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## Internet Runs Out Of IP Addresses

The supply of IPv4 addresses is technically exhausted. It's time to accelerate the transition to IPv6.

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The pool of Internet addresses [has officially been drained](#). Four non-profit Internet administrative groups -- the Internet Corporation for Assigned Names and Numbers (ICANN), the Number Resources Organization (NRO), the Internet Architecture Board (IAB) and the Internet Society -- said at a press conference in Miami, Florida, on Wednesday that the supply of IPv4 addresses has been depleted.

"This is a major turning point in the ongoing development of the Internet," said Rod Beckstrom, ICANN's president and CEO, in [a statement](#).

The situation however isn't imminently dire: It's not as if companies or individuals who want to launch a Web site will be unable to do so. There are likely to be addresses to be had for months if not years, and the dwindling supply may be extended through network addressing tricks. But the limits of IPv4 are no longer theoretical.

With the last remaining IPv4 addresses allocated -- two blocks of IP addresses, about 33 million, were assigned to the Regional Internet Registry (RIR) for the Asia Pacific region earlier this week and the five final blocks were doled out in conjunction with the press conference -- Internet service and network providers may finally be motivated to deploy equipment that supports IPv6, an updated version of the Internet Protocol designed to be IPv4's successor.

IPv4 addresses take the form of four octets -- four sets of numbers ranging from 0 to 255 separated by periods. They can describe about 4.3 billion addresses ( $2^{32}$ ), which generally then get associated with an Internet domain name through the DNS system. IPv6 addresses are expressed using eight sets of four-digit hexadecimal numbers and can represent  $2^{128}$  possible addresses, enough that it's difficult to foresee IPv6 address exhaustion ever being a problem.

Beckstrom said that the Internet technical community has been planning for this day and that IPv6 adoption is now of paramount importance, in order for Internet-related innovation to continue.

IPv6 is not widely adopted yet. According to Google, [only about 0.2% of Google visitors](#) would be capable of accessing an IPv6 version of Google search if the company offered such a service.

Help is on the way, slowly. On June 8, 2011, the Internet Society will be staging an event called [World IPv6 Day](#). At that time, Akamai, Cisco, Facebook, Google, Microsoft, Limelight Networks, Juniper Networks, Yahoo, and a handful of other organizations will be enabling IPv6 on their networks, though only as a 24-hour test.

While the transition from IPv4 to IPv6 is taking place, expect speculators to try to exploit the situation, as happens when any resource becomes scarce.

Martin Hannigan, a member of the American Registry for Internet Numbers (ARIN) advisory board, acknowledged that there's an underground market for IP address blocks, despite the existence of legitimate transfer mechanisms. He anticipates that in the five to ten years it will take for the IPv6 transition to take hold, there's likely to be black market trade in IP addresses and that prices will rise. But he suggests such activity could actually accelerate IPv6 adoption, by making it more cost effective than IPv4.

Whatever happens, the transition won't come soon enough.