a "supervisor" of TDS-HA activities. The Server for the CMSC Service is known as the CMSR.

1.2.2 Active and Backup

While both Members are running, for each HA Service there is an Active Server on one Member and a Backup Server on the other Member.

The Active Server actually supports the Service. The Backup Server does not actually support the Service; the Backup Server waits and is ready to "rescue" the Active Server (in case of failure). The Member on which the Active Server is running is known as the Active Member for that Service. A Member can be Active for one Service and Backup for another Service at the same time.

1.2.3 Takeover

The process whereby a Backup Server switches to Active and starts supporting its Service is known as a Takeover. A Takeover is always global, that is, all HA Services are taken over (you cannot select just a few HA Services for Takeover). After a successful Takeover, the Active Servers for all HA Services are on the same Member.

1.3 YOUR DUTIES

Your main duties are as follows:

- Start the CMSRs, the Members, and the Services.
  See chapter 2.

- Stop the Services, the Members, and the CMSRs.
  See chapter 3.

- Monitor the Complex.

See chapter 4.

- Perform and monitor Takeovers.
  See chapter 5.

- Handle Incidents.
  See chapter 6.

2. Starting the Complex

To start the Complex, you must do the following:

1.　　Start the CMSRs.

2.　　Start the Members.

3.　　Start the Services.

2.1　　STARTING THE CMSR

The CMSR can be started automatically by GCOS 7 or you can start it manually.

2.1.1　　Automatic Start of CMSR

If HA = ON (the default) in the IL01 options (at ISL), then the CMSR is started automatically when you start GCOS 7. You need not manually start the CMSR. However, even if you try to start the CMSR manually, it does not do any harm (you just get a message to warn you that the CMSR is already running).

2.1.2 Manual Start of CMSR

When to do a Manual Start of the CMSR

You must manually start the CMSR in the following cases:

- If HA = OFF in the IL01 options (at ISL), then you must start the CMSR manually after GCOS 7 starts.

- You stop the CMSR manually, and now you want to restart it.

- An incident has caused the CMSR to stop (or abort), and now you want to restart it.

How to do a Manual Start of the CMSR

You start the CMSR manually using a SCMSR command. SCMSR stands for START_CMSR.

Syntax

```
SCMSR;
```

Each Member has its own CMSR. If neither CMSR is running, you must start both of them (that is, issue an SCMSR command on each Member).

Result

If the command is accepted, you get the following message:

```
CM17  SCMSR ACCEPTED
```

If the command is successful, you get the following message:

```
CM08  CMSR STARTED
```

Time to Execute

You should get the CM08 message less than 2 or 3 minutes after the CM17 message. If you do not, you should assume that there is a problem. If there is a problem, see paragraph 6.1.

2.2   STARTING THE MEMBERS

The Members are not started automatically by GCOS 7. You must start them manually using an SMB command. SMB stands for START_MEMBER.

Conditions

The CMSRs must already be running.

If you are not sure about the CMSRs, use a DS EX command to see that the CMSR job is executing. If necessary, start the CMSRs using SCMSR commands (as described above).

Syntax

```
SMB MB = member-name;
```

to start one Member.

```
SMB MB = { member-name1 member-name2 | * } ;
```

to start both Members.

Result

If the command is accepted, you get the following message:

```
CM17   SMB member-name ACCEPTED
```

If the command is successful, you get the following message:

```
CM22   MEMBER member-name STARTED
```

If you start both Members, you should get a CM17 and a CM22 message for each Member.

Time to Execute

You should get the CM22 message less than 1 minute after the CM17 message. If you do not, you should assume that there is a problem. If there is a problem, see paragraph 6.2.

2.3   STARTING THE SERVICES

The Services are not started automatically by GCOS 7. You must start them manually using SSRV commands. SSRV stands for START_SERVICE.

Conditions

The Members must already be running.

If you are not sure about the Member, use a DMB command and check that the Running_state is "Running". If necessary, start the Members using SMB commands (as described above).

Syntax

```
SSRV SRV = service-name
[ RESYNC = 0 | Bool } ]
[ OPT = char240 ]
[ MB = (member-name [member-name] ) ]
[ USRV = (service-name [service-name] ... ) ]
;
```

Restrictions

Do not use RESYNC without the approval of your HA administrator.

Result

If the command is accepted, you get the following message:

```
CM17  SSRV service-name ACCEPTED
```

If the command is successful, you get the following messages:

```
CM66  SERVICE service-name STARTED IN ACTIVE
MODE ON MEMBER member-name
```

```
CM66  SERVICE service-name STARTED IN BACKUP
MODE ON MEMBER member-name
```

You should get a CM17 and two CM66 messages for each HA Service. If the Service is an NHA/W TDS (which runs on just one Member), you will not get the second CM66 message.

Time to Execute

For a JAS, you should get the CM66 messages less than 1 minute after the CM17 message. For an ORACLE Service, the time should be less than 2 minutes if the previous shutdown was normal, but it may be considerably longer if the previous shutdown was abnormal (due to the time taken by ORACLE's recovery processing). For a TDS, the time depends mainly on the number of files (of the TDS). The time to start a TDS will also include the time to start its JAS and ORACLE Service (if any) unless these are already running.

For a TDS, the time to start depends on a number of factors including DPS 7000 model, type of disks, current system load, etc.

You may estimate the approximate time to start as follows:

   0 to 5 minutes,

   plus 2 or 3 seconds per file,

   plus about 50 milliseconds per terminal.

A TDS which opens a large number of files may take a considerable time (perhaps up to 30 minutes). As you get experience of starting your TDSs, you will learn how long each takes to start (its expected time to start). In future, you should get worried only if the actual time to start exceeds this expected time.

If you do not get the CM66 messages within the time expected, you should assume that there is a problem. If there is a problem, see paragraph 6.3.

3. Stopping the Complex

To stop the Complex, you must do the following:

1.　Stop the Services.

2.　Stop the Members.

3.　Stop the CMSRs.

3.1　STOPPING THE SERVICES

The Services are not stopped automatically by GCOS 7. You must stop them manually using TSRV commands. TSRV stands for TERMINATE_SERVICE.

