



Department of Computer Science

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**CS411 - Network Security**  
**June 1<sup>st</sup> 2020**  
**Assignment 5 - Weight 6 %**  
**Group assignment**

1. Make groups of 5 (from the same section). You can retain the same group members from the previous assignment or make new ones. You are responsible for the group dynamics therefore select your group partners wisely. Only one group of less than five members will be allowed. All other groups have to have 5 members. This idea behind larger groups is that you have discussions before writing your answers.
2. This assignment represents the type of question you will be given in the final take-home exam, therefore, spend time and effort to understand and complete this assignment. Although a group assignment, individual effort is in your best interest.
3. Remember, there will be many correct answers, but how you present and justify your answer is more important.
4. Consider a multi layered network with high-level servers, medium-level servers, low-level servers, and clients. All the servers (high level, medium level, low level) have knowledge of the complete layout of the network. However, all servers can only communicate with the servers that are their direct parent or direct child.
5. Construct a secure network data transmission protocol using all the knowledge you have gained in this course.
  - a. The protocol should ensure that when a client sends a message to another client anywhere in the network, no other device along the way is able to read the contents of the message.
  - b. The protocol should ensure that when a client sends a message, it is not received by any other client except the one it is intended for. It can pass through any number of servers to reach the intended clients.
6. Focus on the security aspects. Do not worry about efficiency and other core network concepts.
7. Justify each choice you make with arguments. You should use diagrams to elaborate your solution.

**Notes**

1. Title page of the assignment should clearly mention the names and IDs of both groups members
2. You are also allowed to collaborate with you friends as much as you like.
3. Since we are at the end of the semester, the deadline is **FIRM**.
4. One submission per group member on SLATE should suffice.

Deadline to submit: Sunday June 15<sup>th</sup>, 11:55 PM via SLATE.