



TAGORE ENGINEERING COLLEGE

Approved by AICTE, New Delhi | Affiliated to Anna University, Chennai
Rathinamangalam, Vandalur – Kelambakkam Road, Chennai, Tamil Nadu 600127, India

Department of Computer Science and Engineering

Faculty Name : F.L.Dixcy, Assistant professor-CSE

Subject: Computer Networks

Role-Play Activity: Error Control Techniques

Objective:

Students will learn about the error control techniques, including error detection (e.g., checksums, CRC) and error correction (e.g., ARQ protocols), through a simulated network troubleshooting exercise.

Roles

1. Network Engineer (Student A)
2. Network Technician (Student B)
3. Network Administrator (Student C)
4. Support Staff (Student D)
5. Observer/Reporter (Student E)

Preparation:

1. Prepare handouts with information on error detection and correction techniques (e.g., CRC, checksums, ARQ).
2. Set up a basic network simulation if available, or use a network diagram to visualize the scenario.

Introduction

Explain the goal of the activity. The students will work in teams to troubleshoot network errors using error control techniques.

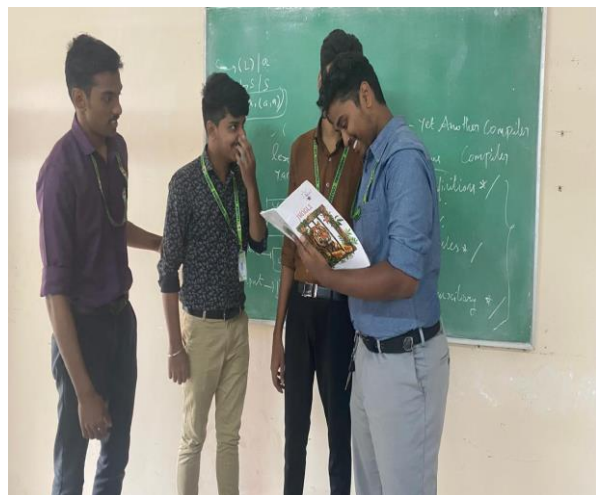
Assign each student a role from the list above. Each role has specific responsibilities.

- Present the scenario to the students. For example: Your company's network is experiencing high levels of data corruption and packet loss. You need to diagnose the problem and implement solutions to ensure reliable data transmission.
- Provide each student with their role-specific instructions:
- Network Engineer (Student A): Analyze the network traffic and identify error patterns.

- Network Technician (Student B): Implement and test error detection techniques (e.g., checksum or CRC).
- Network Administrator (Student C): Review and adjust error correction protocols (e.g., ARQ mechanisms).
- Support Staff (Student D): Document the troubleshooting process and communicate findings to the team.
- Observer/Reporter (Student E): Observe the process, take notes, and report on the team's performance and outcomes.

Role-Playing and Troubleshooting

1. Network Engineer (Student A): Use network simulation tools or diagrams to identify patterns of packet loss and corruption.
2. Network Technician (Student B): Apply and test error detection methods. For instance, if using a simulation tool, adjust settings to implement CRC and observe changes.
3. Network Administrator (Student C): Implement and adjust error correction strategies, such as switching from Stop-and-Wait ARQ to Go-Back-N ARQ. Test and monitor the impact on network performance.
4. Support Staff (Student D): Keep detailed records of what changes were made, the rationale behind them, and any observed effects.
5. Observer/Reporter (Student E): Watch the interactions and decision-making processes. Prepare a brief report on the effectiveness of the solutions applied.



Discussion and Debrief

1. Group Discussion: Have each student or group present their findings, solutions, and the impact of the error control techniques they implemented.

2. Review Techniques

- Discuss the effectiveness of the error detection methods (e.g., how CRC improved detection compared to checksums).
- Evaluate the error correction strategies (e.g., how Go-Back-N ARQ reduced retransmissions compared to Stop-and-Wait ARQ).

3. Feedback: Allow the Observer/Reporter to provide feedback on the team's performance and discuss any challenges faced during the role-play.

4. Q&A: Open the floor for any questions or additional insights on error control techniques.

Aim of Rollplay

- Students can Understand how different error detection methods work and their impact on network reliability.
- They will learn how error correction techniques can improve data transmission efficiency.
- Students Gaining practical experience in troubleshooting and problem-solving within a network environment.