

# IPv6 Essentials

## 2nd Edition

### AUTHOR PROFILE:

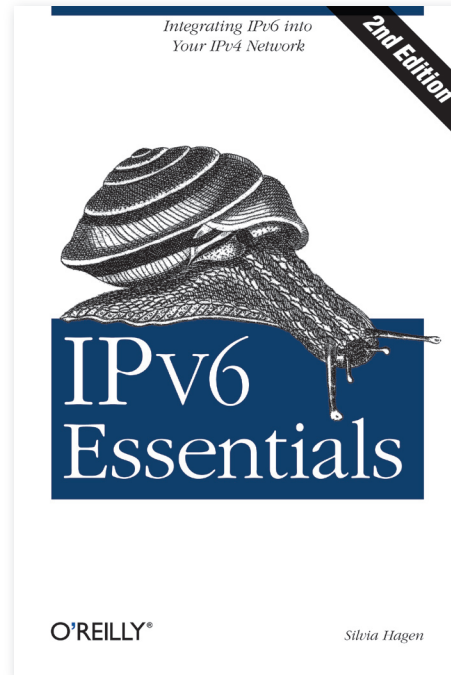
Silvia Hagen has been in the networking industry since 1990, and became a CNE and CNI in 1992. She began her career as a successful instructor, and has trained hundreds of system engineers. Today she is CEO of Sunny Connection AG in Switzerland and works as a senior consultant and analyst for many mid-size and large sized companies. Her expertise is in identity management and protocol analysis. She loves technologies that create frameworks for collaboration. She is the author of the successful book 'Novell's Guide to Troubleshooting TCP/IP', published by Novell Press and 'SLP - Guide to Service Location Protocol', published by Podbooks. She also presents internationally on various networking topics for Universities, Novell's Brainshare, NetWare Users International Conferences and also offers customized corporate presentations. For more details and contact information visit her website at <http://www.sunny.ch>.

### DESCRIPTION:

*IPv6 Essentials*, Second Edition provides a succinct, in-depth tour of all the new features and functions in IPv6. It guides you through everything you need to know to get started, including how to configure IPv6 on hosts and routers and which applications currently support IPv6. The new IPv6 protocols offers extended address space, scalability, improved support for security, real-time traffic support, and auto-configuration so that even a novice user can connect a machine to the Internet. Aimed at system and network administrators, engineers, network designers, and IT managers, this book will help you understand, plan for, design, and integrate IPv6 into your current IPv4 infrastructure.

Beginning with a short history of IPv6, author Silvia Hagen provides an overview of new functionality and discusses why we need IPv6. Hagen also shares exhaustive discussions of the new IPv6 header format and Extension Headers, IPv6 address and ICMPv6 message format, Security, QoS, Mobility and, last but not least, offers a Quick Start Guide for different operating systems.

Whether you're ready to start implementing IPv6 today or are planning your strategy for the future, *IPv6 Essentials*, Second Edition will provide the solid foundation you need to get started.



### *IPv6 Essentials*, 2nd Edition

by Silvia Hagen  
 ISBN 059-610-058-2, 436 pages  
 \$44.99 US/\$58.99 CAN  
 MAY 2006

### TABLE OF CONTENTS:

<b>PREFACE</b>	<b>IX</b>
<b>I. WHY IPV6?</b>	<b>I</b>
The History of IPv6	3
What's New in IPv6?	4
Why Do We Need IPv6?	5
Common Misconceptions	8
When Is It Time for IPv6?	10
IPv6 Around the World	12
IPv6 Status and Vendor Support	15
References	16

*continued on back*

<b>2. THE STRUCTURE OF THE IPv6 PROTOCOL</b>	<b>17</b>	<b>5. SECURITY WITH IPv6</b>	<b>101</b>	<b>10. INTEROPERABILITY</b>	<b>255</b>
General Header Structure	17	General Security Concepts	101	Dual-Stack Techniques	255
The Fields in the IPv6 Header	18	General Security Practices	102	Tunneling Techniques	256
Extension Headers	22	IPsec Basics	103	Network Address and Protocol Translation	278
References	34	IPv6 Security Elements	108	Comparison	284
<b>3. IPv6 ADDRESSING</b>	<b>35</b>	Overview of New IPsec RFCs	115	Integration Scenarios	286
The IPv6 Address Space	35	Interaction of IPsec with IPv6 Elements	116	Case Studies	288
Address Types	36	IPv6 Security “Gotchas”	116	What Is Missing?	301
Address Notation	37	Enterprise Security Models for IPv6	122	Security Aspects	305
Prefix Notation	38	References	124	Applications	305
Global Routing Prefixes	39	<b>6. QUALITY OF SERVICE</b>	<b>128</b>	Cost of Introduction	306
Global Unicast Address	40	QoS Basics	128	Vendor Support	308
Special Addresses	44	QoS in IPv6 Protocols	130	References	310
Link- and Site-Local Addresses	48	Using QoS	135	<b>11. MOBILE IPv6</b>	<b>314</b>
Anycast Address	49	References	135	Overview	315
Multicast Address	51	<b>7. NETWORKING ASPECTS</b>	<b>137</b>	The Mobile IPv6 Protocol	319
Required Addresses	56	Layer 2 Support for IPv6	137	ICMPv6 and Mobile IPv6	326
Default Address Selection	57	Detecting Network Attachment (DNA)	145	Mobile IPv6 Communication	329
References	58	References	146	Security	336
<b>4. ICMPv6</b>	<b>60</b>	<b>8. ROUTING PROTOCOLS</b>	<b>148</b>	Extensions to Mobile IPv6	337
General Message Format	60	The Routing Table	149	References	339
ICMP Error Messages	64	RIPng	152	<b>12. GET YOUR HANDS DIRTY</b>	<b>341</b>
ICMP Informational Messages	69	OSPF for IPv6 (OSPFv3)	163	Linux	341
Processing Rules	70	BGP-4 Support for IPv6	201	BSD	343
The ICMPv6 Header in a Trace File	71	Additional Routing Protocols for IPv6	214	Sun Solaris	347
Neighbor Discovery (ND)	73	References	222	Macintosh	348
Autoconfiguration	87	<b>9. UPPER-LAYER PROTOCOLS</b>	<b>224</b>	Microsoft	350
Network Renumbering	91	UDP/TCP	224	Cisco Router	354
Path MTU Discovery	92	DHCP	226	Applications	359
Multicast Listener Discovery (MLD)	93	DNS	242	Description of the Tests	359
Multicast Router Discovery (MRD)	98	SLP	247	<b>A. RFCs</b>	<b>365</b>
References	99	FTP	248	<b>B. IPv6 RESOURCES</b>	<b>378</b>
		Telnet	250	<b>C. RECOMMENDED READING</b>	<b>406</b>
		Web Servers	250	<b>INDEX</b>	<b>407</b>
		References	252		