



PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
SCHOOL OF ENGINEERING
COMPUTER SCIENCE DEPARTMENT

IIC2523 Distributed Systems (II/2018) - Parallel 1

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Test 2

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Question 1 (15 pts): Pastry Routing

Write an example of routing in which a node takes 4 jumps to find another. For this you must consider the following:

- Nodes are connected to the network long time ago
- The GUIDs consist of 4 characters, each one representing a hexadecimal digit
- Leaf sets consist in 5 elements
- Routing table has 4 levels
- At least 2 jumps must be given in nodes that are in the leaf sets

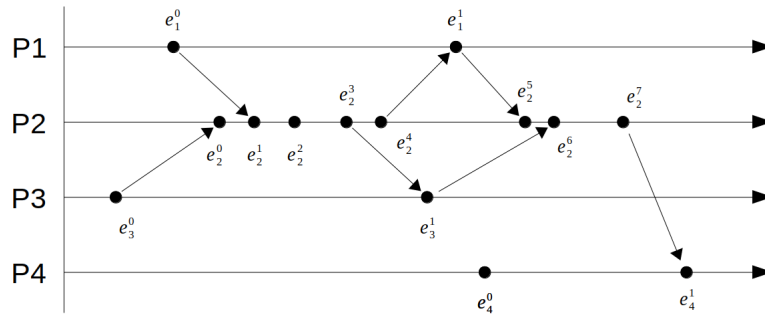
For this you must clearly indicate the GUID of the current node, the leaf set and the routing table (only if it needed) for each step.

Remember that when jumping using the routing table, you can reach a node with the prefix you jumped at.

Question 2 (20 pts): Clock Synchronization

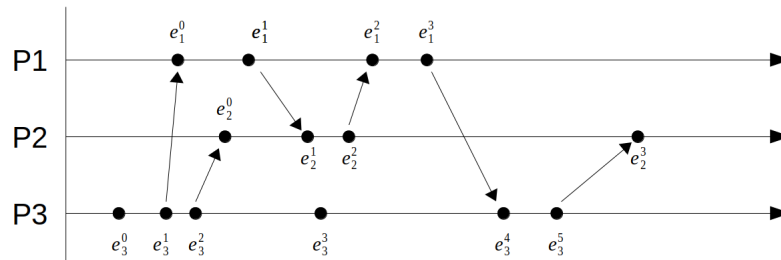
For this set of processes, answer the following questions:

1. (4 pts) Write *Lamport timestamps* for those processes
2. (4 pts) Write *Vector clocks* for those processes
3. (8 pts) In what cases does the first method not give us as much information as the second?
Answer with an example applied to the processes image.
4. (4 pts) What are the disadvantages of the second method?



Question 3 (25 pts): Processes and states

For this set of processes, answer the following questions:



1. (5 pts) Make a consistent cut and an inconsistent cut. Reference edges in each case.
2. (5 pts) Write two linearizations (linearizaciones) for those processes.
3. (15 pts) Indicate the final states for Chandy-Lamport *snapshot* algorithm, started by P3 after the first event. In the next image, you can see how marker messages were sent.