Syntax

```
TSRV SRV = service-name
[ RESYNC = 0 | Bool ]
[ OPT = char255 ]
[ FORCE = 0 | Bool ] ;
```

Restrictions

Do not use RESYNC without the approval of your HA administrator.

If the Service is a TDS, you can use FORCE = 1 to do the equivalent of a TTDS STRONG.

You should not use FORCE in the case of a JAS. If TSRV does not stop a JAS, you should use the DJAS command to get a list of the jobs using the JAS. You then use CJ to cancel these jobs (if the job is an IOF session, you can ask the user to log off). The JAS will stop after the last of these jobs has stopped.

Result

If the command is accepted, you get the following message:

```
CM17  TSRV service-name ACCEPTED
```

If the command is successful, you get the following messages:

```
CM32  SERVICE service-name TERMINATED ON MEMBER
member-name
```

```
CM32  SERVICE service-name TERMINATED ON MEMBER
member-name
```

You should get a CM17 and two CM32 messages for each HA Service. If the Service is an NHA/W TDS (which runs on just one Member), you will not get the second CM32 message.

Time to Execute

If you use FORCE, or if there are no transactions in progress, you should get the CM32 message less than 1 or 2 minutes after the CM17 message. If you do not, you should assume that there is a problem.

If you do not use FORCE and there are transactions in progress, you will not get the CM32 message until the "last" transaction has completed.

If there is a problem, see paragraph 6.4.

3.2   STOPPING THE MEMBERS

The Members are not stopped automatically by GCOS 7. You must stop them manually using a TMB command. TMB stands for TERMINATE_MEMBER.

Conditions

The Services must not be running.

If you are not sure if Services are running, use a DMB command to see the state of the Services. If necessary, stop the Services using TSRV commands (as described above).

Syntax

```
TMB MB = { (member-name [member-name]) | * }
 FORCE = { 0 | Bool } ;
```

Restrictions

Never use FORCE without the approval of your HA administrator.

Result

If the command is accepted, you get the following message:

```
CM17  TMB member-name ACCEPTED
```

If the command is successful, you get the following message:

```
CM22  MEMBER member-name TERMINATED
```

If you stop both Members, you should get a CM17 and a CM22 message for each Member.

Time to Execute

You should get the CM22 message less than 1 or 2 minutes after the CM17 message. If you do not, you should assume that there is a problem. If there is a problem, see paragraph 6.5.

3.3   STOPPING THE CMSR

The CMSR is stopped automatically at GCOS 7 shutdown of the Member.   You can also stop it manually using a TCMSR command. TCMSR stands for TERMINATE_CMSR.

Syntax

```
TCMSR [ FORCE = { 0 | Bool } ] ;
```

Each Member has its own CMSR. If you want to stop both CMSRs, you must issue a TCMSR command on each Member.

Restrictions

Do not use FORCE without the approval of your HA administrator.

Result

If the command is accepted, you get the following message:

```
CM17  TCMSR ACCEPTED
```

If the command is successful, you get the following message:

```
CM09  CMSR TERMINATED
```

Time to Execute

You should get the CM09 message less than 1 or 2 minutes after the CM17 message. If you do not, you should assume that there is a problem. If there is a problem, see paragraph 6.6.

4. Monitoring the Complex

4.1 KEEPING SYSTEM TIMES IDENTICAL

In an installation with TDS-HA, it is important to keep the system time identical on each Member. If a time difference arises, then there may be problems at Takeover (since the time-stamp on after journal images are no longer coherent).

4.1.1 Detecting at CMSR Start

When a CMSR starts it compares the two system times. If it finds a difference (which is greater than the 1 minute time limit tolerated), it issues the following CM37 message:

```
CM37   WARNING : THE TIME IS NOT THE SAME ON THE TWO
MEMBERS, DATA INTEGRITY MAY BE DAMAGED IF A TAKEOVER
OCCURS
```

If you get such a CM37 message, you should regulate the times as described in paragraph 4.1.2.

As long as both CMSRs are running, they compare the GCOS 7 system times at regular intervals (of 15 minutes). If a difference (which is greater than the 1 minute time limit tolerated) is detected, you get an appropriate CM37 warning message.

4.1.2 Regulating the System Time

You do the following:

1. Stop each CMSR with a TCMSR command.

2. Regulate the clocks on the two Members.
   You do this using the MODIFY_TIME command.
   You should adjust "forward" the time of the Member which
   has the earlier time. Adjusting time "backward" is risky.

3. Restart the two CMSRs with SCMSR commands.

Example:

Member A has a system time of 10:05 (local time) and Member
B has a system time of 09:55 (local time). If you set A "back" to
09:55 you may cause problems. So, you should set B "forward"
to 10:05. In this example, local time is 1 hour ahead of GMT
(Greenwich Mean Time or Universal Time). When GMT is
13:00, local time is 14:00.

You do this as follows (on Member B):

```
S: MODIFY_TIME SHIFT = + 1.10 ;
```

Note that you must specify +1.10 (plus 1 hour and 10 minutes)
and not just +10. After the command, both Members should
have a system time of 10.05 (local time). No After Journal
activities must be taking place when you execute the command.

4.2 MONITORING OPERATIONS

To monitor operations, the following commands are available:

- DCX (DISPLAY_COMPLEX)

- DMB (DISPLAY_MEMBER)

- DSRV (DISPLAY_SERVICE)

- DJAS (DISPLAY_JAS).

4.2.1   DCX (DISPLAY_COMPLEX) Command

You can use the DCX command to display static information about the Complex. Static means that the information displayed does not change as the Complex is running. The information changes only if you re-generate the Complex. The DMB and DSRV commands display dynamic information.

Example:

```
S: DCX;
```

This displays the following:

```
 time CM26 COMPLEX ....
 SERVICE    TYPE    member-1    member-2
  BLUE      JAS     ACTIVE      BACKUP
  GREEN     JAS     ACTIVE      BACKUP
  TDSX      TDS     ACTIVE      BACKUP
  ....      ...     ......      ......
```

The 3 Services (BLUE, GREEN, TDSX) are shown to be Active on member-1 and Backup on member-2. However, this is only how they start by default. It does not mean that they are currently Active on member-1. They are no longer be Active on member-1 if you explicitly started them Active on member-2 or if a Takeover has made them Active on member-2.

