CS455 – Lab Session 03
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Agenda
- Quiz – 1 review
- ASG-01 – Setup guide for password less login
- ASG-01 – FAQ

Quiz-1 review
1. Manchester encoding fixes the following problem(s) in NRZ:
   a. Baseline wander
   b. Clock recovery
   c. Both (a) and (b)
   d. None of the above
   Manchester encoding:
   - Transition for every bit
   - Receiver can synchronize with sender's clock

Quiz-1 review
2. The 4B/5B encoding scheme ensures that the translated codes (4-bit to 5-bit encodings) do not result in more than 1 leading 0 and no more than 2 trailing 0’s. This is because:
   a. It allows the transmissions to be more energy efficient
   b. The 5-bit codes are transmitted using NRZI that performs transitions for 1s
   c. The receiver averages for signal strengths would be much closer to the media signal strength between 1 and 0.
   d. None of the above

Quiz-1 review
3. What is the efficiency of the 4B/5B encoding scheme?
   a. 4/5 or 80%  
   b. 3/4 or 75%

Quiz-1 review
4. Circuit switched networks require circuits and their accompanying state to be established before data can be transferred.
   a. Establish a dedicated circuit
   b. Send data on the circuit
   True/False

Quiz-1 review
5. When multiplexing data onto a physical link, setting aside time quanta is not feasible because:
   a. Number of flows must be known ahead of time
   b. The link may be idle if a particular flow is not active
   c. Typical network usage patterns are bursty
   d. All of the above

Quiz-1 review
6. The Delay x Bandwidth product tells us how many bits fill in a network pipe. What is the maximum number of pipes that a sender can fill before it receives an acknowledgement from the receiver? 2
Quiz-1 review

7. The latency observed in a channel cannot be attributed to:
   a. Bandwidth
   b. Propagation delay
   c. Queueing delay
   d. Time required to transmit a unit of data

8. In statistical multiplexing, packets from a particular sender are placed in a predetermined slot in the routing schedule.
   [True/False]

Password less remote login

- Run following commands on any of the CS department machines

```bash
ssh-keygen -t rsa -P "" -f ~/ssh/id_rsa
```

- You will be able to remotely login any of the CS department machines without password

FAQ

Customization
- You can add additional messages
- Additional info in messages
- For ex, additional message sending listening port after connection establishment between two messaging nodes

Concurrency issue
- Multiple messages are sent at same instance
- Original message to send from MN1
- Relayed message to send from MN1
- Race condition
- MN2 throws exception while reading

Customization
- Overlay creation
- No partition
- Method shown in Lab session 1
- Build your own implementation
- Shortest paths
- Compute before sending message OR compute just after getting link weights
How to tackle the issue

- Synchronize the message sending part
- Serial access of message sending method
- A bit slow

```java
public synchronized void sendData()
{
...
```

Corner cases you should handle

- A MessagingNode can register and de-register itself multiple times before creation of overlay
- A host can work as multiple MessagingNodes
- Your solution should work for at least 5000 rounds
- We will check up to 20,000 rounds
- A MessagingNode can register and de-register itself multiple times before creation of overlay
- A host can work as multiple MessagingNodes
- Your solution should work for at least 5000 rounds
- We will check up to 20,000 rounds
- You should wait for 15s or more after receiving all TASK_COMPLETE messages
- To allow message transfers to be completed
- Before issuing FULL_TRAFFIC_SUMMARY
- Your solution should work for multiple TASK_INITIATE messages
- Reset counters after sending TRAFFIC_SUMMARY
- Communication between nodes must happen in bytes
- Deductions for any format other than bytes.

QUESTIONS?