

Alcatel-Lucent Network Routing Specialist II (NRS II) Self-Study Guide Preparing for the NRS II Certification Exams

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Alcatel-Lucent
NRS^{II}
CERTIFICATION

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Dedicated to my father, Richard G. Warnock—you quietly inspired my sense of curiosity and passion for teaching and the value of hard work. This book would never have been started without the bedrock of my family—my wife, Maggie, and my daughter and son, Jana and Kim. And Fred—I know you would be proud.

—Glenn

To my parents, for their support over the years.

—Amin

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Glenn Warnock earned a B.Sc. in Computer Science from the University of Ottawa in 1977—in the early prehistory of Ethernet, the Internet, and fiber optics. He became fascinated with the possibilities of networking technologies while working for AT&T Canada and Apple Canada. Since he delivered his first course, “Programming in Pascal,” in 1979, teaching has also been an important and rewarding part of Glenn’s career. He was attracted to Alcatel-Lucent in 2006 by the potential of the 7750 SR and the opportunity to participate in the development of the Service Routing Certification program. The success of both has exceeded his optimistic expectations. He can be reached on Twitter at @Glenn_Warnock.

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The content of this book is entirely based on the three SRC courses—Interior Routing Protocols, Multiprotocol Label Switching, and Services Architecture. That means that this book is a joint effort of the SRC Subject Matter Experts group, past and present, who have all contributed to this content. Current members are Bo Li, Connie Kwan, Dave Watts, Ghassan Shaheen, Latif Ahmed, Michael Weir, Mira Ghafary, and Ray Belleville. We are also greatly indebted to the Alcatel-Lucent University SRC instructors who teach and contribute to the development of these courses. We are proud to be members of this skilled and committed team.

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—*The authors*

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—*Glenn Warnock*

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—*Amin Nathoo*

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Foreword

IP networks are supporting phenomenal change worldwide. Smartphones and tablets have untethered the Internet and communications, information, entertainment and commerce are available anytime, anywhere. Advances in networking, computing and storage technologies are also changing how we interact and conduct business. And at the heart of this change are advanced Service Routing platforms under the management and control of networking engineers like you.

Your investment in this Service Routing Certification self-study program from Alcatel-Lucent will help you and your organization acquire the technical skills, knowledge, and competency needed to succeed in this dynamic and fast-paced environment. The challenges are great. Customers are demanding a more diverse set of applications and services, across many more devices. This greatly impacts how service providers, mobile operators, and enterprise and vertical customers build, operate and maintain their IP networks.

The continuous scaling of networks at the lowest per-bit delivery cost is critical to meeting these new challenges—equaled only by the need to extract greater value from the network to support new business models and revenues. This is the foundation of the Alcatel-Lucent High Leverage Network™ vision—carefully architected changes to basic router and network design in order to scale routing performance while also scaling service sophistication. This is what we call *Service Routing*—a concept we introduced with the world's first Service Router, and which is now deployed by more than 400 service provider customers around the world.

The business, organizational, and customer value of having highly trained personnel with professional certifications in the areas of IP/MPLS and Ethernet-based networks and services has never been greater. Congratulations on taking this important step forward to attain your Network Routing Specialist II certification. With this certification you will be well positioned to help your company or customer succeed in this exciting new world of advanced IP communications and collaboration.

—*Basil Alwan*

President, IP Division and Head of Portfolio Strategy,
Alcatel-Lucent Networks Group

