Week 6: Assignment 6

The due date for submitting this assignment has passed.

Due on 2025-03-05, 23:59 IST.

Assignment submitted on 2025-03-03, 20:13 IST

1) Which algorithm can synchronize clocks in a distributed system using a master process to average offsets? ***1 point***

- Christian's Algorithm
- NTP
- Berkley's Algorithm
- DTP

Yes, the answer is correct.
Score: 1
Accepted Answers:
Berkley's Algorithm

2) What problem is solved by using logical clocks in distributed systems? ***1 point***

- Message loss recovery
- Event ordering across processes
- Reducing memory usage
- Faster message transmission

Yes, the answer is correct.
Score: 1
Accepted Answers:
Event ordering across processes

3) What does the term "external synchronization" imply in distributed systems? ***1 point***

- All clocks are synchronized to a single external reference

- Clocks are synchronized relative to each other
- Clocks are not synchronized
- Each process maintains its local time independently

Yes, the answer is correct.
Score: 1
Accepted Answers:
All clocks are synchronized to a single external reference

4) Which relationship between events is established by Lamport Timestamps? ***1 point***

- (•) Happens-before relationship
- Total ordering
- Concurrent event relationship
- Absolute event timing

Yes, the answer is correct.
Score: 1
Accepted Answers:
Happens-before relationship

5) What is the maximum drift between two clocks if each has a maximum drift rate of 5 ms per second? ***1 point***

- 5 ms
- (•) 10 ms
- 15 ms
- 20 ms

Yes, the answer is correct.
Score: 1
Accepted Answers:
10 ms

6) Which protocol is widely used for clock synchronization in distributed systems? ***1 point***

- FTP
- FTTP
- (•) NTP
- TCP

Yes, the answer is correct.
Score: 1
Accepted Answers:
NTP

7) What rule does Lamport Timestamps use for assigning timestamps to events in the same process? ***1 point***

- The timestamp is incremented by 2 for each event
- The timestamp is always set to 1
- The timestamp is decremented by 1 for each event
- (•) The timestamp is incremented by 1 for each event

Yes, the answer is correct.
Score: 1

Accepted Answers:
The timestamp is incremented by 1 for each event

8) Which technology does Google's B4 use for traffic engineering? ***1 point***

- MPLS
- Software-defined networking (SDN)
- Virtual LAN
- Internet Protocol (IP)

Yes, the answer is correct.
Score: 1

Accepted Answers:
Software-defined networking (SDN)

9) What is the main purpose of vector timestamps in distributed systems? ***1 point***

- To detect and manage concurrent events
- To synchronize physical clocks
- To replace logical clocks
- To reduce network latency

Yes, the answer is correct.
Score: 1

Accepted Answers:
To detect and manage concurrent events

10) Which of the following algorithms is used for external time synchronization in distributed systems? ***1 point***

- Berkeley Algorithm
- Lamport Timestamps
- Paxos
- Christian's Algorithm

Yes, the answer is correct.
Score: 1

Accepted Answers:
Christian's Algorithm