Cristian's Algorithm
(Physical clock synchronization algorithm)

Cristian's Algorithm

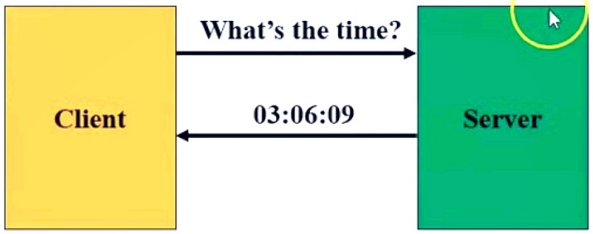
- The process on the client issues RPC to the Time Server at time T0 to obtain the time.

Cristian's Algorithm

- Cristian's Algorithm is a physical clock synchronization technique used in distributed systems.

- **Basic idea**: If client wants to correct its time as per server time, then it will make the request to the time server and correct accordingly.

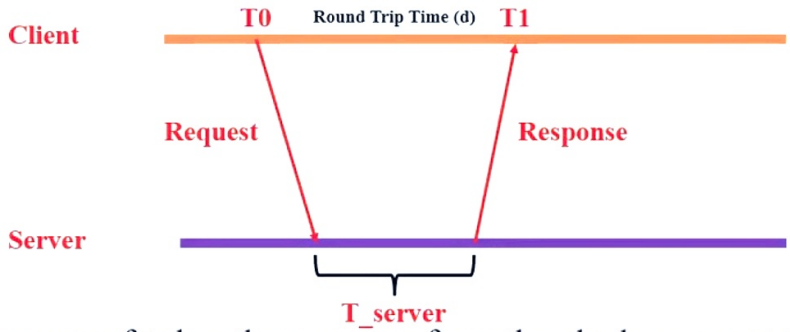
- **Based on : Client Server concept (makes use of RPC)**



- **It makes use of UTC i.e., Co-ordinated Universal Time**

Cristian's Algorithm

- The process on the client issues RPC to the Time Server at time T0 to obtain the time.
  - ➢Client makes a request T0 in d/2 seconds
  - ➢d=max difference between the clock and UTC



- The client process fetches the response from the clock server at time T1 and calculates the new synchronized client clock time by

$$T\_client = T\_server + \frac{(T1-T0)}{2}$$

Cristian's Algorithm illustration

- Send request at 5:08:15:100 (T0)
- Receive response at 5:08:15:900 (T1)
- Response contains 5:09:25:300 (T_server)

➢Elapsed Time (also called as Round Trip Time) is (T1-T0)/2

= 5:08:15:900 - 5:08:15:100 = 800 msec

= (T1-T0)/2 = 800/2 = 400 msec

➢Set time to

T_client = T_server + elapsed time

T_client = 5:09:25:300 + 400

T_client= 5:09:25:700