**Split Brain Syndrome in Oracle RAC**

In AMSPRD DC1 (10.102.117.11&12) Unfortunately instance was down, we have observed instance was down suddenly on 2024-02-24 06:07:23.555 and checked in cluster log file showing error  is Network communication with node cdc1aodbdb1 (1) has been missing for more than  of 50% of the timeout interval.  If this persists, **Split brain Syndrome** is happened, then after  removal of this node from cluster will occur on that time.

**Split Brain Syndrome in Oracle RAC**

In an Oracle RAC environment, multiple nodes (servers) collaborate to provide high availability and scalability for a shared database. However, under certain conditions, communication between nodes can break down, leading to a situation known as **Split Brain Syndrome**. Here’s how it occurs:

1. **Cluster Interconnect**:
   * Each node in an Oracle RAC cluster is interconnected through a **private interconnect**.
   * End-users connect to the cluster through a **public network**.
2. **Scenario**:
   * Imagine a scenario where:
     + Node 1 and Node 2 are part of the RAC cluster.
     + The private interconnect between Node 1 and Node 2 fails.
     + Both nodes continue to run their database instances independently.
3. **Consequences**:
   * **Instance Perception**:
     + Node 1 thinks that Node 2 is down due to the lack of communication.
     + Node 2 similarly perceives Node 1 as down.
   * **Independent Operation**:
     + Both nodes start working independently.
     + Each RAC node can accept user connections and process transactions.
   * **Data Integrity Risk**:
     + Data blocks might be read or written by both instances simultaneously.
     + This can lead to data integrity issues, as changes made by one instance may not be synchronized with the other.
4. **Voting Disk**:
   * In a split-brain situation, the **voting disk** plays a crucial role.
   * The voting disk determines which node(s) survive and which node(s) get evicted.
   * Ideally, the voting disk ensures that only one set of nodes remains active to maintain data consistency.
5. **Node Eviction**:
   * If Node 1 cannot communicate with Node 2 (and vice versa), the voting disk decides which node survives.
   * The surviving node(s) continue to serve user requests, while the other node(s) are evicted.
6. **Resolution**:
   * Proper configuration of the voting disk and network settings is essential to prevent split-brain scenarios.
   * Oracle recommends using an **odd number of voting disks** for better decision-making during such situations.

**Diagram (Simplified Representation):**

+-------------------+ +-------------------+

| | | |

| Node 1 | | Node 2 |

| | | |

| +---------------+ | | +---------------+ |

| | Database | | | | Database | |

| | Instance | | | | Instance | |

| | | | | | | |

| +---------------+ | | +---------------+ |

| | | |

| Private Interconnect | | Private Interconnect |

| | | |

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THESE ARE THE CLUSTER LOGS :-

2024-02-24 06:07:09.450 [OCSSD(15161)]CRS-1612: Network communication with node cdc1aodbdb1 (1) has been missing for 50% of the timeout interval.  If this persists, removal of this node from cluster will occur in 14.100 seconds

2024-02-24 06:07:16.455 [OCSSD(15161)]CRS-1611: Network communication with node cdc1aodbdb1 (1) has been missing for 75% of the timeout interval.  If this persists, removal of this node from cluster will occur in 7.100 seconds

2024-02-24 06:07:21.458 [OCSSD(15161)]CRS-1610: Network communication with node cdc1aodbdb1 (1) has been missing for 90% of the timeout interval.  If this persists, removal of this node from cluster will occur in 2.090 seconds

2024-02-24 06:07:23.555 [OCSSD(15161)]CRS-1632: Node cdc1aodbdb1 is being removed from the cluster in cluster incarnation 578102888

2024-02-24 06:07:23.685 [OCSSD(15161)]CRS-1601: CSSD Reconfiguration complete. Active nodes are cdc1aodbdb2 .

2024-02-24 06:07:23.764 [CRSD(16388)]CRS-5504: Node down event reported for node 'cdc1aodbdb1'.

2024-02-24 06:07:29.069 [CRSD(16388)]CRS-2773: Server 'cdc1aodbdb1' has been removed from pool 'Generic'.

2024-02-24 06:07:29.086 [CRSD(16388)]CRS-2773: Server 'cdc1aodbdb1' has been removed from pool 'ora.AMSPRD'.

2024-02-24 06:07:29.091 [CRSD(16388)]CRS-2773: Server 'cdc1aodbdb1' has been removed from pool 'ora.AMSPRD\_AMSPRDDC1'.

