

# Home Task 02

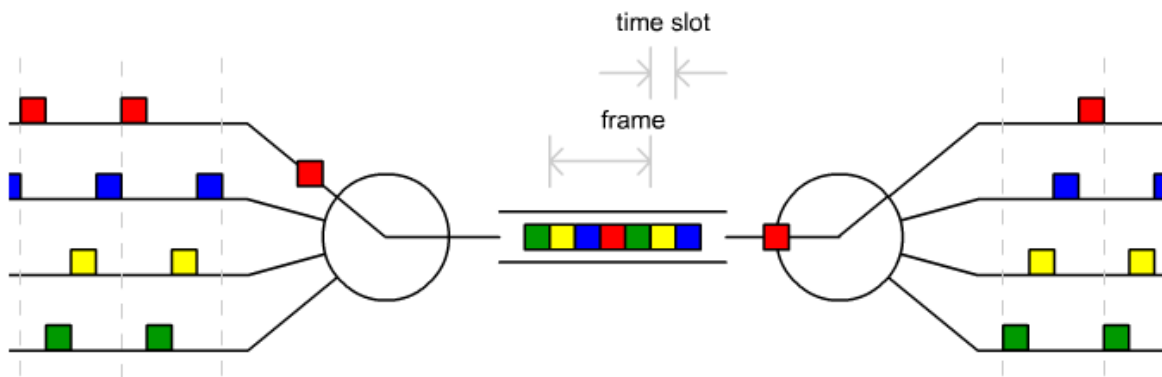
## CSE 2213- Data and Telecommunications Lab

### Emulation of Sync-TDM and Stat-TDM

#### Problem Description

This experiment emulates Synchronous Time Division Multiplexing (Sync-TDM) and Statistical Time Division Multiplexing (Stat-TDM). Consider two different traffic models: Consider two different traffic models: *backlogged traffic model*, where data values are always available from n input files and *Poisson process model*, where the presence of traffic from a particular file is random.

```
Random randomGenerator = new Random();  
int randomInt = randomGenerator.nextInt(100);  
if(randomInt<50) \\will generate packet  
otherwise \\no packet
```



Consider that  $n = 5$  (5 files with different sizes, should need more than five individual slots to send an entire file), slot size: 10 Byte. Each slot will have a specific format like below:

Start Marker	Source Address	Destination Address	Data	End Marker
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The frame format will be like below:

Start Marker	Slot 01	Slot 02	Slot 03	Slot 04	Slot 05	End Marker
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***Now, implement the Statistical-TDM with backlogged traffic model.***

In case of TDM, time slots are allocated to channels, even if they have no information to transmit. This is just wastage of the bandwidth and to overcome this inefficiency of standard TDM, a technique known as STDM has been developed where time is allocated to lines only when it is required. This is achieved with the use of intelligent devices that are capable of identifying when a terminal is idle.

Output:

- Print the whole frame before sending to the other side.
- Print the whole frame after receiving.
- Store the outputs properly in the different files.

## Write a report on your understating and lab experiment 02 (sync-TDM and stat-TDM)

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Your report must contain the following:

1. Problem definition:
  - a. Define the problem as what was expected to accomplish
  - b. What where the inputs and outputs
  - c. Equipment required
2. Theoretical background
  - a. What is multiplexing?
  - b. Why do we require it?
  - c. Different kinds of multiplexing
  - d. Details of TDM
    - i. Brief history
    - ii. Operational principles
    - iii. Different kinds of TDM
    - iv. Advantages of TDM over other multiplexing techniques
3. Working principle
  - a. How did you accomplish your Lab05 task
  - b. Write a pseudo code for your program
  - c. Main challenges and their solutions
4. Discussion (main section this is where you have to do your research and homework)
  - a. Applications
    - i. Where is it used today? A few Real life examples –as many as you can)

- ii. Any hardware that support TDM, trainer boards (for example any chip, IC or device that perform TDM on given inputs, are those available in Bangladesh?
- b. Comparative analysis
  - i. Different implementations and versions (other than sync and stat)
    - Describe at least one of its variants.
  - ii. Why stat-TDM performs better than sync-TDM
    - Is there a situation where the reverse is true?
  - iii. Performance analysis (performance metric: throughput)
    - Define throughput with examples
    - How can you calculate the throughput for sync and stat-TDM?
- 5. Create graphs for the following:
  - a. (y-axis: throughput of sync-TDM) vs (x-axis: Number of same sized files (vary from 3-10))
  - b. (y-axis: throughput of stat-TDM) vs (x-axis: Number of same sized files (vary from 3-10))
  - c. (y-axis: throughput of sync-TDM) vs (x-axis: Number of different sized files (vary from 3-10))
  - d. (y-axis: throughput of stat-TDM) vs (x-axis: Number of different sized files (vary from 3-10))

*For any further query feel free to contact through Piazza and also feel free to discuss in person.*

### **Report Due:**

- **20/08/2017**
- **You may work in teams of two. Team members must be from the same lab group.**
- **Print the report using A4 paper with proper cover page.**

### **Assignment Due:**

- **19/08/2017, 11:59pm**
- **You may work in teams of two. Team members must be from the same lab group.**
- **Submit the assignment in piazza as a private message:**
  - **Title: Lab Home Task 02\_roll01\_roll02\_(Odd/EVEN)**