

Phase-4 2PC Report

Team Lonely:

- Pragn Saxena (20171127)

Algorithm Used:

For co-ordinator:

Algorithm 12.1: 2PC Coordinator Algorithm (2PC-C)

```
begin
  repeat
    wait for an event ;
    switch event do
      case Msg Arrival
        Let the arrived message be msg ;
        switch msg do
          case Commit {commit command from scheduler}
            write begin_commit record in the log ;
            send "Prepared" message to all the involved
              participants ;
            set timer
          case Vote-abort {one participant has voted to abort;
            unilateral abort}
            write abort record in the log ;
            send "Global-abort" message to the other involved
              participants ;
            set timer
          case Vote-commit
            update the list of participants who have answered ;
            if all the participants have answered then {all must
              have voted to commit}
              write commit record in the log ;
              send "Global-commit" to all the involved
                participants ;
              set timer
          case Ack
            update the list of participants who have acknowledged ;
            if all the participants have acknowledged then
              write end_of.transaction record in the log
            else
              send global decision to the unanswering participants
        end switch
      case Timeout
        execute the termination protocol
    end switch
  until forever ;
end
```

For participant

Algorithm 12.2: 2PC Participant Algorithm (2PC-P)

```
begin
  repeat
    wait for an event ;
    switch ev do
      case Msg Arrival
        Let the arrived message be msg ;
        switch msg do
          case Prepare      {Prepare command from the coordinator}
            if ready to commit then
              write ready record in the log ;
              send "Vote-commit" message to the coordinator ;
              set timer
            else
              write abort record in the log ;
              send "Vote-abort" message to the coordinator ;
              abort the transaction
          case Global-abort
            write abort record in the log ;
            abort the transaction
          case Global-commit
            write commit record in the log ;
            commit the transaction
          case Timeout
            execute the termination protocol
        end
      end
    until forever ;
  end
```

Testing and Overview:

- The code support every kind of operations for 2PC including commit, abort and timeout
- For simulating abort and timeout, the code present on the server randomly decides for aborting or taking time more than timeout with probabilities of 10% and 5% respectively.
- Any kind of update operation is supported as per phase-4 requirements
- The algorithm implemented is taken from books as mentioned above
- The two-phase protocol supports the atomic execution of the update operations across sites.
- Log files are created which keeps log of every activity

Screenshots of working code:

“Co-ordinator Code”

```
Enter your update query
UPDATE Supplier SET CompanyName="New Name 2" WHERE id = 2
Sending Prepare Message to each site
Sending Global Commit for transaction
Recieved Acknowledgment from every Site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 5" WHERE id = 4
Sending Prepare Message to each site
Sending Global Commit for transaction
Recieved Acknowledgment from every Site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 1" WHERE id = 2
Sending Prepare Message to each site
Recieved Abort from site http://10.3.5.212:7000/
Recieved Abort from site http://10.3.5.208:7000/
The transaction is not possible sending global abort to all site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 1" WHERE id = 2
Sending Prepare Message to each site
Sending Global Commit for transaction
Recieved Acknowledgment from every Site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 1" WHERE id = 2
Sending Prepare Message to each site
Recieved Abort from site http://10.3.5.212:7000/
Recieved Abort from site http://10.3.5.211:7000/
The transaction is not possible sending global abort to all site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 1" WHERE id = 2
Sending Prepare Message to each site
Recieved Abort from site http://10.3.5.211:7000/
The transaction is not possible sending global abort to all site
Enter your update query
Sending Prepare Message to each site
Sending Global Commit for transaction
Recieved Acknowledgment from every Site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 6" WHERE id = 3
Sending Prepare Message to each site
Timeout Occured for the prepare on url = http://10.3.5.212:7000/
Timeout Occured for the prepare on url = http://10.3.5.208:7000/
The transaction is not possible sending global abort to all site
Enter your update query
```

“Participant Code”

```

Recieved response Prepare from the Co-ordinator
Ready to commit
10.11.1.166 - - [19/Apr/2021 21:34:43] "GET /prepare HTTP/1.1" 200 -
{'Query': 'UPDATE Supplier SET CompanyName="New Name 2" WHERE id = 2'}
UPDATE Supplier SET CompanyName="New Name 2" WHERE id = 2
Txn Succesful
10.11.1.166 - - [19/Apr/2021 21:34:44] "POST //query HTTP/1.1" 200 -
Recieved response Prepare from the Co-ordinator
Ready to commit
10.11.1.166 - - [19/Apr/2021 21:35:14] "GET /prepare HTTP/1.1" 200 -
{'Query': 'UPDATE Supplier SET CompanyName="New Name 5" WHERE id = 4'}
UPDATE Supplier SET CompanyName="New Name 5" WHERE id = 4
Txn Succesful
10.11.1.166 - - [19/Apr/2021 21:35:14] "POST //query HTTP/1.1" 200 -
Recieved response Prepare from the Co-ordinator
Not ready to commit, preparing abort
10.11.1.166 - - [19/Apr/2021 21:35:43] "GET /prepare HTTP/1.1" 200 -
Global Abort recieved
Aborting from process
10.11.1.166 - - [19/Apr/2021 21:35:44] "GET /abort HTTP/1.1" 200 -

```

```

Sending Prepare Message to each site
Sending Global Commit for transaction
Recieved Acknowledgment from every Site
Enter your update query
UPDATE Supplier SET CompanyName="New Name 6" WHERE id = 3
Sending Prepare Message to each site
Timeout Occured for the prepare on url = http://10.3.5.212:7000/
Timeout Occured for the prepare on url = http://10.3.5.208:7000/
The transaction is not possible sending global abbort to all site
Enter your update query

```