



# Welcome to IPv6

IPC\_121d | On-Demand | Transport | ⚙️

Course Duration: 1 hour

As the communications industry transitions to wireless, wireline converged networks to support voice, video, data and mobile services over IP networks, a solid understanding of IP and its role in networking is essential. IP is to data transfer as a dial tone is to a wireline telephone. IPv6 was defined in 1998 but saw little adoption for over a decade. With continued IPv4 address depletion and the migration to wireless VoIP in LTE networks, the time for widespread adoption has finally arrived. This course begins with a look at the motivation for migrating to IPv6, followed by an explanation of the IPv6 header and addressing concepts, and the 128-bit address necessitates changes to many of the supporting protocols for IP.

## Intended Audience

This course is intended for technical personnel with a grounding in IPv4 networks who are seeking a technical overview of IPv6 and related protocols.

## Objectives

After completing this course, the student will be able to:

- Describe why the migration to IPv6 is finally happening
- List the key benefits of IPv6
- Explain key fields in the IPv6 header
- Discuss how IPv6 addresses are formatted and how they are assigned
- Explain how the basic IP supporting protocols are enhanced to support IPv6
- Describe how automatic routing for IPv6 networks is enabled by BGP and OSPF
- Discuss how dual stack devices help ease the transition from IPv4 to IPv6
- Understand the differences between configured and automatic tunnels for IPv6 transition

## Course Prerequisites

No Prerequisites

## Outline

1. Motivation and Benefits
  - 1.1 IPv4 address depletion
  - 1.2 Limitations of NAT
  - 1.3 Benefits of IPv6
2. IPv6 Header and Addresses
  - 2.1 Header format
  - 2.2 Address format
  - 2.3 Address notation
  - 2.4 Types of addresses
  - 2.5 Address assignment
3. Supporting Protocols
  - 3.1 ICMP
  - 3.2 DNS
  - 3.3 DHCP
  - 3.4 OSPF
  - 3.5 BGP
4. Transition to IPv6
  - 4.1 The transition problem
  - 4.2 Dual stack
  - 4.3 Configured tunneling
  - 4.4 Automatic tunneling
  - 4.5 IPv6 in LTE