INCOGNITO FACT SHEET

Overcoming IPv4 exhaustion and preparing for IPv6 with MAP-T

Introduction

Shortages. They aren't just for toilet paper, bicycles, or computer chips. There's also an exhaustion of IPv4 addresses. At one time the world's nearly 4.3 billion IPv4 addresses seemed like plenty, but in a highly connected world where every stationary and mobile device has an IP address, it's amazing how quickly 4.3 billion can go.

Like most problems, IPv4 exhaustion has solutions, but that doesn't mean they're simple.

What can operators do?

Operators have three main options:

Seek to acquire IPv4 addresses to expand their existing resource pool.

- However, at $32 USD per address—and rising—that's a costly proposal.

Migrate from IPv4 to IPv6

- Long-term this is coming, and Incognito can help you get there. For now, though, the Internet isn't ready for IPv6 only—some aspects of IP communications still rely on IPv4. And the magnitude of the migration process means it's not a practical short-term plan.

Extend existing IPv4 investment while planning for IPv6 migration

- This is the approach many operators will pursue, but even this option leads to more choices which we explain next.

MAP-T vs. CGNAT

CGNAT—stateful solution

CGNAT (carrier-grade NAT) was developed specifically to address IPv4 exhaustion by allowing multiple subscribers to share.

Unfortunately, like a stateful solution, CGNAT is hardware-intensive and costly. Because CGNAT tracks the state of every single lease, session, IP address assignment, and more, it has significant CPU, database, and memory requirements.

MAP-T—stateless solution

Enter Mapping of Address and Port—Translation (MAP-T). This primarily stateless technology extends IPv4 in a similar way to CGNAT, with a much less costly deployment because there's no requirement for a server to keep track of every single session and address assignments and availability, and provides v4-v4 connectivity over a v6 domain.

MAP-T sounds like a great solution, and you may be wondering if there's a catch. Well, yes—for large-scale deployment, MAP-T requires special IPv6 configurations by the DHCP server.

The good news is, Incognito's Broadband Command Center (BCC 8.0) supports those specialized configurations.

Automating complex DHCPv6 settings

There are three main ways to tackle the necessary DHCP settings:

Open-source DHCP servers

While open source may seem like a cost-cutting approach, it's not carrier-grade and you have to maintain it yourself, so the savings you want may not materialize.

Broadband network gateway (BNG) or broadband remote access server (B-RAS)

These tools may seem well-suited for the task, but they're not vendor agnostic and may lock you in.

Incognito's BCC 8.0

By automating complex DHCPv6 settings, Incognito's proven, carrier-grade BCC (Broadband Command Center) product can help you extend your IPv4 investment with MAP-T automation while preparing you to deploy IPv6 at scale.

Configuration settings simplified by BCC 8.0

Incognito's carrier-grade BCC platform can automate configurations for operators to easily introduce MAP-T at scale in the following ways:

DHCPv6 complex options for MAP-T:

- DHCPv6 option 95; sub-options 89, 91, 93
- Multiple data types in the sub-options

DHCPv6 link address criteria—v6 gateway:

- Client class
- Device classifier

Summary

MAP-T is a technology telecom operators can use to extend the life of their valuable IPv4 resources. Although the method is similar to CGNAT, this technology is "stateful" and requires a large hardware investment. As a primarily stateless solution, MAP-T is less costly to deploy. However, it requires some special configurations by the DHCPv6 server to be deployed on a large scale. BCC 8.0 now supports those specialized configurations.

To find out how our solution can help you address your IPv4/IPv6 challenges in the most efficient way possible, please visit www.incognito.com/products/broadband-command-center/.

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