

Energy Impacts of Wired and Wireless Networks

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Abstract

Many commercial and residential buildings now have wired telecommunications networks. An emerging trend is to substitute wired with wireless networks, which have generally lower bandwidth but are easier to setup and manage. In order to compare the relative impacts of these two types of computer networks, we consider a case study of Carnegie Mellon University's campus network, which includes ubiquitous wired and wireless networks. We find that the network infrastructure alone consumes 6% of the campus electricity load. Further, while there is some difference in network performance between the two types of networks (and are thus not completely equivalent), the wireless network consumes considerably less energy. Since a college campus (especially a highly computer intensive one like the one studied) is not representative of all commercial, industrial, or residential buildings, these results are not generalizable, but are still useful in understanding some of the components of the 3% of all electrical load that is attributable to information technology in the U.S.. However, there are still important points to be made associated with the relative energy efficiency of wireless networking that can aid future deployment and policy issues..

Keywords

Electricity, network, wireless, infrastructure

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