

**D.N.R COLLEGE OF ENGINEERING & TECHNOLOGY**  
**Department of Electronics and Communication Engineering**  
**Academic Year: 2020- 2021 (Odd Semester)**  
**Innovative Teaching Method**

**B-Tech, Semester& Branch:** IV/ I Semester ECE

**Title:** Embedded Systems

**Name of the Faculty member:** Dr.S.Koteswari

**Name of the Topic:** Fault Tolerance Technique

**Name of the Innovative Practice:** Fraternize Group

**Date& Duration:** 06.08.2020 & 1 Hour 30 minutes

**Justification:**

The activity 'Fraternize Group' is used to recall the concepts learnt and enhance the learning through this collaboration. Through this activity the friendly relationship between students can develop. It encourages listening, engagement, and empathy by giving each member of the group an essential part to play in the academic activity.

**Details of the Implementation:**

The lessons are divided into subcategories. Students are divided into groups of 6 or 7 Students. The Class Strength is divided into 7 Groups with 6 members. The 7 groups are named as 1,2,3,4,5,6,7. Each group allotted with one topic, student learns about his or her topic, preparation materials are posted in CANVAS and presents it to group. Next, Expert group is formed consist of members from each group and discuss their topic with its member 15 Minutes, which has been already discussed with home group. Next, students gather into groups divided by topic. Expert group member presents topics to home group members. It is a cooperative learning method that brings about both individual accountability and achievement of the team goals. Each of these group is given a different topic and allowed to learn about it.



**Reflective Critique:**

***Feedback of practice from students and other stakeholders:***

Students feel that it was interesting. They learn how to communicate with team members and work together.

**Challenges faced in implementation:**

The main challenge faced is group conflict. Few Students are not ready to work together.

**References:**

1. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley Publications, 2013.
2. Embedded Systems-Lyla B.Das-Pearson Publications, 2013.

**D.N.R COLLEGE OF ENGINEERING & TECHNOLOGY**  
**Department of Electronics and Communication Engineering**  
**Academic Year 2020- 2021 (EVEN Semester)**  
**Innovative Teaching Method**

**B-Tech, Semester& Branch:** IV/ II Semester ECE

**Title:** Wireless Sensors And Networks

**Name of the Faculty member:** Dr.S.Koteswari

**Name of the Topic:** Designing Routing protocol for Adhoc wireless Networks

**Name of the Innovative Practice:** Think Pair and share

**Date& Duration:** 11.02.2021& 1 Hour 30 minutes

**Justification:**

After explaining the concept of Hidden terminal problem in adhoc wireless networks, to understand the learning level of the student about finding the nodes suffering from hidden terminal problem this activity was given. Since the classes were taken in online mode this technique was used.

**Details of the Implementation:**

- Displayed the presentation slide with a case study and asked them to find the nodes after by the hidden terminal problem.
- Identified 10 pair of students and asked them to think for one minute about hidden terminal problem.
- After that, the students were asked to chat in whatsapp among themselves about hidden terminal problem.
- Finally, asked them to enter the answer in chat box.

**Assessment of Effectiveness/Success of the Activity:**

- ✓ This activity was effective for online mode of delivery. It helped to find the active participation of the students.
- ✓ The success of the activity is measured by the performance in the internal Assessment test and Online Quiz.

**ISSUES IN DESIGNING A ROUTING PROTOCOL FOR AD-HOC WIRELESS NETWORKS**

- **Mobility :**
  - Due to mobility, frequent path break
  - Routing protocol able to Perform efficient and effective mobility management
- **Bandwidth Constraint:**
  - Radio band is limited – data rate offered is less than wired network
  - Optimal bandwidth usage with less overhead
  - Due to frequent change in topology, maintaining topological information involves more control overhead

**Contd...**

- **Error prone shared broadcast radio channel:**
  - Time varying characteristics in terms of link capacity and link error probability
  - To find alternate path through better quality links
  - Should find path with less congestion
- **Hidden and exposed terminal problem.**
- **Resource constraints:**
  - Battery life and processing power
  - Adhoc routing protocol should manage these resources

**Hidden and Exposed Terminals**



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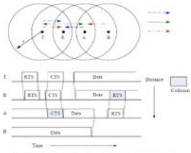
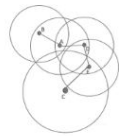


Figure 7.2 Hidden-terminal problem with RTS/CTS from IEEE 802.11

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**Think-Pair-Share**



For a given network, list all the node triplets that could potentially suffer from hidden node problem

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**Characteristics of an Ideal Routing Protocol for Ad Hoc**

- wired network routing protocols cannot be used in ad hoc wireless networks. Hence ad hoc wireless networks require specialized routing protocols
- Fully distributed – involves risk of single point failure
  - Adaptive to frequent topology changes – mobility of nodes
  - Minimum connection setup time is desired
  - Localized
    - global maintenance involves a huge state propagation control overhead

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- Loop free and free from stale routes
- Packet collision must seldom happen
- Converge to optimal route quickly
- Optimally use scarce resource
  - Bandwidth, computing power, memory, and battery
- Remote parts of the network must not cause updates in the topology information maintained by this node
- Provide quality of service and support for time sensitive traffic

**REFERENCES:**

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, “Wireless Sensor Networks- Technology, Protocols, and Applications”, John Wiley, 2007.
2. Feng Zhao & Leonidas J. Guibas, “Wireless Sensor Networks- An Information Processing Approach”, Elsevier, 2007.
3. Ad- Hoc Mobile Wireless Networks: Protocols & Systems, C.K. Toh ,1 ed. Pearson Education.
4. Wireless Sensor Networks - C. S. Raghavendra, Krishna M. Sivalingam, 2004, Springer
5. Wireless Sensor Networks – S Anandamurugan , Lakshmi Publications

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