Sheet 2, SS 2015
Verteilte Systeme/ Distributed Systems
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Distributed Systems Lecture - Discussion 21.5.2015

Assignment 1. Chord Routing Assume the simple DHT-based structured overlay as shown in Fig. 1, showing a Chord system.

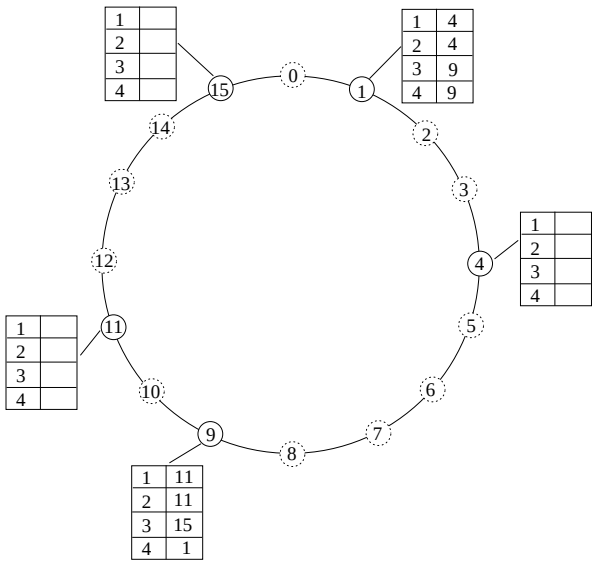

Figure 1: Chord system

Please

1. fill the finger tables with missing items
2. assume a process contacts node 1 to access item 14. Explain the steps needed to find this item.
3. assume address 6 is a node that has just joined the ring? Adjust the finger tables accordingly.
4. what happens if node 11 or item 12 leave the ring?
5. try to use prefix-routing by transforming addresses into binary numbers. Would this work?

Assignment 2. Happened before relation

Fig. 2 shows a happened-before and a potential causality model of a distributed computation.

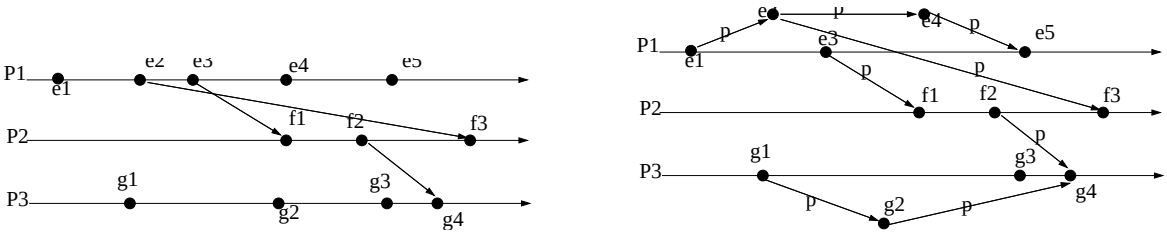

Figure 2: Distributed Computation

1. Please explain the graphs.
2. Please define the *locally precedes* relation
3. Please state the *remotely precedes* relation
4. Based on the previous relations, please define the *happened-before* and the *potential causality* relations. What properties do those relations have?
5. Please prove or falsify whether the happened-before relation is consistent with the potential causality relation.

Distributed Systems Seminar - Discussion 28.05.2015

Assignment 1. FUcoin: The Research Phase

We want to implement a Bitcoin variant: FUcoin - a decentralized payment system! Research all information you can get about the inner workings of Bitcoin. Only stop if it is clear to you how it could be implemented.

This includes (not exclusively):

- Block chain
- Unit limit
- Ownership of money
- Transactions
- Mining

You can take common techniques as granted, i.e. you don't have to explain how SHA-256 or public-key cryptography works.

Please use Akka to implement a virtual wallet, which can hold a positive amount of cash.