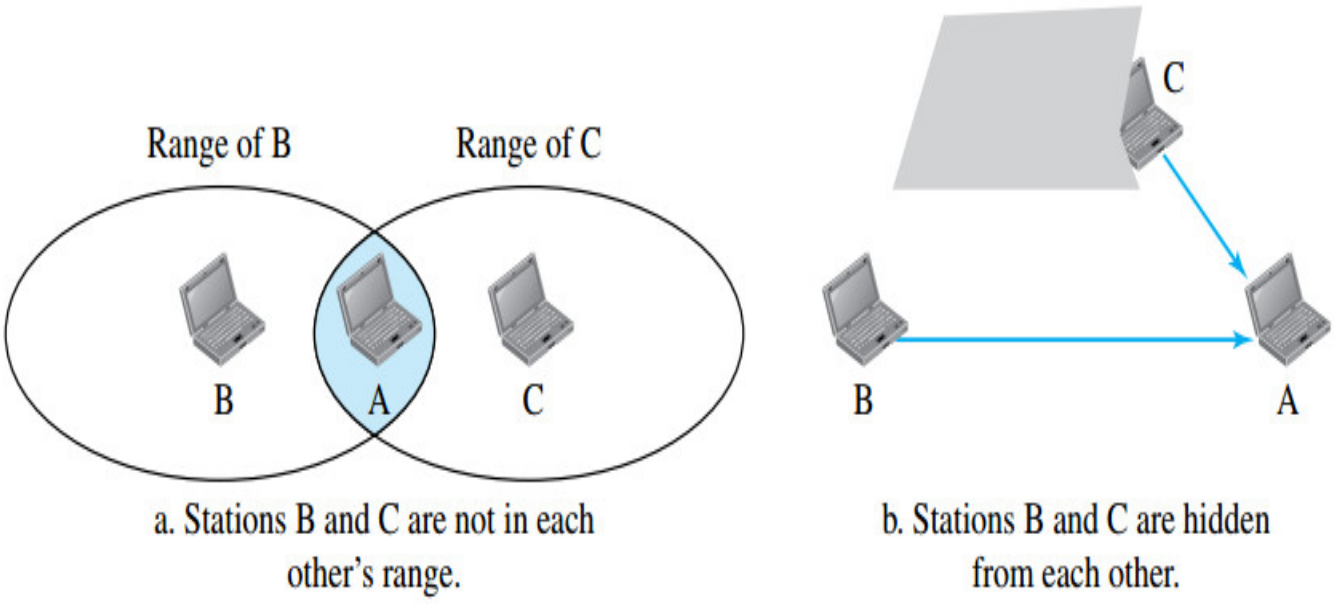
Principles of Data Communications

Reference Book: Data Communications and Networking by Behrouz A. Forouzan

Hidden Terminal Problem

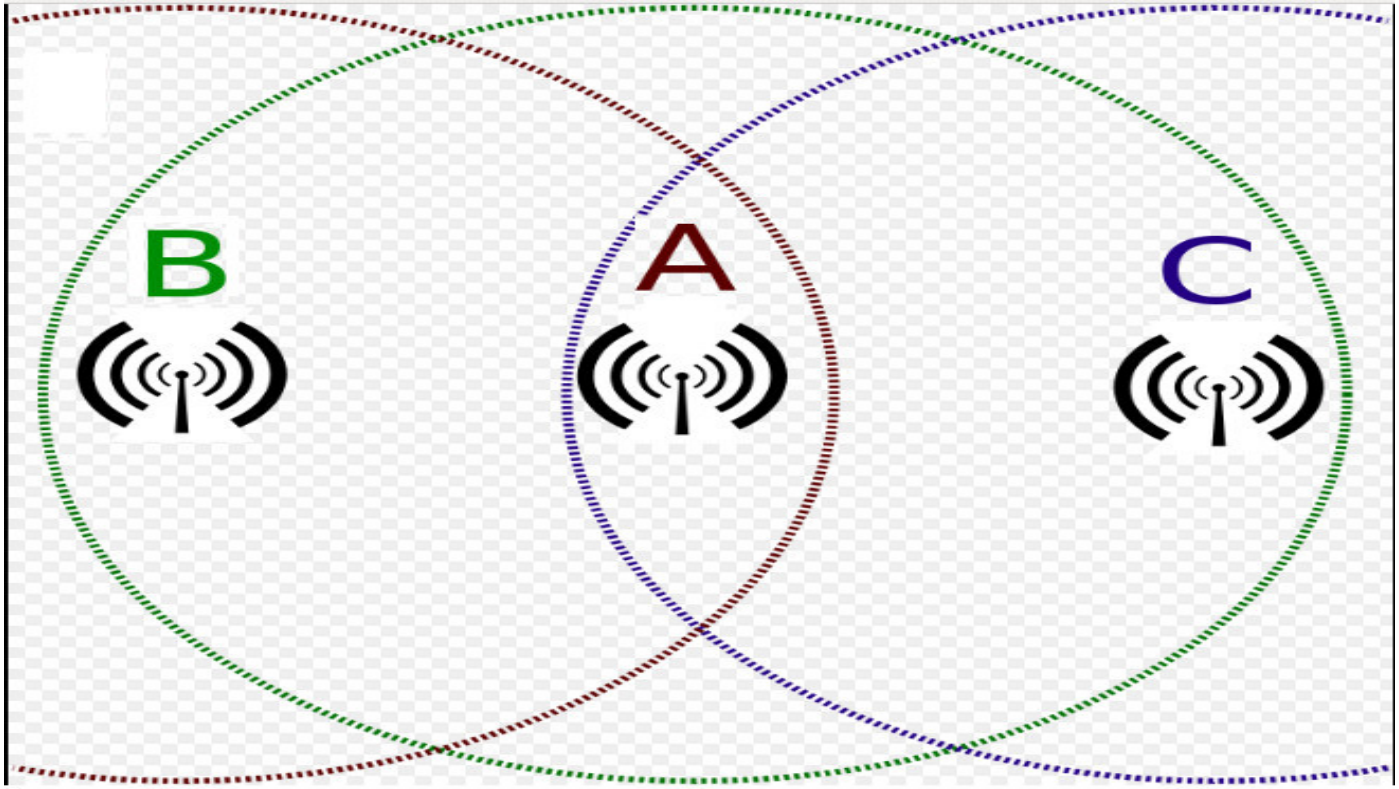
Hidden station problem



a. Stations B and C are not in each other's range.

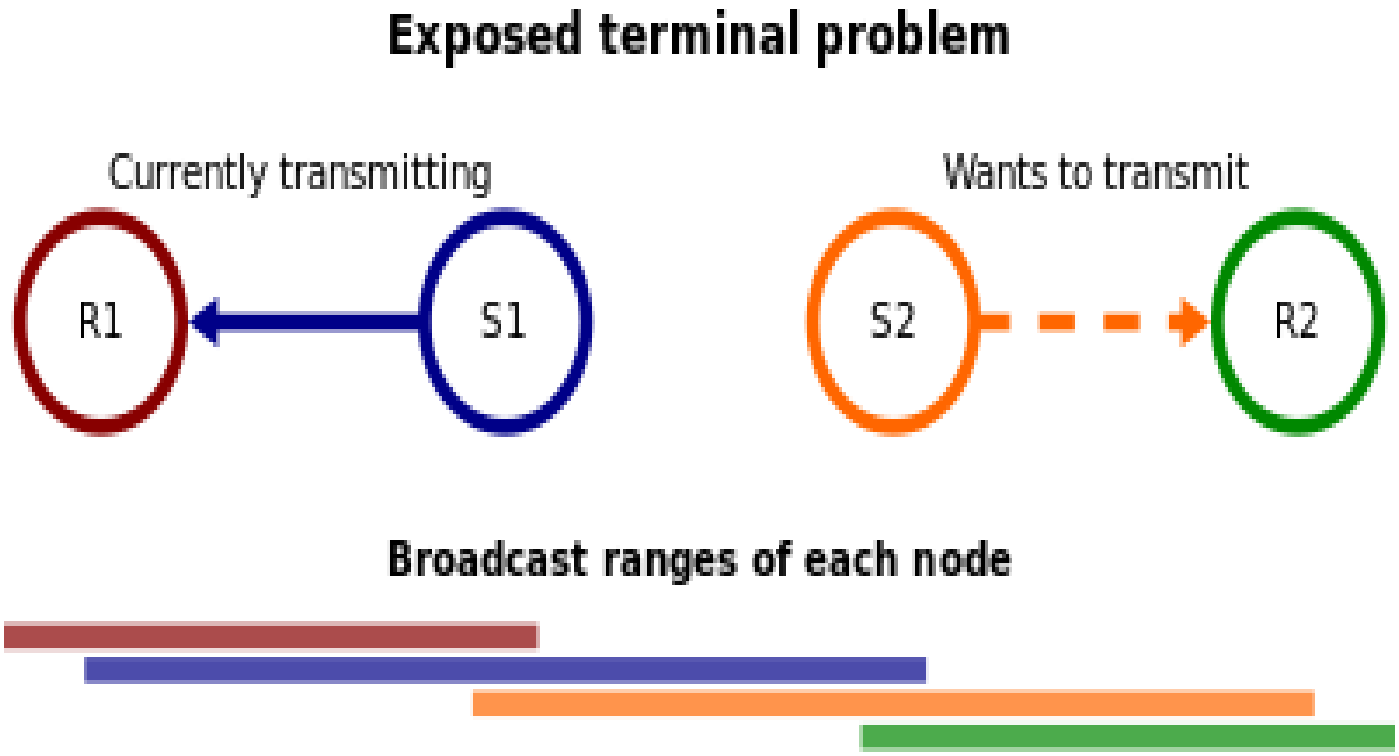
b. Stations B and C are hidden from each other.

Hidden Terminal Problem



- The solution to the hidden station problem is the use of the handshake frames (RTS and CTS).
- Because both B and C are within the range of A, the CTS message, which contains the duration of data transmission from B to A, reaches C.
- Station C knows that some hidden station is using the channel and refrains from transmitting until that duration is over.

Exposed Terminal Problem



- In wireless networks, the exposed node problem occurs when a node is prevented from sending packets to other nodes because of co-channel interference with a neighboring transmitter.
- Consider an example of four nodes labeled R1, S1, S2, and R2, where the two receivers (R1, R2) are out of range of each other, yet the two transmitters (S1, S2) in the middle are in range of each other.
- Here, if a transmission between S1 and R1 is taking place, node S2 is prevented from transmitting to R2 as it concludes after carrier sense that it will interfere with the transmission by its neighbor S1.
- However note that R2 could still receive the transmission of S2 without interference because it is out of range of S1.

- When a node hears an RTS from a neighboring node, but does not generate the corresponding CTS, that node can deduce that it is an exposed node and is permitted to transmit to other neighboring nodes.

THANK YOU