

One-Pager: MACAW (Bharghavan *et al.*, 1994)**Due at start of lecture, 23rd January, 2009**

In a typed essay of 200–500 words, concisely and clearly answer the following question:

The MACAW MAC protocol does not perform carrier sense (CSMA). As the authors explain in Section 2.2 of the paper, carrier sense doesn't solve the hidden terminal problem, and furthermore, it can give rise to the exposed terminal problem. As it turns out, however, not even the RTS/CTS mechanism included in MACAW allows exposed senders to send concurrently. Consider the exposed terminal problem that occurs in the topology in Figure 1, when B and C wish to send concurrently. The authors introduce the DS packet into MACAW specifically for this exposed terminal case. Would the DS packet be needed in the MACAW protocol if MACAW used carrier sense? Justify your answer by explaining the details of the problem with the RTS/CTS exchange that the DS packet solves, and explaining in detail how carrier sense would or would not solve that problem.