

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination: Semester 2

Academic Year: 2004-2005

Date: 23rd February 2005

Time: 13.30-16.30 (3 hours)

Subject Number: 240-631

Room: R00

Subject Title: Parallel and Distributed Simulation Systems

Exam Duration: 3 hours

This paper has 9 pages, 6 questions and 40 marks (30%).

Authorised Materials:

- Writing instruments (e.g. pens, pencils).
- Textbooks, a notebook, handouts, and dictionaries are permitted.

Instructions to Students:

- Scan all the questions before answering so that you can manage your time better.
- Attempt all questions in Thai.
- Write your name and ID on every page.
- Any unreadable parts will be considered wrong.

When drawing diagrams or coding, use good layout, and short comments; marks will not be deducted for minor syntax errors.

ทูลรลทในการสอบ

โทษจันต่ำ ปรบัตคในรายวلمانันและพักการเรยน 1 ภาคการศึกษา

โทษสูงสุด ให้ออก

Question 1

(18 marks; 60 minutes)

- a) What are the differences between *time parallel* and *space parallel* frameworks
(2 marks)

- b) What are the differences between *Global Virtual Time (GVT)* and *lower bound on the time stamp (LBTS)*?
(2 marks)

- c) What are the differences between *Batch fossil collection* and *On-the-fly fossil collection*?
(2 marks)

- d) Tell the differences between *conservative* and *optimistic* algorithms in distributed simulation systems.
(2 marks)

- e) Tell the differences amongst the followings in terms of algorithm and tradeoff.
(4 marks)

- Copy State Saving

- Infrequent State Saving

- Incremental State Saving

- Reverse Computation

f) Show the following scenarios using diagrams and give a solution to solve the problems. (6 marks)

- Zero Lookahead,

- Simultaneous Events

- Repeatability

Question 2

(6 marks; 30 minutes)

Tell the differences amongst the followings in terms of algorithm and usage. Use diagrams to help explanation.

- Event Retraction
- Lazy Cancellation
- Lazy Re-Evaluation

Question 3

(4 marks; 20 minutes)

Tell the differences amongst the followings in terms of algorithm and usage. Use diagrams to help explanation.

- Storage optimal protocols
- Artificial Rollback

Question 4

(4 marks; 20 minutes)

Show solutions to the following problems in *Global Virtual Time* using diagrams.

a) transient message

(2 marks)

b) simultaneous reporting

(2 marks)

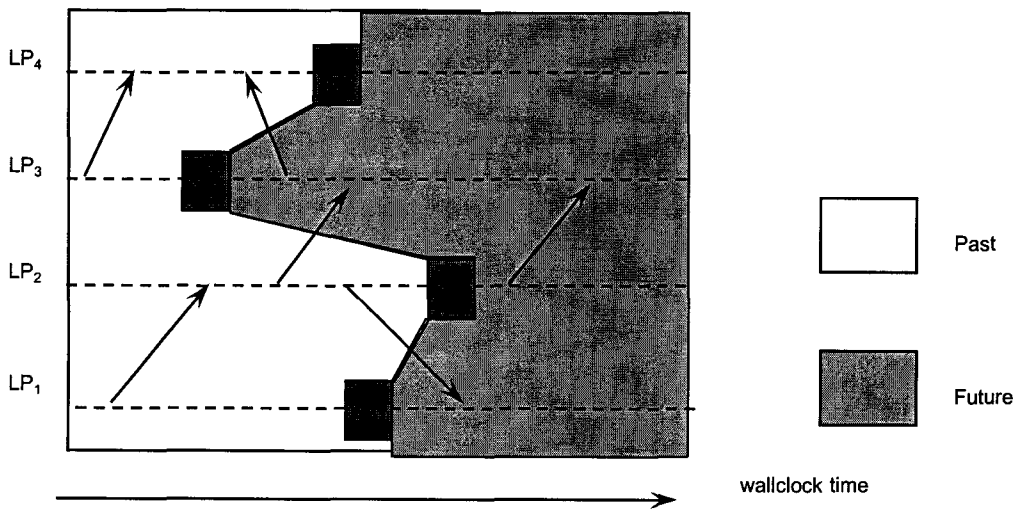
Question 5

(4 marks; 20 minutes)

a) How does the *fossil collection* deal with GVT in *time warp*? (1 mark)

b) How does *message sendback* work? And what is it for? (2 marks)

c) From the following diagram, circle *cut messages*. (1 marks)

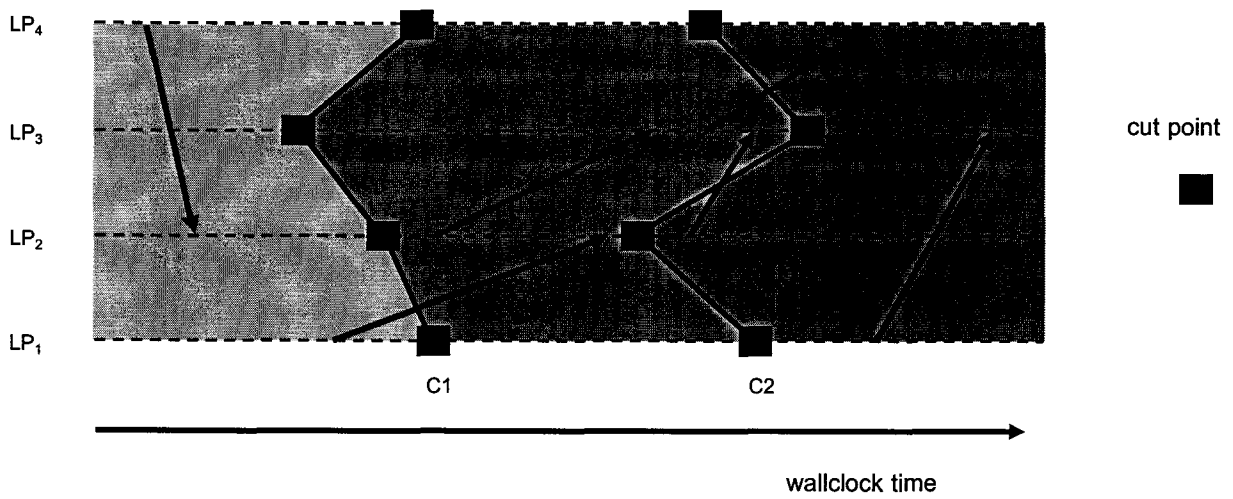


Question 6

(4 marks; 20 minutes)

a) From the following picture, explain how each cut is made briefly.

(2 marks)



b) Explain the use of third cut and other cuts.

(2 marks)

----End of Examination----

Pichaya Tandayya

Lecturer