1.	Record Nr.	UNINA9910508474503321
	Autore	Zhuang Weihua
	Titolo	Dynamic Resource Management in Service-Oriented Core Networks / / by Weihua Zhuang, Kaige Qu
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2021
	ISBN	3-030-87136-3
	Edizione	[1st ed. 2021.]
	Descrizione fisica	1 online resource (182 pages)
	Collana	Wireless Networks, , 2366-1445
	Disciplina	384.54524015193
	Soggetti	Computer networks
		Wireless communication systems
		Mobile communication systems
		Machine learning
		Computer Communication Networks
		Wireless and Mobile Communication
		Machine Learning
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di bibliografia	Includes bibliographical references and index.
	Sommario/riassunto	This book provides a timely and comprehensive study of dynamic resource management for network slicing in service-oriented fifth-generation (5G) and beyond core networks. This includes the perspective of developing efficient computation resource provisioning and scheduling solutions to guarantee consistent service performance in terms of end-to-end (E2E) data delivery delay. Based on a simplified M/M/1 queueing model with Poisson traffic arrivals, an optimization model for flow migration is presented to accommodate the large-timescale changes in the average traffic rates with average E2E delay guarantee, while addressing a trade-off between load balancing and flow migration overhead. To overcome the limitations of Poisson traffic model, the authors present a machine learning approach for dynamic VNF resource scaling and migration. The new solution captures the inherent traffic patterns in a real-world traffic trace with non-stationary traffic statistics in large timescale, predicts resource demands for VNF

resource scaling, and triggers adaptive VNF migration decision making, to achieve load balancing, migration cost reduction, and resource overloading penalty suppression in the long run. Both supervised and unsupervised machine learning tools are investigated for dynamic resource management. To accommodate the traffic dynamics in small time granularities, the authors present a dynamic VNF scheduling scheme to coordinate the scheduling among VNFs of multiple services, which achieves network utility maximization with delay guarantee for each service. Researchers and graduate students working in the areas of electrical engineering, computing engineering and computer science will find this book useful as a reference or secondary text. Professionals in industry seeking solutions to dynamic resource management for 5G and beyond networks will also want to purchase this book.