If you want to see their current actual states, you should use a DMB or a DSRV command (as described on page 4-4).

4.2.2 DMB (DISPLAY_MEMBER) Command

You can use the DMB command to display dynamic information about the Complex. Dynamic means that the information changes as the Complex is running.

Example:

```
S: DMB member-1;
```

This displays the following:

```
time CM26 MEMBER member-1

REQUIRED STATE   EFFECTIVE STATE   MONITORING _STATE   RUNNING_STATE
SWITCHABLE       SWITCHABLE        CONNECTED           RUNNING

SERVICE          TYPE       EFFECTIVE_STATE
 BLUE            JAS        ACTIV_SWITCHABLE
 GREEN           JAS        BACKUP
 TDSW            TDS        ACTIV_SWITCHABLE
 TDSZ            TDS        BACKUP
 ....            ...        ......
```

BLUE and TDSW are currently Active and Switchable on member-1. GREEN and TDSZ are currently Backup on member-1. This information is dynamic; it changes as the state of the Servers change. However, to see the change you must re-execute the DMB command.

4.2.3 DSRV (DISPLAY_SERVICE) Command

You can use the DSRV command to display dynamic information about a Service. Dynamic means that the information changes as the state of the Service changes.

Example:

```
S: DSRV TDSW;
```

This displays the following:

```
time CM26 SERVICE TDSW TYPE TDS :

               REQUIRED STATE        EFFECTIVE STATE
  member-1     ACTIV_SWITCHABLE      ACTIV_SWITCHABLE
  member-2     BACKUP                BACKUP

NO MAIN SERVICE
USED_SERVICE  BLUE
```

> TDSW is currently Active and Switchable on member-1. It is currently Backup on member-2. This information is dynamic; it changes as the state of TDSW changes. However, to see the change you must re-execute the DSRV command.

4.2.4   DJAS (DISPLAY_JAS) Command

You can use the DJAS command to display the jobs connected to a JAS (or all JASs).

Example:

```
S: DJAS BLUE;
```

This displays the following:

```
time  JAS:BLUE  X151.1   TP7JCLAC  OPERATOR  P  TDS1
                X168.2   BAT2      USER2     P  H_BAT2
```

> Jobs X151 and X168 are currently connected to BLUE JAS. This list of jobs is dynamic; it changes as jobs connect and/or disconnect from BLUE. However, to see the change you must re-execute the DJAS command.

Example:

```
S: DJAS;
```

This displays the following:

```
time  JAS:SYS    X148.1  BAT1      USER1     P  H_BAT1
      JAS:BLUE   X151.1  TP7JCLAC  OPERATOR  P  TDS1
                 X168.2  BAT2      USER2     P  H_BAT2
      JAS:GREEN  NO JOBS LINKED TO THIS JAS
```

Job X148 is currently connected to SYS JAS. Jobs X151 and X168 are currently connected to BLUE JAS. No jobs are connected to GREEN JAS.

4.3   LIST OF SHARED DISKS

In an installation with TDS-HA, it is important to ensure that both Members have an identical list of shared disks.

If the two lists of shared disks are not identical, then there may be problems at Takeover. You may have failed Takeovers, incomplete file recoveries, and unstable files.

4.3.1   Detecting the Difference

Periodically, you should execute a DC MS command (on each Member) and compare the shared disks. If you find a difference, you should eliminate it as described in paragraph 4.3.2.

If there are 100 or fewer shared disks and both CMSRs are running, the CMSRs check the list of shared disks at regular intervals. If there is a difference, you get a CM72 message (stating that there is a difference).

4.3.2   Eliminating the Difference

You do the following:

- Execute an MDHW OUT command to remove a disk from the configuration.

- Execute an MDHW IN SHARE command to add a disk to the list of shared disks on both machines.

You use MDHW OUT and MDHW IN SHARE as often as necessary to make the lists of shared disks identical.

Example:

After executing a DC MS command, you note that the disk device MS11 is IN and SHARED on Member A but OUT on Member B.

Depending on the requirements of the applications, you can either make it OUT on Member A or make it IN and SHARED on Member B. In this example, the second option is chosen.

You do this (on Member B) as follows:

```
S: MDHW MS11 IN SHARE;
```

4.4   FSVRTO (FORCE_SERVER_TIMEOUT) COMMAND

The FSVRTO command forces a Timeout for a Service.

Conditions

You should use FSVRTO only in the following cases:

- A Server's job aborts immediately, it cannot notify the CMSR of its abort. A JCL error is an example of this. The CMSR will wait a certain time (the Timeout period) before assuming that the Server cannot start. During this period, you cannot use CMSC commands to stop/start other Services. If you do not want to wait for the Timeout period, you use FSVRTO.

- If a TDS job has not yet reached its STEP statement, FSVRTO alone will not work. You must also use a CANCEL_JOB command to kill the job. An ASSIGN statement which "WAITS FOR DUAL SHARING CONDITIONS" is an example of this case.

Syntax

```
FSVRTO SERVICE = TDSQ ;
```

Result

If the command is accepted, you get the following message:

```
CM17   FSVRTO TDSQ ACCEPTED
```

If the command is successful, you get the following message:

```
CM32   SERVICE TDSQ TERMINATED FORCE ON MEMBER member-1
```

Time to Execute

You should get the CM32 message less than 2 or 3 minutes after the CM17 message. If you do not, you should assume that there is a problem.

5. Takeovers

5.1 AUTOMATIC TAKEOVER

An Automatic Takeover occurs if a Member crashes and it has at least one Active Server running on it. An Automatic Takeover is started by the system, you do not have to take any action.

In case of problems, see paragraph 6.7.

Result

If the Takeover is successful, you get the following messages:

```
CM34  SERVICE service-name-1 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-2 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-3 TAKEN OVER ON MEMBER member-name
      .....................................................

CM37  END OF TAKEOVER PROCESSING
```

You should get a CM34 message for each Service which had an Active Server running on the crashed Member.

