

Bandwidth Provisioning Scheme for 3D Wireless Sensor Networks

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Bandwidth (BW) resources are scarce and valuable in Wireless Sensor Networks (WSNs). Managing this scarcity in BW is a key challenge in WSN's environments. Achieving high BW utilization (BWU) will rise the Quality of Service (QoS) that network can guarantee, without the omission of the importance of concurring BWU, with the minimizing of connection blocking (CBP) and dropping (CDP) probabilities. This paper considers attaining high QoS from point of BW scheduling whether WSNs is designed in two or three dimensions, also our scheme studies the effect of existence or the absence of base station blind spot. We have tested WSN under sixteen different cases, which comprised: Two Dimension structure (2D), 3D structure, Indoor space (Is), Outdoor space (Os), without Blind Spot (nBS), with Blind Spot (wBS), using static borrowing mechanism (SBBS), and finally using dynamic borrowing mechanism (DBBS). The results revealed that considering network with using dynamic borrowing scheme and with rate up to 50 connection rate (CR) will have better QoS guarantees. Moreover, we can summarize that 3D space outperforms 2D space in general view. Finally, not considering BS and building network outdoor will have better QoS guarantee in general. In addition, it is worth mentioning that previous results are processed from repetition each situation 2500 times, which make these results high strict and reliable.

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