2024-02-24 06:07:29.109 [CRSD(16388)]CRS-2773: Server 'cdc1aodbdb1' has been removed from pool 'ora.AMSPRD\_AMSPRDDC2'.

2024-02-24 06:07:40.618 [OHASD(12010)]CRS-8011: reboot advisory message from host: cdc1aodbdb1, component: cssmonit, with time stamp: L-2024-02-24-06:07:40.048

2024-02-24 06:07:40.680 [OHASD(12010)]CRS-8013: reboot advisory message text: oracssdmonitor is about to reboot this node due to no I/O completions with majority of voting disks.

2024-02-24 06:07:40.680 [OHASD(12010)]CRS-8011: reboot advisory message from host: cdc1aodbdb1, component: cssagent, with time stamp: L-2024-02-24-06:07:40.048

2024-02-24 06:07:40.681 [OHASD(12010)]CRS-8013: reboot advisory message text: oracssdagent is about to reboot this node due to no I/O completions with majority of voting disks.

we are faced again instance was down suddenly on 2024-03-02 08:21:19.105 and checked in cluster log file showing error  is Network communication with node cdc1aodbdb1 (1) has been missing for more than  of 50% of the timeout interval.

2024-03-02 05:42:47.770 [OCSSD(15161)]CRS-1727: Network communication between this node 'cdc1aodbdb2' (2) and node 'cdc1aodbdb1' (1) re-established. Node removal no longer imminent.  
2024-03-02 06:14:09.511 [OHASD(12847)]CRS-8500: Oracle Clusterware OHASD process is starting with operating system process ID 12847  
2024-03-02 06:14:09.640 [OHASD(12847)]CRS-2112: The OLR service started on node cdc1aodbdb2.  
2024-03-02 06:14:10.250 [OHASD(12847)]CRS-1301: Oracle High Availability Service started on node cdc1aodbdb2.  
2024-03-02 06:14:10.256 [OHASD(12847)]CRS-8017: location: /etc/oracle/lastgasp has 2 reboot advisory log files, 0 were announced and 0 errors occurred\

2024-03-02 08:21:04.464 [OCSSD(23937)]CRS-1612: Network communication with node cdc1aodbdb1 (1) has been missing for 50% of the timeout interval.  If this persists, removal of this node from cluster will occur in 14.140 seconds  
2024-03-02 08:21:11.467 [OCSSD(23937)]CRS-1611: Network communication with node cdc1aodbdb1 (1) has been missing for 75% of the timeout interval.  If this persists, removal of this node from cluster will occur in 7.140 seconds  
2024-03-02 08:21:16.470 [OCSSD(23937)]CRS-1610: Network communication with node cdc1aodbdb1 (1) has been missing for 90% of the timeout interval.  If this persists, removal of this node from cluster will occur in 2.140 seconds  
2024-03-02 08:21:19.105 [OCSSD(23937)]CRS-1632: Node cdc1aodbdb1 is being removed from the cluster in cluster incarnation 578102892  
2024-03-02 08:21:19.640 [OCSSD(23937)]CRS-1601: CSSD Reconfiguration complete. Active nodes are cdc1aodbdb2 .  
2024-03-02 08:21:19.667 [OCTSSD(25321)]CRS-2407: The new Cluster Time Synchronization Service reference node is host cdc1aodbdb2.  
2024-03-02 08:21:23.723 [CRSD(25400)]CRS-5504: Node down event reported for node 'cdc1aodbdb1'.

We are raised SR to Oracle support on **2024-02-24T16:12:23.92 with SR 3-35872591681 : ORA-29740: evicted by instance number 1 ,** from oracle support is given action plan :-

CAUSE DETERMINATION  
====================  
  
Instance termination  
  
CAUSE JUSTIFICATION  
===================  
  
Instance 1 evicted by Instance 2

SOLUTION / ACTION PLAN  
======================  
  
As per Logs, we found Instance 1 evicted Instance 2 due to communication issue and this happened due to Slow IO (high-speed interconnects on the private network), which we got from CHM Analyzer. From CHM, we got that during Issue Time, the IO Wait was 47%, which is not normal. So you need to check with your OS Admin for IO Issue.  
  
As per Log "AMSPRD1\_lmon\_40651.trc", "rp\_filter" for Private Interface is 1. But from RAC, the value suggested to keep 0 or 2.