Cn Lab Assignment on Mac Layer Protocol

Objective:

To simulate and analyze the performance of Pure ALOHA and Slotted ALOHA protocols using NS2.

Tools:

- NS2 (Network Simulator 2)

Tasks:

Setup:
- Install NS2 on your machine if not already installed.
- Familiarize yourself with the NS2 environment and basic commands.

Scenario Setup:
- Create a simple network topology with multiple nodes.
- Set up a sender and receiver node.
- Configure the nodes with wireless interfaces.

Implementing Pure ALOHA:
- Implement the Pure ALOHA protocol in NS2.
- Set parameters such as packet size, transmission rate, propagation delay, and collision detection.
- Run simulations for different scenarios and analyze the throughput and efficiency of Pure ALOHA.

Implementing Slotted ALOHA:
- Implement the Slotted ALOHA protocol in NS2.
- Set parameters similar to those in Pure ALOHA.
- Run simulations and compare the performance of Slotted ALOHA with Pure ALOHA.

Performance Metrics:
- Measure and compare the throughput, collision rate, and efficiency of Pure ALOHA and Slotted ALOHA under different network conditions.
- Plot graphs to visualize the performance metrics.

Analysis:
- Discuss the advantages and disadvantages of Pure ALOHA and Slotted ALOHA.
- Explain how slotting affects the performance of Slotted ALOHA compared to Pure ALOHA.

Optimization:

- Experiment with different parameters to optimize the performance of both protocols.
- Discuss any improvements achieved and the trade-offs involved.

Conclusion:

- Summarize the key findings from the simulations.
- Reflect on the suitability of Pure ALOHA and Slotted ALOHA in different scenarios.

Submission:

Prepare a report documenting your implementation, simulations, and analysis. Include relevant code snippets, graphs, and observations.

Additional Tips:

- Use NS2 documentation and online resources for assistance.
- Include comments in your code to explain each section.
- Feel free to customize the scenarios and parameters to explore different aspects of the protocols