

High-Speed Mobile and Wireless Networks

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Abstract. Mobile wireless networks have significantly different characteristics and constraints from wired networks. While link rates in these networks have traditionally been lower than fixed fiber optic networks, mobile and wireless links are getting more and more sophisticated. 802.11a operates at 54Mb/s, LMDS at 36Mb/s; satellite links of 622Mb/s have been experimentally deployed, and fixed point-to-point RF and free wireless links at 100Mb/s and beyond are available.

Mobile links present challenges to high-speed networks in the control plane due to the dynamic nature of topology and the resulting impact on QOS, such as time-varying bandwidth capacity and latency. Wireless links require fundamentally different mechanisms due to their unreliability, ranging from error control mechanisms to correct bit errors to compensating for highly dynamic channel conditions. As the bandwidth- \times -delay product of these links increase, so does the difficulty in dealing with these problems. Current satellite and deep space links have bandwidth- \times -delay products that are no larger than terrestrial networks, but the potential for petabits or exabits exists in future free-space laser interplanetary links.

This discussion session will explore the issues and challenges posed by high speed mobile wireless networks, and ways in which to meet these challenges at the MAC, link, transport, session, and application layers.

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