

Preface

There has been increasing interest in the domain of emerging maritime wideband communication networks, which could be a low-cost alternative for current maritime satellite system. It is envisioned that building up a “maritime highway” system will greatly contribute to the maritime distress, urgency, safety, and general communications, and thereby facilitate a myriad of attractive applications related to monitoring (e.g., large capacity data such as surveillance videos being uploaded after collecting from bridge, engine room or other critical regions of a vessel), safety (e.g., maritime safety information dissemination), infotainment (e.g., mobile office and multimedia data download and upload, especially for cruise industry), and cargo online management (e.g., real-time cargo status notification and handling management). With rapidly evolving applications, maritime wideband communication networks can not only revolutionize the navigation pattern to be safer and more efficient, but also extend wideband services from the land to the ocean with lower expense.

This brief aims at providing valuable insights on the video transmission scheduling for the maritime wideband networks. Notably, the alternative eco-friendly and renewable green energy in maritime environment will make the scheduling issue more challenging and fascinating. To the best of our knowledge, this is the first work in the form of monograph to do such investigation facing distinguished challenges with unique characteristics imposed in maritime wideband networks. The problem is of great importance since related fundamental guidance is very limited. In Chap. 1, we give a brief introduction to maritime wideband communication networks, maritime video applications and challenges to video transmission scheduling, based on identifying unique characteristics of this dedicated system. A comprehensive survey is then provided pertaining to maritime wideband networks, video transmission scheduling and energy modeling based video transmission scheduling in Chap. 2. In Chap. 3, video transmission scheduling is studied aiming at maximizing the weights of uploaded video packets. A store-carry-and-forward routing mechanism is designed to address the intermittent connectivity of maritime wideband communication networks. In Chap. 4, an energy and content aware scheduling scheme is proposed to maximize the delivered video packets throughput in green-energy-powered maritime wideband networks, based on the analysis of green energy buffer model. Especially, the simulations in this brief present real cases studies, which all depend on real ship

route traces obtained from navigation software BLM-Shipping. Finally, we draw conclusions and highlight future research directions in Chap. 5. This brief is meant as a petri dish to provide valuable guidance and new ideas in the field of video transmission scheduling for future maritime wideband networks.

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Maritime Wideband Communication Networks

Video Transmission Scheduling

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