5.2 STRONG TAKEOVER

A Strong Takeover causes the Member to be taken over to crash. Once the crash occurs, a Strong Takeover behaves like an Automatic Takeover. Any Active Servers running on the crashed Member are taken over.

In most cases, you do not have to take any action (after you submit the command). In case of problems, see paragraph 6.7.

Conditions

A Strong Takeover is suitable in the following cases:

- Deadlock on one Member,

- Severe Slow-down of one Member (due to overload).

Syntax

```
TKMB STRONG;

ARE YOU SURE? YES OR NO    YES
```

For the command to take effect, you must answer YES to the question ("Are you sure?").

Result

If the command is accepted, you get the following message:

```
CM17   TKMB   STRONG   ACCEPTED
```

If the Takeover is successful, you get the following messages:

```
CM34  SERVICE service-name-1 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-2 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-3 TAKEN OVER ON MEMBER member-name
      .....................................................

CM37  END OF TAKEOVER PROCESSING
```

You should get a CM34 message for each Service which had an Active Server running on the crashed Member.

5.3   WEAK TAKEOVER

A Weak Takeover does not cause the Member being taken over to crash. On the Member doing the Takeover, Backup Servers become Active.

In most cases, you do not have to take any action (after you submit the command). The time taken for the Takeover to become effective depends on the amount of processing in progress. The Takeover will not complete while there are transactions in progress. To speed up the Takeover, you could ask TDS users to stop/complete their transactions.

In case of problems, see paragraph 6.7.

Conditions

A Weak Takeover is suitable in the following cases:

- Planned shutdown of a Member (for example, to do software and/or hardware maintenance),

- Transfer of the HA workload onto one Member (leaving the non-HA workload on the other).

In the case of a planned shutdown, the Weak Takeover makes the Servers Backup on the Member being taken over. Next, you use TMB with FORCE to stop the Member followed by TCMSR to stop the CMSR. Then, you stop GCOS 7.

Syntax

```
TKMB WEAK;
```

There is no question ("Are you sure?").

Result

If the command is accepted, you get the following message:

```
CM17   TKMB   WEAK   ACCEPTED
```

If the Takeover is successful, you get the following messages:

```
CM34   SERVICE service-name-1 TAKEN OVER ON MEMBER member-name
CM34   SERVICE service-name-2 TAKEN OVER ON MEMBER member-name
CM34   SERVICE service-name-3 TAKEN OVER ON MEMBER member-name
        ....................................................

CM37   END OF TAKEOVER PROCESSING
```

You should get a CM34 message for each Service which had an Active Server running on the Member (being taken over). There are two CM34 messages per Service (one on each Member).

5.4   FORCE TAKEOVER

A Force Takeover bypasses the Member being taken over to crash. On the Member doing the Takeover, Backup Servers become Active (ignoring the state of the other Member).

In most cases, you do not have to take any action (after you submit the command). However, before submitting the command, you MUST ensure that the other Member is inoperational (that is, no software or firmware activity in progress). You should always check with your HA administrator before you do a Force Takeover.

In case of problems, see paragraph 6.7.

Conditions

A Force Takeover is suitable in the following cases:

- co-Member inoperational (for example, power failure),

- co-Member in System Check,

- To force the Backup Servers on the operational Member to become Active while the other Member is down and cannot restart.

In the first two cases above, the failures do not lead to a crash (and consequent Automatic Takeover), so you must take action.

Syntax

```
TKMB FORCE;

ARE YOU SURE? YES OR NO    YES
```

For the command to take effect, you must answer YES to the question ("Are you sure?").

Result

If the command is accepted, you get the following message:

```
CM17   TKMB   FORCE   ACCEPTED
```

If the Takeover is successful, you get the following messages:

```
CM34  SERVICE service-name-1 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-2 TAKEN OVER ON MEMBER member-name
CM34  SERVICE service-name-3 TAKEN OVER ON MEMBER member-name
      ....................................................

CM37  END OF TAKEOVER PROCESSING
```

You should get a CM34 message for each Service which had an Active Server running on the Member (being taken over).

6. Handling Incidents

In this section, only the most common and easily resolved incidents are discussed. For each incident an action is proposed. For incidents not discussed in this section, please refer to the *High Availability Administrator's Guide*.

6.1 SCMSR (START_CMSR)

CM18   SCMSR MEANINGLESS: ALREADY STARTED

The CMSR is already started on this Member. Use a DS EX * command to check that the CMSR job is running. Action: none.

CM18   SCMSR MEANINGLESS: CMSC IN TERMINATION STEP

You cannot start the CMSR because there is another one which is not yet finished. Action: wait and re-type this command after receiving the message "CM09 CMSR TERMINATED".

CM37   WARNING : THE TIME IS NOT THE SAME ON THE TWO MEMBERS, DATA INTEGRITY MAY BE DAMAGED IF A TAKEOVER OCCURS

Action: set the same time ("same" means a difference of less than one minute) on both Members. Refer to Section 4.1.

CM58 CMSR WILL WAIT UP TO 5 MINUTES FOR TELECOM TO BE STARTED

The CMSR needs the telecom to be started so that it can communicate with the other CMSR (of the other Member). Action: if necessary, start the telecom. (Note: telecom is usually started via the system startup).

CM58 CMSR IS GOING TO START WITHOUT TELECOM

After waiting 5 minutes for telecom to start, the CMSR has started without telecom. Action: try to restart the telecom.

CM59 RESYNCHRONIZATION WITH THE CMSR OF THE MEMBER member_name HAS FAILED: IN CASE OF DOUBLE FAILURE, PLEASE REFER TO YOUR HA ADMINISTRATOR'S GUIDE

The two CMSRs cannot communicate. This can be because the other CMSR is not running. Action: verify the state of the other Member. If the message appears after a Double Failure, please inform your HA administrator.

CM59 RESYNCHRONIZATION WITH THE CMSR OF THE MEMBER member_name HAS SUCCEEDED : END OF THE DOUBLE FAILURE IF THERE WAS ANY

Communications between the two CMSRs has been re-established. This message is the normal conclusion of the incident signalled by the previous CM59 message. Action: none.

