Experiment No. 09

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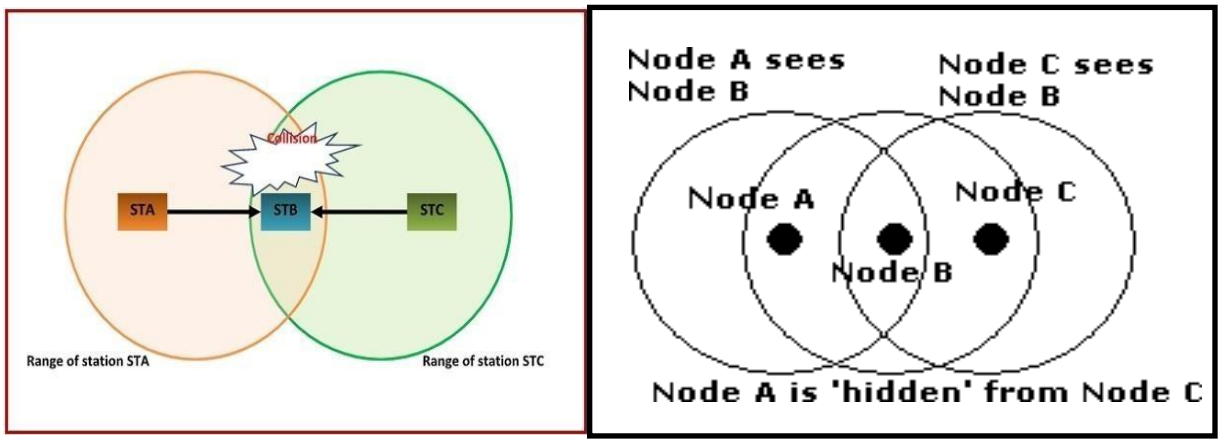
AIM: Illustration of Hidden Terminal Problem (NS-2)

THEORY:

In wireless LANs (wireless local area networks), the hidden terminal problem is a transmission problem that arises when two or more stations who are out of range of each other transmit simultaneously to a common recipient. This is prevalent in decentralized systems where there aren't any entities for controlling transmissions. This occurs when a station is visible from a wireless access point (AP), but is hidden from other stations that communicate with the AP.

Problem Illustration

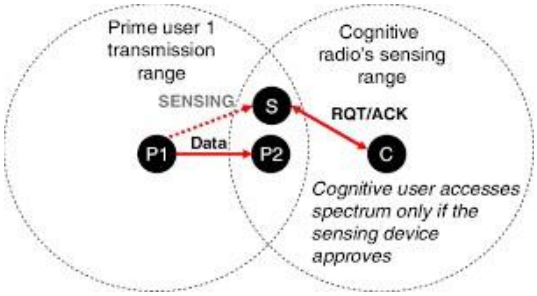
Suppose that there are three stations labelled STA, STB, and STC, where STA and STC are transmitting while STB is receiving. The stations are in a configuration such that the two transmitters STA and STC are not in the radio range of each other. This is shown in the following figure −



Solution

The exposed terminal problem is solved by the MAC (medium access control) layer protocol IEEE 802.11 RTS/CTS, with the condition that the stations are synchronized and frame sizes and data speed are the same. RTS stands for Request to Send and CTS stands for Clear to Send.

A transmitting station sends a RTS frame to the receiving station. The receiving station replies by sending a CTS frame. On receipt of CTS frame, the transmitting station begins transmission.

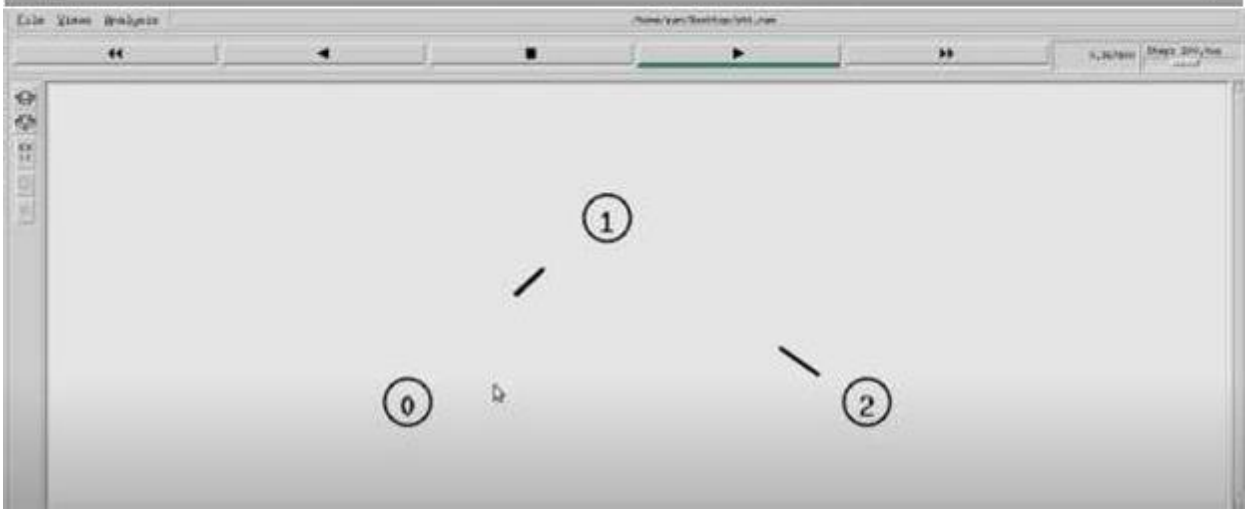


Any station hearing the RTS is close to the transmitting station and remains silent long enough for the CTS. Any station hearing the CTS is close to the receiving station and remains silent during the data transmission.

In the above example, station STC hears does not hear RTS from station STA, but hears CTS frame from station STB. So, it understands that STB is busy defers its transmission thus avoiding collision.

OUTPUT:

The node 0 and 2 want to send data to node 1 the range of node 0 and 2 is limited to 1 they do not know that other node is also sending data to 1 and therefore collision occurs.



CONCLUSION

From this experiment, we learnt about the hidden terminal problem. This problem is a transmission problem that arises when two or more stations who are out of range of each other transmit simultaneously to a common recipient. We have performed this experiment using NS2 and properly the same which helps to understand this problem properly.