HADR PROCESS - High Availability Data Replication

SYSTEM REQUIREMENTS:

1. Primary and standby must have the **same platform and OS version**. FOR EX: Both on windows or Linux.
2. Primary and standby must have the same **DB2 major version**.
3. The DB2 software on primary and standby must have the same bit size (both 64 bit, or both 32 bit).
4. Same bit size on the host platform is recommended, to minimize compatibility risk. Like 32 bit or 64 bit.
5. Primary and standby must have the same paths for tablespace containers, to support tablespace replication.
6. Same hardware (CPU, memory, disk, etc.) is recommended on the primary and standby, so that standby has enough power for replay.
7. Same amount of memory is recommended on the primary and standby, so that buffer pool replication is less likely to fail.

Note : HADR support on pureScale is starts from DB2 V10.5. If you are on earlier releases, you may use Q-rep for DR solution, or consider upgrade.

Process:

STEP 1: Check db2 version.

Command: db2level

Step 2: check db2 instance:

Command: db2 get instance

Now we need to open the ports.

For Linux:

Step 1: login from root and execute the following commands:

firewall-cmd --permanent --add-port=51012/tcp --zone=trusted

firewall-cmd --permanent --add-port=51013/tcp --zone=trusted

firewall-cmd --reload

now open db2 console:

1. On primary database

Commands

1. Db2 connect to database name
   For e.g db2 connect to sample
2. Create a folder db2logs at location /home/db2admin/
3. db2 update db cfg for **DB NAME** using LOGARCHMETH1 DISK:/home/db2admin/db2logs/

Setting up HADR cfg parameters on PRIMARY database.

4. db2 update db cfg for **DB NAME** using HADR_LOCAL_HOST **<PRIMARY DB IP>**
5. db2 update db cfg for **DB NAME** using HADR_LOCAL_SVC 51012
6. db2 update db cfg for **DB NAME** using HADR_REMOTE_HOST **<STANDBY DB IP>**
7. db2 update db cfg for **DB NAME** using HADR_REMOTE_SVC 51013
8. db2 update db cfg for **DB NAME** using HADR_REMOTE_INST **<STANDBY DB INSTANCE>**
9. db2 update db cfg for **DB NAME** using LOGINDEXBUILD ON
10. db2 update db cfg for **DB NAME** using INDEXREC RESTART
11. db2 UPDATE DB CFG FOR **DB NAME** USING HADR_SYNCMODE ASYNC

NOW TAKE AN OFFLINE BACKUP OF PRIMARY DATABASE

Db2 backup dbname to /home/dbadmin/

Now commands for standby database:

Step 1 : db2 connect to dbname

Download the backup file from primary database server and upload the backup file to standby server.

2. restore the backup taken at primary database.

Command : db2 restore db **dbname** from /home/db2admin/ taken at **timestamp** into **dbname**

Setting up HADR cfg parameters on standby database.

3. db2 update db cfg for sample using HADR_LOCAL_HOST **<IP OF STANDBY DATABASE>**
4. db2 update db cfg for sample using HADR_LOCAL_SVC 51013
5. db2 update db cfg for sample using HADR_REMOTE_HOST **<IP OF PRIMARY DATABASE>**
6. db2 update db cfg for sample using HADR_REMOTE_SVC 51012
7. db2 update db cfg for sample using HADR_REMOTE_INST **<INSTANCE OF STANDBY DATABASE>**
8. db2 update db cfg for sample using LOGINDEXBUILD ON
9. db2 update db cfg for sample using INDEXREC RESTART
10. db2 UPDATE DB CFG FOR SAMPLE USING HADR_SYNCMODE ASYNC
11. db2set DB2_COMPATIBILITY_VECTOR=ORA
12. db2set DB2_HADR_ROS=ON
13. db2set DB2_STANDBY_ISO=UR
14. db2stop
15. db2start

NOW START THE HADR PROCESS :

db2 start hadr on database **DBNAME** as standby

NOW ON PRIMARY SERVER, START THE HADR PROCESS:

db2 start hadr on database **DBNAME** as primary

check the hadr status

db2dp –db **dbname** –hard

PROCESS COMPLETED

If the primary server fails, then takeover to the standby server.

Db2 force stop (on primary database)

Db2 takeover hadr on database **dbname** by force (on standby database)

The STANDBY instance is now the primary

https://www.ibm.com/support/pages/step-step-procedure-set-hadr-replication-between-db2-databases

https://ibm.github.io/db2-hadr-wiki/hadrTutorial.html

Please go through the above links for more details and understanding.

Stop HADR and deactivate both databases (do not stop the database manager on primary)

On Standby

Deactivate -> db2 deactivate db sample

Stop HADR -> db2 stop hadr on db sample

db2stop

On Primary

Stop HADR -> db2 stop hadr on db sample

Deactivate -> db2 deactivate db sample

Troubleshooting :

Error : IBM.Data.DB2.DB2Exception (0x80004005): ERROR [08001] [IBM] SQL30081N A communication error has been detected. Communication protocol being used: "TCP/IP". Communication API being used: "SOCKETS". Location where the error was detected: "193.16.100.18". Communication function detecting the error: "recv". Protocol specific error code(s): "*", "*", "0". SQLSTATE=08001

Effect: This error is coming on the read only node. This error not does occur every time, out of 10 connections, it will get fails 2-3 times.

Solution: The error message indicates that there is a communication issue between your application and the IBM DB2 database server. The error message contains the following details:

1. The communication protocol being used is TCP/IP.
2. The communication API being used is SOCKETS.
3. The location where the error was detected is "193.16.100.18".
4. The communication function detecting the error is "recv".
5. The protocol specific error code(s) is "", "", "0".
6. The SQLSTATE code for the error is 08001.

To resolve this issue, you can try the following:

1. Check if the network connection between your application and the database server is stable and there are no network issues.
2. Check if the database server is up and running.
3. Check if the database server is configured to accept connections using TCP/IP and SOCKETS protocols.
4. Check if the firewall settings on your machine or the database server are not blocking the communication between your application and the database server.
5. If the issue persists, contact your system administrator or the DB2 database administrator for further assistance. They can analyse the logs and identify the root cause of the issue.