CM68   CMSR RESYNCHRONIZATION IN PROGRESS

The CMSRs are communicating. This may occur each time telecoms between CMSRs is restored after an interruption. You cannot enter any CMSC command until you get the "CM68 END OF CMSR RESYNCHRONIZATION" message. Action: none.

CM68   END OF CMSR RESYNCHRONIZATION

This is the normal conclusion to the "CM68 CMSR RESYNCHRONIZATION IN PROGRESS" message. From now on, CMSC commands may be entered. Action: none.

6.2   SMB (START_MEMBER)

CM18   SMB member_name MEANINGLESS: ALREADY STARTED

The specified member_name is already started. Use a DMB command to monitor the Member (refer to Appendix A for the command). Action: none.

CM19   SMB member_name REJECTED: member_name UNKNOWN

The specified member_name is not known by the CMSC. Action: verify the Member names using a DCX command (refer to Appendix A for the command) and re-type the command with the valid member_name.

**CM19   SMB member_name REJECTED : RESYNCHRONIZATION
IN PROGRESS**

> You cannot enter any CMSC command during CMSR Resynchronization. Action: wait and re-type the command after the reception of the "CM68 END OF RESYNCHRONIZATION" message.

CM19   SMB REJECTED : CMSR IN TERMINATION STEP

> You cannot enter any CMSC command because the CMSR is terminating. Action: none.

CM19   SMB REJECTED : CMSR NOT RUNNING

> You cannot enter any CMSC command on that member as the CMSR is not yet running. Action: re-type the command after having started the CMSR with the SCMSR command.

CM19 SMB REJECTED : CMSR NOT YET OPERATIONAL

> Action: wait and re-type the command after the message "CM08 CMSR STARTED".

CM45   SMB member_name REJECTED : RETRY LATER...

> Action: re-type the command later.

CM49   SMB member_name UNSUCCESSFUL : ISOLATED MEMBER

> Action: you must either restart the telecom or wait for co-CMSR to restart (if the co-Member has crashed). Then, re-type the SMB command.

CM68   CMSR RESYNCHRONIZATION IN PROGRESS

CMSRs are communicating. That may occurs each time communications between the CMSRs has been re-established (after an interruption). You cannot enter any CMSC command until you get the "CM68 END OF CMSR RESYNCHRONIZATION" message. Action: none.

CM68   END OF CMSR RESYNCHRONIZATION

This is the normal conclusion to the "CM68 CMSR RESYNCHRONIZATION IN PROGRESS" message. From now on, CMSC commands may be entered. Action: none.

6.3   SSRV (START_SERVICE)

Incident Messages

CM18   SSRV service_name MEANINGLESS: ALREADY STARTED

The Service is already running. Use DSRV to monitor this Service (refer to Appendix A for the command). Action: none.

CM19   SSRV REJECTED: CMSR IN TERMINATION STEP

You cannot enter any CMSC command because the CMSR is terminating. Action: none.

CM19   SSRV REJECTED: CMSR NOT RUNNING

The CMSR is not running. Action: re-type the command after having started the CMSR with the SCMSR command.

CM19   SSRV REJECTED : CMSR NOT YET OPERATIONAL

Action: wait and re-type the command after the reception of the "CM08 CMSR STARTED" message.

CM19   SSRV service_name REJECTED: RESYNCHRONIZATION IN PROGRESS

You cannot enter any CMSC command as the CMSR Resynchronization is not yet finished. Action: wait and re-type the command after the reception of the "CM68 END OF RESYNCHRONIZATION" message.

CM19   SSRV service_name REJECTED: service_name NOT USED

The USED_SERVICE specified is not valid. Action: verify the used_service names with the DCX command (refer to Appendix A for the command) and re-type the command with the valid used_service or with no used_service.

CM19   SSRV service_name REJECTED: service_name UNKNOWN

The specified service_name is not known by the CMSC. Action: verify the Service names with a DCX command (refer to Appendix A for the command) and re-type the command with the valid service_name.

**CM19   SSRV service_name REJECTED: SWITCHABILITY
MODIFICATION IMPOSSIBLE, AT LEAST ONE NON_HA STARTED
SERVICE WHICH USES A JAS SERVICE**

> You are trying to start a Service which is incompatible with those
> already running.   Action: ask your HA administrator which
> Services are incompatible and re-type the command as soon as
> these Services are terminated. You can check the termination
> of these services with DSRV and DMB command.

**CM20   SSRV service_name REJECTED: ACTIVE MEMBER
member_name TELECOM ISOLATED**

> The two CMSRs cannot communicate. Action: try to restart the
> telecom and re-type the command.

**CM20   SSRV service_name REJECTED: ACTIVE MEMBER
member_name SILENT**

> This message means that the Member member_name is
> temporarily unavailable. Action: re-type the command after the
> reception of the "CM22 MEMBER member_name NOT SILENT"
> message. If you do not receive this CM22 message, inform
> your HA administrator.

**CM20   SSRV service_name REJECTED: ACTIVE MEMBER
member_name NOT RUNNING**

> The Active Member is not running. Action: wait for its restart
> and re-type the command.

CM20   SSRV service_name REJECTED: ACTIVE MEMBER member_name NOT STARTED

> The Active Member is not started. Action: re-type the command after having started the Active Member with the SMB command.

CM20   SSRV service_name REJECTED: MEMBER LIST INCOMPLETE

> The specified Member list is incomplete.   Action: verify the Member list with a DCX command (refer to Appendix A for the command) and re-type the command with the valid Member list.

CM20   SSRV service_name REJECTED :MEMBER member_name SWITCHABLE

> You are trying to start a type of Service which is incompatible with those already running.   Action: Ask your administrator which Services are incompatible, re-type the command as soon as these Services are terminated, as soon as both Members are UNSWITCHABLE.   You can check the termination of these services with DSRV and DMB commands and the modification of the switchability of the members (SWITCHABLE to UNSWITCHABLE) with a DMB command.

