

IPV4 TO IPV6 NETWORK ADDRESS TRANSLATOR

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Abstract

IPv6 is a new version of internetworking protocol designed to address the shortcomings of the current standard IPv4. The address space is limited to only 32 bits in IPv4 whereas IPv6 has 128 bits address in addition to mobility constraints and network layer security. The main problem is that IPv4 and IPv6 are not directly compatible. So various translation mechanisms have been developed to address interoperability of IPv4 and IPv6 networks and systems. This project aims at translating IPv4 into IPv6 and vice-versa. To communicate with IPv6, the address of IPv4 changed to IPv6. This can be done by two methods namely: IPv4 addressing and MAC addressing. In IPv4 addressing, the translator contains 96-bit binary address. The machine in which we are working contains the IPv4's 32-bits address and it is converted into binary form. Separate every 8-bits into 4-bits sequences. Thereby translator obtains the eight 4-bits sequences. This form will also in the binary form. Removing the dots from IPv4 address and divide the 32-bits into two 16-bits sequences and adding 96-bits before the 32-bits. Finally 128-bits binary values and transformed to the hexadecimal values. In MAC addressing, the translator contains 64-bits binary address. The machine in which we are working contains the IPv4's 48-bits MAC address and it is converted into EUI-64 form. This form will be added after 64-bits binary address. Finally 128-bits address are transformed to the hexadecimal values. These two above translator methods are designed and tested. For implementations, packets are sent from IPv4 machine to IPv6 machine through the translator and it was properly sent and received by the other.