

# CCNA Summary

## CCNA Routing & Switching *200-120* Understanding Networks and their Building Blocks

TODO

This chapter is not yet complete!

### IP Addressing and Subnets

TODO

This chapter is not yet complete!

### Introduction to Cisco Routers, Switches and IOS

TODO

This chapter is not yet complete!

### Introduction to IP Routing

TODO

This chapter is not yet complete!

### Routing Protocols

TODO

This chapter is not yet complete!

### Switching and Spanning Tree Protocol

TODO

This chapter is not yet complete!

### VLANs and VTP

TODO

This chapter is not yet complete!

### Network Security

TODO

This chapter is not yet complete!

### Access Lists

TODO

This chapter is not yet complete!

### Network Address Translation (NAT)

TODO

This chapter is not yet complete!

### Wide Area Networks

TODO

This chapter is not yet complete!

### Virtual Private Networks

TODO

This chapter is not yet complete!

### IPv6

#### IPv6 Introduction

Due to the shortcomings of IPv4, the Internet Protocol version 6 (IPv6) has been created. The main reason for migratig TCP/IP networks from IPv4 to IPv6 is the avaiaable address space. While IPv4 uses a 32-bit address, IPv6 uses a 128-bit address. The change from IPv4 to IPv6 also impacts other protocols as well (*OSPFv3*, *EIGRPv6*, *etc.*).

Just like IPv4, the main objective of IPv6 is to enable devices to forward packets through multiple routers so they arrive at the correct destination. However, IPv6 contains a number of differences over IPv4:

- Larger address space;
- Auto-configuration;
- The IPv6 header is *not* similar to the IPv4 header;
- Extension headers/options;
- Authentication and privacy;
- Flow labels (*QoS*).

There are thee types of IPv6 addresses:

**Unicast** Unique address for each interface.

**Anycast** Multiple interfaces, packets are send to one (*nearest*).

**Multicast** Multiple interfaces, packets are send to all.

#### Key Concept

IPv6 broadcast addresses are special case of multicast addresses.

An IPv6 address is a 128-bit value, displayed as 8 groups of 4 hexadecimal digits. For example:  
2001:0DB8:0000:0000:0006:0600:300D:527B. Leading zeros can be left out: 2001:DB8:0:0:6:600:300D:527B, one or more adjacent groups of 16 bit of zeros can be replaced with the :: symbol (*once!*): 2001:DB8::6:600:300D:527B.

IPv6 provides tow similar options for unicast addressing:

**Global Unicast** Similar to public IPv4 addresses. These addresses are allocated by the IANA. Each company is assigned a unique IPv6 address block called a *global routing prefix*. Global Unicast addresses make up the majority of IPv6 addresses.

**Unique Local** Similar to private IPv4 addresses. Can by used by when behind a IPv6 NAT and in networks that aren't connected to the internet.

Address Type	Binary Prefix	IPv6 Notation
Unspecified	0000 (128 bits)	::/128
Loopback	0001 (128 bits)	::1/128
Multicast	1111 1111	FF00::/8
Link-Local Unicast	1111 1110 10	FE80::/10
Global Unicast	<i>everthing else</i>	<i>everthing else</i>

#### IPv6 Address Configuration

TODO

This chapter is not yet complete!

#### OSPF version 3

TODO

This chapter is not yet complete!

#### EIGRP for IPv6

TODO

This chapter is not yet complete!

#### IP Services

TODO

This chapter is not yet complete!