CM20   SSRV service_name REJECTED: NOT MAPPED ON MEMBER member_name

> The specified member_name is not valid.   Action: verify the Member names with a DCX command (refer to Appendix A for the command) and re-type the command with a valid member_name.

CM20   SSRV service_name REJECTED: USED_SERVICE service_name ACTIVE ON MEMBER member_name

The specified USED_SERVICE is already Active on the other Member. Action: re-type the command with MB= (mb1, mb2) where mb1 is the Member where the used-service is Active.

CM45   SSRV service_name REJECTED : RETRY LATER...

Action: re-type the command later.

CM61   SSRV service_name UNSUCCESSFUL : MEMBER member_name UNSWITCHABLE

You are trying to start a Service which is incompatible with those already running. Action: ask your administrator which Services are incompatible and re-type the command as soon as these Services have terminated. You can check the termination of these Services with DSRV and DMB commands.

CM61   SSRV service_name UNSUCCESSFUL ON MEMBER member_name: NOT RUNNING

The co-Member is not running. Action: none, the Service will be started as soon as the Member restarts.

CM61   SSRV service_name UNSUCCESSFUL ON MEMBER member_name : NOT STARTED

The co-Member is not started. Action: submit an SMB command for the Member member_name, the Service will start as soon as the co-Member starts.

CM61 SSRV service_name UNSUCCESSFULL: MEMBER member_name TELECOM ISOLATED DURING THE SWITCHABILITY MODIFICATIONS, RETRY LATER

The two CMSRs cannot communicate. Action: try to restart the telecom, the Service will start as soon as the telecom restarts.

Other Incidents

THE JOB LAUNCHED BY THE START_SERVICE COMMAND IS WAITING FOR A RESOURCE NOT ACCESSIBLE

If you do not want to wait and want to stop the Service, use the FSVRTO command (refer to section 4-4).

THE START OF THE SERVICE WHICH IS AN ORACLE SERVER IS UNSUCCESSFUL: CM32 SERVICE oracle_server_name TERMINATED FORCE ON MEMBER member_name

Perhaps the COR Service is not started. Action: verify with a DMB command that the COR Service is running on the Member. If necessary, start the COR Service with the SSRV command and then restart the ORACLE Server.

6.4   TSRV (TERMINATE_SERVICE)

CM18 TSRV service_name MEANINGLESS: ALREADY TERMINATED

The specified service_name is already terminated. Use a DSRV command to monitor this Service (refer to Appendix A for the command). Action: none.

CM18   TSRV service_name MEANINGLESS: ALREADY IN PROGRESS

> You cannot terminate a Service twice. Action: wait for the termination to complete.

CM18   TSRV service_name option1 MEANINGLESS: TSRV option2 ALREADY IN PROGRESS

> A termination with option2 is already in progress. Action: wait for the termination to complete.

CM19   TSRV service_name REJECTED: CMSR NOT RUNNING

> You cannot terminate a Service if the CMSR is not running. Action: re-type the command after having started the CMSR with the SCMSR command.

CM19   TSRV REJECTED : CMSR NOT YET OPERATIONAL

> Action: wait and re-type the command after the reception of the "CM08 CMSR STARTED" message.

CM19   TSRV REJECTED : CMSR IN TERMINATION STEP

> You cannot enter any CMSC command because the CMSR is terminating. Action: none.

CM19 TSRV service_name REJECTED: RESYNCHRONIZATION IN PROGRESS

> You cannot enter any CMSC command as the CMSR Resynchronization has not yet finished. Action: wait and re-type the command after the reception of the "CM68 END OF RESYNCHRONIZATION" message.

CM19 TSRV service_name REJECTED: service_name STILL USED

> You cannot terminate a Service which is still used by a Main Service. Action: use DSRV service_name to display the Main Service, if necessary, stop it with TSRV..

CM19 TSRV service_name REJECTED: service_name UNKNOWN

> The specified service_name is not known by the CMSC. Action: verify the Service names with the DCX and DMB commands (refer to Appendix A for the command) and re-type the command with the valid service_name.

CM20 TSRV service_name REJECTED: ACTIVE MEMBER member_name TELECOM ISOLATED

> The two CMSRs cannot communicate. Action: try to restart the telecom and re-type the command as soon as the telecom restarts.

CM45 TSRV service_name REJECTED : RETRY LATER

> Action: re-type the command later.

CM61   TSRV service_name UNSUCCESSFUL ON MEMBER member_name: member_name NOT RUNNING

> The co-Member is not running. Action: none, the Service will be started as soon as the Member restarts.

CM61   TSRV service_name UNSUCCESSFUL ON MEMBER member_name: member_name TELECOM ISOLATED

> The two CMSRs cannot communicate. Action: try to restart the telecom, the Service will start as soon as the telecom restarts.

CM65   TSRV service_name REJECTED: INVALID OPTION PARAMETER VALUE

> Your OPTION parameter is syntactically incorrect. Action: re-type the command with a correct string of values in the OPTION parameter (you can specify any parameter of the TDS master command TTDS except STRONG).

**JP79   jasname: STOP REQUESTED FOR THIS JAS.
          THERE ARE STILL STEPS CONNECTED TO IT.
          USE DJAS COMMAND TO IDENTIFY STEPS TO
          BE TERMINATED**

> Action: issue the DJAS (DISPLAY_JAS) command to list the steps connected to this JAS. Then, terminate the steps.

6.5 TMB (TERMINATE_MEMBER)

**CM18 TMB member_name MEANINGLESS :ALREADY
TERMINATED**

> The specified member_name is already terminated. Use DMB
> to monitor the Member (refer to Appendix A for the command).
> Action: none.

**CM19 TMB member_name REJECTED :RESYNCHRONIZATION IN
PROGRESS**

> You cannot enter any CMSC command as the CMSR
> Resynchronization is not yet finished. Action: wait and re-type
> the command after the reception of the "CM68 END OF
> RESYNCHRONIZATION" message.

CM19 TMB member_name REJECTED :member_name UNKNOWN

> The specified member_name is not known by the CMSC.
> Action: verify the Member names with the DCX command (refer
> to Appendix A for the command) and re-type the command with
> the valid member_name.

