# IPv6 Basics: Addressing and Subnetting

IPv6 is the next-generation internet protocol that will replace IPv4. IPv6 addresses are 128 bits long, compared to IPv4 addresses which are 32 bits long. This increase in address space allows for a much larger number of devices to be connected to the internet.
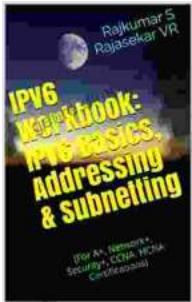
IPv6 Workbook: IPv6 Basics, Addressing & Subnetting: (For A+, Network+, Security+, CCNA, HCNA Certifications) by Sahara Sanders

★★★★★ 5 out of 5

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IPv6 addressing is based on hexadecimal notation. Each hexadecimal digit represents four bits. IPv6 addresses are typically written in eight groups of four hexadecimal digits, separated by colons. For example, the IPv6 address 2001:0db8:85a3:08d3:1319:8a2e:0370:7334 represents the following binary value:

```
00100000 00001101 10111011 10010111 00000001 00011011 11101011 01110100
```

The first 64 bits of an IPv6 address represent the network prefix. The remaining 64 bits represent the host identifier. The network prefix identifies

the network to which the device is connected. The host identifier identifies the specific device on the network.

IPv6 subnetting is the process of dividing a network prefix into smaller subnetworks. Subnetting allows for more efficient use of IP addresses and can improve network security. To subnet an IPv6 network, you use a subnet mask. A subnet mask is a 128-bit value that indicates which bits of the IPv6 address represent the network prefix and which bits represent the host identifier.

For example, the following subnet mask would create two subnetworks from the network prefix 2001:0db8:85a3:08d3::/64:

```
ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff
```

The first 64 bits of the subnet mask are all ones, which indicates that all 64 bits of the network prefix are used to identify the network. The remaining 64 bits of the subnet mask are all zeros, which indicates that all 64 bits of the host identifier are used to identify the host.

This subnet mask would create two subnetworks with the following network prefixes:

```
2001:0db8:85a3:08d3::/65 2001:0db8:85a3:08d3:ffff:ffff:ffff:ffff/65
```

Each of these subnetworks could then be further divided into smaller subnetworks, if necessary.

IPv6 addressing and subnetting are essential topics for network engineers and administrators. This book provides a comprehensive overview of these topics, with clear explanations and examples. If you are interested in learning more about IPv6, this book is a valuable resource.

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This chapter provides a detailed overview of IPv6 subnetting, including the benefits of subnetting, the different types of subnet masks, and the rules for subnetting IPv6 networks.

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This chapter provides tips for troubleshooting IPv6 problems, including common IPv6 problems and how to resolve them.

IPv6 is the next-generation internet protocol that will eventually replace IPv4. This book provides a comprehensive overview of IPv6 addressing and subnetting, essential topics for network engineers and administrators. If you are interested in learning more about IPv6, this book is a valuable resource.
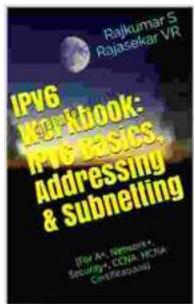
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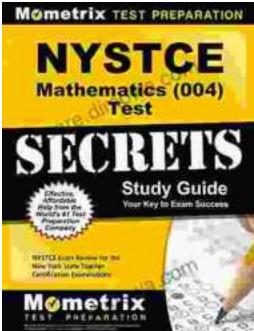
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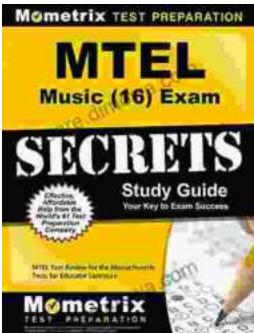
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