CM19 TMB REJECTED : CMSR IN TERMINATION STEP

> You cannot enter any CMSC command because the CMSR is
> terminating. Action: none.

CM19 TMB member_name REJECTED : CMSR NOT RUNNING

> You cannot terminate a Member if the CMSR is not running.
> Action: re-type the command after having started the CMSR
> with the SCMSR command.

CM19   TMB REJECTED : CMSR NOT YET OPERATIONAL

Action: wait and re-type the command after the reception of the "CM08 CMSR STARTED" message.

CM45   TMB member_name REJECTED : RETRY LATER...

Action: re-type the command later.

CM49   TMB member_name UNSUCCESSFUL :ISOLATED MEMBER

Action: you must either restart the telecom or wait for co-Member to restart (if it has crashed) and then re-type the SMB command.

CM61   TMB member_name UNSUCCESSFUL :SERVICES NOT ALL TERMINATED

There are still Services running on member_name. Action: use DMB member_name to display them and re-type the command after terminating the running services with TSRV command(s).

6.6   TCMSR (TERMINATE_CMSR)

CM18   TCMSR MEANINGLESS : ALREADY TERMINATED

You cannot terminate a CMSR twice. Action: none.

**CM18   TCMSR MEANINGLESS : CMSR ALREADY IN
TERMINATION STEP**

You cannot terminate a CMSR which is already being terminated. Action: wait for normal completion.

CM18   TCMSR MEANINGLESS : CMSR NOT YET OPERATIONAL

Action: wait and re-type the command after the reception of the "CM08 CMSR STARTED" message.

CM19   TCMSR REJECTED : MEMBER NOT TERMINATED

The Member is not terminated. Action: re-type the command after having terminated this Member with the TMB command.

CM19   TCMSR REJECTED : RESYNCHRONIZATION IN PROGRESS

You cannot enter any CMSC command as the CMSR Resynchronization has not yet finished. Action: wait and re-type the command after the reception of the "CM68 END OF RESYNCHRONIZATION" message.

CM45   TCMSR REJECTED: RETRY LATER

Action: re-type the command later.

6.7   TKMB (TAKEOVER_MEMBER)

CM18   TKMB option MEANINGLESS : ALREADY IN PROGRESS

A TKMB command has already been taken into account. Action: wait for the normal completion.

CM18   TKMB option MEANINGLESS : NO SERVICE TO TAKEOVER

All the Servers running on the current Member are already in Active mode. Action: none.

CM19   TKMB option REJECTED :RESYNCHRONIZATION IN PROGRESS

You cannot enter any CMSC command as the CMSR Resynchronization has not yet finished. Action: wait and re-type the command after the reception of the "CM68 END OF RESYNCHRONIZATION" message.

CM19   TKMB REJECTED: CMSR IN TERMINATION STEP

The TKMB command is rejected because the CMSR of the Member where you submitted the command is already in the termination step. Action: none.

CM19   TKMB REJECTED: CMSR NOT RUNNING

The TKMB command is rejected because the CMSR of the Member where you submitted the command is not running. Action: Re-submit the command after you start the CMSR with a SCMSR command.

CM19   TKMB REJECTED : CMSR NOT YET OPERATIONAL

Action: wait and re-type the command after the reception of the "CM08 CMSR STARTED" message.

CM19   TKMB option1 REJECTED : TKMB option2 ALREADY IN TERMINATION STAGE

There is already a Takeover with option2 in its termination phase. Action: none.

CM20   TKMB option REJECTED :MEMBER member_name NOT STARTED

The Member is not started. Action: re-type the command after having started the Active Member with the SMB command.

CM20   TKMB option REJECTED : MEMBER member_name NOT RUNNING

CM20   TKMB option REJECTED : MEMBER member_name SILENT

CM20   TKMB option REJECTED : MEMBER member_name TELECOM ISOLATED

Takeover is impossible because of the inaccessibility of the co-Member. Action: none.

CM20   TKMB option REJECTED : MEMBER member_name UNSWITCHABLE

> TKMB is rejected because there is no Service to be taken over. The Services running on the Member (if any) are not Services which can be taken over (NHA/W Services). Action: none.

CM20   TKMB option1 REJECTED : TKMB option2 IN PROGRESS

> There is already a Takeover with a higher priority in progress. Action: none.

CM45   TKMB option REJECTED : RETRY LATER

> Action: re-type the command later.

6.8   INCIDENTS DURING OPERATION

CM22   MEMBER member_name SILENT

> Action: if this message is not followed by the "CM22 MEMBER member_name NOT SILENT" message, check to see if there is a problem on the silent member (deadlock). Inform the HA administrator.

CM22   TELECOM ISOLATION

> There has been a failure in the telecom between the two Members.   Action: try to restart the failed one (STSVR command).

CM33   SERVICE service_name ABORTED ON MEMBER member_name: RESTART ATTEMPT IN PROGRESS

> The Service has aborted on the specified Member. The CMSR is trying to restart the aborted Service. Action: none.

CM72   WARNING: SHARED DISKS ARE NOT THE SAME ON THE TWO MEMBERS OF COMPLEX complex_name: THIS COULD PREVENT SHARED DISK FILES ACCESS IF A TAKEOVER OCCURS

> The list of disks declared shared on one Member is different from that declared shared on the other Member. Action: Make the two lists identical (using the MDHW command). See also the paragraph "Setting Up the Systems" in the Section "Installing HA".

CM72   SHARED DISKS LISTS ARE THE SAME ON THE TWO MEMBERS OF COMPLEX complex_name

> The lists of shared disks are identical on each Member. Action: none.

CM72   TIME IS THE SAME ON THE TWO MEMBERS OF COMPLEX complex_name (DIFFERENCE IS LESS THAN ONE MINUTE)

> The system time is either identical on each Member or the difference is less than the limit tolerated. Action: none.

CM 73 WARNING: SHARED DISKS LISTS COHERENCE CANNOT BE CHECK, TOO MANY DISKS ON MEMBER member_name

> The number of disks declared shared on the Member exceeds the limit that is checked by the CMSR. Action: You must check manually that the two lists of shared disks are identical. The CMSR will continue to run, but it will no longer warn you if the lists diverge. See also the paragraph "Setting Up the Systems" in the Section "Installing HA".

A. Syntax of CMSC Commands

This appendix gives the syntax of the CMSC commands used to operate and monitor a TDS-HA Complex.

For a detailed description of the CMSC commands and their parameters, refer to the *High Availability Administrator's Guide*.

For a detailed description of the DJAS (DISPLAY_JAS) command and its parameters, refer to the *File Recovery Facility User's Guide*.

A.1   DCX (DISPLAY_COMPLEX) COMMAND

```
{ DISPLAY_COMPLEX }
{                  }   ;
{ DCX             }
```

A.2   DJAS (DISPLAY_JAS) COMMAND

```
{ DISPLAY_JAS }
{             }
{ DJAS        }

   [ JAS_NAME = { SYS | BLUE | GREEN } ]   ;
```

A.3   DMB (DISPLAY_MEMBER) COMMAND

```
{ DISPLAY_MEMBER }
{                }
{ DMB            }
```

```
{ MEMBER }
{        } = name4
{ MB     }

[          {   0  } ]
[ STATE = {        } ]
[          { Bool } ]

[ { SERVICES }   {   0  } ]
[ {          } = {      } ]   ;
[ { SRV      }   { Bool } ]
```

A.4   DSRV (DISPLAY_SERVICE) COMMAND

```
{ DISPLAY_SERVICE }
{                 }
{ DSRV            }

    { SERVICE }
    {         } = name8
    { SRV     }

    [          {   0  } ]
    [ STATE = {        } ]
    [          { Bool } ]

    [ { MAIN_SERVICES }   {   0  } ]
    [ {               } = {      } ]
    [ { MSRV          }   { Bool } ]

    [ { USED_SERVICES }   {   0  } ]
    [ {               } = {      } ]
    [ { USRV          }   { Bool } ]

    [ { DETAILED }   {   0  } ]
    [ {          } = {      } ]   ;
    [ { DTLD     }   { Bool } ]
```

A.5 FSVRTO (FORCE_SERVER_TIMEOUT) COMMAND

```
{ FORCE_SERVER_TIMEOUT }
{                      }
{ FSVRTO               }

   { SERVICE }
   {         } = name8    ;
   { SRV     }
```

A.6 SCMSR (START_CMSR) COMMAND

```
{ START_CMSR }
{            }    ;
{ SCMSR      }
```

A.7 SMB (START_MEMBER) COMMAND

```
{ START_MEMBER }
{              }
{ SMB          }

   { MEMBER }   {            *            }
   {        } = {                         }   ;
   { MB     }   { (name-4 [name-4]...) }
```

A.8 SSRV (START_SERVICE) COMMAND

```
{ START_SERVICE }
{               }
{ SSRV          }

   { SERVICE }
   {         } = name8
   { SRV     }
```

```
[              {   0    } ]
[ RESYNC =     {        } ]
[              { Bool } ]

[ { OPTION }               ]
[ {        } = char240     ]
[ { OPT    }               ]

[ { MEMBER }                      ]
[ {        } = (name4 [name4]) ]
[ { MB     }                      ]

[ { USED_SERVICE }                        ]
[ {              } = (name8 [name8]...) ]  ;
[ { USRV         }                        ]
```

A.9   TCMSR (TERMINATE_CMSR) COMMAND

```
{ TERMINATE_CMSR }
{                }
{ TCMSR          }

[             {   0    } ]
[ FORCE =     {        } ]    ;
[             { Bool } ]
```

A.10   TKMB (TAKEOVER_MEMBER) COMMAND

```
{ TAKEOVER_MEMBER }
{                 }
{ TKMB            }

[ { OPTION }   { WEAK   } ]
[ {        } = { STRONG } ]    ;
[ { OPT    }   { FORCE  } ]
```

A.11 TMB (TERMINATE_MEMBER) COMMAND

```
{ TERMINATE_MEMBER }
{                  }
{ TMB              }

   { MEMBER }   {              *            }
   {        } = {                           }
   { MB     }   { ( name4 [name4] ... )     }

   [          { 0    } ]
   [ FORCE  = {      } ]   ;
   [          { Bool } ]
```

A.12 TSRV (TERMINATE_SERVICE) COMMAND

```
{ TERMINATE_SERVICE }
{                   }
{ TSRV              }

   { SERVICE }
   {         } = name8
   { SRV     }

   [           { 0    } ]
   [ RESYNC  = {      } ]
   [           { Bool } ]

   [ { OPTION }            ]
   [ {        } = char255  ]
   [ { OPT    }            ]

   [           { 0    } ]
   [ FORCE   = {      } ]   ;
   [           { Bool } ]
```

Glossary

This glossary contains a list of some TDS-HA terms and acronyms. An explanatory text is given for each item. A more comprehensive glossary is included in the *High Availability Administrator's Guide*.

Active   A Server is Active if it is actually supporting its Service. The Member on which the Active Server is running is the Active Member for the Service. A Member can be Active for one Service and Backup for another Service.

Backup   A Server is Backup if it is ready to rescue the Active Server. The Backup Server is **not** currently supporting its Service. The Member on which the Backup Server is running is the Backup Member for the Service. A Member can be Backup for one Service and Active for another Service.

CMSC   Abbreviation of Complex Management Service.

CMSR   Abbreviation of Complex Management Server.

Complex   A set of two Members which cooperate to support Services and a single CMSC.

JAS   Abbreviation of Journalization Advanced Service; see this term.

Journalization Advanced Service

GCOS 7 product that guarantees the integrity of a set of user files.

Member   DPS 7000 system (host) running and belonging to a Complex (supporting Servers). To be integrated in a Complex, a Member must have a CMSR (Complex Management Server) running on it.

Service   Implementation of a functional component (examples: TDS, JAS, ORACLE).

Takeover   Switching from the Backup to the Active state for a Server (Takeover of the corresponding Service).

TDS   Stands for Transaction Driven Subsystem, the transaction processing system available on Bull DPS 7000 platforms.

D

E, F, G

F

J, K, L

M

N

O

P

R

S

T, U, V

W